# Commitment, connectivity and the neighbors:
# Greenway trail placement in North Carolina towns

Dilys Bowman

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements for the degree of Doctor of Philosophy
in the Department of Geography.

Chapel Hill
2009

Approved by:

Melinda Meade

Stephen Birdsall

Deborah Bialeschki

John Florin

Wendy Wolford

## Abstract

DILYS BOWMAN: Commitment, connectivity and the neighbors:
Greenway trail placement in North Carolina towns
(Under the direction of Melinda Meade)

Greenways – "linear parks" that usually include walking and cycling trails - are increasingly popular throughout the country because they offer an opportunity for exercise and the potential for bicycle and pedestrian transportation to practical destinations. There is limited and conflicting information about whether greenway trails are distributed equitably within towns. This dissertation examines the distribution of greenway trails within 11 towns in North Carolina and tries to answer two questions: 1) To what extent do African-Americans have equitable access to urban and suburban greenway trails in North Carolina towns? 2) What factors in the planning process have contributed to the placement of greenways within a given area that have led to their equitable or inequitable distribution?

Population and economic data from the 2000 Census, town greenway plans, information from planning and parks and recreation departments, and other data were used to select the towns in the study. GPS and GIS were used to map and analyze greenway access points in the 11 towns and the population demographics of the neighborhoods around those greenways. The GIS analysis was complemented by interviews with 41 people knowledgeable about planning greenways in North Carolina.

The results indicate that there is not spatial inequity overall in access to greenways within towns, but that some towns do have inequitable access for African-Americans. The priorities of the town, and land and other constraints, influence greenway route distribution.

A commitment to equity and/or a commitment to connectivity were more likely in towns that had at least equitable access for African-Americans. Equitable access may be less likely where trails are built solely for recreational purposes. Rail-trails' potential to promote equitable access is eroded by fragmentation of rail corridors. Developers often benefit from greenways and may influence their route. Neighborhood input, often unsupported by facts, frequently opposes greenways, in part because they may connect diverse neighborhoods. Opposition can derail plans for trails when there is not a firm commitment from the town. Objections almost always subside after a trail goes in.

**Acknowledgments**

I owe a lot of people a lot of thanks for making it possible for me to do the research and write the dissertation. At school, I am grateful first of all to my advisor, Melinda Meade, who supported, encouraged and gave me helpful advice throughout my long period as a graduate student, even when we had differences of opinion over what I was or should be doing. Equally important, she nudged me into local involvement with trail people and organizations, an involvement which I did not take up until prodded, but which I have found and continue to find very gratifying. I also feel fortunate to have had Deborah Bialeschki on my doctoral committee. Deb took time out to give me advice, reassurance and the benefit of a lot of knowledge and understanding of the value of trails. Steve Birdsall, John Florin and Wendy Wolford, in their capacities as members of my committee, all offered valuable insight and advice which is directly responsible for the fact that the research ended up being a manageable, achievable project.

Having a dissertation support group was a big help. It makes a great difference to be one among peers who are traveling the same route and to be able candidly to discuss one's progress - or lack of progress - and to receive feedback, suggestions and general support. I am lucky to have had Helene Ducros, Tamara Johnson, Joseph Palis and Matthew Reilly in my support group.

I also want to thank three other geographers who offered help, encouragement and friendship and whom I greatly admire: Angela Cacciarru, Rebecca Dobbs, and Jill Sherman. I feel privileged to consider them friends and I am very glad to be in their orbit.

The dissertation would not exist and I would never have got the information that I did without the people who agreed to be interviewed. They made time to see me and answer all my questions, even when they felt some of the subjects were risky to discuss. People were hospitable – I was offered tours of greenways and possible future greenways; they were forthcoming - I learned a huge amount from them, about greenways and local politics and towns – and the interviews were tremendously interesting and useful for me. I thank all my interview respondents for their valuable knowledge and their willingness to help me. They are the soul of the dissertation.

Outside academia I would like to thank Al Capehart and Carolyn Townsend, North Carolina Rail-Trail stalwarts who are tremendously knowledgeable about rail-trails and who answered many questions about them. In the process they got me keenly interested in rail-trails. I thank them for their help, their hospitality and their gratifying interest in my work.

In the far-flung support category are my twin Janet and my big sister Briony, both of whom have offered unfailing encouragement and enthusiasm about my being in school via e-mail and phone calls from their respective continents. All three of us owe an appreciation of learning to the influence of our parents, Margaret and George Bowman. My father in particular, a lover of ideas, of education and of walking, would have been so supportive of this project and thrilled to know what his children were doing.

At home I have been very lucky to have three wonderful children, Mairi, Tamzin and Luc Mitchell – all in elementary school when I began my MPH in Michigan, all in middle or high school when I embarked on the PhD, and now respectively a university graduate, an about-to-graduate senior and a college freshman. I have been at this so long that they might have begun to think that grad school is a permanent condition! – but as I leave grad school Tamzin is headed there herself and I hope her experience will be at least as enjoyable as mine. I thank all three for making my life outside school much more rewarding and entertaining than it would have been without them.

Finally, I owe a great deal to Will Mitchell, my favourite person and my long-time cheering section. Since I took up with him in 1980 I have had his constant love and support. Additionally, ever since I entered the PhD program, whenever I voiced any doubts about getting past the next hurdle – which I did at regular intervals - he countered them with absolute assurance that I would succeed. Eventually I began to think that he might be right after all. I feel very fortunate to have him in my life.

For my father, George Bowman

## Table of Contents

## List of Tables

## List of Figures and Illustrations

# Chapter 1: Introduction

Greenways, to use Erickson's (2004) definition, are “linear open spaces along natural or human-made features such as rivers, ridgelines, railroads, canals or roads. They are planned, designed and managed to connect and protect ecological, scenic, recreational and cultural resources.” (p. 200). In the United States greenways also represent a new form of public space, one that did not really become widely popular until the 1980s. Greenways are now seen as a tremendously popular amenity and also as an integral part of municipal pedestrian plans.

Preserving environmentally sensitive land through greenways is often done in concert with the provision of recreational facilities, generally pedestrian/bike trails: most, although not all, greenways include trails. Because of their linearity and their exclusion of motor vehicles, greenway trails are uniquely suited for engaging in physical activity, most often through walking or bicycling. As public open space, greenways clearly have parallels to parks, but their trails are even better suited than parks as places to get some exercise in the outdoors. For greenway users the health benefits of using the trails may be the most important aspects of greenways, or at least the most commonly cited reason for being on the greenways (Lindsey, 1999).

Part of the context for this dissertation is the rapid increase in the number of greenways, and greenway trails, across the country in the last couple of decades (Melekian, 2006). There have been a number of reasons for their increased popularity. For one, municipalities and other planning entities have begun to recognize their value as

multi-functional linear corridors that offer environmental, recreational and even economic benefits, from providing green space to revitalizing neighborhoods (e.g. Walmsley, 1995). Greenways have the additional significant advantage that this new type of public open space can often make more practical and scenic use of previously unusable land, such as disused railway corridors or run-down waterfronts.

Concurrent with this trend over the last 20 or so years has been the growing awareness of planning and public health researchers that the built environment, including physical access to resources such as parks and trails, is relevant and important to our health, including our likelihood of engaging in physical activity. There is also wide public support for more places to get exercise: for example over 75% of North Carolinian adults would like to see their communities spend more money on ways to make it easier and safer to bicycle and walk (Stutts and Hunter, 2002), and even non-users see the value of a good greenway system (Lindsey et al., 2001). Unsurprisingly, greenway trails have become a frequently-touted amenity in many new housing developments because they often offer a more peaceful or natural environment in which to walk, run, bicycle or engage in other pedestrian activities.

Coming into line with the realization of the connection between the built environment, physical activity and health has been the acknowledgment that building more and wider roads is not the only solution to traffic problems and that transportation policies based only on accommodation of the automobile create their own problems, including traffic congestion, pollution, global warming, and others. There has begun a steady, if slow change in focus in planning towards accommodating more pedestrian-friendly modes of transit, from the provision of more safety features that protect and

encourage pedestrian transit, to building better mass transit, to constructing bike lanes and other pedestrian spaces. Both sidewalks and greenway trails are fundamental features in this changing landscape.

Finally, a crucial part of the foundation for this work is the continuing concern in the literature, especially parks and recreation literature, over whether public open spaces such as parks but also more recently trails, which are essentially a public good, are as available and accessible to low-income and minority groups as they are to white and middle- or higher-income groups. Equity is an environmental justice issue that has barely been addressed in the literature on greenways, but there is evidence that parks are not always evenly distributed (Wolch et al., 2005, Harnik, 2003) and conflicting information about trails'equity of access (Estabrooks et al., 2003; Wilson et al. 2004; Lindsey et al, 2001). The focus of this dissertation is greenway trails in North Carolina towns, their equitable or inequitable distribution, and the reasons for their placement within the towns.

## Chapter 2: Statement of research purpose, and research questions

In this dissertation I examine the placement of greenway trails within a number of towns in North Carolina. I had two main research questions:

1) *To what extent do minority groups, specifically African-Americans, have equitable access to urban and suburban greenway trails within towns in North Carolina?*

2) *What factors in the planning process have contributed to the placement of greenways within a given urban area that have led to their equitable or inequitable distribution?*

The research for the dissertation involves a mixture of both quantitative and qualitative data: to answer the first question, I used GIS mapping of all the greenway trails within each of the study towns and network analysis of the areas surrounding the greenway trails, and for the second question, I conducted interviews with people who were involved in some capacity in planning greenways for their town.

This dissertation is organized in the following fashion. Chapter 3 first covers the relevant literature on greenways, including their history and the evolution of their roles, their relationship to public health and the built environment, their place in the context of sustainability and alternative transportation, and greenways as a form of public space. An additional focus of the literature review is the environmental justice movement and the place of greenways, like parks, as a form of public good - as opposed to the generally more common focus of environmental justice on the siting of such potentially harmful

facilities as hazardous waste dumps. Also addressed is the question of whether minorities actually use or want facilities like greenways, given their historically low use of such outdoor recreation facilities as national parks. Finally, the review focuses on the issue of equity of access, and the meaning and relevance of proximity to trails as one aspect of that.

Chapter 4 describes the methodology used for the dissertation research and describes the theoretical and analysis framework employed.

In Chapter 5 I cover the GIS results for each study town and discuss these in the context of town planning and other issues. In Chapter 6, the interview results, I first look at which of the hypothesized variables were found to be drivers of greenway placement. This is followed by a discussion of these and other themes that emerged in the interviews, addressing the principal concerns about placement, including land availability and development issues as well as community attitudes, and environmental justice. Finally Chapter 7 draws conclusions for the study.

.

## Section 3: Greenways' history and role

Greenways come out of a concern for the preservation and creation of environmental resources. Fábos (2004) ties the history of U.S. greenways to Frederick Law Olmsted, who designed the Boston park system, also known as the "Emerald Necklace" and sometimes called the country's first greenway, as a series of interlinking parks. Other planners and landscape architects followed suit; Charles Eliot II designed Massachusetts's first open space plan in 1928, including greenway corridors where trails now run. In the mid-1960s Phil Lewis put forth the concept of "environmental corridors" when he mapped significant natural and cultural resources in Wisconsin and realized that many of them were concentrated along drainage areas and rivers (Lewis, 1966). Lewis's work and the work of other landscape architects, including Ian McHarg (1969) who expressed the need to set aside green space as part of protection from development, put an emphasis on planning in harmony with ecological and environmental systems. More recently greenways have also been planned and built with other rationales than specifically environmental ones: rail-trails, built on former railway lines and intended for recreation and alternative transportation, are a common example of these.

Greenways' multiple functions also mean that they have become increasingly popular with planners. The planning rationale to use a particular stretch of land for a greenway may be in order to protect or defend land or water at risk, to restore it when it

has been damaged, or to take advantage of an opportunity such as unused or unbuildable land.

Although greenways are frequently viewed as an amenity and municipal greenways are often placed administratively within departments of parks and recreation, they have also become part of an attempt to redress decades of 20th century transportation policies that have made it much more difficult to be a pedestrian, especially in the U.S. As Forsyth and Southworth (2008, p. 1) remark,

> Over the past century pedestrian access has declined steadily in most cities. With some exceptions…each advance in transportation technology…has degraded the pedestrian environment…The automobile-oriented values of classical modernism have been codified in the transportation and street design standards that we struggle with today…

Such standards include cul-de-sac street patterns, segregated land uses, streets without sidewalks "in order to reduce construction and maintenance costs"(!) and a lack of pedestrian connections. Forsyth and Southworth observe that the automobile-dominant paradigm is being reexamined as a result of new realizations of the role of the built environment in health and the value to the environment of pollution-free transport. Walking and bicycling are "green" modes of transport, and as such they are receiving increasing amounts of attention and support.

This new attention comes, however, in a physical environment in which most cities already have a built infrastructure that is often expensive and difficult to dislodge or rebuild. Because greenway trails are relatively narrow and because of the infrastructure limitations, they are often built within otherwise undevelopable strips of land, such as in stream buffers. This may not be the most efficient approach from a transportation, A-to-B standpoint, but it does keep pedestrians and cyclists safely separated from motorists.

Moreover, the fact that greenways can be built in stream buffers means that pedestrian routes can be created even when there is no apparent street room for sidewalks. Hence linear greenway trails can become realistic options not only for recreation, but under the right circumstances for shopping and even commuting as well.

