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A Health Impact Assessment (HIA) of Park, Trail, and Green Space Planning in the West Side of Greenville, South Carolina

South Carolina Institute of Medicine & Public Health

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Introduction

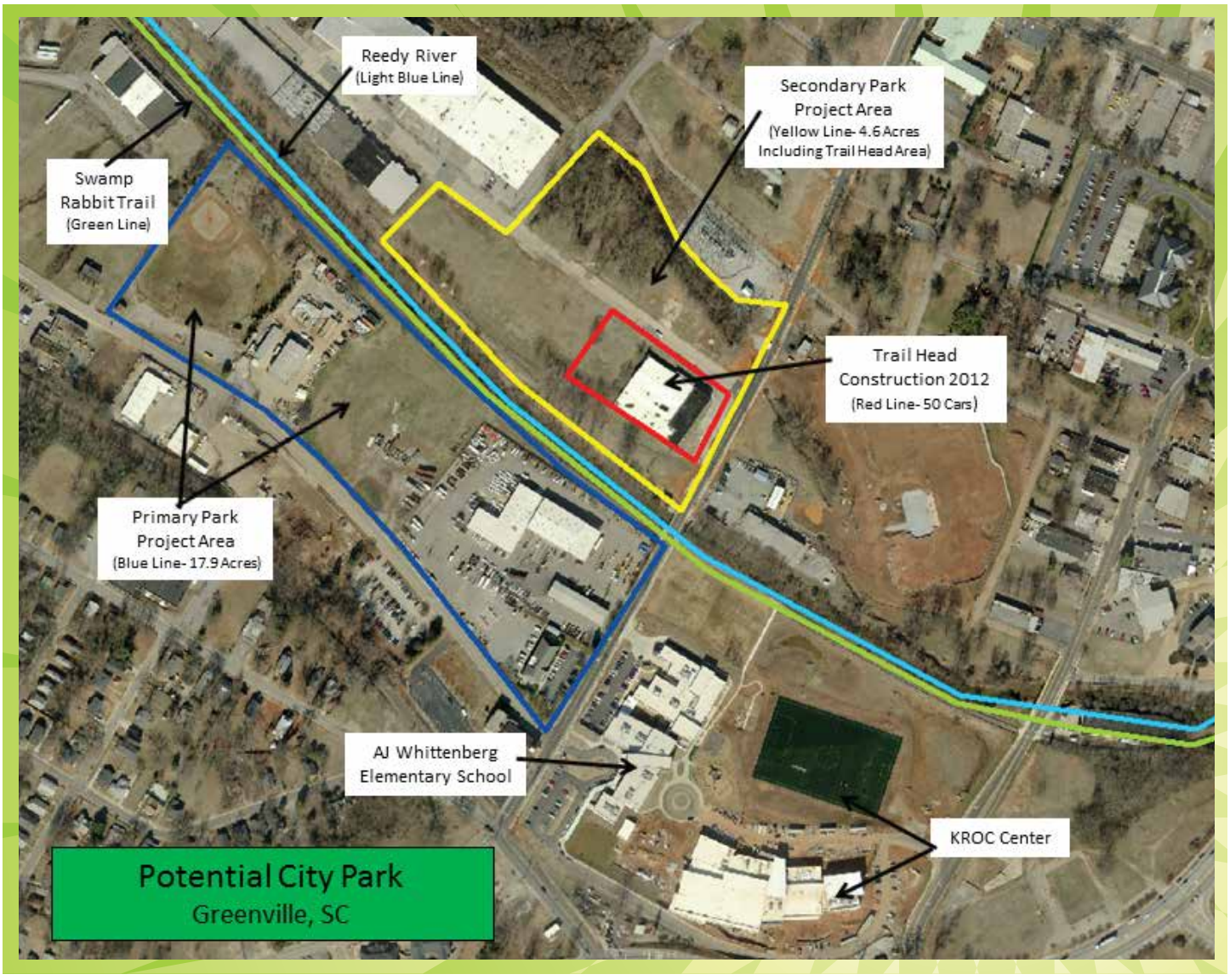
The Centers for Disease Control and Prevention (CDC) reports that in 2010, 36 states had an obesity rate of at least 25 percent and 12 states had a 30 percent or higher obesity rate. South Carolina had a 31.5 percent obesity rate - the fourth worst rate in the country (CDC, 2012a). The 2010 Behavioral Risk Factor Surveillance System (BRFSS) data shows that in South Carolina 64 percent of white adults and 76 percent of African American adults are overweight or obese. Twenty-seven percent of adults in South Carolina do not partake in any leisure time physical activity (CDC, 2010). For Greenville County, the most current BRFSS data indicates that 50 percent of adults do not participate in recommended amounts of physical activity, which is slightly less than the state level of 54.6 percent of adults (BRFSS, 2009).

In a study supported by the Piedmont Health Foundation and performed by Furman University and Activate Upstate in 2008, the Greenville County School District collected Body Mass Index (BMI) data from students by calculating their weight, height, and age to determine rates of overweight and obesity. The research concluded that 26 percent of white, 44 percent of Hispanic, and 49 percent of African American children in Greenville County Schools were overweight or obese (Reed, 2012). A lack of regular physical activity for children in Greenville County contributes to high obesity rates. In order to help reduce obesity rates, alterations to the built environment can be made to make it more conducive to physical activity. Providing areas for recreation such as trails, parks, and open space not only aids in promoting physical activity but also helps the local economy (Reed, 2012).

In Greenville, South Carolina, the City of Greenville is currently conducting a three-year comprehensive planning process called "Connections for Sustainability: Linking Greenville's Neighborhoods to Jobs and Open Space" focusing on Greenville's west side, which includes three economically challenged and physically fragile neighborhoods: West Greenville, West End, and Southernside. To assess the various health effects of potential parks, trails, and green space, the concept of Health in All Policies was implemented through the use of a Health Impact Assessment (HIA). For the HIA, the definition of the west side was expanded to include the surrounding area (See Appendix A for a map). The geographic area of analysis was expanded because the effects of the potential park could reach into surrounding neighborhoods and in order to increase the sample size of the community-level data.

In partnership with the City of Greenville, the South Carolina Institute of Medicine and Public Health (IMPH) integrated an HIA into the part of the comprehensive planning process that focused on parks, trails, and green space. The City's planning process also includes considerations related to economic development, housing, and transportation. The HIA took place between May and December of 2012. During this time, the City began a planning process for a community park as a possible re-use of property currently used to house the Public Works department, which is sited in a flood zone. The map to the right demonstrates a potential outline of the park's boundaries.

Map 1: Potential City Park



How This Report is Organized

This report begins with a brief overview of HIA practice, followed by a description of the setting and participants for this particular HIA project. Following reporting guidelines for HIAs, this report then documents the different phases of this project, starting with screening, and then moving in order through scoping, assessment, and recommendations.[1]

Health Impact Assessment

Increasing evidence indicates that our health is not determined solely by our behavior, choices, and genetics. Health is determined by many different components including socio-economic status and where a person is born, lives, and works. In order to ensure improvements in public health, health needs to be considered in non-health related projects, programs, plans, and policies. Non-health related organizations that influence health include, but are not limited to, those working in transportation, housing, agriculture, and education (National Research Council of the National Academies [NRCNA], 2011). The concept of bringing health to the forefront and strengthening the consideration of health for policies in other sectors is best defined as a Health in All Policies (HiAP) approach. HiAP is a strategy that "focuses on particular social determinants of health through integrated policy response across relevant policy areas with the ultimate goal of supporting health equity" (European Portal for Action On Health Inequalities [EPAOHI], n.d., Definition, para,1). It strives to increase positive health outcomes through assessments that can be associated with certain policies, and thereby decrease negative health impacts (Rajott, Ross, Ekechi, & Cadet, 2011).

HiAP is often implemented through a Health Impact Assessment (HIA). An HIA is a systematic assessment that combines scientific data, professional expertise, and stakeholder involvement to determine the effects that a potential policy, plan, program, or project might have on the health of a particular population (NRCNA, 2011). HIAs provide information to decision-makers that can help minimize the anticipated adverse health effects and maximize positive health outcomes. It can be utilized across a number of sectors and can be applied at the federal, state, tribal, and local levels (NRCNA, 2011). HIAs consist of six steps: screening, scoping, assessment, development of recommendations, reporting, and monitoring/evaluation.

During screening, the proposed policy or program is reviewed to determine if it is a strong candidate for an HIA. Several aspects are considered; including feasibility, ability to inform the decision, and availability of both a sufficient timeframe to conduct an HIA and evidence related to the potential research questions. The scoping phase sets the boundaries and goals of the HIA, brings together interested stakeholders and partners, outlines the timeline, and determines the research questions. This phase also identifies health determinants that should be analyzed and vulnerable populations that could be affected, such as low-income families and individuals, the disabled, children, the elderly, and racial and ethnic minorities (NRCNA, 2011). During the assessment phase, a literature review provides empirical evidence related to the research questions, and baseline demographic,

[1] The final phase of the HIA—monitoring and evaluation—will be conducted following the publication of this report as resources allow.

health, social, economic, and environmental data is collected. This information is utilized to analyze the positive and adverse health effects of the proposed project or policy and specifically to examine the direction, intensity, magnitude, duration, and likelihood of impact (NRCNA, 2011).

Recommendations are developed to maximize the positive health impacts of the proposed policy or project and to mitigate potential negative health impacts that have been identified. These recommendations, typically created and prioritized by an Advisory or Steering Committee, are based on the research collected as well as community input and participation. Ideally, recommendations are cost-effective, practical, and politically acceptable. The reporting phase documents the process and its findings and establishes a dissemination plan for communicating the HIA findings and recommendations. A final HIA report and/or executive summary are then provided to stakeholders, decision-makers, and members of the affected community. The final phase of monitoring/evaluation can be conducted through three techniques: process, impact, and/or outcome evaluation. Process evaluation determines if the HIA was implemented according to the original plan and followed best practices and standards that were set at the beginning. Impact evaluation tracks the impact of the HIA on the decision-making process. Outcome evaluation focuses on the changes in health status due to the implementation of the project; this phase requires a large amount of time and resources and is therefore not always included in HIAs (NRCNA, 2011).

In the United States, the use of HIAs has increased significantly over the past ten years, and HIAs have been implemented on a variety of government levels to evaluate health impacts. Most HIAs to date focus on local communities and are associated with housing, transportation, or land use (NRCNA, 2011). A useful resource on HIA is the Health Impact Project; please visit their website at www.healthimpactproject.org for more information. In South Carolina, there has been one HIA completed that addressed the built environment and a proposed road re-design. "The HIA of Proposed 'Road Diet' and Re-Striping Project on Daniel Morgan Avenue in Spartanburg, South Carolina" was completed in April 2012. The report can be found in the publications section of www.imph.org.

Greenville, South Carolina

The HIA project area is located in Greenville, South Carolina, which is situated in the northwest corner of the state (referred to as the Upstate). Greenville County has the largest population of any county in the state (451,225 people), and the City of Greenville is one of the largest cities in the state (City of Greenville, 2012; U.S. Census, 2010). Relocate America 2010 ranked Greenville in the ten top places to live in the U.S. for 2011, and Greenville is considered one of the best small cities for bike riding, according to Bicycling Magazine (2012). Along with being a bike-friendly area, Greenville is known for its parks (Falls Park ranked in the top 15 in the country by US Airways 2011 in-flight magazine) and for its outstanding art weekends, which ranked 46 out of a total of 600 fine art shows nationally (Greenville Chamber of Commerce, 2012). The Greenville area also has a performing arts center and museums. Recently, the Great American Main Street Award was given to downtown Greenville (City of Greenville, 2012).

When it comes to education, Greenville has the largest public school system within the state, with nine out of the 15 public high schools ranking in the top six percent nationally (Greenville Chamber of Commerce, 2012). In the county, there are 605 National Board Certified (NBC) teachers, which ranks the county 11th in the country for number of NBC teachers. For continuing education, there are more than ten colleges and universities located in or close by Greenville (City of Greenville, 2012; Greenville Chamber of Commerce, 2012).

Over 250 international businesses from 26 nations have located headquarters or other offices in Greenville, such as BMW and Michelin (City of Greenville, 2012). Greenville was ranked in the top 30 best cities for jobs (The Daily Beast, 2011) and the 46th best place in the U.S. for business and careers by Forbes in 2009. According to the U.S. News 2009-2010 guide to America's Best Hospitals, Greenville Memorial Hospital is ranked in the top 50 hospitals in the country; its highest ranking (#24) is for diabetes and endocrine disorders (Greenville Chamber of Commerce, 2012).

With all of these positive aspects of the community, it is important to note that there are vulnerable neighborhoods that need attention. The project area, Greenville's west side, is an economically depressed community with a population of about 16,583 people (U.S. Census, 2010). The community is comprised mostly of minorities: African Americans comprise 37.6 percent of the population, and Hispanics comprise another 20.6 percent (U.S. Census, 2010). Only 30.8 percent of residents age 25 years and over have a high school degree, with only 11.3 percent having any education after high school (American Community Survey [ACS], 2005-2009). Another important aspect of the community is its low home ownership rate (ACS, 2005-2009).

In Greenville's west side, Legacy Charter School has made changes to better the health of its students by requiring physical activity every school day. This is the only public school in South Carolina to have this type of policy in place. Other schools in Greenville County only require 30 minutes a week of physical activity for kindergarteners, physical education once a week for first through fifth grade, one semester of physical education a year for middle school students, and one physical education class for high school students over a four-year period. Benefits to increasing students' physical activity level to five days a week include improved cognitive ability, lowered risk of infection, and decreased risk of cardiovascular disease, depression, anxiety, and type 2 diabetes (Lee, 2012).

Key HIA Terms and Concepts

Health:
A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.[2]

Health Impact:
Any change in the health of a population or any change in the physical, natural, or social environment that has a bearing on public health.[3]

Health Impact Assessment:
HIA is a systematic process that uses an array of data sources and analytic methods in addition to input from stakeholders to determine the potential effects of a potential policy, plan, program, or project on the health of a population and the distribution of the effects within the population. HIA provides recommendations on monitoring and managing those effects.[4]

Stakeholders:
Individuals or organizations who are affected by the policy, plan, or project under consideration; have an interest in the health impacts of the policy, project, or plan under consideration; and/or have direct or indirect influence on the decision-making and implementation process of the policy, project, or plan under consideration.

[2] World Health Organization definition of health.
[3] National Research Council, Improving Health in the United States: The Role of Health Impact Assessment (National Academy Press, Washington, DC, 2011).
[4] National Research Council, Improving Health in the United States: The Role of Health Impact Assessment (National Academy Press, Washington, DC, 2011).

Health Equity

The term equity is an ethical concept used to represent social justice or fairness. When applied to health, equity is used to describe the lack of health disparities. More specifically, "equity in health can be defined as the absence of systematic disparities in health (or in the major social determinants of health) between social groups who have different levels of underlying social advantage/disadvantage" (Braveman & Gruskin, 2003, p. 254). Therefore, health inequity is the term applied when describing vulnerable populations that are disadvantaged when it comes to their health and well-being. Examples of populations that can be considered socially disadvantaged include individuals living in poverty, females, and/or minority groups (Braveman & Gruskin, 2003).

HIA Partners

The City of Greenville Connections for Sustainability team is lead by Wayne Leftwich, Community Planner, and includes Christa Jordan, Livability Grant Coordinator - Economic Development; Keith Brockington, Greenville-Pickens Area Transportation Study (GPATS); Tee Coker, Arnett Muldrow Consulting - Alignment Consultant; Chris Petitt, Arnett Muldrow Consultants - Intern; and Sarah Cook, Grant Coordinator.

Advisory Committee members represented organizations as diverse as Brockwood Senior Housing, Children's Advocacy/Safe Kids Upstate, the County of Greenville, Furman University, Greenville City Council, Greenville County Redevelopment Authority, Greenville Forward, Greenville Hospital System University Medical Center, Hispanic Alliance, LiveWell Greenville, Mental Health America of Greenville County, New Horizon Family Health Services, the Piedmont Health Foundation, Safe States Alliance, SHARE/Head Start, South Carolina Department of Health and Environmental Control (DHEC), Trees Greenville, United Way of Greenville County, Upstate Forever, and Upstate Homeless Coalition. Additionally, a number of community residents participated actively in the Advisory Committee. All Advisory Committee members are listed on page 1 at the beginning of this report.

Timeline

IMPH and City of Greenville staff began discussing the idea of conducting an HIA related to the Connections for Sustainability project in 2011. In March of 2012, IMPH was awarded one of two national HIA demonstration grants from the National Network of Public Health Institutes (NNPHI) and the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts,[5] to conduct a comprehensive HIA. As discussed in the screening section, IMPH staff, with guidance from grant funders, other HIA practitioners, and city staff, decided to conduct the HIA on only one of the project's four focus areas: the expansion and/or addition of parks, green space, and trails in Greenville's west side.[6]

IMPH conducted a full-day HIA training in March 2012 with the support of the Piedmont Health Foundation. Many of the Advisory Committee and Project Team members were in attendance and were introduced to the project at this time. In June 2012, the HIA officially began when the Advisory Committee finalized the scope and determined the goals of the project. They also identified populations that are likely to be affected by the potential park, trails, and green space and established a set of causal pathways, which demonstrate how different factors lead or contribute to various health outcomes. The causal pathways include health impacts,

[5] The opinions expressed in this report are those of the HIA Advisory Committee and do not necessarily reflect the views of the National Network of Public Health Institutes, the Health Impact Project, the Robert Wood Johnson Foundation, or The Pew Charitable Trusts.

[6] The other focus areas are housing, transportation, and economic development.

health determinants, and outcomes that the HIA would address. Due to the large number and complexity of the causal pathways and the limited timeframe for the HIA, the Advisory Committee assigned a priority level (A or B) to each pathway. Priority A pathways were deemed to be most important to the project and would be looked at in-depth through a literature review and data collection. Priority B pathways would be analyzed through a literature review only.

Work on the assessment phase of the project was conducted between July and September 2012. The key data identified during the scoping phase related to Priority A causal pathways was collected and analyzed. The Advisory Committee outlined the direct, indirect, and cumulative pathways for each health determinant and health outcome identified in the scoping process. Based on the information obtained from a literature review and analyzed data, the Advisory Committee began formulating recommendations that would maximize positive health impacts and minimize adverse health impacts of the potential creation of a park, trails, and green space in Greenville's west side. The recommendation phase began in September 2012 and was completed in November 2012. This report was written and completed in early 2013.

