

Walkability and Environmental Justice: An Appraisal of Greenville County, SC



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Abstract

This study assesses the walkability of neighborhoods in Greenville SC at two scales from an environmental justice perspective. At the finer scale we use the Pedestrian Environmental Data Scan (PEDS) survey tool to gather sidewalk quality measures along 700 ft street segments within block groups throughout the county. At the broader scale we use available GIS data layers to calculate metrics related to walkability for the county such as presence/absence of sidewalks. Our goal is to examine correlations between sidewalk presence and quality throughout neighborhoods representing a range of socio-economic characteristics. We also review the literature related to walkability and health, environmental and social justice issues.

Literature Review

Due to a growing interest and movement towards improving and enhancing the **pedestrian environment**, there has been significant research on the significance of the nature of the **built environment** for **physical activity and public health**. Walking is environmentally friendly and a healthy way of transportation, and research has shown that **“favorable pedestrian environments are a necessary condition for promoting walking”** (Parks and Schofer, 2006). If safety and design do in fact impact the “walkability” of cities then it is actually possible to promote walking among residents, thus reducing vehicle-miles traveled, pollution emissions and the dependence upon fossil fuels for transportation (Parks and Schofer, 2006). Moreover, the public health community emphasizes that favorable pedestrian environments are necessary in order to encourage greater physical activity and combat the effects of an increasingly obese population (Cutts *et al.*, 2009). Because **walking is the most common form of leisure activity in America**, walkability studies that “examine the suitability of neighborhood form and function for walking as a means of recreation and transportation” are increasingly relevant and necessary (Cutts *et al.*, 2009). The need to improve the pedestrian environment is especially pronounced among **low-income and minority communities which often “bear a disproportionate health burden of a myriad of chronic diseases”** (Taylor *et al.*, 2007). It is important to make sure that certain groups, particularly groups of people who cannot or do not want to drive in certain areas, are not underrepresented in the assessment and prioritization of implementing pedestrian facility improvements (Hess *et al.*, 2009).

According to **environmental justice** advocates, “unwalkable” neighborhoods that lack environmental amenities such as open space, clean air and safe recreation areas may “disproportionately affect communities with larger populations of low-income or minority residents” (Cutts *et al.*, 2009).

For this reason, **walking suitability assessments** are necessary to identify areas where regular physical activity and alternative modes of transportation may be hindered by the unsuitable walking environment, especially important in low-income communities.



Figure 1 (left) and Figure 2 (right) depict the abrupt ending of a sidewalk, which is a common occurrence for the 47% of roads with sidewalks in Greenville County.



Methods

- We used the **Pedestrian Environmental Data Scan (PEDS)** tool to assess microscale environmental features important to pedestrians, such as
 - Sidewalk infrastructure and condition**
 - Safety**
 - Aesthetics**
- PEDS is “designed to capture a range of elements of the built environment efficiently and reliably” and includes various elements such as **buffers, speed limit, availability of parking, traffic control devices and cleanliness** (Clifton *et al.*, 2007).
- The PEDS tool (see attachment below) is condensed to a single page and can be **completed in 4-5 minutes per 700 ft. segment**, allowing for rapid assessments and large sample sizes. This auditing tool contains a **field protocol and a training session** that we participated in, provided as a PowerPoint presentation (see <http://planningandactivity.unc.edu/RP1.htm>).
- In total, there were 6 different data collectors that went out in pairs over 15 days from November 16, 2010 to March 27, 2011, **surveying almost 150 street segments**.

Conclusions

- Of the sampled road segments in Sterling and Nicholtown, only 47% of the random sampling have sidewalks.
- Overall, the absence of sidewalks in road segments limited our ability to determine a direct correlation of income and sidewalk quality.
- Regardless of our inability to derive any significant conclusions, our research is significant in that it shows the absence of sidewalks across Greenville County. Our research can be used to target low income areas where walking is often the primary means of transportation.
- To encourage walking as a form of transportation in place of cars, increased pedestrian-scale lighting can be used. Lighting encourages walking by enabling commuting at night and increasing a perceived sense of safety. Our results demonstrate that there is a lack of pedestrian-scale lighting in Greenville County.
- The presence of buffers is another means of increasing safety of walking. Only 20% of the sampled roads had sidewalks with buffers in Nicholtown and Sterling. If more sidewalks are constructed in targeted low income areas, adding buffers would be another method of increasing safety of the walking environment.