The potential value of greenways was explicitly addressed, in the context of the need to provide people with access to public open space, in a publication by the President's Commission on Americans Outdoors Report (1987). Since then they have become a fundamental part of many cities' efforts to provide and encourage pedestrian transportation and to protect green space. North Carolina is believed to be the birthplace of the first comprehensive greenway plan in the country, in Raleigh (Little, 1990), which provided a model for dozens of greenway systems in North Carolina and elsewhere in the U.S.

***Greenways as a unique form of public space***

Greenways, as noted earlier, have a variety of roles and representations, from their value in protecting riparian buffers and providing urban green space to their role in providing alternative transportation and a place to get exercise. They are a relatively new public amenity. As public open space greenways are special in two ways, first physically – because of their linearity – and second, in what they represent for many of their users: a place to get out and walk, run or cycle. They offer a specific kind of public space for pedestrians, and in this they have similarities to the sidewalks on a public street: the greenway, like the sidewalk, is the province of the pedestrian. In fact in some ways the greenway – at least where it is separated from roads - is owned by pedestrians even more than a sidewalk, since sidewalks have to compete with the space reserved for automobiles

on most American streets and people on the sidewalk must cope with the nearby noise, pollution and speed of cars.

Talen (2002) notes that access to a public good, such as a park or trail, can be seen as a sign of urban quality. Although greenway trails have parallels to parks since both are public open (green) space, they are also seen as an amenity in new and upper-income subdivisions (Banerjee, 2001). Here their use is sometimes residents-only, and there may be no plans to connect the greenway to other public trails. However, public greenways – the majority - represent an opportunity to add public open space in municipalities that may be short of more usable park space, or may be seeking a way to redeem public space such as dilapidated waterfronts or disused railways. Greenways are also a truly public form of open space in a time of increasingly "privatized" public space - or "public" privatized space - such as malls and corporate plazas (Banerjee, 2001) and of growing attempts to commodify downtowns by making them into economically profitable space (Turner, 2002). Additionally, even though greenways are often viewed as spaces to pass through, they are also legitimate destinations in their own right and can be important resources to the local neighborhood (Gobster, 1995).

***The importance of greenway access: public open space and health***

As a form of linear park, independent of their potential for exercise, greenway trails may offer health benefits. Use of parks is associated with stress reduction (Godbey and Blazey, 1983), psychological benefits (Payne et al., 1998; Tinsley et al., 2002; Ulrich and Addoms, 1981; Gobster, 2005), and they may offer a restorative experience (Kaplan, 1995). Finally, access to "walkable green space" may also be predictive of longer life, independent of demographic factors (Takano et al., 2002).

In addition, greenways' linearity also makes them qualitatively different from other types of public open space. Unlike downtown sidewalks or plazas, or traditional parks, most municipal greenways are not really conducive to more passive and social forms of recreation such as picnicking, people-watching or just "hanging out". Primarily they offer enough space, typically an eight- or 10-foot wide paved trail that is sometimes bordered by vegetation, to move along, and if one wants to experience more of the greenway one must keep moving along it. Thus they are ideal as places to get some exercise. Most often this is walking, which is the most common form of physical activity: 80% of the population are at least occasional walkers and 34% walk regularly (Eyler et al., 2003).

Urban planning and public health studies that look at access to a walkable built environment – including trails – have begun to show connections to physical activity such as walking (Handy et al., 2002; Troped et al., 2001; Powell et al., 2003). In such studies, "access" usually means living within the neighborhood studied. Transportation and planning studies have consistently shown more walking or cycling trips per week in "high-walkable" than in "low-walkable" communities (e.g. Frank et al., 2004, 2005; Saelens et al., 2003a). Self-reported physical activity or pedometer readings have been associated with such neighborhood attributes as the presence of sidewalks or enjoyable scenery (Brownson et al., 2001), trails and access to places for physical activity (Kaczynski et al., 2008; Chad et al., 2005; Huston et al., 2003; Powell et al., 2003), access to attractive public open space (Giles-Corti et al., 2005) and living within walking distance of a park, trail or store (King et al., 2003).

Paved trails seem much more likely to be conducive to physical activity than unpaved trails (at least within parks; Kaczynski et al., 2008) and in one study of 25 parks that had various facilities, the five paved trails were by far the most heavily used setting for physical activity (Reed et al. 2008) - although, notably, whites in the Reed study were much more likely to be engaged in vigorous exercise than were minorities. A caveat is that valid, reliable measures to capture the exercise / environment relationship are still being produced and evaluated (e.g. Saelens et al., 2003b; Troped and Cromley, 2004; Active Living Research, 2005).

Convenience, i.e. proximity, may be the most important attribute of a new trail for people who were not previously exercisers. Such people are generally disproportionately low-income or ethnic minority (Lucas et al., 2004; Crespo et al., 2000). Convenience makes such a trail more likely to be their primary place for physical activity, according to Gordon et al. (2004) who found that new exercisers using a trail traveled less far to the trail than habitual exercisers and were more likely to walk there than the others.

Proximity to physical activity facilities appeared to be an important factor in physical activity in a national study by Gordon-Larsen et al. (2006). Trail proximity and use may also better predict recommended physical activity for people of low socioeconomic status (SES) than for high-SES ones (Wilson et al. 2004, Parks et al. 2003). Parks et al. (2003) also found that lower-income people were more likely to cite free resources such as parks, trails, and neighborhood streets as places where they could exercise; malls and gyms had more effect for higher-income participants. Some studies do not show trail proximity being associated with physical activity (Evenson et al., 2005; Merom et al., 2003), and different researchers define proximity differently. However a

study of Indiana trails (Drew, Hurst and Galloway, 2001) found that from 70% to 95% of trail neighbors – i.e. people whose property backed on to trails, and hence who lived very close to the trails – who had bought their property *before* the trails were built there, had used the trail at least once in the previous 12 months, and average use ranged from 1.43 times per week to 3.1 times per week depending on the trail. Thus it may be that very close proximity to a trail is a significant encouragement.

***Access and equity***

Access to a facility or resource may include map distance (as the crow flies) or road distance; time distance; perceived versus real distance; financial distance (when one must pay for what is offered at the location sought); and social distance. The latter may relate to communication and the social gulf between provider and seeker (Meade and Erickson, 2000) or to simple denial of access, for example suburban parks that deny access to nearby but out-of-the-suburb children, as in Grosse Pointe, Michigan (Loewen, 2005). Such denial of access is also occasionally the case with private greenways built as part of suburban subdivisions.

In addition, access to resources of equal quality may not be available everywhere. Nilon and Huckstep (1998) found that access to the Chicago river corridor for low-income and minority residents was worse in both quantity and quality, with lower vegetation quality and substandard maintenance. Lower-income minority neighborhoods near public housing have also been found to have greater numbers of incivilities such as broken glass, unattended dogs, graffiti or litter, which make the quality of the resource visibly less attractive (Lee et al., 2005).

Regarding access to *parks*, a study of 55 city park systems conducted by the Trust for Public Land (Harnik, 2003) found that most cities do not offer equitable access to parks for all inhabitants and most have not carefully examined which of their residents do not have easy access (defined as a 10-minute walk in densely populated areas or a 10-minute bike ride in spread-out areas). Existing standards for park density do not take into account differences in access between neighborhoods, and there are few such studies of the distribution of outdoor recreation sites (Tarrant and Cordell, 1999; Wolch et al., 2005). One recent study of Los Angeles parks using GIS (Wolch et al., 2005) found that low-income and minority neighborhoods were drastically underserved with regard to parks.

Proximity - the usual focus in studies on trail access - is probably the most important aspect of access for urban greenways, since they are normally free of charge and it is their physical, rather than social, qualities that are sought. Also they are generally used as neighborhood facilities (Furuseth and Altman, 1991, Gobster, 1995). Additionally, low-income people and minorities are least likely to have automobiles so proximity may be more important.

As to whether trails are distributed equitably, data are scant. Estabrooks et al. (2003) found that low- and medium-SES neighborhoods in one U.S. midwestern city had less access to free physical activity resources such as community centers, trails, parks than did high-SES neighborhoods. Low-income residents in Perth, Australia perceived their neighborhoods to be less attractive and less supportive of walking than higher-income residents, and they had objectively much worse access to the beach and its scenic trails (Giles-Corti and Donovan (2002)). Wilson et al. (2004), using GIS, found that low-

SES neighborhoods in rural South Carolina had far fewer miles of trails than their high-SES counterparts. On the other hand, Lindsey et al. (2001) found that in Indianapolis, minority and low-SES residents had disproportionately high access to greenway trails across the city – but they note that this was achieved, in part, by historical serendipity.

***Who uses trails***

The limited research on who actually uses trails suggests that middle- and upper-income people are more frequent users of trails and other parks and recreation facilities (e.g. Furuseth and Altman, 1991, Brownson et al., 2000) – although most people in most income groups use parks and playgrounds (Howard and Crompton, 1984). However, higher-income people may also have more access to trails.

Ethnic minorities seem to use trails less than whites (Furuseth and Altman, 1991; Lindsey, 1999; Tinsley et al., 2002). This is notable because parks and recreation people have long been concerned about their needs for public open space (Scott and Munson, 1994). However, people of color and low-income groups also express their appreciation of and need for parks and other natural resources (Elmendorf et al., 2005, Lindsey et al., 2001, Garcia et al., 2004). Tinsley et al. found that all ethnic groups said exercise was a moderately important aspect of being at parks, and some surveys have found broad support for trails among diverse groups of city residents (e.g. Lindsey et al., 2001).

There are several theories addressing ethnic differences in use of parks, including marginality theory, cultural differences, and interpersonal and institutional discrimination (Floyd, 2001). Income, distance and transportation issues have been found to hamper poor people's access to parks (Scott and Munson, 1994); racism and fear of racial conflict

have also been a deterrent for minorities to visiting both local and national parks (West, 1989; Harris, 1997; Arnold and Shinew, 1998; Floyd, 2001).

Ethnic minority preferences with parks have also been studied and African-Americans have expressed preferences for more recreation activities rather than natural or wilderness situations, and more open, more noticeably maintained spaces than whites prefer (Kaplan and Talbot, 1988; Floyd, 2001; Dwyer, 1994; Johnson, Bowker and Cordell, 2001; Payne et al., 2002; Johnson, Bowker and Cordell, 2004; Elmendorf et al., 2005). (Greenway trails vary in their level of "manicuredness", and preliminary evidence from an interview for this project indicated that low-to-moderate-income neighborhoods - not just African-American - which tend to have higher crime levels, may prefer the most "manicured" trail settings because they provide greater visibility, and hence safety, for the user.)

If trails are used more by whites than ethnic minorities but if proximity to trails is valued by all groups, then might not ethnic minorities' and low-income people's lower levels of use arise in part from having less access to trails? Moreover, if proximity differs by group, why is this so? These are important questions because proximity to places to get exercise does seem to matter, especially to low-income and ethnic minority groups. In North Carolina, several majority African-American communities making their own planning decisions have chosen to build trails: Princeville, which is over 95% black, gained funding and built a 3-mile Heritage Trail; Garysburg in Northampton County applied for and received grant funds with which they built a walking trail; and Green Level in Alamance County (73% black) similarly gained funds to build a town park with a paved walking trail.

***Equity, environmental justice and greenway planning decisions***

Environmentally, equity can be viewed as one end of a continuum at the other end of which is environmental injustice. The majority of the research on environmental justice - or injustice - addresses the placement and distribution of unwanted environmental hazards or uses, including the placement of hazardous waste dumps (e.g. United Church of Christ, 1987), heavy industry (e.g.Elliott et al., 2004) and concentrated agricultural facilities such as hog production (e.g.Wing et al., 2000), often in poor and ethnic minority neighborhoods. The placement of public goods such as parks, and the meaning of environmental justice in a recreation context, have received less attention, although there has been increased interest in this subject in other disciplines such as sociology, transportation and planning (Floyd and Johnson, 2002; Floyd et al., 2008).

Planning greenway placement has obvious implications for equity. The concept of equity is a central part of sustainable development, a multifaceted approach in current planning and one with international support (World Commission on Environment and Development [WCED], 1987). The Code of Ethics of the American Institute of Planners explicitly addresses the need to consider equity for disadvantaged groups Krumholz (1982). However, with a few exceptions equity is rarely at the forefront of planning decisions. Except where it relates to the provision of affordable housing, even in plans that avow sustainable development principles equity is apparently rarely achieved (Berke and Conroy, 2000). Moreover, “sustainable development” does not always include equity (e.g. Ahern, 2002).

The academic literature on greenways rarely addresses equity. However two central features of greenway system plans, connectivity (Ahern, 2004) and linearity

(Hellmund and Smith, 2006), may make it more likely that trails are equitably distributed. Connectivity makes excellent sense in ecological corridors such as riparian greenways, but it is also relevant to recreational access and to alternative transportation because greenways can connect parks and other community resources. If greenways do have connectivity they should have the potential to be accessible to many groups of people (Hellmund and Smith, 2006). Thus greenway systems that are designed with the intent of promoting connectivity throughout a town should be more equitable. Similarly, if Hellmund and Smith are correct, greenways' linearity means that they "tend to run through diverse neighborhoods, further increasing public access" (p. 19). By this reasoning, since rail-trails are especially linear, they should therefore offer access to an especially diverse group of people. It should be noted however that Hellmund and Smith do not offer evidence to support their claim about greenways and equitable distribution.