Screening

In the screening phase, HIA practitioners review proposed policies or programs to determine if they are viable candidates for an HIA. Several aspects are considered, including feasibility, ability to inform the decision, demonstrated stakeholder interest, accessible evidence related to the potential research questions, and availability of a sufficient timeframe and resources.

In November 2011, IMPH staff attended a national two-day HIA training session in Washington, DC funded by the Health Impact Project. At this meeting, IMPH staff introduced the Connections for Sustainability project as a potential candidate for an HIA and worked with trainers and other participants to develop causal pathways and draft research questions related to possible changes to housing, transportation, and parks/trails/green space. Due to a finite timeframe and limited budget, IMPH was encouraged to choose one of the areas of interest when applying for grant funds with which to carry out the HIA. With guidance from grant funders, other HIA practitioners, and city staff, IMPH chose to focus the HIA on the parks/trails/green space component of the City's planning effort. An additional reason for this decision was that the timing of the HIA funding fit well within the timeline of the City's planning project in this area.

Additionally, the potential creation of a park, trails, and green space was a good candidate for the focus of this HIA because:

- According to research, the potential park, trails, and green space created by the plan would provide opportunities for physical activity and possible avenues to increase access to healthy food.
- The project was hypothesized to have positive health benefits for a large number of residents in Greenville's diverse and economically disadvantaged west side, and thus potentially address key health disparities.
- Decisions concerning the project had not yet been made, but the potential creation of a park was being considered by the City and additional information could aid in the decision-making process. A preliminary land identification plan was under development during the HIA process.
- The project has many interested partners from government, the community, and non-profit entities.

HIA Scope & Research Questions

Health equity was explicitly considered at each step of the HIA, in part because of the relatively large number of low income and minority households in the study area, but also because of the documented role that parks and open space play in influencing health equity. Multiple studies show that low income communities have significantly less access to recreational facilities than wealthier communities, resulting in poorer health (Ross, 2007). Key research findings include:

1. A person's income level greatly affects their available opportunities for physical activity, ranging from access to walkable streets to proximity to schools, parks, and open space (Institute of Medicine [IOM], 2012; Jackson, 2012; Moore, Roux, Evenson, McGinn, & Brines, 2008).
2. Families in low income neighborhoods often lack access to safe places for their children to play (County of Los Angeles Public Health, 2007).
3. Disparities in locations and access to parks, trails, and green spaces can have an effect on the ability of individuals to utilize these resources and may limit their ability to meet daily recommended levels of physical activity (Blanck et al., 2012).
4. When recreational facilities are available in lower income neighborhoods, resident families cannot always afford activities that are offered if payment is required. Parks are often a no- to low-cost option that allows for recreation for low income families (Moore et al., 2008).
5. Increasing access to parks is correlated with an increase in physical activity of residents. Proximity to parks is the key issue for most low income residents (County of Los Angeles Department of Public Health, 2007).

In addition to providing opportunities for physical activity, research and community input indicate that a new park/trail/green space in Greenville's west side would also likely influence health equity through impacts on other related health determinants: social cohesion, economic stability, and access to healthy foods. Given the socio-demographic make-up of the west side, the extent to which a park, trail, and open space positively or negatively impact these health determinants also determines the extent to which health equity is improved.

In the scoping phase, the HIA team continued to identify and work with interested stakeholders to establish project goals, identify key health determinants that are likely to be impacted, and develop key research questions for the HIA. The HIA team and stakeholders also identified vulnerable populations that were likely to be impacted, such as low income families and individuals, the disabled, children, the elderly, and racial and ethnic minorities, to help determine the extent to which health equity might also be impacted (NRCNA, 2011).

The Advisory Committee developed the following goals for this HIA:

1. Outline the anticipated positive and negative health impacts of the development of parks/trails/green space in Greenville's west side. Anticipated positive impacts will be supplemented with recommendations about how to maximize these impacts; anticipated negative impacts will be supplemented with recommendations related to minimizing these impacts.
2. Increase understanding among HIA participants and community residents of the relationship between health and the built environment.
3. Foster an approach of HiAP for community members and leaders as well as decision-makers.

4. Develop a more formally structured role for the Advisory Committee in assisting community residents in reviewing proposed policies that would impact health.
5. Continue to build capacity and interest in future HIAs in Greenville and in South Carolina.

Based on research and stakeholder input, the Advisory Committee initially considered a wide variety of health determinants. Eventually, the Advisory Committee decided to focus the HIA on assessing impacts to the following key determinants based on the likelihood and magnitude of impact, as determined by existing research and stakeholder input: physical activity, social cohesion/capital, community and family economic stability, food access, individual and community safety, and air and water quality.

The Advisory Committee developed the scope of the HIA based on the following Priority A research questions. For each Priority A research question, the Advisory Committee developed a set of variables (indicators) to aid in answering the research questions. A data source with those variables was then identified; this data serves as a baseline statistic that represents the community in its current state. This data was supported by a literature review that enabled predictions to be made about each health determinant. Below are the ten research questions used to assess Priority A health determinants and outcomes. For a detailed description of the indicators and data sources for each research question, see Appendix B.

- What are the current physical activity levels for residents in the community, and how could this be affected by a potential park, trails, and green space?
- What are the current rates of overweight, obesity, and chronic diseases in the community, and how could this be affected by a potential park, trails, and green space?
- How many residents have experienced injury due to recreational activity in the community, and how could this be affected by a potential park, trails, and green space?
- How many and what type of community events for residents already exist that promote social cohesion, and how could this be affected by a potential park, trails, and green space?
- What is the current mental health status of residents in the community, and how could this be affected by a potential park, trails, and green space?
- What are the current economic circumstances of the community, and how could this be affected by a potential park, trails, and green space?
- What is the current home ownership rate in the community, and how could this be affected by a potential park, trails, and green space?
- What is the demographic profile of the community, and how could this be affected by a potential park, trails, and green space?
- How many people are currently homeless in the west side community, and how could this be affected by a potential park, trails, and green space?
- How many outlets for healthy food are in the community, and how could this be affected by a potential park, trails, and green space?

In selecting the indicators and data to address each research question, the Advisory Committee focused on data that could be obtained on the community level, was most appropriate to inform a prediction, and was available within the timeframe of the HIA.

For research question one (what are the current physical activity levels for residents in the community), the Advisory Committee examined data from the Greenville County Community Health Needs Assessment (CHNA), looking specifically at the self-reported number of days that residents exercised. It is important to note that all data from the CHNA survey comes from a very small sample size and therefore should be treated as anecdotal evidence. The next research question (what are the current rates of overweight, obesity, and chronic diseases in the community) examined hospital utilization rates and self-reported health status (excellent, very good, good, fair, or poor). Hospital utilization data was obtained from the Office of Research and Statistics at the South Carolina Budget and Control Board, and self-reported health status data was accessed through the CHNA.

For the third research question (how many residents have experienced injury due to recreational activity in the community), the South Carolina Department of Health and Environmental Control's Division of Injury and Violence Prevention (DIVP) provided data related to the number of injuries in the community caused by recreational activities. For the fourth research question (how many and what type of community events for residents already exist that promote social cohesion), the Advisory Committee examined baseline data from community centers in the project area. This includes the number of recreational facilities, the different types of programs that these facilities hold, and how many individuals participate in these programs.

Next, the Advisory Committee examined data related to mental health for research question five (what is the current mental health status of residents in the community). This data, from the CHNA, represents one indicator of mental health and portrays the self-reported frequency of residents feeling depressed. The sixth research question (what are the current economic circumstances of the community) utilizes baseline data from the City of Greenville, the 2010 Census, and the American Community Survey (ACS) 2005-2009. The ACS data was chosen for many variables because it provides data on the census tract level and the five-year estimates (average of the years) have a large sample size, making it the most reliable source when analyzing smaller communities. Variables analyzed in the economic analysis include household income, occupation of residents, percentage of families and individuals living below the federal poverty level, number of business licenses issued in the community, percent of households that are transit-dependent, and unemployment rates in the community.

The ACS data was also utilized for research question seven (what is the current home ownership rate in the community). The Advisory Committee examined the percentage of homes occupied by homeowners, the percentage of homes occupied by renters, housing type (family vs. non-family), property values for owned homes, rental rates, and rental vacancy rates. The eighth research question (what is the demographic profile of the community) encompasses the baseline data for the community and includes variables such as population estimates by age, gender, educational attainment, and race. The ninth research question (how many people are currently homeless in the west side community) utilized data provided by the Upstate Homeless Coalition. The data includes the number of homeless people served by shelters in or near the west side, and thus only includes a portion of the homeless population.

For the final research question (how many outlets for healthy food are in the community), the Advisory Committee looked at healthy food indicators. The data came from the Nutrition Environment Measures Survey (NEMS), which outlines the number of grocery stores, convenient stores, and restaurants in the community.

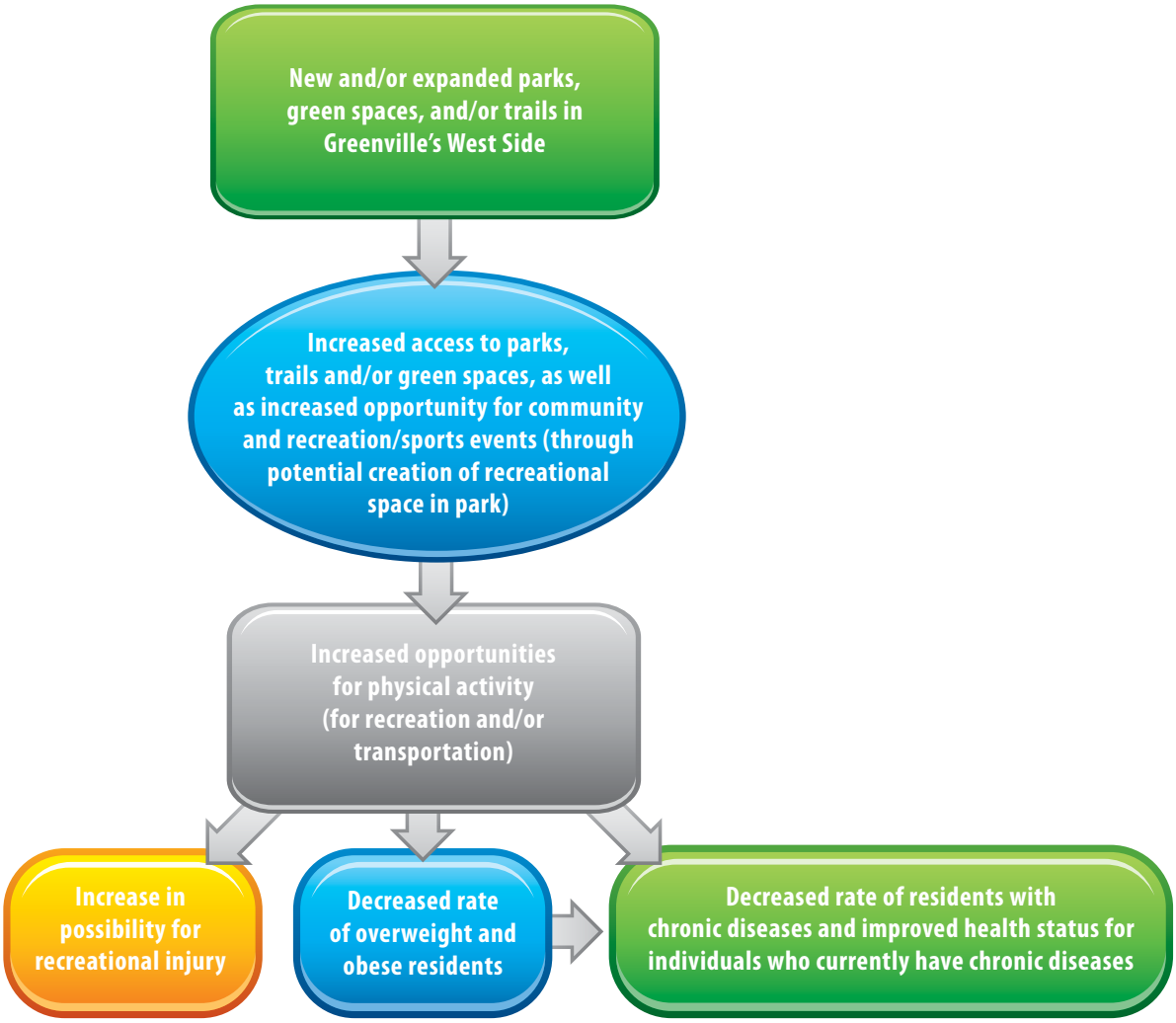
Assessment and Causal Pathways for Health Determinants

This section documents the connections between parks, trails, and green space and health via the identified health determinants and assesses the potential for new amenities in the west side to positively or negatively impact health. For each Priority A heath determinant, the HIA team identified indicators related to each relevant research question and focused research on determining whether these indicators would be positively or negatively impacted by the potential new facilities. The following section addresses each Priority A and Priority B health determinant in turn, with research questions, causal pathways, and related indicators identified at the outset. This is followed by an assessment of potential positive or negative impacts based on a review of relevant research findings and information about local conditions.

Physical Activity (Priority A)

Research Questions 1, 2, and 3: What are the current physical activity levels for residents in the community? What are the current rates of overweight, obesity, and chronic diseases in the community? How many residents have experienced injury due recreational activity in the community?

Physical Activity Pathway



Rationale:

1. Through creation of a new and/or expanded park, trails, and green space in Greenville's west side, there will be an increase in residents' opportunities for physical activity. By participating in physical activity, the health of residents, including those who have a chronic disease or are considered overweight/obese, will improve. This improvement may lead to a decrease in the rates of overweight/obese residents, as well as a decrease in chronic disease.

2. Through creation of a new and/or expanded park, trails, and green space in Greenville's west side, there will be an increase in residents' opportunities for physical activity. The new opportunities could lead to an increase in recreational injuries related to the physical activity.

Supporting Literature:

Literature analysis by County Health Rankings & Roapmaps (2012a) finds that making changes to the built environment to provide greater access to areas for recreation, such as the creation or expansion of parks and green space, is an integral part of encouraging physical activity in a community. Thirty percent of people who are physically active exercise in public parks (Brownson, Baker, Housemann, Brennan, & Bacak, 2001), and the CDC reports that greater access to parks leads to 25 percent more people exercising three or more days a week (CDC, 2001).

Those who live in higher socioeconomic neighborhoods tend to have greater access to recreation; therefore, it is important to provide facilities in low socioeconomic neighborhoods to decrease physical activity disparities (County Health Rankings & Roadmaps, 2012b). Parks can provide no- or low-cost options for physical activity in low income communities by providing facilities for recreation, organized activities, and a walking destination (Cohen et al., 2007; Transportation Research Board [TRB], 2005). Proximity to a park is crucial to increasing physical activity levels (Cohen et al., 2006; Kahn et al., 2002); research in Los Angeles found that individuals living within two miles of a park are 34 percent more likely to exercise at the park than in their own home (Human Impact Partners, 2009). The study also found that 81 percent of individuals living within a mile of a park are four times more likely to go to the park one or more times per week (Human Impact Partners, 2009).

Increasing access to and levels of physical activity in a community can lead to positive health benefits related to obesity and chronic disease (County Health Rankings & Roadmaps, 2012b; TRB, 2005). It is predicted that in 2018, assuming the current trends continue, the medical costs related to obesity will be about $344 billion, which would account for 21 percent of the nations direct health care spending (United Health Foundation, 2009). Statistics from Weight of the Nation (2012) indicate that over one-third of adults and 12.5 million children (ages 2 to 19 years) are obese. In Greenville County, 23.2 percent of adults are obese compared to 30.3 percent in South Carolina and 27.7 percent in the United States (BRFSS, 2009). Those who are most at risk for obesity and related diseases are minority groups, individuals with a low income, individuals with a low education level, and individuals living in rural communities (CDC, 2012a; Weight of the Nation, 2012).

The CDC finds that a lack of recreational facilities and community safety concerns can contribute to a lack physical activity (Jackson & Kochtitzky, 2009). Altering community characteristics, such as creating a park or open space, can have an effect on physical activity and obesity (Epstein et al., 2012). Some residents may live near the park, but busy roads, fences, or a lack of signs and signals could create physical access barriers (Blanck et al., 2012). Individuals are more likely to utilize parks if they are close to where they live, are safe, and are regularly maintained (Jackson & Kochtitzky, 2009). Also, providing a safe entrance to the park, ample signage,

and involving the community in park development are critical to its utilization (Blanck et al., 2012). Decreasing the route distance to the park and creating safe bike paths and sidewalks increases access to parks (Blanck et al., 2012).

An increase in physical activity is beneficial to controlling weight, but even without weight loss, physical activity can improve health by lowering a person's risk for heart disease, stroke, and type 2 diabetes (CDC, 2012b). Other benefits to regular physical activity include lower mortality rates, decreased symptoms of depression and anxiety, and an overall improvement in well-being (Jackson & Kochtitzky, 2009).

While increasing physical activity has a positive impact on health, there is also a potential negative impact. With an increase in opportunities for physical activity, recreational injuries may increase. Recreational injuries are injuries that occur while an individual plays sports or participates in other recreational and physical activities. Nationally, over 3.5 million children 14 years and younger experience recreational injuries each year (National SAFE Kids Coalition [NSKC], 2004). For children ages 5 to 9 years, recreational injuries are most likely to occur on the playground and while riding bicycles (NSKC, 2004). The most common injuries for older children are cycling and sports related (NSKC, 2004).

Indicator: Physical Activity Levels

The physical activity levels of the community were assessed using the Greenville County Community Health Needs Assessment (CHNA) survey. The data shows that 46.9 percent of west side residents exercise five or more days a week, with the next largest percentage reporting less than three days a week of exercise a week (20.3 percent). For the remaining areas of Greenville County (excluding the west side), 34.4 percent of respondents reported three to four days of exercising and the next highest percentage reported five or more days of exercising (29.4 percent). For both geographical areas, "do not exercise" has the lowest percentage of respondents.

Table 1: Self-Report Number of Days Exercising[7]

	West Side[8]		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Do Not Exercise	17	13.3%	212	14.8%
Less Than Three Days	26	20.3%	308	21.4%
Three to Four Days	25	19.5%	495	34.4%
Five Days or More	60	46.9%	422	29.4%
Total	128	100%	1437	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2008 and 2012)[9]

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side and access to a close, safe place for physical activity, the number of days respondents exercise could increase.

[7]Actual questions from CHNA survey: In a typical week, how many days do you exercise?