Results

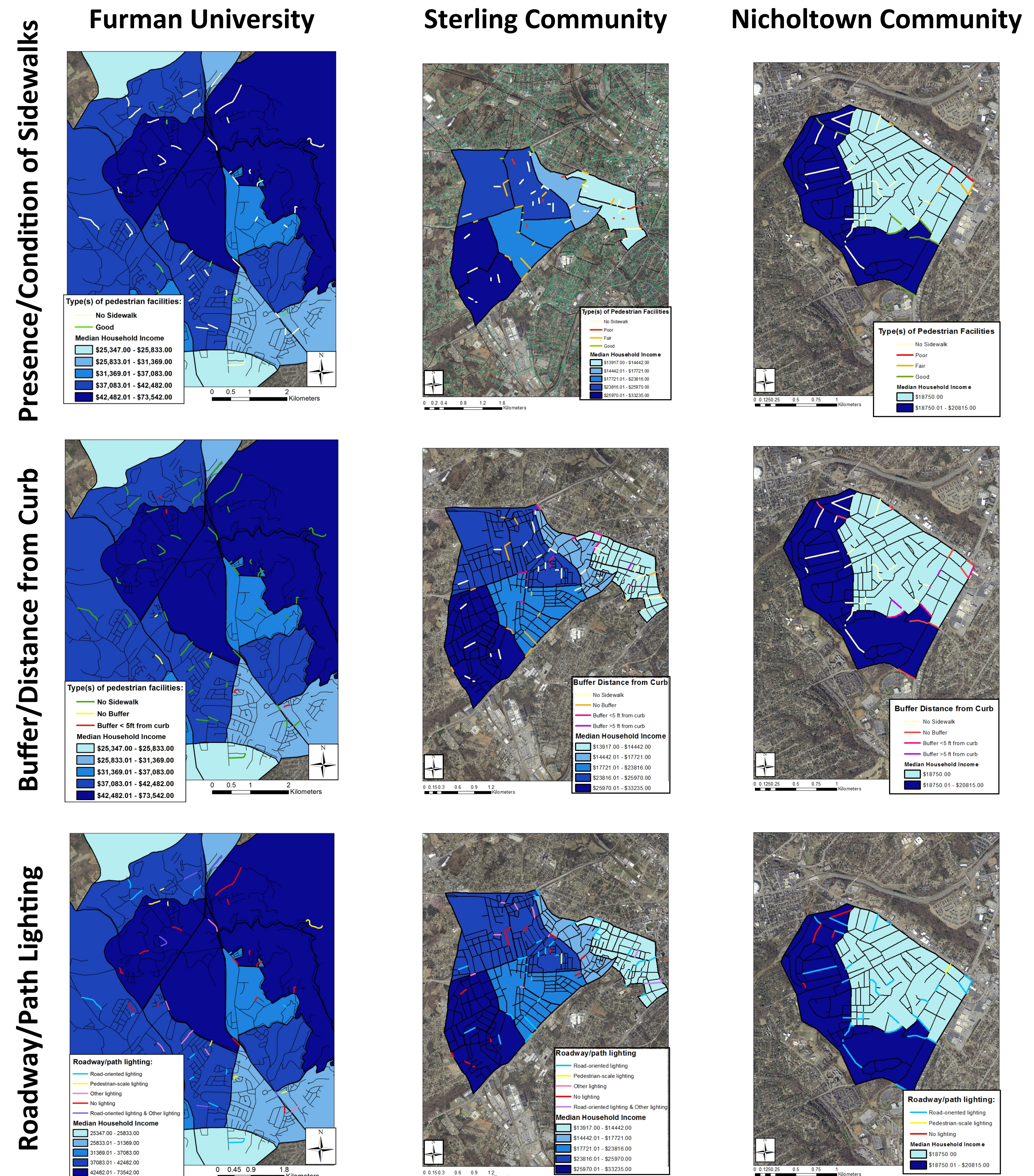


Table 1: Demographics of comparison communities at county, city and local scales.

Census 2000 Data	Greenville County	Greenville City	Nicholtown Community	Sterling Community	Furman University
Total Population	379,616	94,394	4,491	9,014	19,124
White alone (%)	77.5	65.4	13.9	52.2	88.0
Black or African American alone (%)	18.3	30.3	84.1	43.6	6.9
Hispanic or Latino (%)	3.8	3.7	1.6	5.5	4.8
Median household income in 1999 (\$) (range)	9,259 – 109,359	9,259 – 76,956	18,840 – 19,480	13,917 - 33235	25,645 - 73,542
Total Housing Units	162,803	45,084	2,122	4,179	7,420
Total Rental Units	47,579	19,292	1,086	1,590	160
Presence of Sidewalk (%)	25.8	53.3	46.3	44.2	21.5

Figure 3 (top) and Figure 4 (bottom) face opposite directions from the same spot on Pendelton St., revealing the stark contrast between Greenville County and City of Greenville pedestrian facilities.

Future Research

- Compare preliminary results with community-based surveys of the same areas using the **Walking and Bicycling Suitability Assessment (WABSA)** tool to identify areas of greatest need for improvement in sidewalk infrastructure.
- Compare WABSA and PEDS to determine strengths/weaknesses of each tool.
- Compare City of Greenville, SC to Greenville County, SC using both street surveys. To date, the City of Greenville, SC has been more proactive at promoting walkability and bikability initiatives, but is there a noted difference according to these surveys?
- It is important to determine the **demographics** of the constituents who receive the greatest benefit from the investment of public funds in sidewalk and road infrastructure?
- Present results to Greenville City Council for contribution to **Bicycle Master Plan** and “livable streets” movement.

References (see attached)



Figure 5 (left) and Figure 6 (above) illustrate confusing and incomplete sidewalks in Greenville County, SC.

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