On the other hand is the inherently political nature of land use decisions. Discussions of planning theory have noted that despite the prevalence of the still-common rational-comprehensive approach in which planners are assumed to promote the common good and community input is limited, the "common good" has often represented the interests of developers and businesspeople at the expense of the poor (Beauregard, 1989; Troutman, 2004). A newer approach, communicative or consensus-building planning, is not immune either. In a study of San Diego's recent planning process, which aimed to include residents, Troutman found three dominant "property projects", akin to Omi and Winant's (1994) "racial projects", or ways of defining and justifying race-based views and actions, that defined the views and actions of those who did participate. He labeled these *environmentalism*, *individualized ownership*, and *the American Dream*.

These “property projects” overrode the needs of the city’s renters and low-income groups. Race was a constant undercurrent.

Troutman also noted that middle- and upper-class white residents often show the most civic involvement. In planning processes involving neighborhoods, involvement by low-income groups and renters may be the lowest of all (e.g. Fainstein et al., 1993). Thus if the impetus for a greenway often comes from the grassroots level locally (Ahern, 2002) it may be from the higher-income demographic. If ethnic minorities are disproportionately outside these categories, the perception will be that such groups have less interest in initiatives like greenways, and it is less likely that they will get those greenways. However, as mentioned, a number of majority-black municipalities in North Carolina have constructed or applied for funds for walking trails, so interest in the idea does not appear to be confined to white communities.

In the South, Johnson, Parnell et al. (2004) note, “the real political power…still resides with a local White elite, whose political, governmental and commercial interests inevitably intersect” (p. 92). Some recent local planning decisions in small-town North Carolina that include unusual zoning and land-use regulation actions seem expressly designed to reduce the power and the rights of a black community, and to maintain white privilege (Cedar Grove Institute for Sustainable Communities, 2004; Johnson et al., 2004). Pulido et al. (1996) note that with or without malicious intent, because privilege continues to be associated with whiteness, individuals have acted in ways that reinforce and refuel biased views. In this context, plans that involve connecting by road or trail white neighborhoods to ethnic minority neighborhoods, especially to black neighborhoods, may be resisted by white residents because of the desire to prevent

association with those minority areas and what they represent to those residents. Such resistance emerged locally recently over a proposal to rebuild a bridge between a low-income historically black Durham neighborhood and an affluent, mostly white one (Biesecker, 2006). People living near land proposed as greenway trails frequently object to building a greenway because they anticipate that crime will increase owing to the arrival of lawless outsiders, despite evidence that greenways do not increase neighborhood crime rates. This is akin to David Harvey's (1996) discussion of fear of outsiders, and may have a racist subtext where outsiders are people of the "wrong" color.

Additionally, Chuck Flink of Greenways Inc., a company that has designed dozens of greenways and greenway systems in North Carolina and other states, has found that smaller towns tend to pick routes where there is "least resistance and most opportunity"[1] rather than devising a comprehensive master plan. This in turn may be related to the subservient role of planning, which is sometimes a subdivision of "development services", in towns that are eager or anxious to attract development - as many of their websites attest. Towns that already have plenty of development may have other priorities. The General Accounting Office (United States General Accounting Office, 2000) found that conservation of open space and parks is a high or very high priority for 62% of communities concerned about sprawl and for half of non-rural counties.

One last thing to consider is that, given that greenways are often considered an amenity and trails are now the amenity most sought by potential home buyers nationally (Melekian, 2006), towns may be more likely to favor new neighborhoods in building greenways – since extra amenities are likely to help to promote growth, and finding space

[1] Personal communication, June 13th, 2006

for trails is easier where land has not already been developed – rather than adding a costly amenity to an area that is already populated. This begs the question "Whom should the greenway serve?" because one often-mentioned aim in planning greenways is to offer alternative transportation routes. Such alternatives might, in theory, be more relevant to low-income groups or minorities because they have lower rates of car ownership. However if the routes go nowhere near them, the alternative transportation is irrelevant.

***Measuring equity for public open space***

Bullard (1994), discussing environmental justice and environmental hazards, describes three types of equity: procedural (relating to just laws and regulations and their application), geographic (relating to placement of facilities) and social, which encompasses the first two. In the context of access to a public good, perhaps a more productive approach is expressed by Talen (1998), who identifies four types of equity: 1) equality: everyone receives the same public benefit; 2) equity based on need: the needier receive more; 3) equity related to political or economic demand for services: those shouting loudest get more; and 4) equity based on efficiency and market criteria: e.g. frequent users pay more. Talen notes that the distribution of resources is usually measured in non-geographic terms, e.g. acres of park per 1000 residents, without further examination of geographic equity. She suggests "equity mapping" (p. 23), using GIS to map distribution of or access to facilities in combination with socioeconomic characteristics of the area in question. Several researchers have used GIS to map distribution of public facilities such as parks (e.g. Nicholls, 2003; Wolch et al., 2005) although only Lindsey et al. (2001) have looked at the distribution of greenways.

Of these four types of equity mentioned by Talen, equality (equal access for all) may be the most appropriate one in examining access to trails. This is the form used by Lindsey et al. (2001) in examining proximity to Indianapolis greenways, using the container approach (Talen and Anselin, 1998) which expresses accessibility as the presence of a facility or resource within a given area or distance.

***Greenway literature and equity***

Although greenway planning and construction has developed at an increasingly rapid pace, because of their short history there is only a small number of publications on greenways, as Fábos (2004) noted, and most of these are produced for limited distribution to the professionals directly involved. Most of the greenways literature focuses on planning and design with an emphasis on the greenway's place in its physical environment. Even a comprehensive guide to planning and building greenways (Flink and Searns, 1993) mentions access only in the context of types of users, such as pedestrian, vehicular or water-based. The recent book *Designing Greenways* (Hellmund and Smith, 2006) mentions issues of access to different demographic groups, but only briefly. In keeping with greenways' recent history and their environmental value, they are most often addressed in the academic literature in the context of environmental protection or at least planning in harmony with nature.

A special greenways issue in *Landscape and Urban Planning* in 2004 (68:2-3) focused on five areas: public perceptions of greenway corridors, especially along rivers; comparative case studies of historical and current metropolitan greenway planning; historical and cultural greenways; greenways networks in the context of land preservation at the community level; and regional-scale-and-beyond greenway planning (Fabos and

Ryan, 2004). Another special issue in 1995 (33:1-3) had a heavy emphasis on articles about ecological issues in planning greenways. This is logical because as Conine et al. (2004) point out, “perhaps the most important goal of greenway planning is environmental protection” (p. 273), but even with the additional goals of recreation and alternative transportation as these authors suggest, little in the greenway literature mentions access or equity.

Another recent greenway planning article (Walmsley, 2006) compares several development approaches, including New Urbanism, Smart Conservation and transit-oriented development, but again much of the focus is on protection of the land and access for (generic) residents. Planning greenways in the context of access for particular groups of people has rarely been addressed in the academic literature except after the fact (see Lindsey et al. 2001), although Housing and Urban Development funds have been used in several large cities in North Carolina to develop greenways near low-income housing projects (NC Greenways Advisory Panel, 1994).

Of nine American dissertations on greenways and two written outside of the U.S. since 1980, found in a dissertation index search and elsewhere, I found only one that addresses equity in any context. Two focus on trail aesthetics (Lusk 2002, Chon 2004), the former discussing human needs and how greenways fulfill those needs visually and via the trail experience, and the latter discussing the “likeability” of greenways over five aesthetic dimensions. Additionally, Ahern (2002) addresses theories of landscape planning focused on greenways. The user experience is also examined in a dissertation that focuses on past experience and beliefs in determining neighboring landowners’ attitudes to a proposed trail in Cary (Ivy, 2001). One dissertation addresses economic

issues (Tucker, 1993), namely whether people were willing to increase their property taxes, and by how much, to finance additional greenway expansion.

Two other dissertations address organizational behavior in the context of developing greenways. The earliest dissertation I found (Bauer, 1980) is an analysis of the effort to create a greenway, focusing on administrative, political and environmental efforts and the conflicts between the different groups who had a stake in the project. Another (Andrews-Crotwell, 2000) also examines the organizational experience of a greenways task force, using a definition of sustainable collaboration to study how diverse groups came together to act jointly on the Hillsborough River Greenways Task Force in Tampa, Florida. Additionally, a third (Erbil, 2005), examines environmental discourses in cities in two industrial and two developing countries to see whether either type of discourse can be applied to greenway planning strategy in Istanbul.

A different approach is taken by Coutts (2006), who tries to determine the relationship between the number of greenway users and two variables - proximity, which he defines as population density around the trail, and opportunity, which is defined as land use mixture in the area around the trail, on two trails in Michigan.

Finally, there is one dissertation that does address equity, although in the context of planning rather than use. Salazar (2005), looking at greenway planning in Detroit as an urban conservation strategy, focuses on the extent to which greenway planning represents a “participatory process” in racial and ethnic terms, as well as who the participants are and their views and perspectives on greenways. She points out the differences in the perspectives of white middle-class greenway advocates and the city’s usually black and poorer residents, but also notes that if, by using greenways, one makes

nature a part of the everyday life of city residents and part of an equitable development strategy, it can be part of the environmental justice framework.

There is clearly more to environmental justice regarding greenways than simply where they lead through towns, and I don't wish to lose sight of the importance of citizen involvement in a town's or a neighborhood's infrastructure and improvement. Still, given that greenways can be an important part of cities' infrastructure and for most people can be an environmental good, there is still value in examining where greenways do go, and what governs where they lead, within towns.

## Chapter 4: Hypotheses and Methodology

### *Hypotheses*

1) The first hypothesis is that municipal greenways are unlikely to be distributed equitably within a town without specific indications by the town favoring such equity of access. Populations are distributed unevenly throughout towns in terms of race, income, and so on, and there is plenty of evidence that minority parts of town have often been underserved in terms of facilities such as parks and other amenities for physical activity (e.g. Gordon-Larsen et al., 2006; Wolch et al., 2005; Wilson et al., 2004; Pulido et al., 1996). I hypothesize that consciousness of the need for equity, most obviously in written statements such as in greenway plans, will accompany efforts to provide that equity, and that where such statements or indications are lacking, equity of access is less likely. Note that throughout my research, access to greenways is defined as proximity, because proximity is demonstrably an important component – perhaps the most important component – although, as described earlier, other forms of access are also important.

Specifically,

a) *Having a formal greenway plan will favor equity of access.* This is because principles of classic greenway planning, in particular a specific *commitment to connectivity* in the greenway system, favor equity. This seems self-evident, but greenway planning's emphasis on connectivity is distinct from the idea of building trails that loop through, say, a park but that do not lead anywhere else, such as into other neighborhoods.

b) *Commitment to equity*: a written commitment to equity for all demographic groups or for all geographic areas in the municipality, in the greenway mission/vision statement will favor equity.

2) The second hypothesis addresses additional specific factors that are likely to influence equitable or inequitable greenway placement. These include the following:

a) *Use of abandoned railroads* are hypothesized to favor equity, because railroads historically traveled in an uninterrupted line directly into town and out again. Essentially, abandoned railroads are another route to connectivity. For decades, railroads promoted settlement in order to create traffic along the railway lines for the railroad companies (Scott, 1979), including in the South promoting farming and forestry. Thus towns often developed around railroads. Railroad tracks are said to have separated different classes or races in the past, and along with some other physical barriers such as parks and state highways, they still can operate as significant racial barriers, in Chicago for instance (Noonan, 2005). If this is so then rail-trails may straddle racially very different neighborhoods. This is certainly true on parts of Durham's American Tobacco Trail.

Moreover, Hellmund and Smith (2006) posit that greenways will be equitably distributed because of their linearity – and rail-trails are certainly the most linear of greenways.

b) Finally, *local neighborhood input* is hypothesized to work against equity. Specifically, neighborhood residents are likely to oppose greenways that extend into different neighborhoods. This hypothesis stems from the frequently mentioned concerns of residents, in neighborhoods that face a planned greenway, that the greenway will be a conduit for criminals from outside the neighborhood. I also suspect that this is more

common in places where residents have little experience with greenways, which may be more of a concern in small, slow-growth towns because they have fewer new residents who may have encountered greenways elsewhere.

***Methodology***

The dissertation research included two separate parts, involving both quantitative and qualitative data. It is an examination of a sample of North Carolina towns that have greenway trails. In brief, for the first part the intent was to map greenway trails in the identified towns and, using census data at the census block level, determine whether greenways are located equitably, in terms of proximity, for African-American residents relative to white residents. The second part involved conducting interviews with people who had been engaged in some way in planning the greenways in the identified towns.

Clarification of what is meant by "greenway" for the purposes of the greenway research is in order. The meaning of the term can very widely depending on the context, so defining a greenway can be tricky. The working definition I used was similar to that of the North Carolina Department of Transportation. NCDOT uses the term a 'multi-use pathway', and its definition is as follows: "A multi-use pathway is physically separated from motor vehicle traffic, and can be either within the highway right-of-way or within an independent right-of-way. Multi-use pathways include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic….In addition, the pathway should function as a mode of transportation between well-defined locations" (NCDOT, 2007). NCDOT multi-use pathways are generally though not always paved and usually at least eight feet wide.

*Selection of towns with greenways*

In order to embark on sampling greenway towns it was necessary to create a sampling frame. Because there is no comprehensive list of North Carolina towns with greenways, I created my own list of towns with urban or suburban greenway trails. In order to do this I first examined municipal websites, under parks and recreation, and planning categories, using the U.S. Census website, census.gov, to find all towns with a population of at least 1000 that were incorporated by 1990. Only a very few small incorporated towns and villages in North Carolina lack websites, and nearly all of the municipal websites include park and recreation facility and planning department information. Each of the 100 North Carolina counties' websites was also checked because they sometimes mention town greenways where the towns do not. Sixty-eight towns that had existing greenways or greenway-like trails were found, most with a population of at least 5,000. There are approximately 100 towns of this size in North Carolina.