West side residents indicated in the CHNA that there are several barriers to exercising. The most significant barrier for west side and Greenville County residents is a lack of time to exercise. Other barriers to physical activity are outlined in Table 2.

Table 2: Self-Report Barriers to Exercising[10]

	West Side		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Don't Like to Exercise	6	14.6%	80	16.5%
Have No Place to Exercise	4	9.8%	33	6.8%
No Safe Place to Walk	0	0%	11	2.3%
Don't Have Anyone to Exercise With	0	0%	3	0.6%
Have Physical Limitation	13	31.7%	157	32.4%
Not Enough Time	17	41.5%	173	35.7%
Other	1	2.4%	27	5.6%
Total	41	100%	484	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2012)

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side and access to a close, safe place for physical activity, the number of days respondents exercise could increase.

Indicator: Hospital Utilization

One indicator of community health is utilization of healthcare resources. The data below demonstrate the number of hospital visits in 2011, including inpatient admissions and emergency department visits by Greenville County residents. Greenville's west side has more than twice the emergency department utilization rate than Greenville County. The west side also has a higher rate of inpatient utilization than the county.

Table 3: Greenville County: 2011 Inpatient and Emergency Department Visits By Residents

		Inpatient		Emergency	
	Population	Visits	Utilization Rate*	Visits	Utilization Rate*
Greenville's west side	16,583	2,624	1582.3	13,555	8174.0
Greenville County (Including the west side)	451,225	46,218	1024.3	178,564	3957.3

* Per 10,000 people

(Data Sources: Office of Research and Statistics, South Carolina Budget and Control Board and U.S. Census Bureau, 2010 data)

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, there could be an improvement in community health and therefore a decrease in the inpatient and emergency department utilization rates of west side residents.

[8]In this report, the west side is defined by the cumulative of census tracts 2,5,7,8,9,22.01, 22.02, and 23.03.

[9]Data from the CHNA survey comes from a very small sample size and therefore should be treated as anecdotal evidence

[10]Actual question from CHNA survey: What are your barriers to exercising more often?

Indicators: Self-Reported Health Status and Body Mass Index (BMI)

Related to measuring the overall health of the community, the CHNA showed that 32.5 percent of west side respondents report having good health and 8.7 percent report having poor health; this reflects a pattern similar to that of the population of the rest of the county.

Table 4: Self-Report of Health Status [11]

	West Side		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Poor	11	8.7%	86	5.9%
Fair	13	10.3%	235	16.1%
Good	41	32.5%	474	32.6%
Very Good	33	26.2%	423	29.1%
Excellent	28	22.2%	238	16.3%
Total	126	100%	1456	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2008 and 2012)

Examining Body Mass Index (BMI) of the west side residents, 56.1 percent are overweight or obese as compared to 56.4 percent in the rest of Greenville County.

Table 5: Self-Report of Body Mass Index (BMI)[12]

	West Side		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Underweight	3	4.5%	13	2.0%
Normal	26	39.4%	264	41.6%
Overweight	26	39.4%	196	30.9%
Obese	11	16.7%	162	25.5%
Total	66	100%	635	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2012)

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, the self-reported health status in the west side community could improve and BMI rates could decrease. Positive changes in these indicators would reflect improvements to the overall health of the community and its residents.

[11] Actual question from CHNA survey: In general, would you say your health is excellent, very good, good, fair, or poor?
[12] Actual questions from CHNA survey: What is your current weight? What is your height?

Indicator: Recreational Injury Data

Hospital inpatient and emergency department data for the rate of non-fatal recreational injury is available from the South Carolina Department of Health and Environmental Control, Division of Injury and Violence Prevention (DIVP). In the west side, African American males have a higher rate of non-fatal injuries due to sport/recreation when compared to white males and both African American and white females (see Table 6) (South Carolina Department of Health and Environmental Control, Division of Injury and Violence Prevention [DIVP]). The zip codes of the west side area were used in the absence of data on the census tract level.

Table 6: 2006-2010 Hospital Inpatient and Emergency Department Visit Rate From Non-Fatal Injury Due to Sports/Recreation By Race and Gender

	29601		29611		Greenville County (Including West Side Zip Codes)		South Carolina	
	Number	Utilization Rate*	Number	Utilization Rate*	Number	Utilization Rate*	Number	Utilization Rate*
White								
Male	89	1.05	388	4.57	5,712	67.32	41,832	54.67
Female	25	0.29	159	1.83	2,475	28.49	19,598	24.98
African American and Other								
Male	109	4.90	294	13.21	2,301	103.36	25,860	79.52
Female	23	0.93	99	4.02	644	26.15	7,474	20.50

* Per 10,000 people

(Data Source: South Carolina Department of Health and Environmental Control, Division of Injury and Violence Prevention)

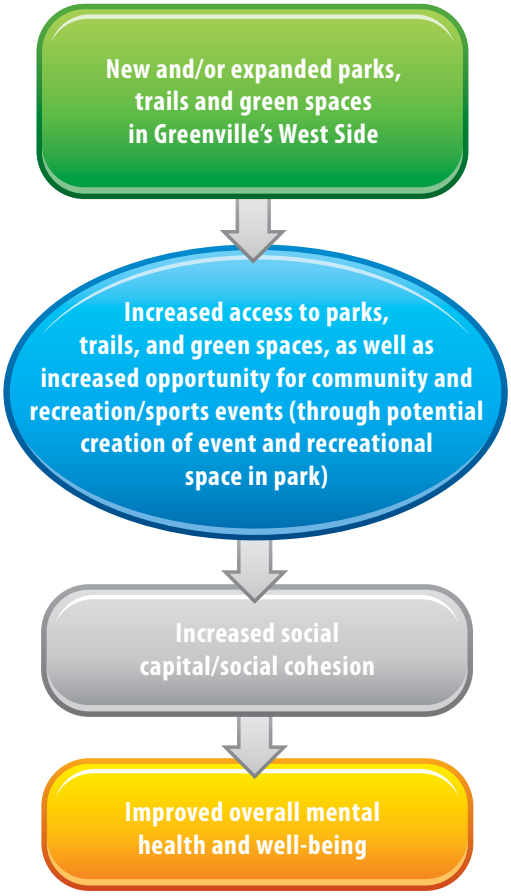
The non-fatal injury data outlined by age (see Appendix C for full table) finds that at the county and state level, people age 10 to 19 tend to experience the highest rate of non- fatal recreational injury. This mirrors the trends of county and state rates.

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, the rate of non-fatal recreational injuries could increase due to the increased opportunity for physical activity in the community.

Social Cohesion/Capital (Priority A)

Research Questions 4 and 5: How many and what type of community events for west side residents already exist that promote social capital/social cohesion? What is the current mental health status of residents in the west side community?

Social Cohesion/Capital Pathway



Rationale:

With the potential creation of a new and/or expanded park, green space, and/or trails in Greenville's west side, there will be increased access to places for community and recreational events. These events can increase social cohesion/social capital; therefore improving the overall mental health and well-being of the community.

Supporting Literature:

The creation of a park is an opportunity to enhance social capital and social cohesion in Greenville's west side. For this HIA, social capital is defined as the degree to which individuals feel that they belong to a socially cohesive community, participate in activities, and utilize community resources (Ross, 2007). Research shows that individuals with greater social capital live longer and are mentally and physically healthier (Jackson & Stacy, 2012; Ross, 2007). A Chicago study finds that 83 percent of people are more likely to participate in social events if they are located in green spaces as opposed to more isolated, less desirable areas (Sullivan, Kuo, & DePooter, 2004). Additionally, residents with a common green space are more likely to have strong social ties, interact with other residents, and take pride in their community (Sherer, 2006; Trust for Public Land, 2004). Providing meeting opportunities, such as in a park, increases social interaction, creates an overall more cohesive community, and decreases feeling of loneliness (Groenewegen, van den Berg, Maas, Verheji, & de Vries, 2012; Sullivan et al., 2004).

National research concluded that green space is an important factor for mental health, especially anxiety and depression (Groenewegen et al., 2012). In the U.S., the most common mental disorder is depression (CDC, 2011). Depression can be improved by interaction with other people and with exercise, even at a low intensity level, such as walking (Jackson & Stacy, 2012). Other research finds that parks and open spaces provide refuge from everyday stressors (Rubinstein, 1997). This not only reduces stress and depression, but it can improve an individual's ability to focus, be productive, and recover from illness (Maller, Townsend, Pryor, Brown, & St. Leger, 2005). Individuals who are not satisfied with their accessibility to green space are at a higher risk (2.4 times) to have mental health issues (Guite, Clark, & Ackrill, 2006).

Green spaces, city parks, agricultural areas, and forests contribute to improving health status and stability (Sherer, 2006). One study found that the percentage of green environment surrounding an individuals living space is related to self-reported health status; people living in homes that are surrounded by 90 percent green environments are less likely to report feeling unhealthy (10.2 percent report feeling unhealthy) compared to areas that have only 10 percent green environment (15.5 percent report feeling unhealthy) (Maas, Verheij, Groenewegen, de Vries, & Spreeuwenberg, 2006). Other research shows that the natural environment and green space reduce stress and improve mental health, which have positive effects on overall health and well-being (Groenewegen et al., 2006).

Indicator: Recreational Facilities and Programs

Two recreational facilities currently exist in in Greenville's west side: the West Greenville Community Center and the Kroc Center. The West Greenville Community Center is one of five community centers supported by the City of Greenville, while the Kroc Center is run and supported by the Salvation Army. They each offer a range of programs for all ages that include aerobics, youth and adult basketball, zumba classes, after school programs, summer camps, and karate for youth. Table 7 outlines the number of participants (residents and non-residents) that participated in the West Greenville Community center's programs between Fall 2011 and Summer 2012.

Table 7: West Greenville Community Center Programs: Fall 2011- Summer 2012

Programs	Number of City of Greenville Resident Participants	Number of Non-Resident Participants
After School Programs	22	0
Zumba	8	0
West African Drum & Dance	2	40
Let's Move Kids Fitness	16	1
Game Night	7	28
Teen Program	8	0
Super Summer Camp	21	43

(Data Source: City of Greenville)

While some of the programs brought in a number of participants, some were canceled on their second attempt due to low participation levels. These include zumba, game night, and the teen program. It is reported that the Spring Break Camp and the President's Day Camp were also canceled in 2012 due to low participation.

Impact Prediction: The potential creation of a park, trails, and/or green space in Greenville's west side could bring opportunities for no- or low-cost programs to Greenville's west side. Since the potential park is in a low-income community, individuals will be more likely to attend if they don't have to pay to participate. Participation in these activities supports increased social cohesion and for many, increased physical activity.

Indicator: Community Mental Health

Data from the CHNA examines the mental health of residents. In the west side community, more than half of the residents (59.5 percent) reported not feeling depressed or "blue," while 40.5 percent reported feeling depressed at least one day a week. These findings are similar to the pattern of the whole county.

Table 8: Self-Report of Feeling Depressed or "Blue" [13]

	West Side		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Did Not Feel Depressed	66	59.5%	810	57.6%
One Day	10	9.0%	165	11.7%
Two to Seven Days	19	17.1%	248	17.6%
A Week or More	16	14.4%	183	13.1%
Total	111	100%	1406	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2008 and 2012)

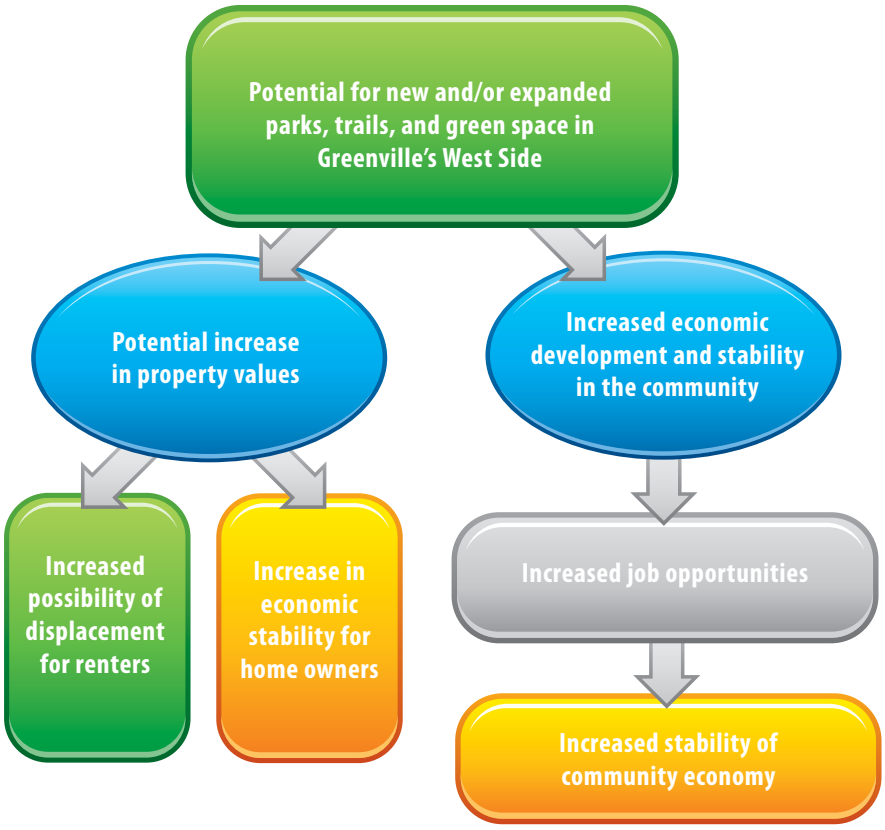
Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, the self-reported levels of depression could decrease due to the positive mental health benefits related to viewing and utilizing parks, trails, and green space.

[13] Actual question from CHNA: Over the past month, about how many days did you feel depressed or "blue"?

Community and Family Economic Stability (Priority A)

Research Questions 6 and 7: What are the current economic circumstances of the community? What is the current home ownership rate in the community?

Community and Family Economic Stability Pathway



Rationale:

The potential creation of a park, trails, and green space could lead to an increase in the property values of the properties surrounding the park, beginning with those closest in proximity. This increase in property value can lead to an increase in economic stability for homeowners as their property values rise, as long as the increased property tax burden is not significant. Increased property values could also cause an increase in rental rates, which could cause involuntary displacement.

Supporting Literature:

Research conducted by Active Living found that areas for recreation, such as open space and trails, increase property values and tax revenues for the surrounding residential properties (Reed, 2012). A study conducted by a professor from Texas A&M University found that out of 25 studies examining the contribution of parks to property values, 20 found an increase of property values near a park or open space (Sherer, 2006). How much the property value increases depends on several factors, including the size and type of open space and how close the property is to the open space (Reed, 2012).

A Colorado greenbelt study determined that for every foot away from the greenbelt there was a decrease of $4.20 in the value of the residential property (Sherer, 2006). Those properties that were next to the greenbelt had a value that was 32 percent higher than the value of property 3,200 feet away (Sherer, 2006). In terms of vulnerable communities, researchers from the University of Southern California determined that the positive relationship between a park and property value is still seen in areas where residents are mostly immigrants and poor (Pincetl, Wolch, Wilson, & Longcore, 2003). This particular study concluded that an increase of 11 percent in the amount of green space, located 200 to 500 feet from a house, can lead to a 1.5 percent increase in the price of a house (Pincetl et al., 2003).

With this potential increase in property values, it is important to provide various housing options that range in price to accommodate all who live in the community. Providing affordable housing options is vital to communities, and housing options should meet the needs of all residents regardless of age or income level. With this approach, the community is more likely to experience housing security. This not only strengthens the community as a whole, but also encourages residents currently renting to invest in a home (Environmental Impacts Analysis Unit Minnesota Department of Health Environmental Health Division, 2011).

Indicator: Economic Circumstances of the Community

The west side community is considered a low socio-economic status community. More than half of the residents in the west side (61.1 percent) have an income level of $24,999 or less and 39.9 percent of the community's population is below the federal poverty level (ACS, 2005-2009). When comparing the project area to the city, county, state, and national level, it is obvious that Greenville's west side has a much higher rate of poverty (see Table 9).

Table 9: Percentage of Families and Individuals Whose Income in the Past 12 Months is Below the Federal Poverty Level*

	West Side	City of Greenville	Greenville County	South Carolina	United States
Percent Below Poverty Level	39.9%	13.9%	10.8%	12.3%	10.1%

(Data Source: ACS 2005-2009)

* Data is an average of five years (2005-2009).
The number of those living below the poverty level is likely higher across all geographies now due to the recession that began in 2008.

One factor of economic success is access to a vehicle, and most households in the west side have at least one vehicle available for use (77.6 percent). However, the west side community has a significantly lower vehicle access rate than city, county, state and national rates (ACS, 2005-2009).

Table 10: Percentage of Households with Access to a Vehicle

	West Side	City of Greenville	Greenville County	South Carolina	United States
Households With Vehicles	77.6%	89.2%	93.7%	92.9%	91.1%
Households Without Vehicles	22.4%	10.8%	6.3%	7.1%	8.9%
Total	100%	100%	100%	100%	100%

(Data Source: ACS 2005-2009)

Data provided by the South Carolina Department of Employment and Workforce (DEW) (2012) shows rates of unemployment in June 2012 as high as 26.1 percent in one of the census tracts in the west side. During the same time period, the Greenville County unemployment rate was 8.2 percent and South Carolina's was 9.4 percent (SC DEW, 2012). Based on this data, it is clear that the west side is disproportionately affected by unemployment. One quarter of employed community members (16 years and over) work in the service industry (ACS, 2005-2009). Other occupations include production, transportation, and material moving (23.0 percent); natural resources, construction, and maintenance (19.7 percent); sales and office (18.4 percent); and management, business, science, and arts (13.2 percent) (ACS, 2005-2009). Table 11 outlines the occupation categories compared to the city, county, state, and national levels.

