Determining Accessibility and Type of Green Space for the Poinsett Highway Revitalization Project Based on Ethnicity, Age and Vehicle Ownership Data



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Abstract

Furman is planning to revitalize a quarter mile radius area located on Poinsett Highway in Greenville, SC. The project will eventually include the conversion of available areas into green space for the nearby communities. This research uses census data and geographical information systems (GIS) mapping to determine the type of green space or park type that may be most useful to the surrounding communities. Neighborhoods within 500 feet walking distance were mapped as most likely to use the space. Age and ethnicity data were mapped for the block groups of the affected communities. Since the majority of the affected neighborhoods were located within the census tract that contained an ethnic majority of African Americans, it is suggested the majority of the green space area be designed to tailor the needs of the African American communities.

I. Introduction

Furman's Poinsett Highway restoration project is looking at implementing green space into the quarter mile radius that has been chosen for the initial portion of the project. ArcGIS allowed for mapping of census tract data for ethnicity, age and vehicle ownership of the surrounding communities, which was used to analyze the data for determining the best type of green space that should be implemented based on this data. The location of each community was taken into account to determine where each type of green space should be located according to the information provided by previous researchers that reported on recreational preferences by ethnicity and age groups that are likely to use a particular type of recreational space.

II. Literature Review

Parks and green space support communities by increasing the local ecosystems and supporting social interactions (Barbosa et al., 2007) which contribute to the larger goal of sustainability (Pincetl and Gearin, 2005). One particular aspect that is important in the implementation of green space is the addition of trees. Tree canopies can decrease peak discharge of rainfall that drains into sewers and increase the amount of water that contributes to groundwater recharge due to increased permeability (Dwyer and Miller, 1999; Pincetl and Gearin, 2005).

According to Gobster (2002), various ethnic groups use recreational services differently. In the study of a park located in Chicago, IL, park use varied among whites, blacks and Latinos. Whites were more likely to visit the park alone and use the park trails for walking, biking or walking their dog. Blacks had a tendency to use the park in groups that averaged 3.7 people and preferred to utilize the basketball courts. Latinos accessed the park in average groups of 4.4 people and were likely to picnic or play soccer. Common activities among all three groups were walking, picnicking, biking and relaxing. Overall, the park was viewed as a safe place in all areas except where the park was located under the overpass.



Figure 1. The green areas are proposed green space areas, and the red areas are residential neighborhoods within 500 feet walking distance on roads. The pink areas are additional residential neighborhoods that are within 1000 feet walking distance.



Figure 2. Vehicle data by census tract. The darkest red indicates the percentage of households with zero vehicles, bright red is percentage with one vehicle, pink is percentage with 2 vehicles, and light pink is 3+ vehicles.

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III. Methodology



Figure 3. Green represents a block group with greater than 50% white population and the red crosshatch over the green includes black and white populations between 25%-50%. Red represents a block group with greater than 50% African American population. Black represents a block group with greater than 25% Latino.

V. Conclusion

Since the block group data for the areas connected to the proposed park are likely to walk due to the majority of residents owning zero to one cars, the neighborhoods within walking distance will most likely gain the majority of the benefits of green space. Twelve of the fourteen areas within 500 feet walking distance are contained within the block group with a dominant ethnicity of African Americans. This suggests that the main areas of the park should be geared toward African American preferences such as a basketball court or other group activities (Gobster, 2002). The neighborhood located southwest of the park is likely to contain a higher percentage of Latino residents, so this area may benefit most from a soccer field and picnic tables for family gatherings. The area may also benefit from a walking trail that would allow people to walk from one area of the park to another. Since there were no neighborhoods within walking distance for the northeast, yet this block group contains the largest percentage of children, it may be helpful to implement a walking trail into the neighborhoods in this block group. If access were more available for the block group with a high percentage of children, a playground area would be suggested.

IV. Results and Discussion

There were 12 neighborhoods that are most likely to be affected by the proposed green space (Fig. 1). These neighborhoods are located in areas where the majority of residents either do not own a car or there is only one car per household (Fig. 2). The census tracts surrounding the quarter mile project area contain a majority of African Americans on the east side of the park and a majority of whites with a high percentage of Latinos on the west side of the park. Age data suggested up to 28% of the population of the north-eastern block group were children under 15 years of age. This population distribution could change in the future.



Figure 4. Block group data of age groups under 15 years old. Darker color represents higher concentration of this age group.

Future research should include determining the ability to connect the Swamp Rabbit trail to the green space area. It would also be useful to determine whether or not it is feasible and safe for the residents in surrounding neighborhoods to reach the park by walking. Surveys could be used to indicate neighborhood interest and preference for the proposed green space.

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VII. References

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Southworth, M. (1997). Walkable suburbs? An evaluation of neotraditional communities at the urban edge. Journal of the American Planning Association, 61(1), 28-44 U.S. Census Bureau: American FactFinder. (2010). http://factfinder2.census.gov/main.html

Figure 1 Data Sources: 1) Neighborhood boundaries created using zoning shapefiles from the Geographic Information Systems (GIS) Division of Greenville County, SC (2010). 2) Residential communities were defined using Greenville County Zoning Classifications http://www.gcgis.org/webmappub/zon_gvcnty.htm

Figure 2 Data Sources: 1) Census tract shapefile created using http://www.census.gov/cgi-bin/geo/shapefiles2010/main. 2) Vehicle data gathered from U.S. Census Bureau: American FactFinder. (2010). http://factfinder2.census.gov/main.html using 2010 American Community Survey (ACS) 5-year estimates for vehicles per household in Greenville County, South Carolina. Figure 3 Data Sources: 1) Block group shapefile created using http://www.census.gov/cgi-bin/geo/shapefiles2010/main. 2) Ethnicity data gathered from U.S. Census Bureau: American FactFinder. (2010). http://factfinder2.census.gov/main.html using 2010 SF1 100% data for Race Alone data in Greenville County, South Carolina.

Figure 4 Data Sources: 1) Block group shapefile created using http://www.census.gov/cgi-bin/geo/shapefiles2010/main. 2) Ethnicity data gathered from U.S. Census Bureau: American FactFinder. (2010). http://factfinder2.census.gov/main.html using 2010 SF1 100% data for Age Groups and Sex data in Greenville County, South Carolina. All maps created with ESRI ArcDesktop 10 (2012).

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Census and block group data were gathered and downloaded from the U.S. Census Bureau: American FactFinder (2010) website. The data were inserted into separate GIS documents based on ethnicity, age and vehicle ownership of the surrounding neighborhoods. Zoning data were used to determine where housing was located within the area of study. Neighborhoods were chosen based on their connectivity to the proposed green spaces using the measuring tool to determine walking distance along roads of up to 1000 feet. A neighborhood was considered a zoned residential area that was not broken by roads. Polygons were drawn for the residential communities within walking distance of 500 feet and 1000 feet. Ethnicity was displayed based on the percentage of white, African American, or Latino populations within a block group (Fig. 3). Age groups were mapped using block group data for children that were under the age of 15 at the time that the 2010 SF1 census data were gathered.

V.I. Future Research

VIII. Acknowledgements