In addition, I visited the NC Department of Transportation to look at their files of greenway/pedestrian plans. Towns with greenway plans generally notify the DOT of these plans because if the department is alerted, it has an obligation to try to accommodate such plans in its own highway construction projects. I also checked on the internet for mention of greenway plans and grants awarded for greenways from NCDOT Transportation Improvement Plan files and some other sources.

I entered the resulting list of towns with greenways into an Excel spreadsheet along with Census 2000 (100% population) data about town population and population

change since 1990, percent African-American and Hispanic, as well as a census measure of income from the census long form or 1-in-6 sample. The income data was used because I wanted to be sure that all the towns had at least a minimal proportion of people in poverty. I also included GIS and planning web contacts for each municipality and each of the 100 counties. The use of Census 2000 data is less than ideal because it is increasingly out of date, but this is to some extent mitigated by two factors: 1) the long lead time between when greenways were planned and when they went on the ground, generally several years, and 2) the relative proportions of the two populations I am examining, whites and African-Americans, have not changed greatly overall in most North Carolina towns, while the population that has probably changed most significantly, Latinos, was small (less than 5%) in most towns at the time of the last census, when many of the greenways in this study were in the planning stages.

Because I wanted to examine greenways in towns that had both ethnic and economic diversity, I first removed from the list 14 towns that did not have an ethnic minority as at least 10% of their population in the 2000 census from the sampling frame. Practically speaking this meant towns with fewer than 10% African-Americans, though towns with fewer than 10% African-Americans almost always had fewer than 5% Latino residents as well. North Carolina's black population in 2000 was 21.6% of the total, and the larger municipalities tend to have higher proportions of black residents than that. The town of Princeville, which has a trail, was excluded because it is 97% black. Five additional towns were removed because they had less than 5% of the population living in poverty – this left out towns such as Cary, which has an extensive greenway system but a population that is not very diverse economically.

A few towns were excluded because the greenway was not really within the town (e.g. the Broad River Greenway outside of Shelby), the town was too tiny to be counted by the census (Todd, Gold Hill), the “greenway” did not seem to fit the definition I used (e.g. the unpaved 8-mile Roanoke Canal Trail through the woods between Roanoke Rapids and Weldon, which is a terrific trail but generally much narrower, more “rustic” and in places more like a particularly athletic mountain bike trail than my greenway definition) or the people who had been involved with planning the original greenway were no longer there. These exclusions left 39 towns.

I contacted people in each of these remaining towns at the relevant department – usually planning or parks and recreation - by e-mail (see appendix A) or phone or both. The aim was to ask for a copy of the greenway plan, if such a greenway plan existed, for greenway GIS files if they were available - more often they were not - and to determine who should be interviewed initially. This process also served to whittle down the town list some more as in a few towns, the people involved in the greenway planning no longer worked or lived there or repeated phone calls were not returned.

From the remaining towns I used a form of purposeful sampling (Miles and Huberman, 1994). The intent was to include towns of varying populations that included both ethnic and economic diversity, with and without significant population growth between the last two censuses, with one or more greenways per town, in a variety of areas in North Carolina. Greenways in the final sample included rail-trails, riparian greenways, and greenways that ran neither along streams nor along abandoned rail beds.

I also included towns that had greenway plans early on, and towns that developed a greenway when opportunity knocked, i.e. before there was a plan for one. Although I

did not have full information about greenway plans from all the eligible towns before I chose the sample  since not everyone sent a plan, and not every town had a plan, I included ones that had comprehensive as well as minimal plans:  some so minimal as to say that greenways are a good thing and perhaps the town should have some. In towns that had more than one greenway, I included all the town's greenways in the GIS analysis.

I expected that larger towns such as the named cities would be more likely to have longstanding and comprehensive greenway plans and that towns with comprehensive greenway plans, in turn, would have relatively equitable access. Towns with rail-trails were included because I thought they might be particularly conducive to equity of access. I anticipated that towns with little growth, most of which were fairly small, would be likely to experience considerable neighborhood opposition to the novel idea of a greenway whereas large towns that had experienced growth and had new residents from elsewhere would experience less opposition.

Most, though not all, of the towns in the final selection were in the Piedmont region of North Carolina, which has the biggest chunk of the state's population. Since I started from Chapel Hill, nearly all of the towns were all within a day's return drive.

Eleven towns became part of the GIS research. Five of them are cities with well over 100,000 people - in one case over 500,000 - as of the 2000 census:  Charlotte, Durham, Greensboro, Raleigh and Winston-Salem. They were chosen because they all had multiple greenways and extensive but quite different experiences and greenway planning histories. Six are smaller, ranging from a few thousand to about 30,000 people, and I have chosen not to name those towns because it seemed that that would be

necessary to preserve confidentiality of the people I talked to there in addition to the usual respondent confidentiality measures.

*GIS data collection and analysis*

Although I had asked the departments I contacted to provide me with GIS files of their greenways if they had them, not all of them had this data. In addition, I wanted to know where all the access points were to each greenway from the surrounding roads, and complete information about this was for the most part not included in municipal greenway maps or GIS files: often it was limited to trailhead access. In order to get the information about access points, and also to have a clear sense of the greenway environment, I took a Garmin Map60 GPS receiver mounted on my bicycle and rode all the greenways in each of the sample towns. Wherever there was an obvious public access point I noted its location and type (street intersection, path to a nearby road, etc.). I also took brief notes about who – or occasionally what - was on the trail, the amount of litter and other aspects of the trail such as a change in trail surface or things that impeded access. In some towns I made a repeat visit to confirm either GPS data or visual observation.

Once I had the GIS data, I entered it into ESRI's ArcMap (ArcGIS 9.2) and edited it where necessary to make sure that greenways that intersected with streets on the ground also did so on the map. I used Census 2000 TIGER files for the roads in GIS because they match the Census 2000 demographic data that I wanted to use. They are internally spatially consistent – which is to say streets are in the right place relative to each other – but sometimes the lines can be quite inaccurate in cartographic space, and a place where a greenway meets a road in real space can appear to be a significant distance away from the

road on the GIS map. My concern was not with the actual geographic coordinates being perfect as much as it was that roads and greenways should line up at the access points, so Census 2000 TIGER files were generally adequate, with a little editing, usually to create or modify access points that met the TIGER road network. Once or twice I confirmed my memory of a trail when it conflicted with a TIGER file by looking at Google Earth – as for instance when the TIGER file once erroneously showed a major road crossing a lake.

Having done the data cleaning in ArcMap, to evaluate access I used the Network Analyst function of ESRI's ArcView 3.3 because it was quicker and simpler to use than the ArcMap program and still achieved the results I needed. Once again Census 2000 files were used, this time for census block population demographic data. They have been downloaded to the UNC library's GIS folders, so they were readily available for all my sites in North Carolina.

Census block data was used because it provides a more accurate approach to physical access for the purposes of this dissertation than block group or tract data. Lindsey et al. (2001), examining the demographics around Indianapolis greenways, used census tract data, which includes more information including income and education from the 1-in-6 sample census long form, but this scale of data combines demographic boundaries in a way that makes the data much less precise and less accurate for small areas. Lindsey et al. also used straight-line distances, not road network distances. Coutts (2006) used census block data to cover what he called "usersheds", i.e. the area within which people were likely to walk or cycle to trails: he remarks on the value of increased accuracy of the census data because of the smaller size of the units despite the loss of income and education data.

Using people's residences rather than place of work for proximity to greenways seems logical and is consistent with work by research using the American Time Use Study (Denton et al., 2008), which found that people were much more likely to engage in sports or exercise at home or outdoors than at work, regardless of the time of day.

There is no generally accepted figure for what constitutes equal proximity to greenways for different demographic groups. My GIS question was essentially: are minority and low-income groups represented equally in the populations along the roads near the existing greenways? Put another way, what does the neighborhood population look like in the areas around these greenways? To answer these questions I compared the percent African-American in census blocks that represent the ½-mile and 1-mile road networks around the greenways to the percent minority in the town as a whole, to create a greenway location quotient for African-Americans.

For each municipality, the greenways and their access points were entered into ArcView and superimposed on the census block files to show the proportion of the population that is African-American within two distances of the trail access points: a ½-mile access area and a 1-mile access area. I used ½-mile access networks, radiating ½-mile outwards along the roads from each greenway access point, because pedestrian users are not likely to travel more than half a mile – about a 10-minute walk - to reach a trail (Lindsey et al., 2001, Coutts, 2006), and Furuseth and Altman (1991) note that greenways generally serve neighborhoods, not larger areas. I also calculated 1-mile access networks. Drew, Hurst and Galloway (2001) found that of almost 2000 trail users in Minneapolis, although about half of them drove to the trail, the average travel time for all modes was about 5 minutes and trail users generally lived a little over a mile from the trail they used.

In addition, given the likely importance of proximity to facilities for people who did not previously exercise (Lucas et al., 2004, Crespo et al., 2000, Gordon et al 2004), neighborhood-level distances seem appropriate.

All of the options that ArcView's Network Analyst offers to intersect the census block themes and the greenway access network area are of necessity approximations, because they must conform to the boundaries of the census blocks while covering the network area as best they can. I used "features of [the census data] that have their center in" the selected features of the network area. After comparison with other Network Analyst options, this selection seemed to offer the intersection that was most congruent with the actual census blocks without including too little of the network area (e.g. using the option of census blocks that are "completely within" the network area), too much of it (e.g. the option to "intersect" the network area) or creating other shapes that did not conform well with the true intersection of the census blocks and the access area (Liu, 2001).

From the selected census blocks for each greenway access network area at a given network distance of ½ mile and 1 mile for each town, the total population and the white and African-American populations were calculated in ArcView. The proportions of white and African-American residents in the greenway access network areas were then compared with the corresponding populations from each town's 2000 census population totals to arrive at the greenway location quotients for each town for whites and African-Americans. The greenway location quotients were calculated as follows:

$(S_{greenway} / P_{greenway}) / (S_{town} / P_{town})$

where $S_{greenway}$= subgroup population (e.g. African-American) in the greenway area,

$P_{greenway}$ = total population in the greenway area,

$S_{town}$ = subgroup population in the town

$P_{town}$ = total population in the town

*Additional data*

As mentioned above, I asked a person in each of the study towns to supply me with the town's greenway plan, if one existed. In some cases I was able to get more than one (i.e. most recent as well as previous) greenway plan. In a few cases there was no greenway plan to speak of before the greenway trail idea was conceived, as when a trail funding opportunity was noticed in a town with an abandoned rail corridor. Some of the more recent greenway plans, especially for larger municipalities, were available on the Internet. Where there was a greenway plan, I read it for background information and for clues to the priorities of the municipality regarding the role of greenways in that town. This information was a useful backdrop to the interviews that I later conducted.

In addition, I found some additional material about greenways in the study towns from other sources, such as newspaper articles on the Internet that discussed controversial greenway plans, the Greenways Archive at N.C. State University, maps and other information from the relevant municipal department, minutes – available on the Internet - of municipal meetings where greenways were discussed, and even a few local political cartoons addressing controversial greenway plans. Some of this material was used as background material for the interviews, and some of it supplemented the interviews, often

by providing historical facts or insight about the priorities of towns in developing greenways.

*Interviews*

There were 41 interview subjects. Initial interviewees for a given town were determined by the contacts discovered for the most part in the initial selection of towns and the requests for information. I would first ask for an interview with whomever the people within the department thought had been most involved in the process. Most often, but not always, these were municipal staff who were reached through a town's planning or parks and recreation division – in whichever department had responsibility for the greenway or greenways. As well as municipal or county employees, which included town planners - occasionally specifically greenway planners – parks and recreation employees, and other government employees, I interviewed a number of people who were citizen advocates of greenways but not municipal employees and thus not greenway planners by virtue of their jobs. These people had usually sat on boards or committees that advocated or helped to plan a greenway or greenways.

In addition, several people were interviewed who had knowledge of greenway planning at a different scale – county or state, or experience with greenway planning in other states. A few more people were interviewed even though they might not have been involved with any of the specific study towns, because their names were mentioned frequently by interviewees as people who were knowledgeable about greenway planning in some capacity, or they had some other relevant expertise. Each interview concluded with a request for more names of people who were knowledgeable about the greenway planning process, and this would "snowball" to other respondents and other suggestions.

Of the 41 people interviewed, four were African-American. I had hoped and sought to find more, but as one of the interviewees noted of people involved with and advocating for trails and greenways, “we’re awfully white”. Some reasons for this came up in the interviews and will be discussed later.

The approach to questioning was to conduct semi-structured, topical interviews in order to learn about the processes and events involved (Rubin and Rubin, 1995) in planning a greenway or greenways in each town. Using a previously constructed interview question guide with open-ended questions made it possible to cover the intended themes while allowing for additional related information to emerge and be followed. Although the topical interviewer is looking for facts, as Rubin and Rubin remark, the narrative is “the truth as heard and interpreted by the researcher” (p. 30), and even the various truths and the realities themselves are those perceived by the study respondents, but where possible they are confirmed by other interviews or other material - for instance in this study by checking people’s statements about municipal priorities regarding greenways with greenway plans where they existed.