Table 11: Occupation (Civilians employed 16 years and over)

	West Side	City of Greenville	Greenville County	South Carolina	United States
Management, business, science and arts	13.2%	39.3%	35.4%	31.8%	35.3%
Service Occupation	25.7%	18.2%	15.4%	17.2%	17.1%
Sales and Office Occupation	18.4%	26.3%	26.4%	25.3%	25.4%
Natural Resources, construction, and maintenance	19.7%	5.3%	9.2%	10.8%	9.8%
Production, transportation, and material moving	23.0%	10.9%	13.6%	14.9%	12.4%
Total	100%	100%	100%	100%	100%

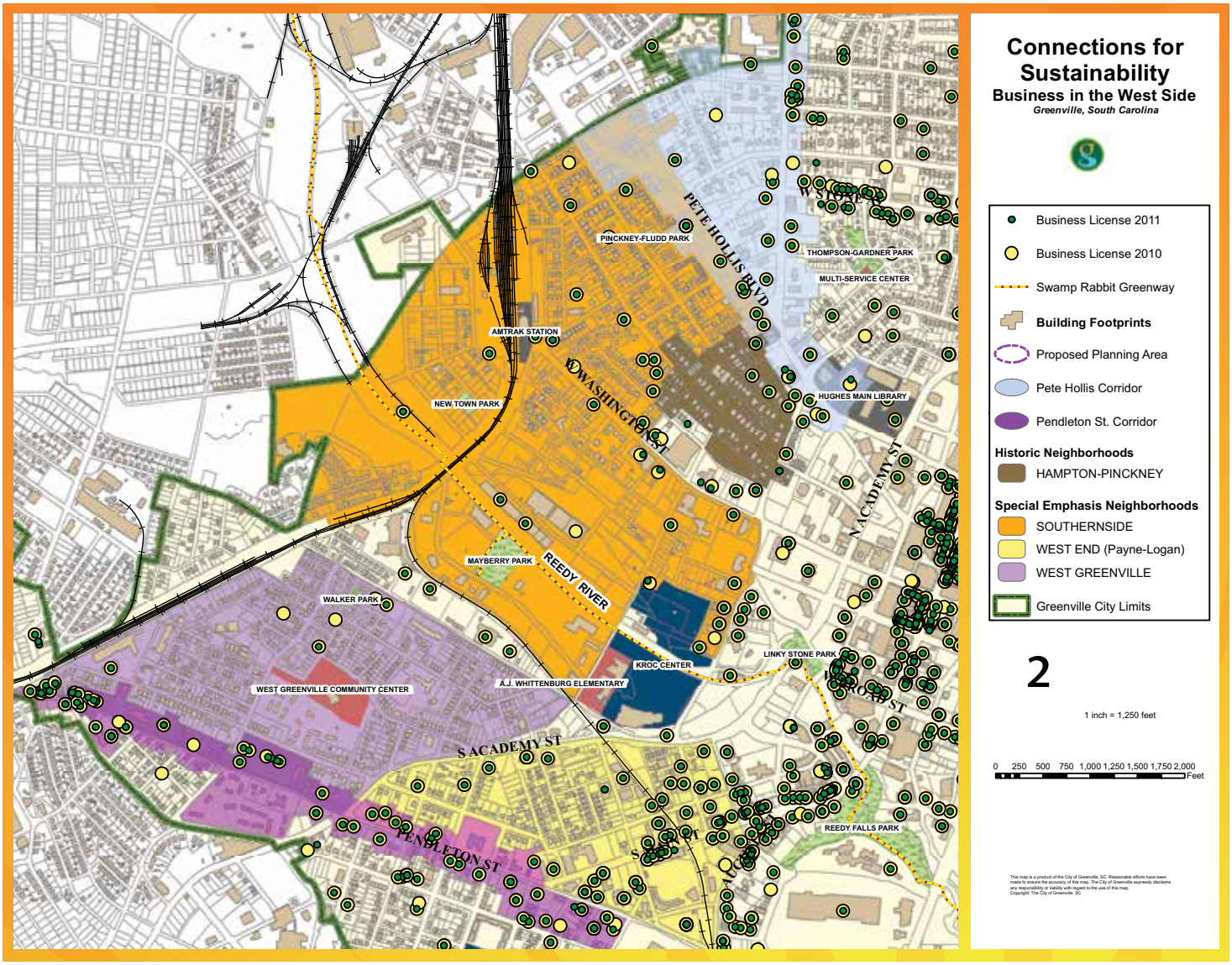
(Data Source: ACS 2005-2009)

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, there could be an increase in property values, giving homeowners increased economic stability. This same increase in property values could cause rental rates to increase, which could result in involuntary displacement of some community members. There is also an increased opportunity for economic development and new businesses, potentially providing job opportunities for area residents and thereby decreasing the number of unemployed residents and increasing income levels.

Indicator: Business Licenses

Another indicator of community economic circumstances is the number of businesses in the neighborhood (See Map 2). According to the City of Greenville records, there were a total of 418 business licenses acquired for businesses in the west side area in 2010. The number of businesses increased to 431 in 2011. On the map, the yellow dots represent business licenses acquired in 2010, and the green dots represent business licenses acquired in 2011. When both colors are present it means that the business was open for both years (the license was renewed). Those with only one color mean that the business was open only during that time period.

Map 2: Business Licenses in Greenville's West Side: 2010 and 2011



(Data Source: City of Greenville)

Impact Prediction: The potential park and related development could bring more opportunities for new and existing businesses and continue the trend of increasing the number of businesses located in the community. These circumstances could help to improve and stabilize the economy of the community.

Indicator: Housing

Housing tenure in the west side was analyzed in order to determine home ownership rates. The data show that there are lower levels of owner-occupied housing (37.7 percent) compared to renter-occupied (62.3 percent) (See Table 12) (ACS, 2005-2009). Data for the type of households indicate that 56.4 percent are family households and 43.6 percent are non-family (which represents a person who lives alone or with non-relatives) household (See Appendix D for full table) (ACS, 2005-2009).

Table 12: Home Ownership

	West Side	City of Greenville	Greenville County	South Carolina	United States
Owner-Occupied	37.7%	48.5%	68.0%	69.9%	66.6%
Renter-Occupied	62.3%	51.5%	32.0%	30.1%	33.4%
Total	100%	100%	100%	100%	100%

(Data Source: ACS 2005-2009)

Also important to note is the home vacancy rate of the community, which is 23 percent according to the 2010 Census. Additionally, 67.8 percent of the house values for the community are under $99,999 (ACS, 2005-2009). This compares to 21.2 percent in the City of Greenville, 27.5 percent in Greenville County, 36 percent in the state, and 23 percent in the nation (ACS, 2005-2009).

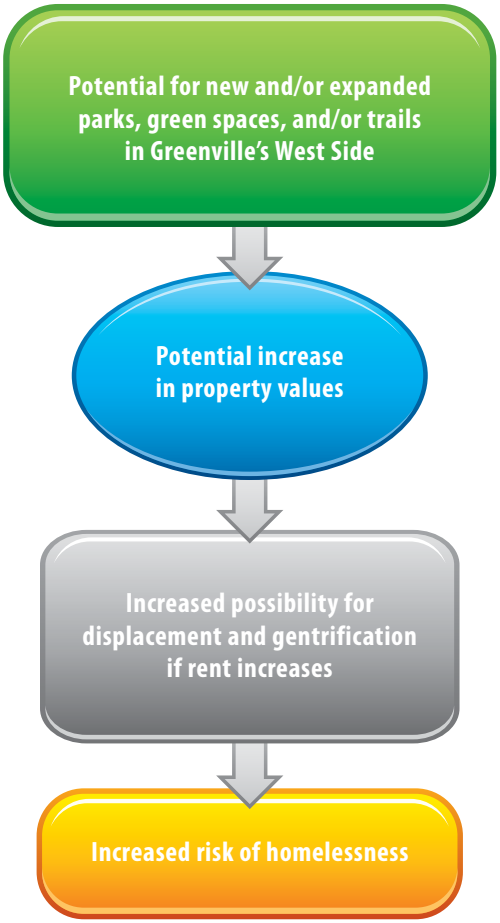
For rental units in the community, most of the renters (67.7 percent) pay $749 or less per month (ACS, 2005-2009). This compares to 63.4 percent in the City of Greenville, 60.5 percent in Greenville County, 57.0 percent in the state, and 40.4 percent in the nation (ACS, 2005-2009). For full comparison of housing values and rental rates please see Appendix D.

Impact Prediction: With an increase in property values in the community, and the opportunity for an increase in housing options that are affordable for all income levels, there could be an increase in home ownership rates among residents that are currently renting in the community. This would increase the owner-occupied rate. The potential for increased property values in the community also means there is a possibility that rental rates could increase, possibly displacing some families and individuals from the community.

Research Questions #8 and #9:

What is the demographic profile of the community? How many people are currently homeless in the west side community?

Homeless Risk Pathway



Rationale:

With the potential creation of a park, trails, and green space in Greenville's west side, the property values of the surrounding homes could increase. With this increase in property values, there is a potential for increased displacement and even homelessness due to increased rent. The potential gentrification could also result in an inability for new people of similar economic circumstances to move into the neighborhood. There could also be an increase in property taxes for homeowners. If they are unable to afford to stay in their homes, they could also be displaced.

Supporting Literature

With the increase in property values that a park can bring to a community, there is a potential negative aspect that should be considered. An increase in property values could lead to the possibility for displacement due to gentrification. Gentrification refers to the increase in property values through renovation and redevelopment in poor neighborhoods. The cause of gentrification can be divided into two categories: production (changes due to developers, housing, and land markets) and consumption (a class of people whose education, household, and consumption patterns encourage revitalization) (Huestis, 2005). Gentrification of neighborhoods encourages individuals with higher income levels to move into the neighborhood because it will yield a greater investment growth over time (Atkinson, Wulff, Reynolds, & Spinney, 2011; Huestis, 2005). The transformation of neighborhoods to include high value homes has the potential to displace long-time residents in the community. This is due to the fact that the newly gentrified areas have higher rents, mortgages, and/or property taxes.

Displacement can have a strong effect on health disparities, especially for the poor, women, children, the elderly, and racial minorities. Research shows that these vulnerable populations tend to have higher rates of asthma, diabetes, and cardiovascular disease (CDC, 2012c). Those residents who are affected by displacement can experience a change in stress levels, crime, and/or mental health (CDC, 2012c). Other health related effects of displacement can include a lack of access to healthy food options, transportation, quality schools, bicycle and walking paths, and affordable housing (CDC, 2012c).

A severe consequence of high rent rates and a lack of affordable housing is homelessness. Research conducted in an East Coast community found that about 26 percent of homeless families had been evicted or locked out of their home (Guzman & Bhatia, 2005). The effects of homelessness can be seen in the physical, behavioral, and mental health of children and adults (Guzman & Bhatia, 2005). Overcrowding of temporary housing facilities and/or a lack of housing contributes to morbidity from tuberculosis and respiratory infections (Guzman & Bhatia, 2005). The homeless can also lack safe water to drink and wash with, proper waste disposal, protection from disease vectors (such as insects and rats), and adequate food storage. The lack of these amenities is known to contribute to the spread of infectious diseases (Guzman & Bhatia, 2005).

Demographic Profile

Greenville's west side area consists of 16,583 residents (50.8 percent male and 49.2 percent female) (U.S. Census, 2010). Over 60 percent of residents are racial and ethnic minorities (U.S. Census, 2010). See Appendix E for full table comparing racial and ethnic composition of the west side to the city, county, state, and nation. When considering the education level of the community, 43.6 percent of residents ages 25 and older do not have a high school diploma while 30.8 percent of residents ages 25 and older have a high school diploma (ACS, 2005-2009). Higher education rates drop significantly with only 2 percent of residents ages 25 and older holding an associate's degree, 5.4 percent having a bachelor's degree, and 3.4 percent having a graduate degree (ACS, 2005-2009). Tables for population by age, gender, race, and educational attainment can be found in Appendix E.

It is also essential to examine the income levels in the west side, which are lower than city, county, state, and national levels. Over half (61.1 percent) of the residents in the west side have an income level below $24,999 (ACS, 2005-2009). This percentage is significantly higher than the city (33.3 percent), county (26.3 percent), state (28.6 percent), and nation (23.5 percent) (ACS, 2005-2009).

Table 13: Household Income Level

	West Side	City of Greenville	Greenville County	South Carolina	United States
Less than $10,000	22.6%	12.8%	8.1%	9.3%	7.2%
$10,000 to $24,999	38.5%	20.5%	18.5%	19.3%	16.3%
$25,000 to $34,999	10.7%	12.2%	11.1%	11.9%	10.5%
$35,000 to $49,999	9.2%	13.3%	15.3%	15.1%	14.1%
$50,000 to $74,999	9.7%	13.9%	17.6%	18.4%	18.6%
$75,000 to $99,999	4.4%	9.3%	11.7%	11.4%	12.4%
$100,000 to $149,999	2.7%	9.0%	10.9%	9.5%	12.3%
$150,000 or more	2.2%	9.0%	6.8%	5.1%	8.6%
TOTAL	100%	100%	100%	100%	100%

(Data Source: ACS 2005-2009)

Table 14: Overnight Homeless Shelter Data, July 2012	
Shelter	Average Number of People Served Each Night
Salvation Army-Men's	102
Salvation Army-Women's	50
Miracle Hill Greenville Rescue Mission-Men's	180

(Data Source: Upstate Homeless Coalition, 2012)

Table 15: Day Homeless Shelter Data, July 2012	
Shelter	Total Number of People Served
United Ministries' Place of Hope	120 (est.)
Triune Mercy Center	120 (est.)

(Data Source: Upstate Homeless Coalition, 2012)

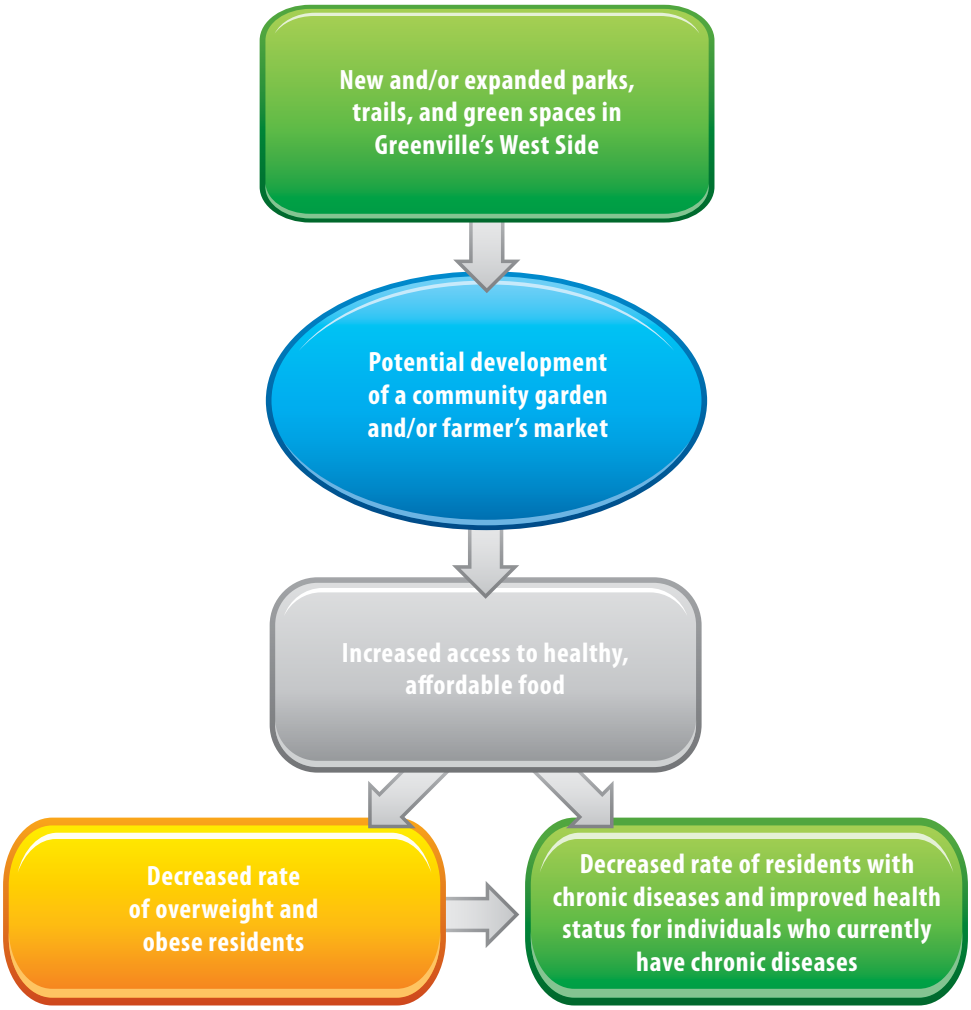
The day homeless shelter data represents the number of people that each shelter saw over the course of a month. Overall, the day shelters serve a combined total of 240 individuals (Upstate Homeless Coalition, 2012). When it comes to unsheltered homeless people, it is reported that on any given night in Greenville County 100-200 people are unsheltered (Upstate Homeless Coalition, 2012).

Impact Prediction: The increase in property values could increase the possibility for displacement and homelessness, which in turn could increase the number of people that are helped by overnight and day homeless shelters. There could also be an increase in the number of individuals who live unsheltered in Greenville County.

Food Access (Priority A)

Research Question #10: How many outlets for healthy food are in the community?

Food Access Pathway



Rationale:

With the potential creation of a park in Greenville's west side community, there is potential to utilize the park as a location for a community garden and/or farmer's market. By establishing one or both, healthy, fresh produce will be brought into the community, creating greater access for residents. With an increase in consumption of fresh and healthy food in the community, there could be a decrease in the rates of obesity and overweight residents. In turn, chronic disease could be reduced and the health of residents that currently have a chronic disease could be improved.

Supporting Literature:

Creating opportunities for access to healthy and affordable food is an important factor when attempting to control and decrease incidence and prevalence of chronic diseases such as hypertension, diabetes, cardiovascular disease, and some cancers. However, access can be limited based on the socioeconomic standing of a community. In low socioeconomic communities and communities with high numbers of racial minorities, a lack of healthy foods makes it difficult for families to eat healthful meals (Hagey, Rice, & Flournoy, 2012). Much of the food bought in low income neighborhoods comes from fast food restaurants and convenient stores. Researchers have found that lack of access to healthy foods is a key factor in obesity rates (Hagey et al., 2012). Minority children and children from low-income families are twice as likely to be overweight compared to children from higher socioeconomic standings (Hagey et al., 2012). In the U.S., almost one-fifth of African American children are obese and almost one-fourth of Mexican American children are obese (Hagey et al., 2012).

Research finds that supermarkets tend to be located in wealthier neighborhoods while small grocery stores, which do not carry as many healthy food items, are located in low income areas. A study conducted in four states concluded that there are more than three times as many supermarkets located in wealthy communities as compared to poorer neighborhoods, and supermarkets are four times more likely to be found in predominantly white neighborhoods (Ross, 2007).

Low socioeconomic neighborhoods tend to have more convenience stores and smaller grocery stores that don't stock fresh, healthy food items (Treuhaft & Karpyn, 2010). Healthy items, such as fruits and vegetables, can be costly and therefore individuals in lower income areas tend to consume mostly cheap food, which can lead to obesity and diabetes (NRCNA, 2011). Areas that have a higher density of fast food and convenience stores have a higher risk for obesity (Epstein et al., 2012). Close proximity to a supermarket can reduce the rate of obesity due to access to healthier food (Epstein et al., 2012). Increasing access to healthy foods, such as fruits and vegetables, could increase consumption and improve nutrition (County Health Rankings & Roadmaps, 2012c).

The creation of a community garden is a good way to increase a community's access to healthy and affordable food. The America Community Gardening Association reports there are over 6,000 community gardens in the U.S., which feed about 300,000 to 400,000 people (Flournoy, 2011). Community gardens are publically available, inexpensive, and can be located in vacant lots, roof tops, public parks, or school yards. The creation of these gardens can lead to several public health benefits including, but not limited to, an increase in healthy food, an increase in physical activity, a decrease in obesity, an increase in social relationships among neighbors, and an improvement in mental health and well-being (County Health Rankings & Roadmaps, 2012; ICMA, 2006).

Another means of bringing healthy food to an underprivileged community is through the establishment of a farmer's market. They can be used as a source of fresh, healthy, affordable food in areas that lack grocery stores. Farmer's markets can range in size and, unlike grocery stores, are not confined by strict land use requirements; therefore they can be easily constructed and altered to fit the needs of a specific community (Flournoy, 2011; International City/County Management Association [ICMA], 2006). There are currently 7,864 farmer's markets registered with the USDA in the U.S. (Cone, 2012). In order to make farmer's market available to individuals from different income levels, the USDA has provided some farmer's markets with equipment to take payments from the Supplemental Nutrition Assistance Program (SNAP) (Cone, 2012). Placing a farmers market in vulnerable communities can lead to an increase in access and consumption of fruits and vegetables (County Health Rankings & Roadmaps, 2012d). The market would also allow for economic benefits to the venders and could provide upward mobility for the residents in the neighborhood that wish to sell produce. A farmer's market could increase social cohesion by providing an opportunity for neighborhood interaction while providing opportunities for educating about healthy food (Flournoy, 2011).

Indicator: Nutrition Environment Measures Survey (NEMS) Data

Data provided by the Nutrition Environment Measure Survey (NEMS) (2011) outlines the number of convenience stores, grocery stores, and restaurants available in the west side community (See Maps 3 and 4 and Table 16). This data demonstrate the need for more access to fresh, affordable, and healthy foods. For maps that show only grocery stores or restaurants please see Appendix F.

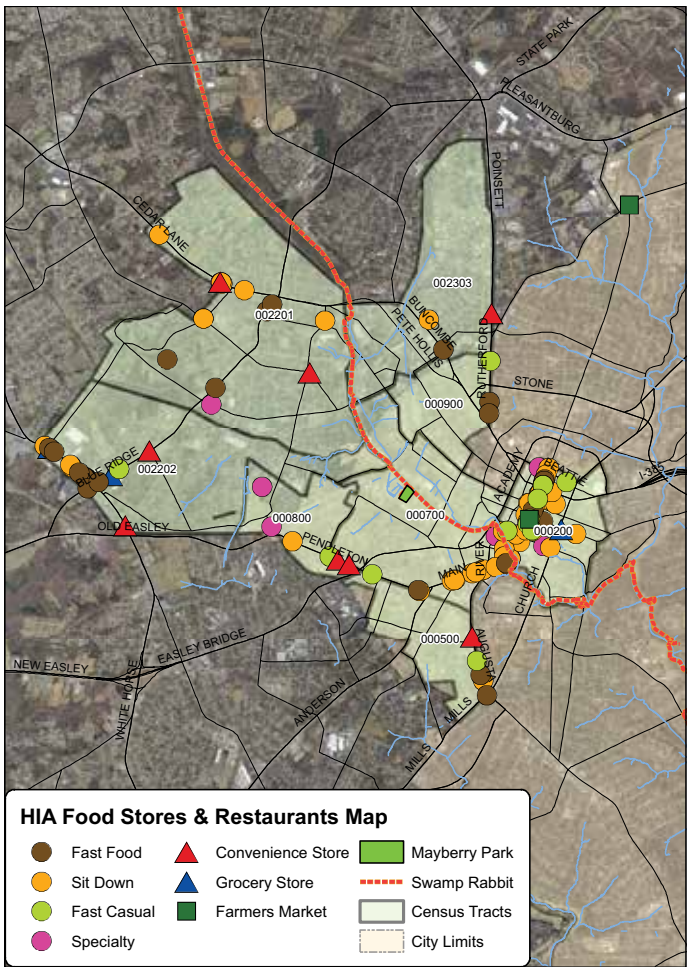
Table 16: Number of Food Sources in 2011

	West Side	City of Greenville
Convenient Stores	8	4
Grocery Stores	3	6
Fast Casual Restaurants	13	69
Fast food Restaurants	24	57
Sit-down Restaurants	61	97
Specialty Stores	20	33

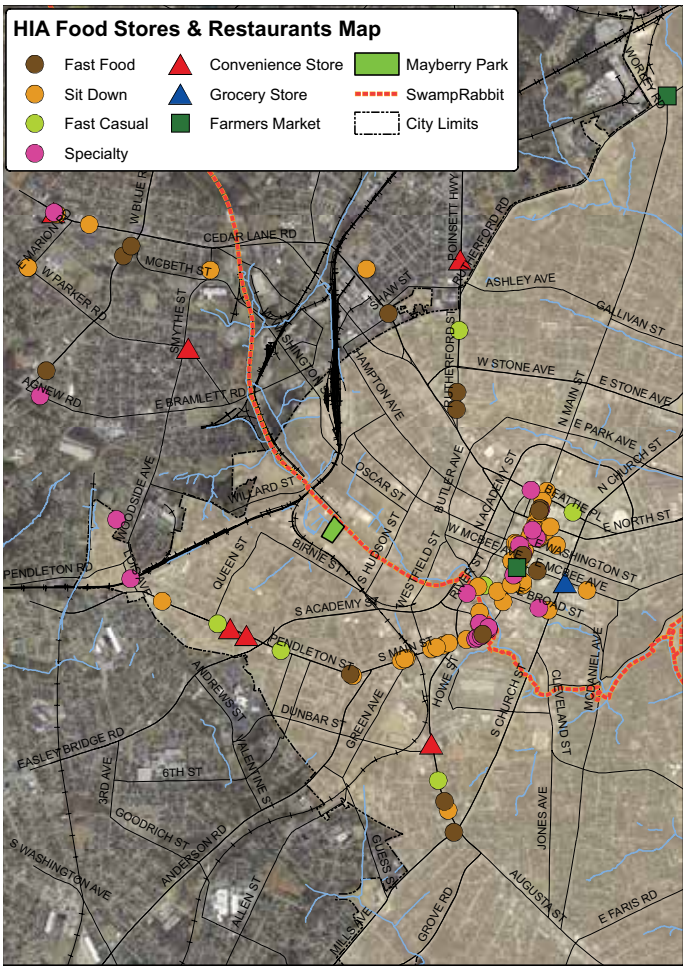
(Data Source: Nutrition Environment Measures Survey (NEMS))

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, residents could have greater access to affordable, fresh, and healthy food through the potential creation of a community garden and/or farmer's market.

Map 3: Food Stores and Restaurants in the West Side



Map 4: Food Stores and Restaurants in the City of Greenville



(Data Source: NEMS Data)

Indicator: Children's Access to Fast Food

The CHNA includes a question concerning children's consumption of fast food. In the west side, 56.7 percent reported that their children eat food from a fast food restaurant one to two times a week. This percentage was similar to that for the rest of Greenville County (52.5 percent).

Table 17: Number of Times a Week Children Eat Fast Food

	West Side		Greenville County (without west side)	
	Number	Percentage	Number	Percentage
Never or rarely	12	40.0%	157	35.5%
1-2 Times	17	56.7%	232	52.5%
3-4 Times	0	0%	25	5.7%
5 or More Times	1	3.3%	28	6.3%
Total	30	100%	442	100%

(Data Source: Community Health Needs Assessment, Greenville County, 2012)

Impact Prediction: With the potential creation of a park, trails, and green space in Greenville's west side, there is an opportunity for increased access to healthy affordable food from community gardens or farmers markets. This could decrease the amount of fast food the children eat due to having healthier options available.

Individual and Community Safety (Priority B)

Crime

An individual's fear of crime can be linked to increased stress and a lack of physical activity. If a person does not feel safe while exercising, they are less likely to participate in activities which can have an effect on obesity. Research in a low income community found that 27.5 percent of women and 25.2 percent of men stated that lack of safety was a barrier to physical activity (Ross, 2007). The safer the neighborhood, the more likely the residents are going to engage in physical activity within that neighborhood (Ross, 2007). Access to parks and recreational facilities is related to reduced crime (Sherer, 2006).

Some tactics for reducing crime include proper and consistent lighting of pathways, ensuring that an individual can see another person's face from at least 82 feet away, and signs that are visible and readable from 66 feet away (Ross, 2007). The signs should be written in a manner suitable for all readers and provide important information related to crime prevention techniques (Ross, 2007).

Increased Access to River

With the potential creation of a park in Greenville's west side, there will be increased access to the Reedy River, which is problematic due to poor water quality and the risk for children and adults related to falling and drowning. The CDC (2012d) reports that ten people die every day from unintentional drowning, which is the fifth leading cause of unintentional death in the U.S. Minorities are most at risk for drowning; research conducted between 2005 and 2009 found that African Americans have a higher rate of drowning than whites (CDC, 2012d). This is especially true for children ages 5 to14: African American children are three times more likely to drown than white children (CDC, 2012d). While drowning can occur at a multitude of locations, more than half of drowning, non-fatal and fatal, for those ages 15 and over occurs in natural water settings (lakes, rivers, and oceans) (CDC, 2012d).

Increased Motor Vehicle Traffic

The potential creation of a park could bring in visitors from outside the community, which could increase the traffic and decrease safety for pedestrians and cyclists. Collisions between motor vehicles and pedestrians or cyclists can cause injury or death. In the U.S., about 5,000 pedestrians are killed and 64,000 injured every year due to collisions with motor vehicles (Lawyers Attorneys, 2008). Areas with large amounts of pedestrians and motor vehicles can lead to higher incidents of injuries (Heller & Bhatia, 2007), with children and elderly being the most likely to be involved in pedestrian related accidents (Lawyers Attorneys, 2008).

Air and Water Quality (Priority B)

Enhancement through Trees

The creation of a park is an optimal time to increase the amount of trees in the area. Trees provide several health benefits including improving air and water quality, increasing individual overall well-being, increasing property values, and providing shade.

Trees have the ability to decrease the rate of water entering the stormwater system. This is done by releasing the water at a slower rate; therefore lessening the impact on the stormwater system. This slow release allows time for the water to be filtered by the trees before it reaches the sewer (Nowak, 1995). Trees also remove carbon dioxide and release oxygen back into the air (Environmental Impacts Analysis Unit Minnesota Department of Health Environmental Health Division [EIAU MDHEHD], 2011). Where there is complete tree coverage, sulfur dioxide (14 percent), particulate matter (13 percent), and nitrogen oxide (8 percent) is removed from the air (Sherer, 2006). Some plants can also absorb the same pollutants; this improves air quality and supports strong cardiovascular and respiratory systems in the population (Conservation Tool.org, 2012).

Research shows that there is also a correlation between the addition of trees and overall mental well-being (Fuller, Irvine, Devine-Wright, Warren, & Gaston, 2007). Individuals tend to respond positively to trees, and those living in low income urban areas have reported wanting to see more trees in their community (Winson, 2011). According to a University laboratory study, respondents that were shown a tree setting recovered from stress in five minutes (Re-Tree Western New York, 2006-2011). This was measured by changes in the respondent's blood pressure and muscle tension (Re-Tree Western New York, 2006-2011). In addition to an increase in overall mental well-being, trees can increase property values (Re-Tree Western New York, 2006-2011), which not only aids in overall well-being but also in economic stability. The value of a tree increases as it continues to mature and improves the overall aesthetics of the neighborhood (Ohio Department of Natural Resources, n.d., para, 2). Statistics from the United States Forest Service report that property values could increase by 10 percent with the addition of trees (Ohio Department of Natural Resources, n.d., para, 3; Re-Tree Western New York, 2006-2011). Other reports show that the market value of a home can, on average, increase by 6 to 7 percent with the addition of trees (Re-Tree Western New York, 2006-2011).

Another beneficial aspect of trees is the shade that they provide. Shade reduces the temperature, which can encourage more physical activity and reduce the incidence of illness related to heat (CDC, n.d, page, 3; Nowak, 1995). If it is too hot, children may not be able to utilize equipment, such as playgrounds, and it is recommended that play areas be placed near trees or under manufactured shade structures (Kids Safe Northern Territory, n.d., para, 3). For outdoor recreation, area temperatures could be reduced by 8 to 10 degrees with the addition of trees, which could lead to an increase in children using the play equipment and getting physical activity and exercise (Kids Safe Northern Territory, n.d., para, 3). Shaded areas also have the possibility of protecting individuals from harmful rays, especially during warmer months (CDC, n.d.). Decreasing exposure to harmful UV rays can reduce the risk of developing melanoma and other skin cancers (Saraiya et al., 2004).

Potential Demolition of Buildings and Housing: Air Quality

Several vacant buildings may need to be demolished to build the potential park, trails, or green space. However, a report supported by the Institution of Environmental Sciences and the Institute of Air Quality Management states that during construction and demolition of buildings or roads a temporary, but substantial, increase in particulate matter may occur (Moorcroft, 2012). Particulate matter consists of small liquid or solid particles

that are suspended in the air. With the increase in particulate matter, several health problems could develop in those that live in close proximity to the area. Particulate matter can easily enter the throat and lungs, which can then increase risk of asthma, bronchitis, and lung disease (Dorevitch et al., 2006; Nevada Division of Environmental Protection, n.d., page, 2). Other negative health effects of exposure to particulate matter include the possibility for cancer and premature death (Ross, 2007). Studies find that respiratory illness and acute changes in lung functioning lead to an increase in hospital admissions for respiratory and heart disease (World Resources Institute, n.d., Particulate Pollution, para, 4). School and job attendance can also decrease due to respiratory illness related to an increase in particulate matter (World Resources Institute, n.d., Particulate Pollution, para, 4).

Potential Demolition of Buildings and Housing: Water Quality

Along with particulate matter entering the air due to demolition of the vacant buildings, water quality may also decrease during demolition. Water flowing over loose soil or impervious surfaces (surfaces that water cannot soak through) has the potential to absorb pollutants and deposit them in the nearest water source (SC DHEC, n.d., para, 1). This can lead to a decrease in the water quality, increase in flooding, and increase in runoff in surrounding areas (Ross, 2007). According to the U.S. Environmental Protection Agency (EPA) (2012), the largest threat to water quality is polluted water runoff. Researched conducted by Johns Hopkins University in 2001 found that over 50 percent of waterborne diseases between 1948 and 1994 were linked to ground water contamination due to an increase in impervious surfaces (Jackson & Kochtitzky, 2009).

Recommendations

Recommendations of the HIA Advisory Committee are for the consideration of the community members, the City, and its consultants as they work together to complete the comprehensive planning on the west side. The HIA Advisory Committee feels that the components and design of the potential park, trails, and green space in Greenville's west side should be informed by the community's residents through the public input process the City of Greenville has planned. The decisions about what to include in the park and how the park should be designed will be determined by this process.

The HIA Advisory Committee aims to maximize the health benefits of the potential development of a park, trails, and green space in the west side and to minimize any adverse affects of the development. Based on community input and existing research regarding the primary ways in which community health would be impacted by the this development, the HIA Advisory Committee focused its assessment and recommendations on the following health determinants, ranked according to the anticipated significance of impact:

Priority A	Priority B
– Physical activity – Social cohesion/capital – Community and family economic stability – Food access	– Individual and community safety – Air and water quality

PHYSICAL ACTIVITY *(Priority A)*

Summary of findings: Research shows that medical costs related to obesity account for almost 10 percent of annual medical costs. It was predicted that by 2008 these costs would be about $147 billion (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Those who are most at risk for obesity and related diseases are minority groups, individuals with a low income, those with low education levels, and individuals living in rural communities (Centers for Disease Control and Prevention [CDC], 2012a; Weight of the Nation, 2012). Physical activity is beneficial to controlling weight, but even without weight loss, physical activity can improve health by lowering the risk for heart disease, stroke, and type 2 diabetes (CDC, 2012b). Increasing access to opportunities for physical activity in communities can provide the potential for positive health benefits and reduce obesity and chronic disease (County Health Ranking and Roadmaps, 2012; Transportation Research Board [TRB], 2005). Parks can provide a no- or low-cost option for physical activity in low income communities by providing a walking destination and facilities for recreation, organized sports, and exercise activities. Individuals are more likely to use a park if it is close to where they live.

RECOMMENDATIONS: Overall, the Advisory Committee recommends that the park, trails, and green space planning maximizes ways to promote physical activity while preventing recreational injuries. Specific recommendations related to promoting physical activity while preventing recreational injuries include:

PHYSICAL ACTIVITY RECOMMENDATIONS

Key Factors in Promoting Physical Activity[14]	Advisory Committee Implementation Suggestions
Provide opportunities to walk and bike to and from the potential park Blanck et al., 2012; Cohen et al., 2006; Epstein et al., 2012; Kahn et al., 2002; NSKC, 2004)	• Provide connections such as new trails, sidewalks, and bicycle lanes for community members to access the potential park and the Swamp Rabbit Trail to maximize utilization and promote active transportation. • Minimize possibilities for recreational injuries through signage and community education.
Provide opportunities for physical activity at the potential park (Cohen et al., 2007; County Health Rankings & Roadmaps, 2012a; County Health Rankings & Roadmaps, 2012b; Transportation Research Board [TRB], 2005)	• Provide opportunities for physical activities for all age groups at the potential park (children, adolescents, adults, and older adults). • Build a walking trail around the perimeter of the potential park. • Provide a parking facility for bicycles, a bicycle share or lending program (with helmets), and bicycle safety education classes; provide education for cyclists, pedestrians, and motorists on the rules of the road. • Include recreation space and sports fields with no-cost programming for children's sports at the potential park. • In the potential park design, include one or more basketball courts and open grassy areas and play fields where exercise programs could be held. • Consider building a splash pad/spray ground at the potential park for children to promote physical activity and prevent use of the river.
Provide ample shade at the potential park (CDC, n.d.; Kids SAFE Northern Territory, n.d.; Nowak, 1995; Saraiya et al., 2004)	• Plant trees throughout the potential park to provide shade in order to encourage physical activity during hot months and reduce the incident of illnesses related to the heat. • Provide a shaded play structure for children at the potential park (shade from trees can reduce the temperature of outdoor play areas for children by 8 to 10 degrees).