Interviews generally lasted an hour to an hour and a half. They were held at a place of the respondent’s choice, most often his/her office or at a café or library. The respondents were informed of their rights as study participants before the interviews, and each was asked to sign a consent form (see appendix B).

Every interview, once completed, was transcribed and then loaded into the qualitative data software program ATLAS.ti. I then coded the interviews, starting with an initial list of concepts derived from the interview questions and adding and subtracting codes as I reread the interview transcripts. I reorganized the concepts in accordance with

the themes from the interview questions such as neighborhood input or greenway priorities) adding additional issues that emerged in the interview answers. Although ATLAS.ti has tremendous capabilities, I used the program chiefly for its capacity to organize and retrieve coded sections of text rapidly and to group and compare responses to questions.

*Limitations of the study design*

In retrospect my choices left a gap in city size between those with populations of over 30,000 and those with populations over 100,000, in part because I did not get responses from some of the towns I contacted originally and in part because the people with knowledge of the history of greenways in some of my originally chosen towns had moved. However, only 23 of North Carolina's hundreds of towns had populations over 25,000 in the 2000 census, so it seems reasonable to include so many smaller municipalities. Moreover, I did include towns with comprehensive and those with minimal or after-the-fact greenway plans, those with rail-trails - in some cases only a rail-trail - and those without, towns with greenways planned primarily for transportation, primarily for recreation and primarily for flood protection; towns with large African-American populations and towns with relatively small ones down to about 15% of population. It is not a completely representative sample of towns, but I think it covers considerable ground and expresses the variety of the independent variables.

In addition, as will be seen in the results chapter, small towns unsurprisingly tend to have fewer greenways and/or fewer miles of greenways, which inevitably makes it more difficult to distribute greenway miles equitably while fulfilling other requirements. So in retrospect a study that focused solely on larger towns, for example, might have

offered clearer answers. However the small town research did shed light on attitudes where greenways are still considered novel, and on some of the drivers of greenways where there is not a greenway plan, so the work on them still provided useful information.

A potentially larger flaw is that I did not interview people who were opposed to greenways. In part this is because they were harder to find and they were usually unorganized. I also repeatedly heard that people who objected were against a specific greenway in their neighborhood, as opposed to greenways in general. More relevant for this dissertation is the fact that they were not likely to be involved in the "Where should greenways go?" question - as opposed to the "Anywhere but here" answer. Their resulting lack of involvement in the overall process made them less attractive as potential interviewees with knowledge of the process. Planners in particular were useful informants because they were often responding to the expressed wishes of a city council for or against a greenway and so their planning of greenways came to be a required part of their job, although as people with knowledge of the uses of greenways they were sometimes also advocates.

The other rationale for the choice of interview subjects is that part of this research and, usually, of the interviewees' responses addressed the impact of neighborhood input, positive or negative. The fact that the interviewees' experiences were so similar, in terms of who opposed greenways and why, lends them verisimilitude. As a volunteer advocate for another trail - not part of this study - in a Piedmont county, I have heard identical objections when we had contacts with trail neighbors or potential trail neighbors who worried about what they thought might be the impact on their properties.

An additional limitation in the GIS limitation is the single measure that I have used, a greenway location quotient for African-Americans and for whites. It made sense - and there is precedent for it, e.g. Lindsey et al. 2001 - to examine the population in the areas round the greenways, because I wanted to examine who was in the greenway neighborhoods rather than get a wholesale measure, say, of how close on average a census block or block group with a given proportion of one demographic group was to a greenway anywhere in town. At the same time, I have not examined income or other demographics such as education level, despite the obvious limitations of considering only race, because the scale at which such data is available, census block group, is too broad and obscures the neighborhood-level – i.e., walkable neighborhood level – fine-grained population data. Small towns are sometimes divided into very few block groups for census purposes, and the precision of "who lives near the greenway" would be hard to extract. I chose to focus on race also in part because it is much more noticeable than something like income or education, and part of the dissertation bears on residents' perceptions of who they might encounter on a greenway.

Conducting the interviews brought home to me that there are a multitude of different stories in every town, and the experiences that each person brings to the interview about the history of his or her town and its connections to greenway planning are unique, not least because the influences of individuals in greenway planning can vary considerably from town to town. There may be elements about greenway planning in North Carolina that do not transfer to sites elsewhere. However, the research does illustrate some of the complexity of the issues involved in greenway planning and how

complicated it can be to build a greenway that takes the most practical route from a pedestrian's standpoint but that also has everyone's approval.

## Chapter 5: GIS results

I will preface this chapter with a note about the mapping experience. The GPS mapping was instructive as most of it was done on greenways I had not visited before beginning the study, and encountering the greenways on the ground was rather different from looking at them on a municipal map. Although greenways in most towns were paved and most were at least 8 feet wide, there were also short sections of greenways in some towns that made me question my original definition – was a residential-sidewalk-width sidewalk a greenway if the town said so? If it was still separated from traffic and it connected two more conventional greenways, I said OK. What about when the wide path suddenly narrowed and at least in one instance, became a steep narrow unpaved rocky trail? If there was a short section that was not up to the town's usual greenway standards but that connected the rest and was labeled as greenway, I included it. If I had to leave the bicycle behind for a short section that amounted to hill scrambling – which only happened once - that short section wasn't a greenway to me. Occasional steps? OK. Several hundred feet of mud-covered paving through a tunnel in the dark? Well, there is paving, and it's connecting other paved greenway sections, so OK…In the end virtually every part of every town's greenway system was included, and I had a new respect for my long-suffering bicycle.

In this chapter I examine the GIS results for greenway access in each of the study towns. The first part addresses the range of location quotients at the ½-mile and 1-mile

distances. The second part of the chapter focuses on the individual towns. They are grouped as follows: first, towns with location quotients for African-Americans that are closest to 1.0, second, towns that have disproportionately good access for African-Americans (over 1.2), and third, towns with the least favorable access, below 0.80. Because there are no standards for what is acceptable leeway in greenway location quotient figures, and given the demographic and other differences among the towns, somewhat arbitrarily I have considered location quotients of 1.0 +/- 20% (i.e. between 0.80 and 1.20) to be within the range of "equitable" [2] and outside those ranges, less-than-equitable or more-than equitable (disproportionately good). One might argue with the cutoff points, but the measure does allow for comparison, and it invites a closer look at the towns where the location quotient is farthest from 1.0 to see what might have caused this.

There are 11 towns in the study, five large and six relatively small. I have chosen not to identify the six smaller towns by name, regardless of how equitable their access to greenways is, because it would be harder to maintain confidentiality of interviews if I did so. These towns will be identified on the maps and tables and in the text by the alphabetically-convenient letters A to F.

---

[2]Note: because nearly all towns in North Carolina, and all the towns in this study, are predominantly white, a large discrepancy between the proportion of black residents in the greenway area and that in the town as a whole could be reflected only as a relatively small discrepancy in the equivalent proportions of white residents. For example if a town is 20% black and 80% white and the area within a ½-mile network of roads around the greenways is 10% black, the greenway access ratio for black residents is only 0.5, meaning that the proportion of residents in the greenway area that is black is only 50% of their proportion of the town's population, but the ratio for whites is 90/80, or 1.125; so white residents are, percentage-wise, less over-represented than black residents are under-represented.

Additionally, when the town is relatively small and the black population is relatively small percentage of that small population, it may be understandable that extending nearby access to a greenway to a small population is not the first priority among several competing ones. However it is worth noting that in the towns in this study, with the exception of Town E, the African-American population is over 25% and ranges up to 47%, while the white population ranges from 46% to 71%, with the same exception, town E, representing 81% of the population. Thus minority residents in nearly all of the towns studied do represent a very significant proportion of the population

*Table 1* (page 46) sets out the location quotients for black and white residents for each town at each of the two distances. The 22 pages of maps (pages 47 to 68) show for each town the road networks around the greenways within a half-mile and then within a mile of the greenway access points. *Figure 1* (page 69) is a graph that shows the location quotient for African-Americans in each town at both the ½-mile and 1-mile distances. Discussion of the GIS results begins on page 70.

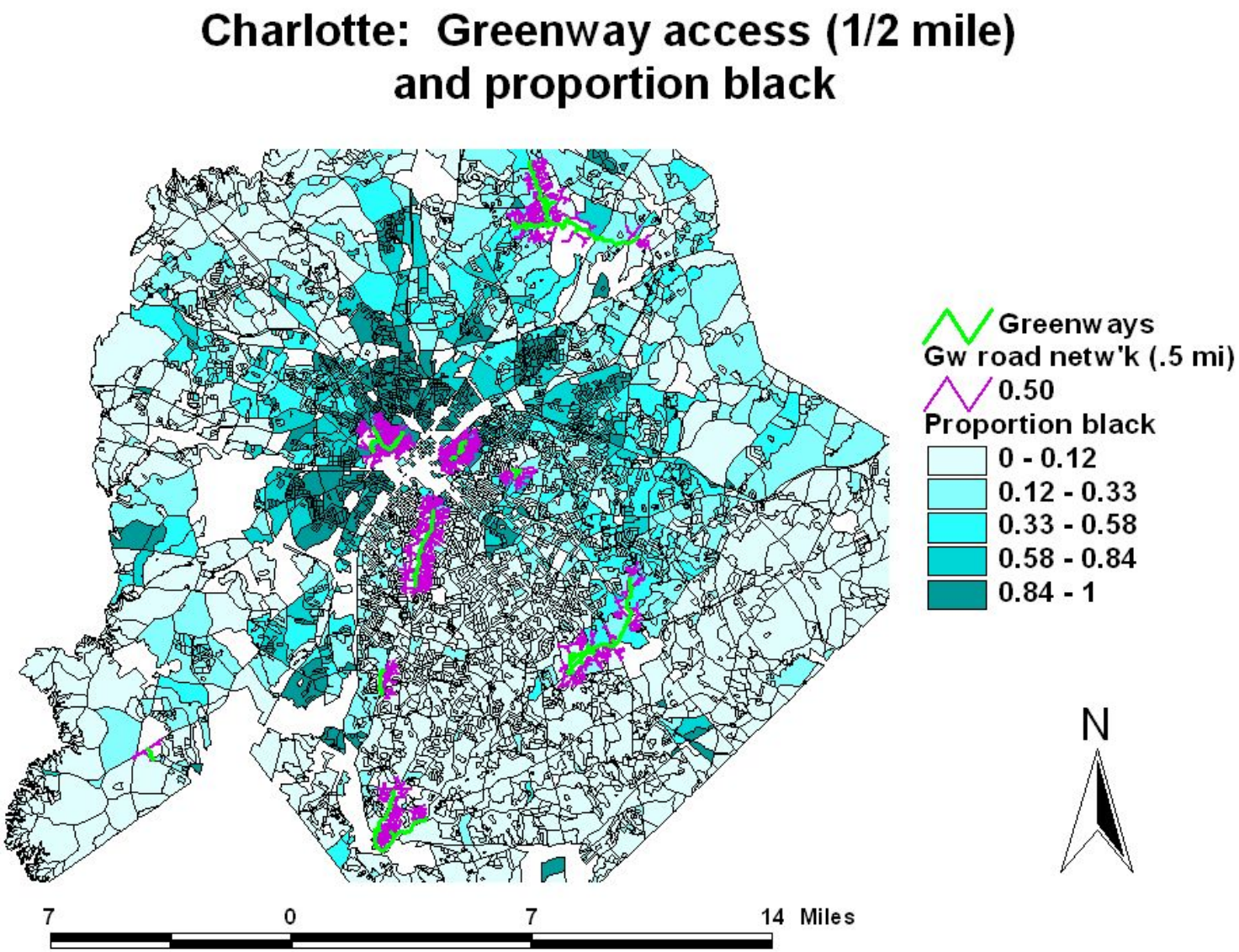
Finally, although I usually mapped the greenway(s) on an interview trip to a given town, GIS analysis was nearly always conducted after the interviews, so I did not have the GIS results at the time of the interviews.