[14] The considerations and factors in promoting physical activity listed in this table are demonstrated by research to be beneficial in increasing physical activity.

SOCIAL COHESION/CAPITAL *(Priority A)*

Summary of findings: Social capital is the degree to which individuals feel that they belong to a socially cohesive community, participate in activities, and utilize community resources (Ross, 2007). Social capital and cohesion impact health in numerous ways. Research has demonstrated that individuals with high levels of social cohesion live longer and experience improved mental and physical health (Jackson & Sinclair, 2012; Ross, 2007). While numerous variables can influence opportunities for social cohesion in a particular area, one of the necessary precursors is physical space for people to be able to come into contact with each other. Providing meeting and event space creates opportunities for increased social interaction, which creates an overall more cohesive community.

RECOMMENDATIONS: The Advisory Committee recommends designing the potential park, trails, and green space in a way that maximizes social cohesion and social capital, mental health, and overall well-being for community residents. The potential park should be designed to meet the needs and aspirations of the residents of the west side community. More specific considerations related to the potential park and promoting social cohesion include:

SOCIAL COHESION/CAPITAL RECOMMENDATIONS

Key Factors in Promoting Social Cohesion/Capital[15]	Advisory Committee Implementation Suggestions
Provide opportunities for interaction between community members (Jackson & Stacy, 2012; Ross, 2007; Sullivan et al., 2004; Sherer, 2006; Trust for Public Land, 2004)	• Consider including a community garden in the potential park. A community garden within a park is shown to be an inexpensive way to bring healthy food to communities, increase physical activity, decrease obesity, and increase social relationships among neighbors. • Include event space, such as an amphitheater, within the potential park. • Provide recreation space and sports fields as part of the potential park. • Provide picnic shelters and adequate, accessible restrooms and water fountains in the potential park. • Develop a programming plan with something for every age group at the potential park. • Design the potential park to be handicap-accessible and provide an outlet to re-charge electronic handicapped chairs.
Provide safe paths and signs to encourage utilization of the potential park (Blanck et al., 2012; Jackson & Kochtitzky, 2009; Ross, 2007)	• Provide connections within the west side to the potential park site. This can include sidewalks, trails, and/or bicycle lanes. A park will not benefit community residents unless they can safely access it. • Provide signage pointing to the potential park from various points in the community; add in symbols and/or languages other than English to overcome language barriers.
Provide opportunities to strengthen the relationship between the potential park and the surrounding community members (Groenewegen et al., 2012; Sullivan et al., 2004; Sherer, 2006; Trust for Public Land, 2004)	• Look for ways to integrate the history and culture of the community into the design of the potential park. • Encourage a partnership with local artists to design something unique to the potential park, and encourage residents to paint a mural at the potential park.
Provide opportunities to improve the mental health of community residents (Groenewegen et al., 2012; Guite et al., 2006; Jackson & Stacy, 2012; Maller et al., 2005)	• Design places within the potential park for relaxation and meditation, such as an open green space with benches and swings.

[15] The considerations and factors in promoting social cohesion/capital listed in this table are demonstrated by research to be beneficial in increasing social cohesion/capital.

"Where inequality exists, where poor children grow without adequate nutrition, with no access to a park for playing little league, where the youth are in the dawn of life, the poor are in the pit of life, and the elderly are in the dusk of life… Our children are the true measure of our wealth, and we must do what we can to see that children can reach their potential."

– Mary Neal, West End Community Member and HIA Advisory Committee Member

COMMUNITY AND FAMILY ECONOMIC STABILITY

(Priority A)

Summary of findings: Poverty is a leading cause of poor health. The west side community has a low socio-economic status, with 40 percent of families and individuals living below the poverty level (American Community Survey [ACS], 2005-2009). The poor tend to have worse health and die at a younger age, in part due to a higher than average rate of child and maternal mortality, higher levels of disease, and limited access to health care as compared to those with a higher income (Organization for Economic Co-operation and Development [OECD], 2003).

Areas for recreation, such as open space and trails, increase property values and tax revenues for the surrounding residential properties (Reed, 2012). High-quality parks also encourage economic development and attract homebuyers by increasing residential property values up to 15 percent, meaning increased wealth for homeowners and revenues for cities (City Parks Alliance, n.d, "Significant Savings", para, 3). However, 62 percent of residents in the west side area rent their homes (ACS, 2005-2009), so concerns exist about involuntary displacement if property values increase. Displacement has a number of health consequences, including stress and anxiety as well as the potential for homelessness (ACS, 2005-2009). This same economic development can also lead to new businesses and jobs in the community, which would help to alleviate the levels of poverty and unemployment; in the west side, there are census tracts with unemployment as high as 26 percent (South Carolina Department of Employment and Workforce [SC DEW], 2012).

RECOMMENDATIONS: Overall, the Advisory Committee recommends ensuring that the potential park, trails, and green space be implemented in a way that maximizes community and family economic stability for residents. Suggestions related to the potential park for improving the economic stability of the community are:

COMMUNITY AND FAMILY ECONOMIC STABILITY RECOMMENDATIONS

Key Factors in Promoting Community and Family Economic Stability[16]	Advisory Committee Implementation Suggestions
Encourage opportunities to expand on current assets and economic opportunities in the community (Pincetl et al., 2003; Reed, 2012; Sherer, 2006)	• Design the potential park in such a manner that it can easily be expanded in the future. • Capitalize on recently added assets in the west side area, such as the Kroc Center and A.J. Whittenberg Elementary School, to spur economic development in the west side as part of the comprehensive planning process as a method to provide jobs to those in the community. • Create an emphasis in the Request for Proposals (RFPs) for construction and other work related to development in the west side that encourages use of minority owned businesses and workers from the community.
Provide opportunities for affordable housing (Atkinson et al, 2011; CDC, 2012c; Environmental Impacts Analysis Unit Minnesota Department of Health Environmental Health Division, 2011; Guzman & Bhatia, 2005; Huestis, 2005)	• Through the west side Comprehensive Plan, to be developed in 2013, the City of Greenville, in partnership with the residents of the west side, should include a plan to make adequate affordable housing stock available in the community and minimize displacement, evictions, and foreclosures in the event that property values increase as a result of the potential park and other redevelopment in the community.

[16] The considerations and factors in promoting community and family economic stability listed in this table are demonstrated by research to be beneficial in increasing community and family economic stability.

"I have lived in the west Greenville area over 60 years, the majority of my life. It would be nice to have a health food store in my community or a large grocery store to keep the people healthy."

– Mamie L. Davis "AKA" Flamey, West Greenville Community Member

FOOD ACCESS *(Priority A)*

Summary of findings: In Greenville's west side, there are only three grocery stores, but 24 fast food restaurants. Research shows that providing access to healthy and affordable foods is an important contributing factor for decreasing cancer and chronic diseases, including hypertension, stroke, and cardiovascular disease (Ross, 2007). Farmer's markets and community gardens can serve as avenues to increase a community's access to healthy and affordable food. Either or both can be easily constructed and do not adhere to strict land use requirements; they can be tailored to the needs and desires of the community.

RECOMMENDATIONS: Overall, the Advisory Committee recommends creating the potential park, trails, and green space in a way that increases access to healthy foods in order to decrease rates of overweight and obesity and help control chronic disease for the residents of Greenville's west side. A consideration for the potential park related to access to healthy food is:

FOOD ACCESS RECOMMENDATION

Key Factor in Promoting Access to Healthy Food[17]	Advisory Committee Implementation Suggestions
Provide access to healthy and affordable food sources (County Health Rankings & Roadmaps, 2012; Epstein et al., 2012; Flournoy, 2011; Hagey et al., 2012; ICMA, 2006; Ross, 2007; County Health Rankings & Roadmaps, 2012d)	Consider including a community garden and/or farmer's market in the potential park (possibly in rehabilitated warehouse space) or a mobile food truck that could provide fresh produce to the community.

[17] The factor in promoting food access listed in this table is demonstrated by research to be beneficial in increasing food access.

The Advisory Committee also made recommendations related to promoting individual and community safety and maintaining and improving air and water quality.

INDIVIDUAL AND COMMUNITY SAFETY *(Priority B)*

Summary of findings: Studies show that an individual's fear of crime can be associated with increased stress and a lack of physical activity (Ross, 2007). Research finds that women (27.5 percent) and men (25.2 percent) from low-income areas considered safety issues a barrier to physical activity (Ross, 2007). Access to parks and recreational facilities can reduce crime, and safer neighborhoods encourage more physical activity (Sherer, 2006).

RECOMMENDATIONS: The Advisory Committee recommends the creation of the potential park, trails, and green space in a way that promotes individual and community safety in order to maximize use of these potential resources. Considerations for the potential park related to promoting individual and community safety are:

INDIVIDUAL AND COMMUNITY SAFETY RECOMMENDATIONS

Key Factors in Promoting Individual and Community Saftey[18]	Advisory Committee Implementation Suggestions
Provide opportunities to increase safety and the perception of safety to encourage utilization of the potential park, trails, and green space (Ross, 2007; Sherer, 2006)	• Adopt relevant Crime Prevention Through Environmental Design (CPTED) principles in and near the potential park and trails (including lighting, signage, and landscaping strategies). • Implement a maintenance plan once the potential park is built. • Plant trees rather than bushes to maintain visibility and line of sight. • Educate community members about personal safety through signage, newsletters, and neighborhood meetings.
Limit access to the river to decrease risk of drowning (CDC, 2012d)	• Design the area near the river to discourage people from entering the river (plants, signage, etc.). • Provide opportunities to observe the river from afar (for example, a bridge or benches near low-lying vegetation).
Provide opportunities for parking near the potential park that are away from pedestrians and cyclists (Heller & Bhatia, 2007; Lawyers Attorneys, 2008)	• Construct the parking lot for the potential park and nearby crosswalks in a way that motor vehicles are aware of pedestrians and cyclists (there should be no roads within the park, and engineering should be focused on the pedestrian and cyclist). • Post new, lower speed limits by the park.

[18] The considerations and factors in promoting individual and community safety listed in this table are demonstrated by research to be beneficial in increasing individual and community safety.

AIR AND WATER QUALITY *(Priority B)*

Summary of findings: The vacant buildings in and around the space being examined for a potential park, trails, or green space may need to be removed. This could temporarily increase the potential for particulate matter, which could increase the risk of asthma, bronchitis, and lung disease. Demolition can also increase the amount of loose soil, which can lead to an increase in water run off and decrease in the quality of the water.

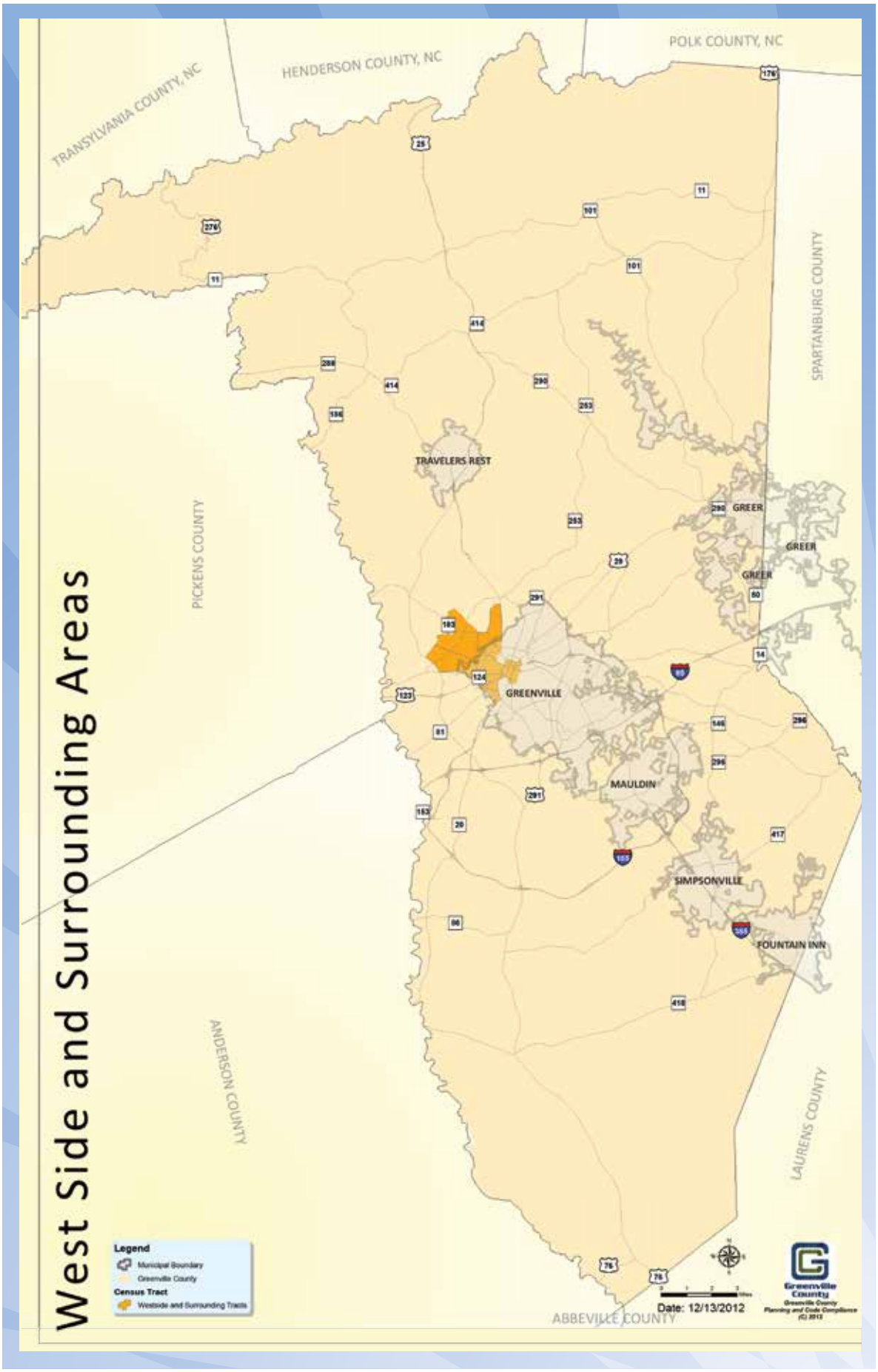
RECOMMENDATIONS: The Advisory Committee recommends that the potential park, trails, and green space be constructed in a way that maintains or improves air and water quality. Considerations for the potential park related to maintaining or improving air and water quality are:

AIR AND WATER QUALITY RECOMMENDATIONS

Key Factors in Improving and Maintaining Air and Water Quality[19]	Advisory Committee Implementation Suggestions
Provide opportunities to maintain air and water quality during construction (Dorevitch et al., 2006; Jackson & Kochtitzky, 2009; Moorcroft, 2012; Nevada Division of Environmental Protection, n.d., page, 2; Ross, 2007;SC DHEC, n.d., para, 1; World Resources Institute, n.d.,Particulate Pollution, para, 4)	• Develop a mitigation plan for temporary increases in particulate matter during construction (contractors should be asked to do this as part of the bidding process).
Improve air and water quality in the long term Conservation Tool.org, 2012; EIAU MDHEHD, 2011; Nowak, 1995; Sherer, 2006)	• Design the potential park and trails to minimize the increase in loose soil and implement mitigation strategies for runoff. • Keep existing trees and plant new trees in the potential park. • Utilize plants that are indigenous and do not require fertilizer. • Add a bus stop near the potential park so that people can utilize public transportation to get to the park.

[19] The considerations and factors in improving and maintaining air and water quality listed in this table are demonstrated by research to be beneficial in improving and maintaining air and water quality.

APPENDIX A: Map: Greenville's West Side



APPENDIX B: Research Questions, Indicators, and Data Sources

Research Questions	Indicators	Data Source
1) What are the current physical activity levels for residents in the community and how could this be affected by the potential park, trails, and green space?	# of days residents exercise (self report)	Baseline: Community Health Needs Assessment Projection: Literature Review
2) What are the current rates of overweight, obesity, and chronic diseases in the community and how could this be affected by the potential park, trails, and green space?	BMI, Prevalence of chronic disease (self-report)	Baseline: Community Health Needs Assessment Projection: Literature review
3) How many residents have experienced injury due recreational activity in the community and how could this be affected by the potential park, trails, and green space?	# of injuries in the community related to recreation	Baseline: DIVP Projection: Literature Review
4) How many and what type of community events for residents already exist that promote social capital/ social cohesion and how could this be affected by the potential park, trails, and green space?	# of recreational facilities, # of people participating in community events	Baseline: Community Recreation Facilities Projection: Literature Review
5) What is the current mental health status of residents in the community and how could this be affected by the potential park, trails, and green space?	Residents' self report of frequency of feeling of depression	Baseline: Community Health Needs Assessment Projection: Literature Review
6) What are the current economic circumstances of the community and how could this be affected by the potential park, trails, and green space?	Average household income of residents, percentage of families and individuals living below the federal poverty level, number and type of business licenses issued in the community	Baseline: U.S. Census, City of Greenville Projection: Literature Review
7) What is the current home ownership rate in the community and how could this be affected by the potential park, trails, and green space?	Percentage of homes occupied by homeowners, percentage of homes occupied by renters, rate of renter turnover, property values	Baseline: U.S. Census Projection: Literature Review
8) What is the demographic profile of the community and how could this be affected by the potential park, trails, and green space?	Population estimates, unemployment by age, rental vacancy rate, average monthly rental rates	Baseline: U.S. Census Projection: Literature Review
9) How many people are currently homeless in the west side community and how could this be affected by the potential park, trails, and green space?	# of Homeless people in the community, count of homeless people served in community, average occupancy of beds in homeless shelters in the community, number of encampments (compared to overall county)	Baseline: The Upstate Homeless Coalition Projection: Literature Review
10) How many outlets for healthy food are in the community and how could this be affected by the potential park, trails, and green space?	# of grocery stores in the community that stock fresh, healthy, affordable food and produce # of farmers markets in the community	Baseline: Nutrition Environment Measures Survey Data (identifies restaurant, grocery, and convenience food establishments) Projection: Literature Review

APPENDIX C: Recreational Injuries

2006-2010 Non-Fatal Injury Rate Due to Sports/Recreation by Age								
	29601		29611		Greenville County		South Carolina	
Age	Number	Injury Rate*	Number	Injury Rate*	Number	Injury Rate*	Number	Injury Rate*
0-9 years	36	1.51	202	6.72	2,420	80.50	19,568	66.43
10-19 years	63	2.15	407	13.92	5,093	174.13	44,394	145.47
20-29 years	38	1.34	137	4.84	1,388	49.05	12,244	39.99
30-39 years	34	1.24	81	2.64	904	29.50	7,412	25.57
40-49 years	36	1.11	73	2.25	750	23.11	5,814	18.31
50-59 years	28	1.18	27	1.13	398	13.54	3,205	10.58
60-69 years	6	0.90	7	0.99	128	6.32	1,433	6.53
70+ years	5	0.52	6	0.76	59	3.23	732	3.59
TOTAL	246	1.13	940	4.30	11,140	50.96	94,802	42.33

* Per 10,000 people

(Data Source: DIVP)

APPENDIX D: Housing Data

Housing Types										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Family Household	3,472	56.4%	12,441	49.2%	113,005	66.0%	1,173,912	67.4%	76,254,318	66.8%
Non-Family Household	2,683	43.6%	12,853	50.8%	58,228	34.0%	568,082	32.6%	37,981,678	33.2%
Total Household	6,155	100%	25,294	100%	171,233	100%	1,741,994	100%	114,235,996	100%

(Data Source: ACS 2005-2009)

Owner-Occupied Housing by Value										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Less than $50,000	642	27.7%	472	3.9%	9,826	8.4%	169,766	14.0%	6,203,294	8.2%
$50,000-$99,999	930	40.1%	2,122	17.3%	22,247	19.1%	267,976	22.0%	11,301,615	14.8%
$100,000-$149,999	408	17.6%	2,208	18.0%	27,141	23.3%	243,160	20.0%	11,794,496	15.5%
$150,000-$199,000	36	1.6%	1,924	15.7%	21,781	18.7%	185,156	15.2%	10,874,859	14.3%
$200,000-$499,999	222	9.6%	4,037	32.9%	29,566	25.4%	283,988	23.3%	26,418,074	34.7%
$500,000 -$99,999	70	3.0%	1,240	10.1%	4,746	4.1%	50,269	4.1%	7,679,537	10.1%
$1,000,000 or more	10	0.4%	254	2.1%	1,103	1.0%	17,187	1.4%	1,817,775	2.4%
Total	2,318	100%	12,257	100%	116,410	100%	1,217,502	100%	76,089,650	100%

(Data Source: ACS 2005-2009)

Renter-Occupied Housing by Contracted Rent Amount										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Less than $200	144	4.0%	582	4.7%	1,503	3.0%	12,666	2.7%	811,017	2.3%
$200-$299	241	6.7%	539	4.3%	1,482	2.9%	17,906	3.8%	1,227,352	3.4%
$300-$499	858	23.8%	1,716	13.8%	6,999	13.8%	66,910	14.3%	3,526,622	9.8%
$500-$749	1,197	33.2%	5,034	40.6%	20,758	40.8%	168,984	36.2%	8,956,458	24.9%
$750-$999	894	24.8%	3,107	25.0%	13,232	26.0%	120,234	25.7%	8,772,933	24.4%
$1,000 or more	271	7.5%	1,433	11.6%	6,887	13.5%	80,651	17.3%	12,674,933	35.2%
Total	3,605	100%	12,411	100%	50,861	100%	467,351	100%	35,969,315	100%

(Data Source: ACS 2005-2009)

APPENDIX E: Demographic Data

Total Population by Age										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent	Population	Percent
Under 5 years	1,241	7.5%	3,807	6.5%	31,164	6.9%	302,297	6.5%	20,201,362	6.5%
5-9 years	1,002	6.0%	3,115	5.3%	29,892	6.6%	295,853	6.4%	20,348,657	6.6%
10-19 years	1,992	12.0%	6,588	11.3%	60,794	13.5%	626,275	13.5%	42,717,537	13.9%
20-29 years	2,624	15.8%	11,478	19.7%	60,539	13.4%	636,872	13.8%	42,687,848	13.8%
30-39 years	2,389	14.4%	8,538	14.6%	61,367	13.6%	584,360	12.6%	40,141,741	13.0%
40-49 years	2,225	13.4%	7,303	12.5%	64,892	14.4%	637,376	13.8%	43,599,555	14.1%
50-59 years	2,331	14.1%	7,309	12.5%	60,091	13.3%	629,902	13.6%	41,962,930	13.6%
60-69 years	1,488	9.0%	4,885	8.4%	43,969	9.7%	496,116	10.7%	29,253,187	9.5%
70-79 years	771	4.7%	2,803	4.8%	23,831	5.3%	266,730	5.9%	16,595,961	5.4%
80 and over	520	3.1%	2,583	4.4%	14,686	3.3%	149,583	3.2%	11,236,760	3.6%
Total	16,583	100%	58,409	100%	451,225	100%	4,625,364	100%	308,745,538	100%

(Data Source: U.S. Census 2010)

Total Population by Gender										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent	Population	Percent
Male	8,417	50.8%	28,091	48.1%	218,791	48.5%	2,250,101	48.6%	151,781,326	49.2%
Female	8,166	49.2%	30,318	51.9%	232,434	51.5%	2,375,263	51.4%	156,964,212	50.8%
Total	16,583	100%	58,409	100%	451,225	100%	4,625,364	100%	308,745,538	100%

(Data Source: U.S. Census 2010)

APPENDIX E: Demographic Data, Continued

Total Population by Race										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
White	6,376	39.9%	36,011	62.3%	310,850	71.2%	2,907,675	64.5%	196,572,772	64.7%
African American	6,013	37.6%	17,777	30.7%	77,281	17.7%	1,262,372	28.0%	37,122,425	12.2%
Hispanic	3,298	20.6%	2,328	4.0%	32,305	7.4%	208,754	4.6%	47,727,533	15.7%
Other	305	1.9%	1,705	3.0%	16,001	3.7%	132,627	2.9%	22,542,542	7.4%
Total	15,992	100%	57,821	100%	436,437	100%	4,511,428	100%	303,965,272	100%

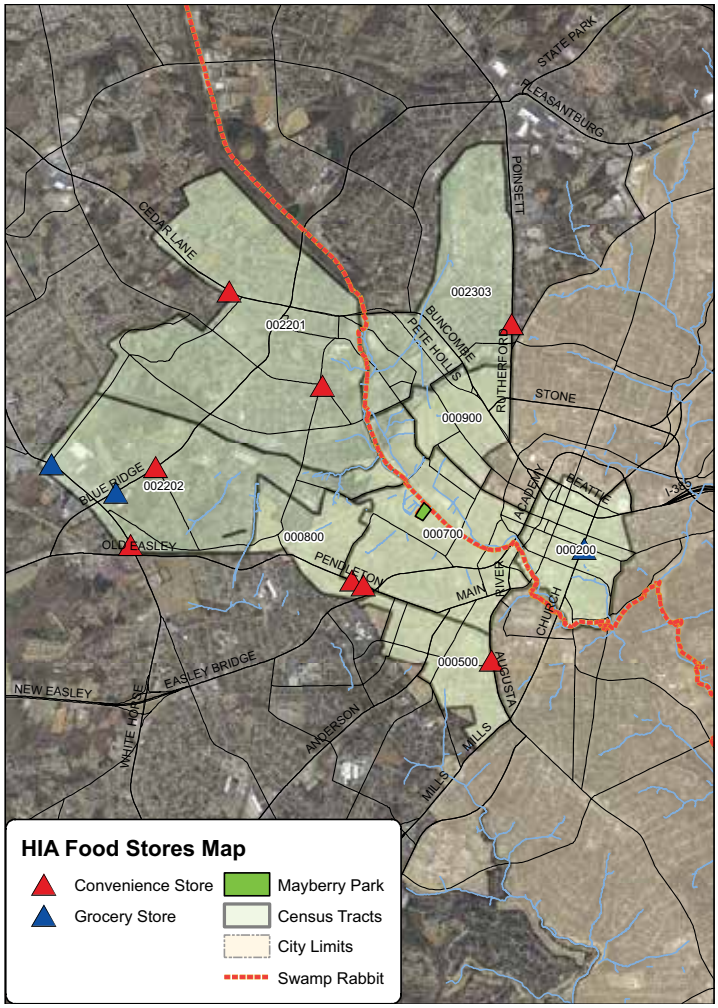
(Data Source: U.S. Census 2010)

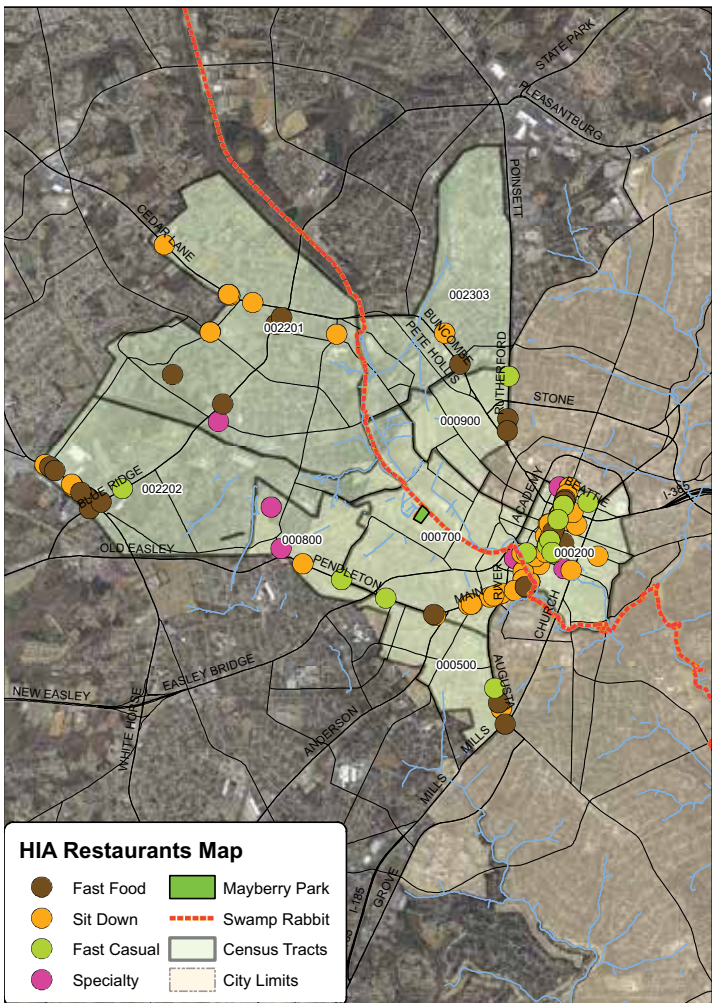
Educational Attainment (Estimate and Percent for Population 25 years and over)										
	Greenville West Side		City of Greenville		County of Greenville		South Carolina		United States	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
No High School Degree	4,471	43.6%	6,199	16.2%	46,216	16.0%	506,502	17.0%	29,898,483	14.9%
High School Degree	3,161	30.8%	8,231	21.5%	78,863	27.3%	931,546	31.2%	57,903,353	29.0%
Some College, No Degree	1,471	14.3%	6,366	16.6%	54,314	18.8%	581,690	19.5%	41,175,904	20.6%
Associate's Degree	204	2.0%	2,121	5.5%	23,070	8.0%	247,448	8.3%	15,021,920	7.5%
Bachelor's Degree	551	5.4%	9,990	26.1%	57,945	20.0%	462,485	15.5%	35,148,428	17.6%
Graduate or Professional	402	3.9%	5,395	14.1%	28,728	9.9%	251,711	8.4%	20,578,571	10.3%
Total	10,260	100%	38,302	100%	289,136	100%	2,981,382	100%	199,726,659	100%

(Data Source: ACS 2005-2009)

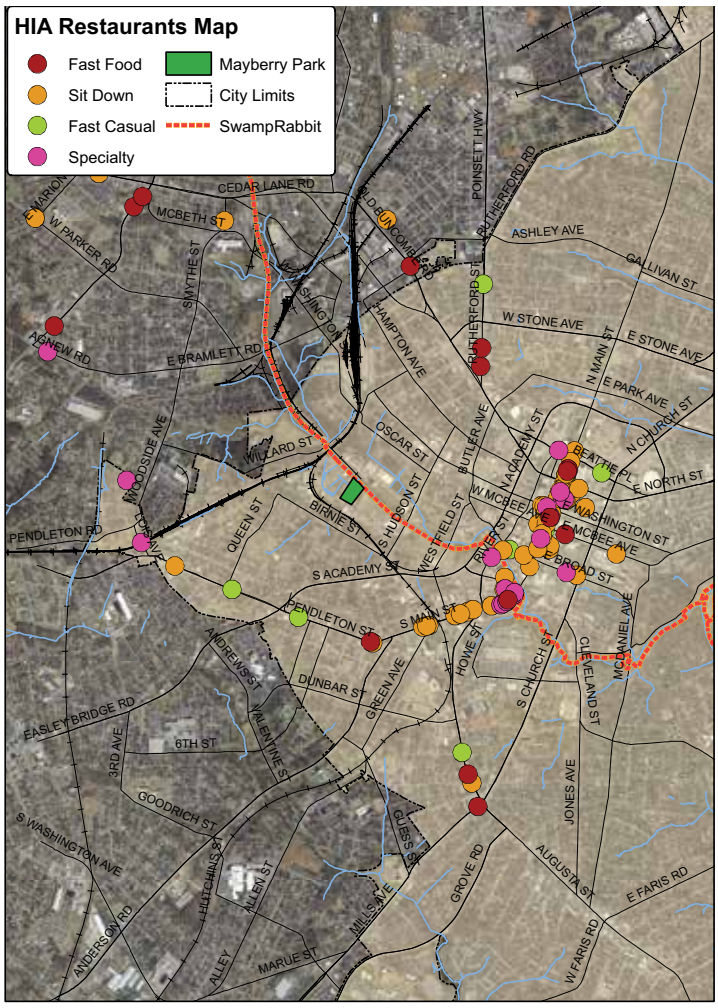
APPENDIX F: Nutrition Environment Measures Survey (NEMS) Maps

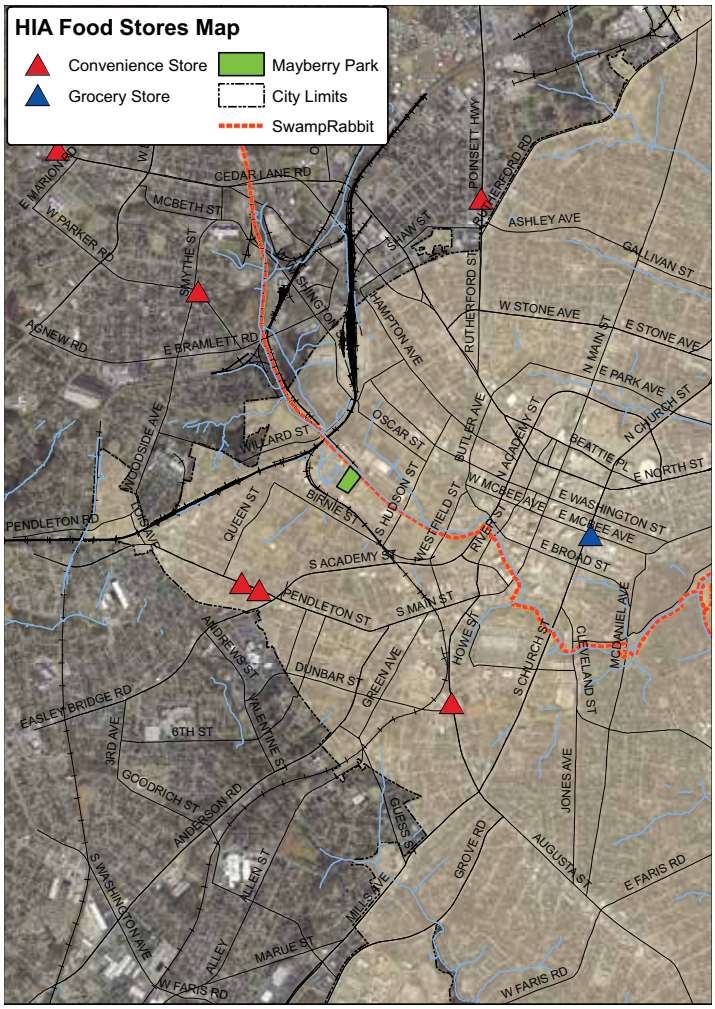
Greenville's West Side





City of Greenville





REFERENCES

American Community Survey (ACS). (2005-2009). *South Carolina.* Retrieved July 26, 2012, from ACS website: http://www.census.gov/acs/www/

Atkinson, R., Wulff, M., Reynolds, M., & Spinney, A. (2011). *Gentrification and Displacement: The Household Impacts of Neighborhood Change.* Retrieved June 26, 2012, from the Australian Housing and Urban Research Institute website: www.ahuri.edu.au/publications/download/40548_fr

Behavioral Risk Factor Surveillance System (BRFSS). (2009). *South Carolina.* Retrieved June26, 2012, from the CDC website: http://www.cdc.gov/brfss

Bicycling Magazine. (2012). *Best Small Cities for Cycling.* Retrieved January 22, 2013, from the Bicycling Magazine Website: http://www.bicycling.com/news/advocacy/best-small-cities-cycling

Blanck, H., Allen, D., Bashir, Z., Gordon, N., Goodman, A., Merriam, D., & Rutt, C. (2012). Let's Go to the Park Today: The Role of Parks in Obesity Prevention and Improving the Public's Health. *Childhood Obesity*, 8(5), 423-428.

Braveman, P. & Gruskin S. (2003). Defining Equity in Health. *Journal of Epidemiology and Community Health*, 57, 254-258.

Brownson, R.C. , Baker, E. A., Housemann, R. A., Brennan, L. K., & Bacak, S. J. (2001). Environmental and policy determinants of physical activity in the United States. *American Journal of Public Health*, 91(12), 1995-2003.