## Table 1:
## Greenway location quotients for 11 North Carolina towns

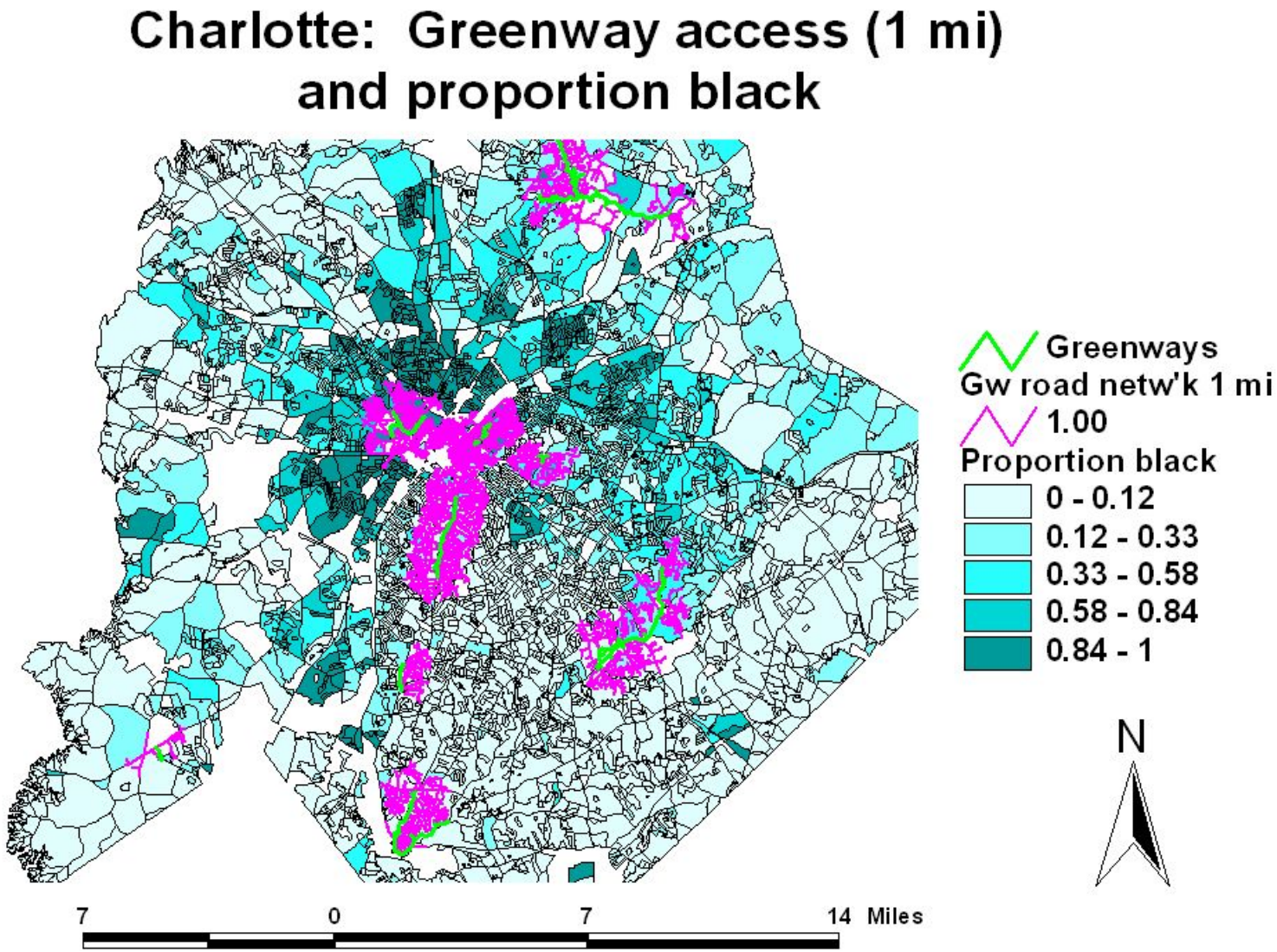
| Town | Census 2000 population in town | black GLQ 1/2 mile | white GLQ 1/2 mile | 1/2 mile: % town pop in gw area | black GLQ 1 mile | white GLQ 1 mile | 1 mile: % town pop in gw area | gw miles per 1000 residents | netw'k miles per gw miles |
|---|---|---|---|---|---|---|---|---|---|
| **town A** | <25,000 | 1.44 | 0.61 | 42.2 | 1.17 | 0.85 | 79.0 | 0.733 | 22.1 |
| **town B** | <25,000 | 0.56 | 1.20 | 24.6 | 0.89 | 1.07 | 63.4 | 0.386 | 16.3 |
| **town C** | <50,000 | 1.32 | 0.83 | 11.7 | 1.11 | 0.95 | 37.2 | 0.091 | 23.8 |
| **town D** | <25,000 | 0.83 | 1.09 | 5.6 | 0.55 | 1.32 | 17.4 | 0.076 | 13.5 |
| **town E** | <25,000 | 0.33 | 1.16 | 10.6 | 1.01 | 1.00 | 32.2 | 0.242 | 9.0 |
| **town F** | <25,000 | 0.25 | 1.26 | 6.1 | 0.51 | 1.21 | 24.6 | 0.916 | 5.3 |
| **Charlotte** | 540,828 | 1.10 | 0.99 | 5.5 | 0.96 | 1.06 | 18.1 | 0.054 | 14.2 |
| **Durham** | 187,035 | 1.16 | 0.89 | 15.0 | 1.15 | 0.88 | 41.4 | 0.083 | 26.0 |
| **Greensboro** | 223,891 | 0.64 | 1.25 | 9.4 | 0.70 | 1.19 | 25.2 | 0.083 | 21.8 |
| **Raleigh** | 276,093 | 1.07 | 0.99 | 19.6 | 1.01 | 1.00 | 49.4 | 0.168 | 13.6 |
| **Winston-Salem** | 185,776 | 1.47 | 0.66 | 8.1 | 1.32 | 0.75 | 25.1 | 0.103 | 11.0 |

$\mathbf{GLQ = (S_{greenway} / P_{greenway}) / (S_{town} / P_{town})}$, where $S_{greenway}$= subgroup population in the greenway area, $S_{town}$ = subgroup population in the town, $P_{greenway}$ = total population in the greenway area, $P_{town}$ = total population in the town

= high GLQ (over 1.20)GLQ = low GLQ (under 0.80)

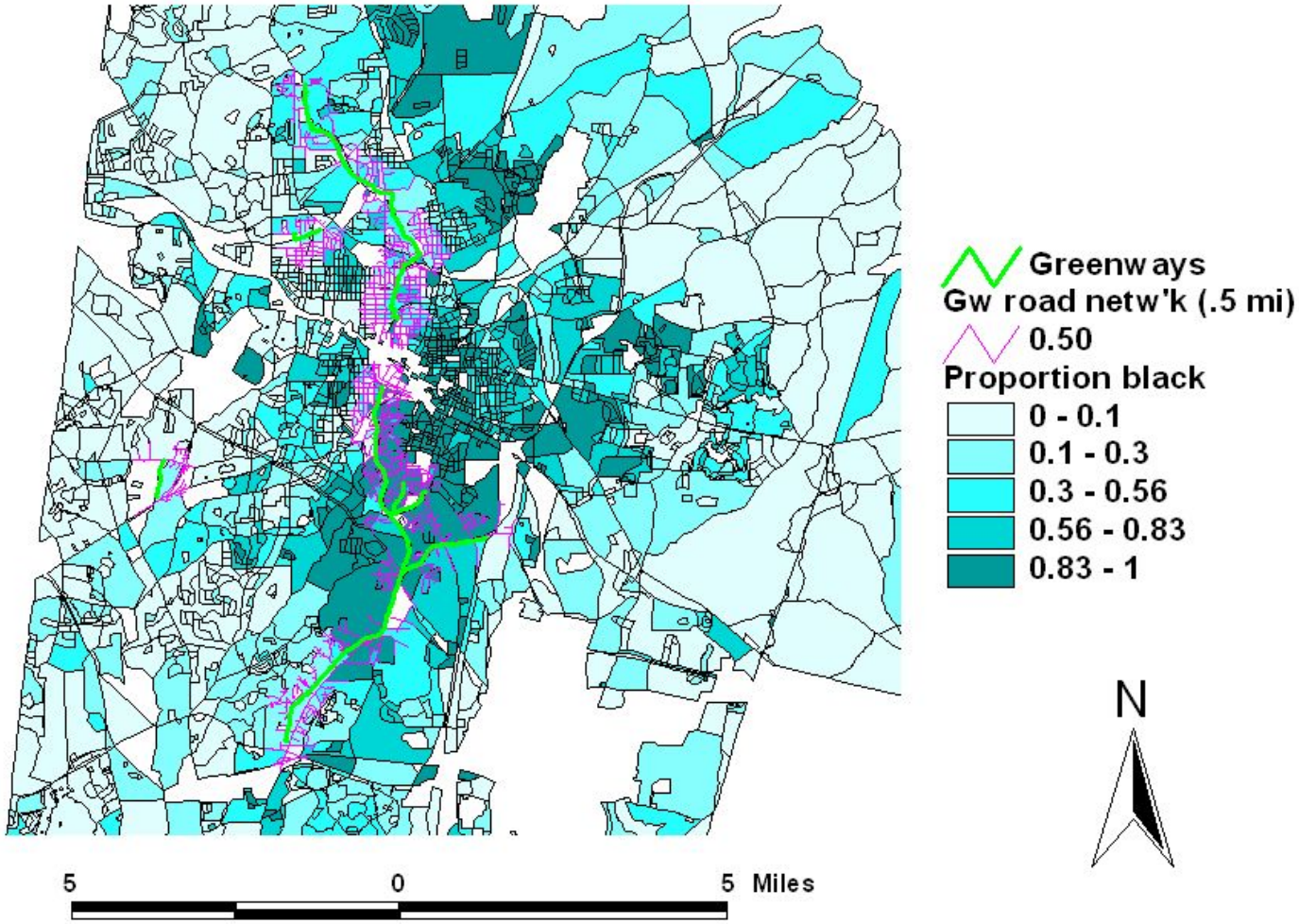

Charlotte: Greenway access (1/2 mile)
and proportion black
Greenways
Gw road netw'k (.5 mi)
0.50
Proportion black
0 - 0.12
0.12 - 0.33
0.33 - 0.58
0.58 - 0.84
0.84 - 1
N
7
0
7
14 Miles

Map 1


Charlotte: Greenway access (1 mi)
and proportion black
Greenways
Gw road netw'k 1 mi
1.00
Proportion black
0 - 0.12
0.12 - 0.33
0.33 - 0.58
0.58 - 0.84
0.84 - 1
N
7
0
7
14 Miles

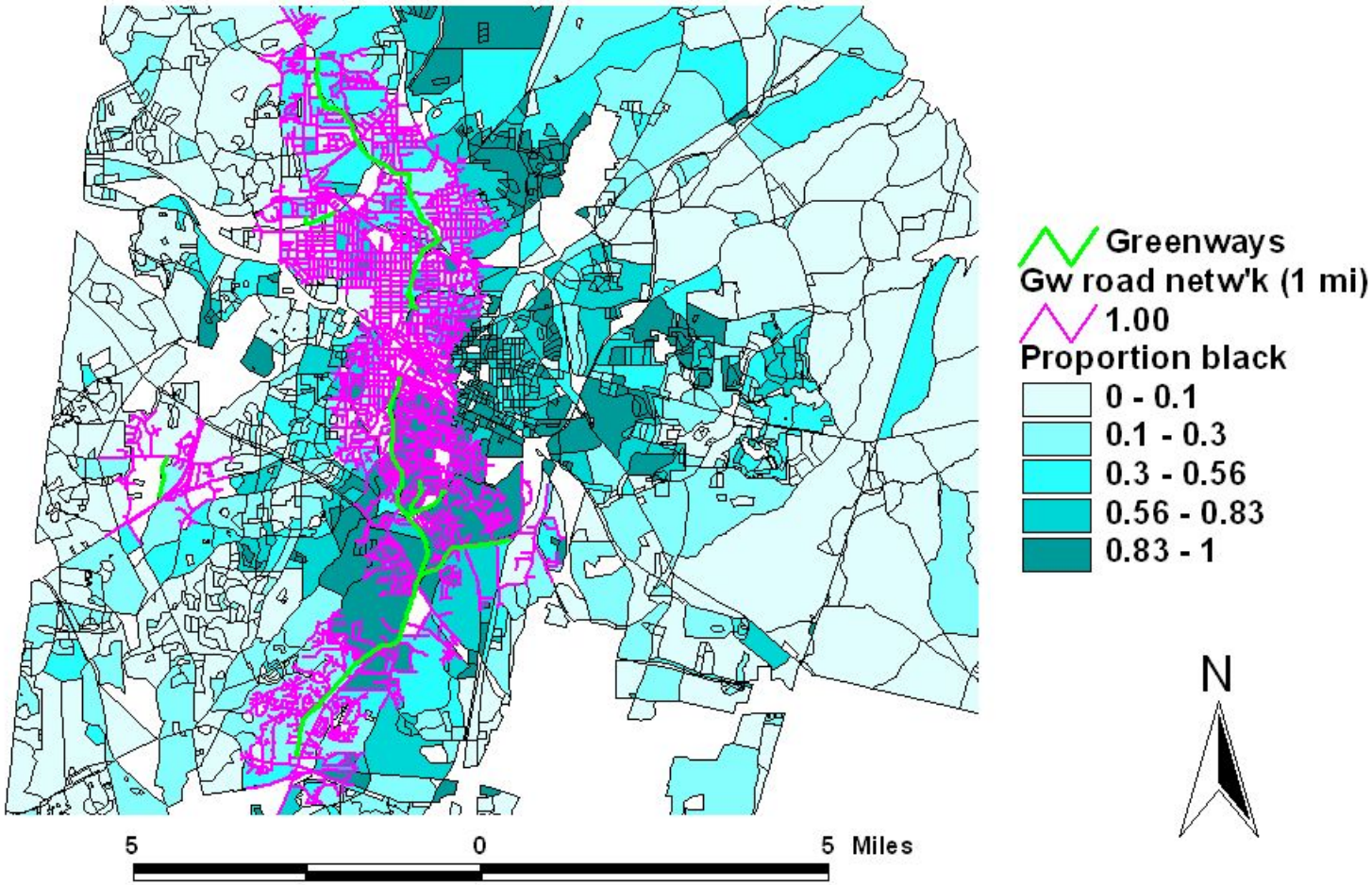
Map 2

# Durham: Greenway access (1/2 mile) and proportion black



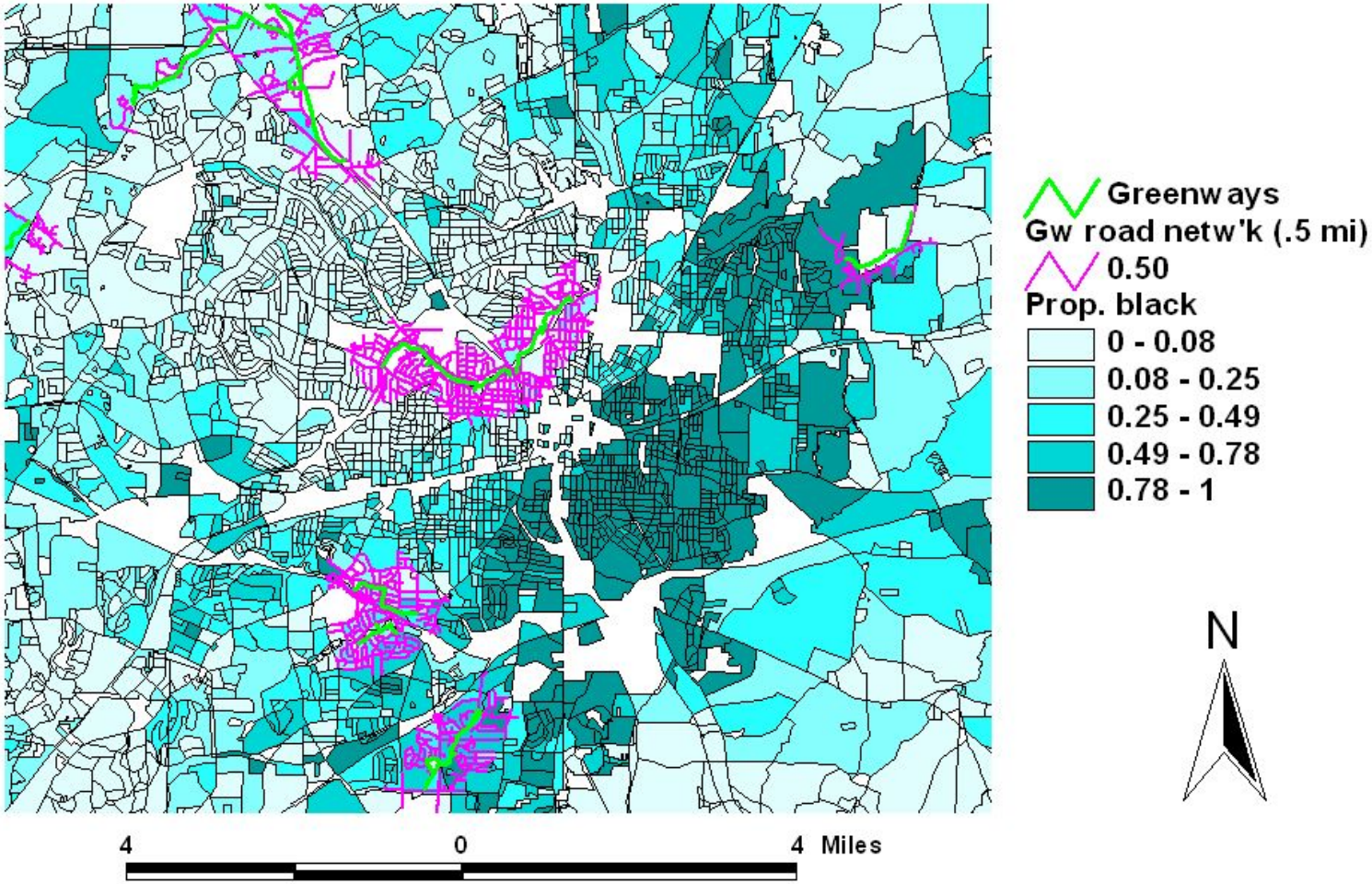

Map 3

# Durham: Greenway access (1 mile) and proportion black



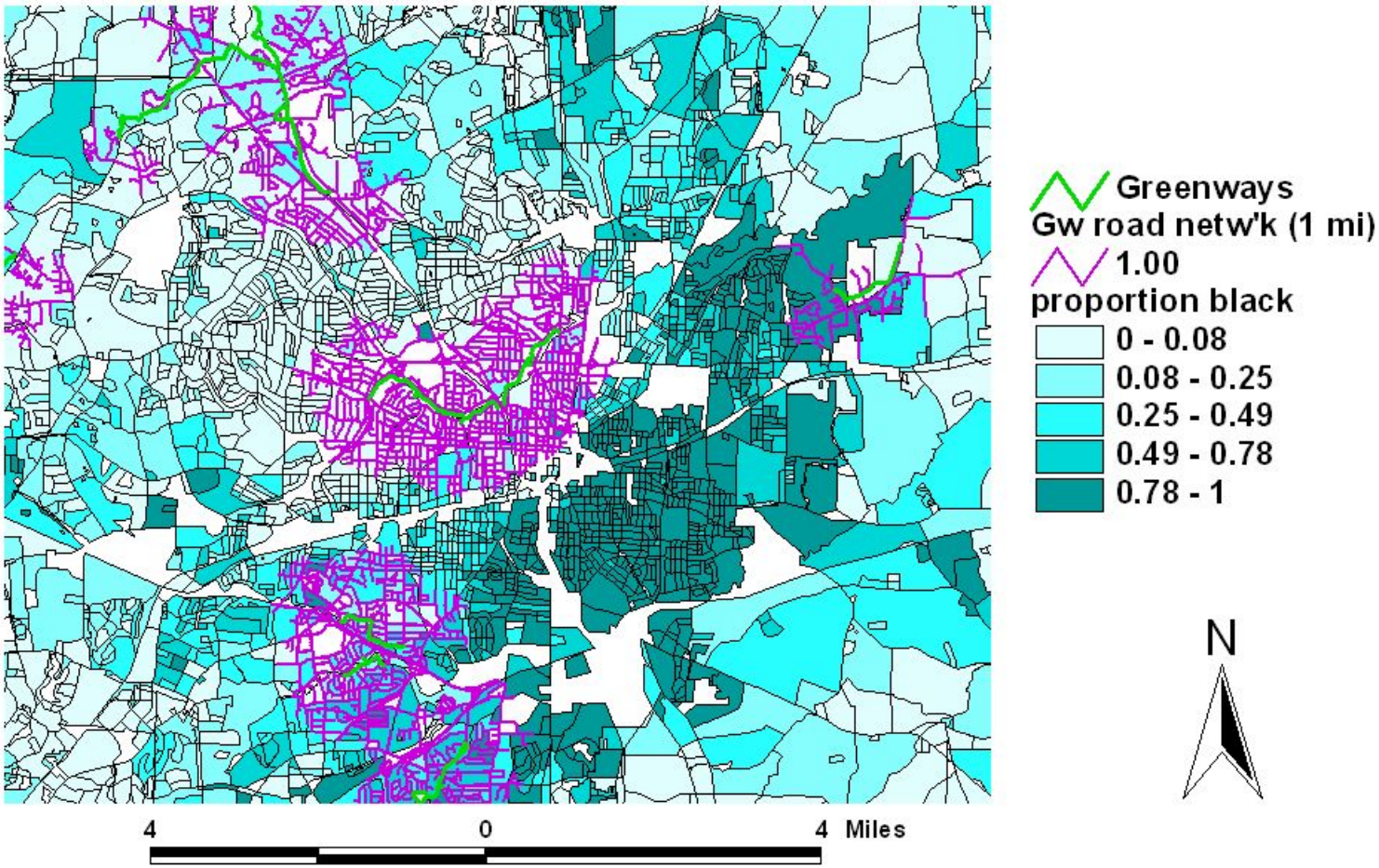

Map 4

# Greensboro: Greenway access (1/2 mile) and proportion black



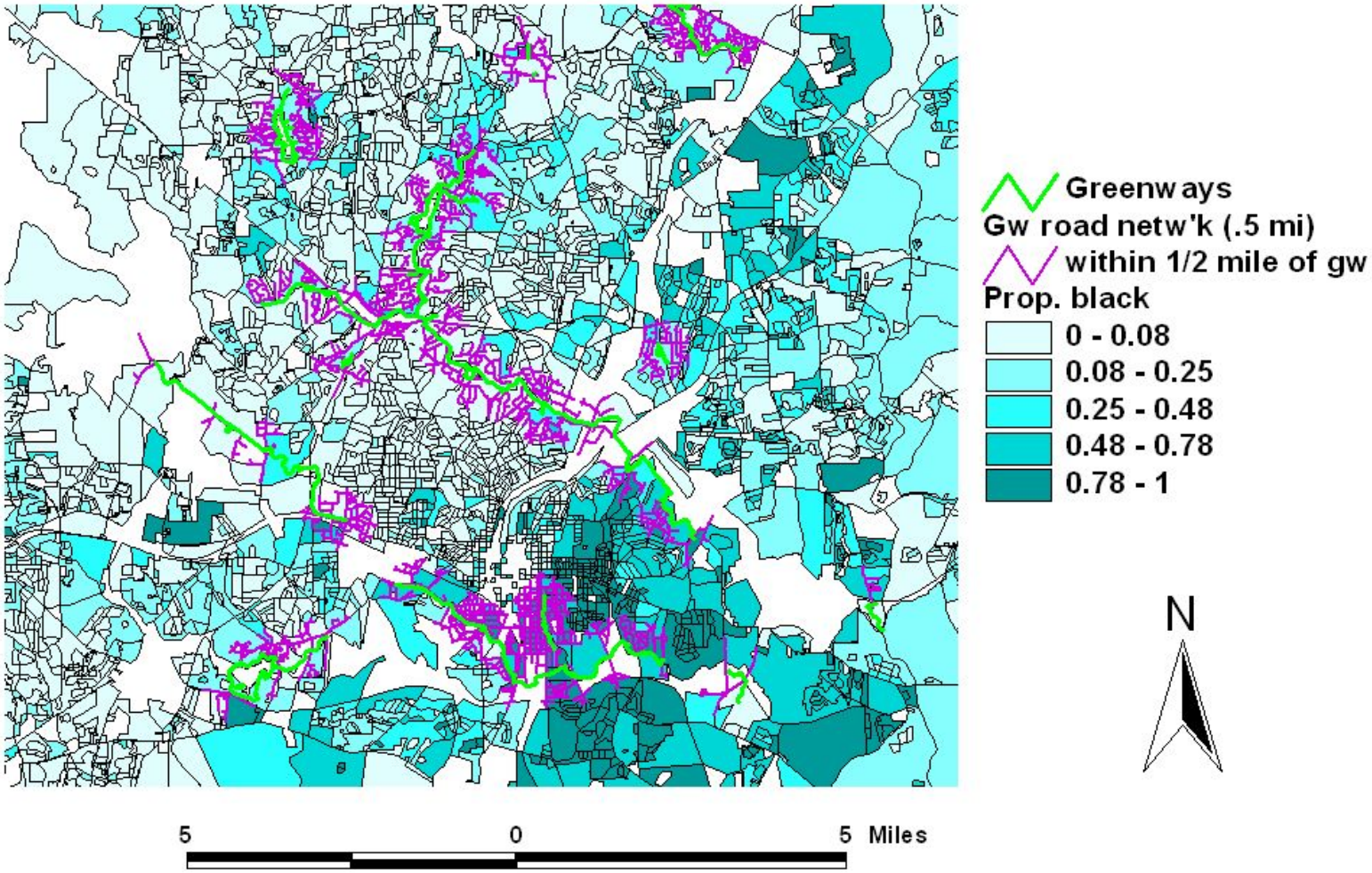

Map 5

# Greensboro: Greenway access (1 mile) and proportion black



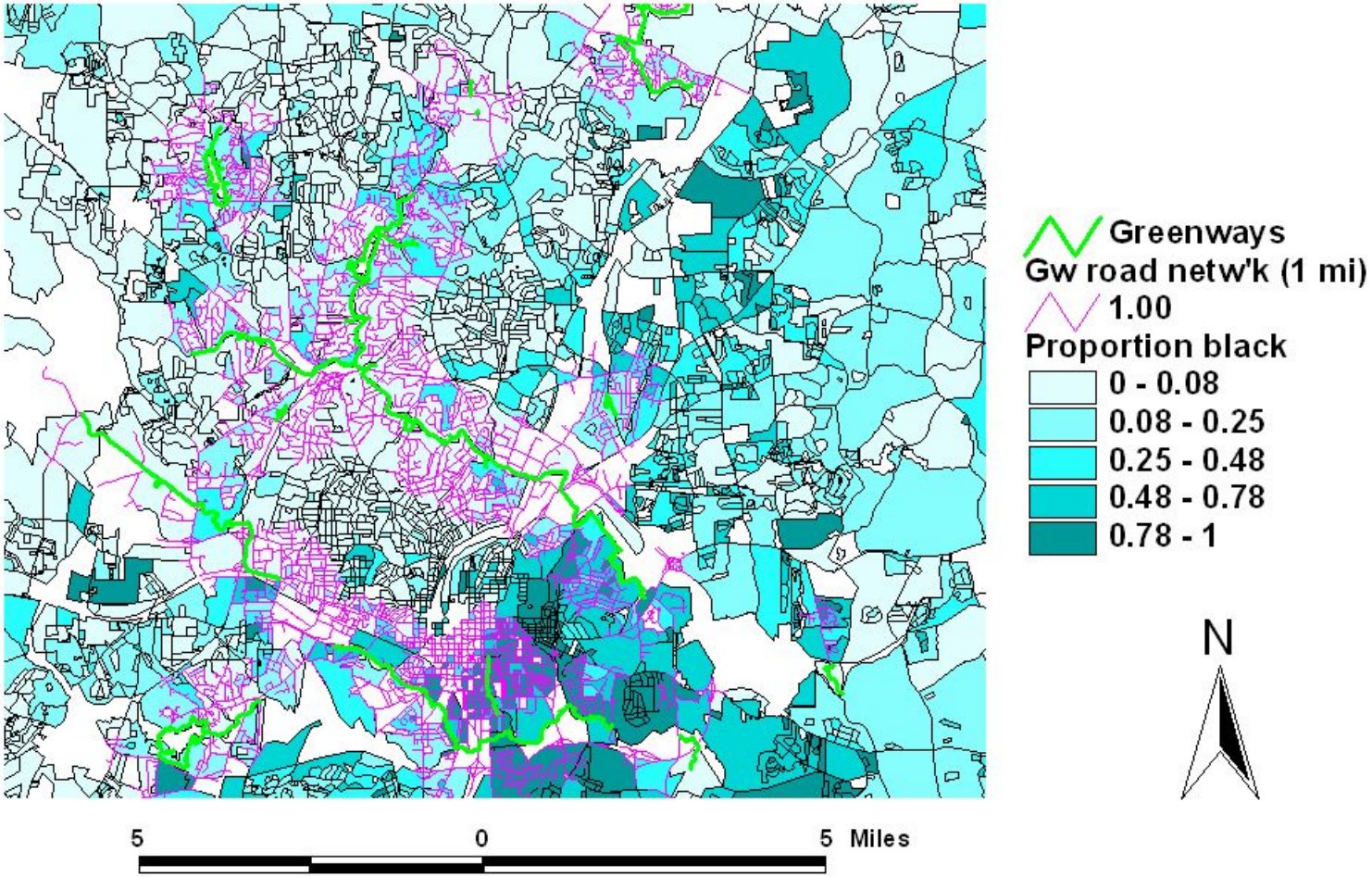