Center for Disease Control and Prevention (CDC). (n.d.). *Shade Planning for America's Schools.* Retrieved August 6, 2012, from the CDC website: http://www.cdc.gov/cancer/skin/pdf/shade_planning.pdf

Center for Disease Control and Prevention (CDC). (2001). *Increasing physical activity: A report on recommendations of the Task Force on Community Preventive Services.* Retrieved June 26, 2012, from the CDC website: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5018a1.htm

Center for Disease Control and Prevention (CDC). (2011). *Mental Health Basics.* Retrieved June 26, 2012, from the CDC website: http://www.cdc.gov/mentalhealth/basics.htm

Centers for Disease Control and Prevention (CDC). (2012a). *Overweight and Obesity.* Retrieved June 26, 2012 from the CDC website: http://www.cdc.gov/obesity/data/adult.html

Centers for Disease Control and Prevention (CDC). (2012b). *More People Walk to Better Health.* Retrieved June 26, 2012, from the CDC website: http://www.cdc.gov/VitalSigns/Walking/index.html?s_cid=ostltsdyk_govd_265

Center for Disease Control and Prevention (CDC). (2012c). *Health Effects of Gentrification.* Retrieved June 26, 2012, from the CDC website: http://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm

Center for Disease Control and Prevention. (2012d). *Unintentional Drowning: Get the Facts.* Retrieved June 26, 2012, from the CDC website: http://www.cdc.gov/HomeandRecreationalSafety/Water-Safety/waterinjuries-factsheet.html/

City of Greenville. (2012). *Facts and Figures.* Retrieved June 26, 2012, from the City of Greenville website: https://www.greenvillesc.gov/EconDev/factsfigures.aspx

City Parks Alliance. (n.d.). *Economic Value of Urban Parks.* Retrieved December 3, 2023, from the City Park Alliance website: http://www.cityparksalliance.org/why-urban-parks-matter/economic-value

Cohen, D., Sehgal, A., Williamson, S., Sturm, R., McKenzie, T.L., Lara, R., & Lurie, N. (2006). *Park Use and Physical Activity in a Sample of Public Parks in the City of Los Angeles.* Retrieved June 26, 2012, from the RAND website:http://www.rand.org/pubs/technical_reports/2006/RAND_TR357.sum.pdf

Cohen, D., McKenzie, T., Sehgal, A., Williamson,S., Golinelli, D., & Lurie, N. (2007). Contribution of public parks to physical activity. *American Journal of Public Health*, 97(3), 509-14.

Community Health Needs Assessment. (2008 & 20012). Greenville County. Received November 15, 2012.

Cone, T. (2012). USDA: *Number of Farmers Markets up Due to Demand.* Retrieved August 8, 2012, from the ABC News website: http://abcnews.go.com/US/wireStory/ap-newsbreak-number-us-farmers-markets-surges-16919120#.UCJxNaDsJdi

ConservationTools. (2012). *Economic Benefits of Parks.* Retrieved June 26, 2012, from the Conservation Tools website: http://conservationtools.org/guides/show/98#heading_2

County Health Rankings & Roadmaps. (2012a). *Increase Green Space/Parks.* Retrieved September 24, 2012, from the County Health Rankings & Roadmaps website: http://www.countyhealthrankings.org/program/increase-green- spaceparks

County Health Rankings & Roadmaps. (2012b). *Access to Places for Physical Activity.* Retrieved September 24, 2012, from the County Health Rankings & Roadmaps website: http://www.countyhealthrankings.org/program/access- places-physical-activity

County Health Rankings & Roadmaps. (2012c). *Increase Fruit and Vegetable Availability.* Retrieved September 24, 2012, from the County Health Rankings & Roadmaps website: http://www.countyhealthrankings.org/program/increase-fruit-vegetable-availability

County Health Rankings & Roadmaps. (2012d). *Farmers Markets/ Stands in Low Income Neighborhoods.* Retrieved September 24, 2012, from the County Health Rankings & Roadmaps website: http://www.countyhealthrankings.org/program/farmers-marketsstands-low income-neighborhoods

County of Los Angeles Department of Public Health. (2007). *Preventing Childhood Obesity: The Need to Create Healthy Places.* Retrieved June 26, 2012, from the County of Los Angeles Public Health website: http://lapublichealth.org/wwwfiles/ph/hae/epi/chr2-childhood_obesity.pdf

Dorevitch, S. , Demirtas, H., Perksy, V., Erdal, S., Conroy, L., Schoonover, T., & Scheff, P. (2006). *Demolition of High-Rise Public Housing Increases Particulate Matter Air Pollution in Communities of High-Risk Asthmatics.* Retrieved June 26, 2012, from the University of Illinois at Chicago website: http://www.uic.edu/depts/ovcr/iesp/Publications/Faculty%20Publications/Dorevitch/Dorevitch_DemolitionHighrisePublicHousing.pdf

Environmental Impacts Analysis Unit Minnesota Department of Health Environmental Health Division. (2011). *St. Louis Park Comprehensive Plan Health Impact Assessment*. Retrieved July 30, 2012, from the Minnesota Department of Health: http://www.health.state.mn.us/divs/hia/docs/slp_hia.pdf

Epstein, L., Raja, S., Daniel, T.O., Paluch, R.A., Wilfley, D.E., Saelens, B.E., & Roemmich, J.N. (2012). *The Built Environment Moderates Effects of Family Based Childhood Obesity Treatment Over 2 Years.* Annals of Behavioral Medicine, 44 (2), 248-258.

European Portal for Action On Health Inequalities (EPAOHI). (n.d.). *Health in All Policies.* Retrieved June 26, 2012, from the EPAOHI website: http://www.health- inequalities.eu/HEALTHEQUITY/EN/policies/health_in_all_policies/

Finkelstein, E. J., Trogdon, J., Cohen, J.W., & Dietz, W. (2009). *Annual Medical Spending Attributable to Obesity: Payer-And Service-Specific Estimates.* Health Affairs, 28(5), 822 831.

Flournoy, R. (2011). *Healthy Food, Healthy Communities Promising Strategies to Improve Access to Fresh, Healthy Food and Transform Communities.* Retrieved August 31, 2012, from the Policy Link website: http://www.policylink.org/atf/cf/%7B97c6d565-bb43-406d-a6d5- eca3bbf35af0%7D/HFHC_FINAL.PDF

Forbes. (2009). *Best Places For Business and Careers.* Retrieved January 21, 2013, from the Forbes Website: http://www.forbes.com/lists/2009/1/bizplaces09_Best- Places-For-Business-And-Careers_Rank.html

Fuller, R. A., Irvine, K.N., Devine-Wright, P., Warren, P.H., & Gaston,K.J. (2007). Psychological benefits of green space increase with biodiversity. *Biology Letters*, 3, 390-394.

Guite, H.F., Clark, C., & Ackrill, G. (2006).The impact of physical and urban environment on mental well-being. *Public Health*, 120, 1117-1126.

Greenville Chamber of Commerce. (2012). *Greenville Rankings.* Retrieved June 26, 2012, from the Greenville Chamber website: http://www.greenvillechamber.org/greenville- rankings.php

Groenewegen, P. P., van den Berg, A. E., Maas, J., Verheij, R.A., & de Vries, S. (2012). Is a Green Residential Environment Better for Health? If So, Why? *Annals of the Association of American Geographers*, 102(5), 996-1003.

Guzman, C. & Bhatia, R. (2005). *Anticipated Effects of Residential Displacement on Health: Results from Qualitative Research.* Retrieved November 1,2012, from the Health Impact Project website: http://www.healthimpactproject.org/resources/document/HIA-Report-Trinity-Plaza-Housing-Redevelopment.pdf

Hagey, A., Rice, S., & Flournoy, R. (2012). *Growing Urban Agriculture: Equitable Strategies and Policies for Improving Access to Healthy Food and Revitalizing Communities.* Retrieved June 26, 2012, from the Policy Link website: http://www.policylink.org/atf/cf/%7B97c6d565- bb43-406d-a6d5eca3bbf35af0%7D/URBAN%20AG_FULLREPORT_WEB2.PDF

Heller, J. C. & Bhatia, R. (2007). *The East Bay Greenway HIA.* Retrieved June 26, 2012, from the Health Impact Project website: http://www.healthimpactproject.org/resources/document/East-Bay-Greenway.pdf

Huestis, J. (2005). *Gentrification: Will the University of Illinois at Chicago Threaten Surrounding Communities?* Retrieved June 26, 2012, from the University of Michigan website: http://www.umich.edu/~econdev/gentrification/

Human Impact Partners. (2009). *Concord Naval Weapons Station Reuse Project Health Impact Assessment.* Retrieved June 26, 2012, from the Human Impact Partners website: http://www.healthimpactproject.org/resources/document/concord-naval weapons-station-reuse-project.pdf

Institute of Medicine (IOM). (2012). *Accelerating Progress in Obesity Prevention Solving the Weight of the Nation.* Washington, DC: The National Academies Press

International City/County Management Association (ICMA). (2006). *Community Health and Food Access: The Local Government Role.* Retrieved June 26, 2012,from the International City/County Management Association: http://bookstore.icma.org/freedocs/E43398.pdf

Jackson, R. & Kochtitzky, C. (2009). *Creating A Healthy Environment: The Impact of the Built Environment on Public Health.* Retrieved August 29, 2012, from the Sprawl Watch website: http://www.sprawlwatch.org/health.pdf

Jackson, R. & Stacy, S. (2012). *Designing Healthy Communities.* San Francisco, California: Jossey-Bass.

Kahn, E.B., Ramsey, L.T., Brownson, R.C., Heath, G.W., Howze, E.H., Powell, K.E., Stone, E.J., Rajab, M.W., Corso, P., and the Task Force on Community Preventive Services. (2002). The Effectiveness of Interventions to Increase Physical Activity. *American Journal of Preventive Medicine*, 22(4s), 73-107.

Kids Safe Northern Territory. (n.d.). *Safe Shade Play.* Retrieved June 26, 2012, from the Kidsafe Northern Territory website: http://www.kidsafent.com.au/safe-shade-play/

Lawyers Attorneys. (2008). *Pedestrian Accident Statistics.* Retrieved June 26, 2012, from the Law Information website: http://legalcatch.wordpress.com/2008/03/18/pedestrian-accident-statistics/

Lee, A. (2012). Active students linked to better academic performance. Retrieved November 30, 2012, from the Furman University website: http://www.furman.edu/if/11.14.12gnews.pdf

Maas, J., Verheij, R. A., Groenewegen, P. P., de Vries, S., & Spreeuwenberg, P. (2006). Green space, urbanity, and health: how strong is the relation? *Journal of Epidemiology and Community Health*, 60(7), 587-592.

Maller, C., Townsend, M., Pryor, A., Brown, P., & St. Leger, L. (2005). Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International*, 21(1), 45-53.

Moorcroft, S. (2012). *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites.* Retrieved January 8, 2013, from The Institution of Environmental Sciences website: http://www.ies-uk.org.uk/sites/default/files/resources/reports/monitoring_construction_sites.pdf

Moore, L. V., Roux, A. V., Evenson, K. R., McGinn, A. P., & Brines, S. J. (2008). Availability of Recreational Resources in Minority and Low Socioeconomic Status Areas. *American Journal of Preventive Medicine*, 34(1), 16–22.

National Coalition for the Homeless. (2009). *Why Are People Homeless?* Retrieved September 20, 2012, from the National Coalition for the Homeless website: http://www.nationalhomeless.org/factsheets/why.html

National Research Council of the National Academies (NRCNA). (2011). *Improving Health in the United States: The Role of Health Impact Assessment.* Retrieved June 26, 2012, from the NRCNA website: http://www.nap.edu/catalog.php?record_id=13229

National SAFE Kids Coalition. (2004). *Recreational Injury Fact Sheet.* Retrieved October 2, 2012, from the Automotive Safety Program website: http://www.preventinjury.org/PDFs/RECREATIONAL_INJURY.pdf

Nevada Division of Environmental Protection (NDEP). (n.d.). *Particulate Matter Pollution Fact Sheet.* Retrieved June 26, 2012, from the NDEP website: http://ndep.nv.gov/baqp/monitoring/docs/particulate_matter.pdf

Nowak, D. J. (1995). *Urban Trees and Air Quality.* USDA Forest Service, Syracuse, NY

Nutrition Environment Measures Survey (NEMS). (2011). *West Side and City of Greenville Food Sources.* Received October 10, 2012.

Ohio Department of Natural Resources. (n.d.) An Easy Way to *Increase Your Property Value: Plant Tree!* Retrieved June 26, 2012, from the Ohio Department of Natural Resources website: http://ohiodnr.com/forestry/urban/features/propertyvalue/tabid/5459/Default.aspx

Organization for Economic Co-operation and Development (OECD). (2003). *Poverty and Health in Developing Countries: Key Actions.* Retrieved December 3, 2012, from the OECD website: http://www.oecd.org/health/18514159.pdf

Pincetl, S., Wolch, J., Wilson, J., & Longcore, T. (2003). *Towards a Sustainable Los Angeles: A "Nature's Services" Approach*. Retrieved November 6, 2012, from the Hollywood United Neighborhood Council Website: http://www.hollywoodunitednc.org/tempreport_haynes.pdf

Rajott, B. R., Ross, C. L., Ekechi, C. O., & Cadet, V. N. (2011). *Health in All Policies: Addressing the Legal and Policy Foundations of Health Impact Assessment.* Retrieved September 18, 2012, from the American Society of Law, Medicine & Ethics: http://www.aslme.org/media/downloadable/files/links/0/5/05.Rajotte.pdf

Reed, J. (2012). *Greenville Hospital System Swamp Rabbit Trail: Year 1 Findings.* Retrieved June 26, 2012, from the Upstate Forever website: http://www.upstateforever.org/newsviews_other/SRTImpactStudyYear1.pdf

Relocate America. (2010). *Relocate America Announces Top 10 Cities for 2011.* Retrieved January 21, 2013, from the Relocate America Website: http://www.relocateamerica.com/2011/08/02/relocateamerica-announces-top-10-cities-for-2011/

Re-Tree Western New York. (2006-2011). *Benefits of Trees.* Retrieved June 26, 2012, from the Re-Tree website: http://www.re-treewny.org/benefits.html#property

Ross, C. (2007). *Atlanta Beltline Health Impact Assessment.* Retrieved August 27, 2012, from the Health Impact Project website: http://www.healthimpactproject.org/resources/document/Atlanta-Beltline.pdf

Rubinstein, N.J. (1997). *The Benefits of Open Space: The Psychological Value of Open Space.* Retrieved February 2, 2013, from the Great Swamp Watershed Association website: http://www.greatswamp.org/Education/rubinstein.htm

Saraiya, M., Glanz, K., Briss, P., Nichols, P., White, C., Das, D., Smith, S. J., Tannor, B., Hutchinson, A., Wilson, K., Gandhi, N., Lee, N., Rimer, B., Coates, R., Kerner, J., Hiatt, R., Buffler, P., & Rochester, P. (2004). Interventions to Prevent Skin Cancer by Reducing Exposure to Ultraviolet Radiation. *American Journal of Preventive Medicine*, 27(5), 422-466.

Sherer, P. (2006). *The Benefits of Parks: why America needs more city parks and open space.* Retrieved November 6, 2012, from the Citizens for East Shore Park website: http://www.eastshorepark.org/benefits_of_parks%20tpl.pdf

South Carolina Budget and Control Board Office of Research and Statistics. (2012). In-patient and emergency room usage data. Received August 1, 2012.

South Carolina Department of Employment and Workforce (SC DEW). (2012). Retrieved September 21, 2012, from the SC DEW website: http://dew.sc.gov/

South Carolina Department of Health and Environmental Control. (n.d.). *Water.* Retrieved January 8, 2013, from the DHEC website: http://www.scdhec.gov/environment/water/npspage.htm

South Carolina Department of Health and Environmental Control, Division of Injury and Violence Prevention [DIVP]. (2006-2012). *Hospital Visit Rate From Non-Fatal Injury Due to Sports/Recreation by Race.* Received January 2, 2013.

Sullivan W. C., Kuo F. E., & DePooter S. (2004). The fruit of urban nature: Vital neighborhood spaces. *Environment and Behavior*, 36(5), 678-700.

The Daily Beast. (2011). *30 Best Cities For Jobs*. Retrieved January 21, 2012, from The Daily Beast Website: http://www.thedailybeast.com/galleries/2011/11/04/from-san-diego-to-cleveland-the-best-cities-for-jobs-in-2011-photos.html

Transportation Research Board (TRB). (2005). *Does the built environment influence physical activity? Examining the evidence.* Retrieved June 26, 2012, from the TRB website: http://onlinepubs.trb.org/onlinepubs/sr/sr282.pdf

Treuhaft, S., & Karpyn, A. (2010). *The Grocery Gap: Who Has Access to Healthy Food and Why It Matters.* Retrieved June 26, 2012, from the Policy Link website: http://www.policylink.org/atf/cf/%7B97C6D565-BB43-406D-A6D5- ECA3BBF35AF0%7D/FINALGroceryGap.pdf

Trust for Public Land. (2004). *No Place to Play: a comparative analysis of park access in seven major cities.* Retrieved June 26, 2012, from the New York State Recreation and Park Society: http://www.nysrps.org/images/uploads/misc/1245246041_inb_noplacetoplay_09. pdf

United Health Foundation, American Public Health Association, & the Partnership for Prevention. (2009). *The Future Costs of Obesity: National and State Estimates of the Impact of Obesity on Direct Health Care Expenses.* Retrieved June 26, 2012, from the Fighting Chronic Disease website: http://www.fightchronicdisease.org/sites/fightchronicdisease.org/files/docs/CostofObesityReport-FINAL.pdf

Upstate Homeless Coalition. (2012). *Overnight and Day Homeless Shelter Data.* Received August 22, 2012.

U.S. Census Bureau. (2010). *South Carolina.* Retrieved July 26, 2012, from the U.S. Census website: http://www.census.gov/2010census/

U.S. Environmental Protection Agency [EPA]. (2012). Liquid Assets 2000: Today's Challenges. Retrieved June 26, 2012, from the EPA website: http://water.epa.gov/lawsregs/lawsguidance/cwa/economics/liquidassets/challenges.cfm

Weight of the Nation. (2012). *What is Obesity.* Retrieved June 26, 2012, from the HBO website: http://theweightofthenation.hbo.com/

Winson, A. (2011). *Flourishing trees, flourishing minds: nearby trees may improve\mental wellbeing among housing association tenants.* Retrieved July 23, 2012, from the Institute of Chartered Foresters: http://www.forestry.gov.uk/pdf/Trees-people-and-the-buit-environment_Winson.pdf/$FILE/Trees-people-and-the-buit-environment_Winson.pdf

World Health Organization. (2003). *WHO Definition of Health.* Retrieved December 14, 2012, from the World Health Organization Website: http://www.who.int/about/definition/en/print.html

World Resources Institute. (n.d.). *Urban Air: Health effects of particulates, sulfur dioxide, and ozone.* Retrieved June 26, 2012, from the World Resources Institute website: http://www.wri.org/publication/content/8335

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