Map 6

# Raleigh: Greenway access (1/2 mile) and proportion black



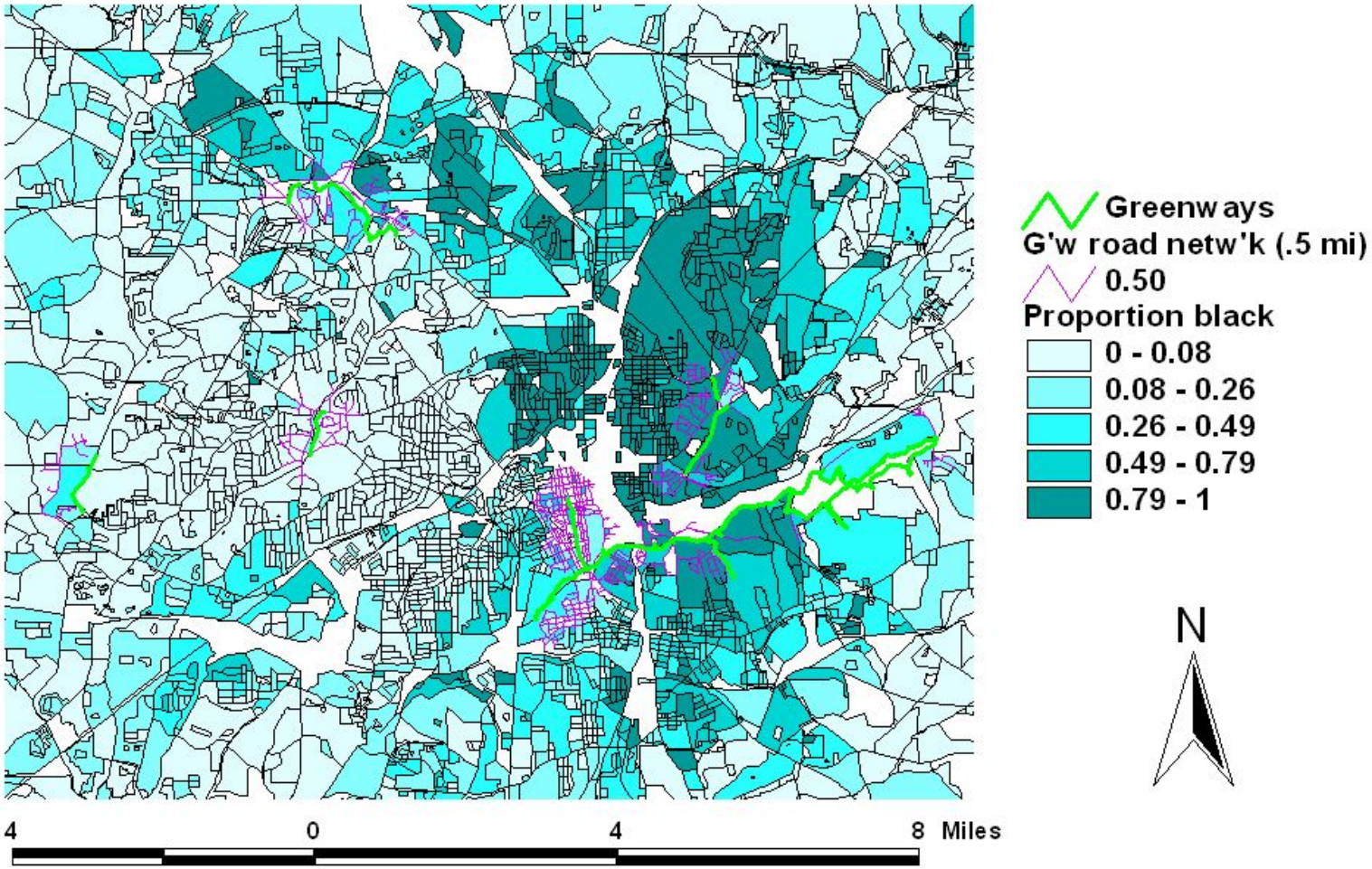

Map 7

# Raleigh: Greenway access (1 mi) and proportion black



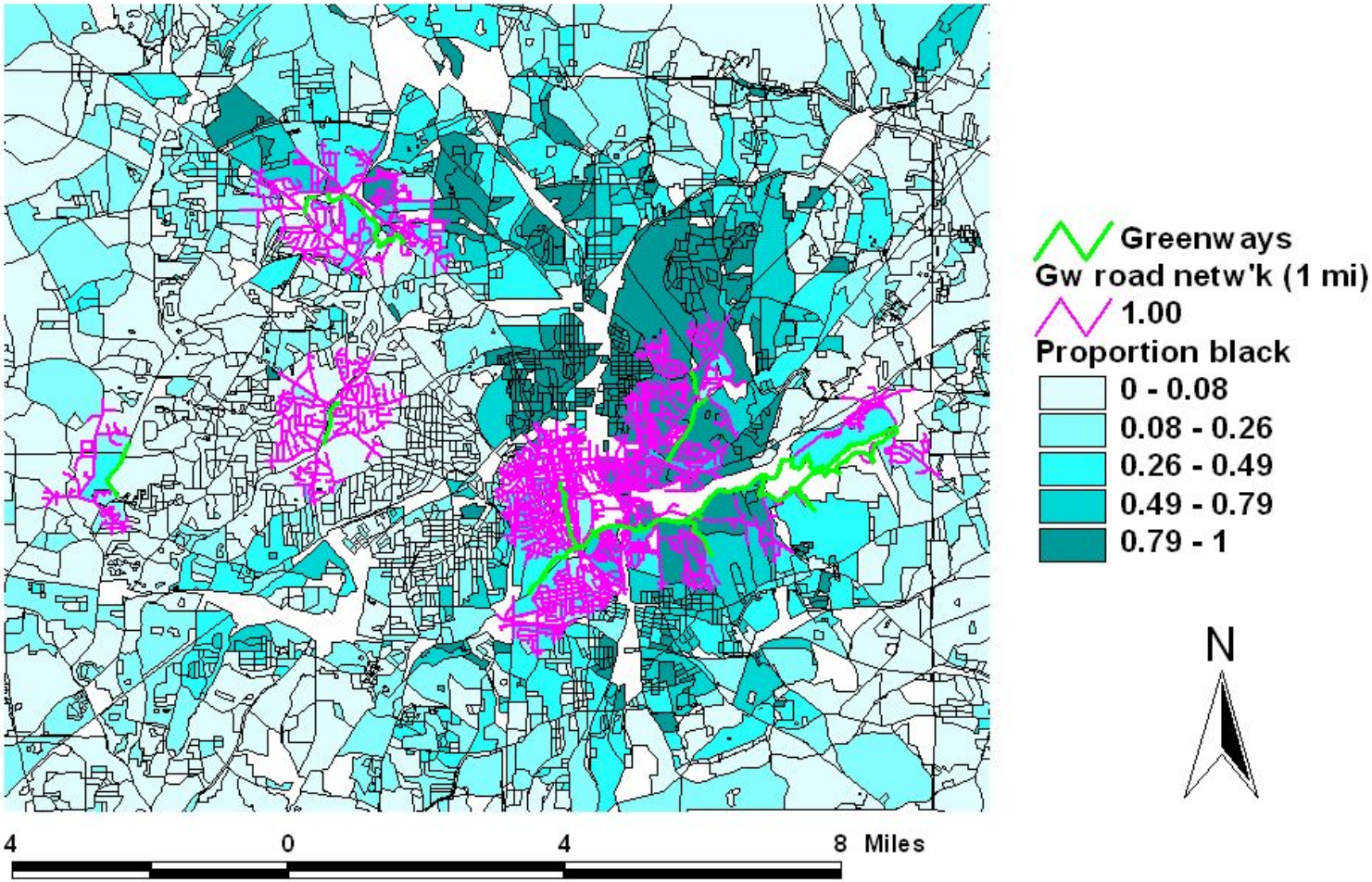

Map 8

# Winston-Salem: Greenway access (1/2 mile) and proportion black



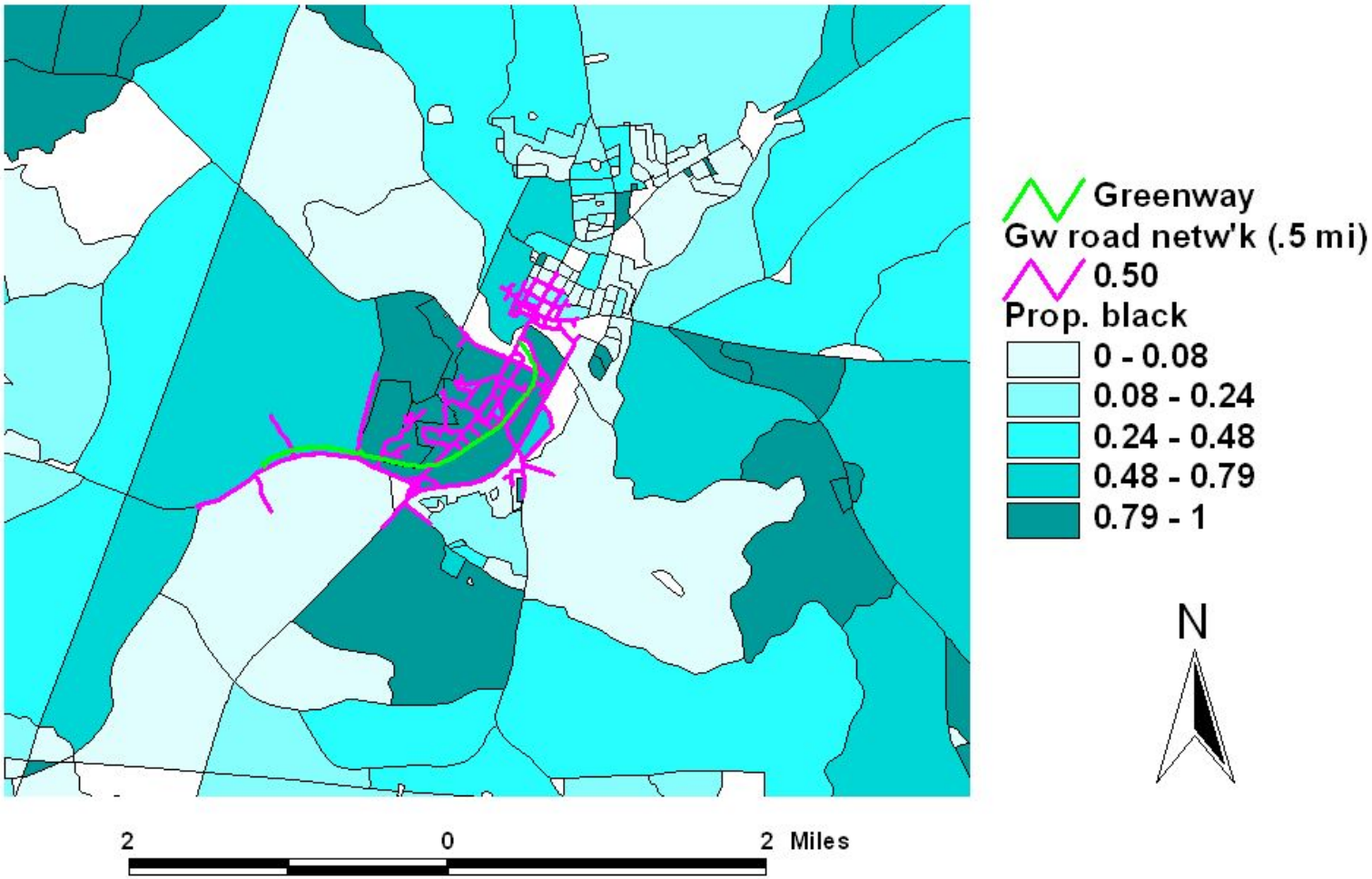

Map 9

# Winston-Salem: Greenway access (1 mile) and proportion black



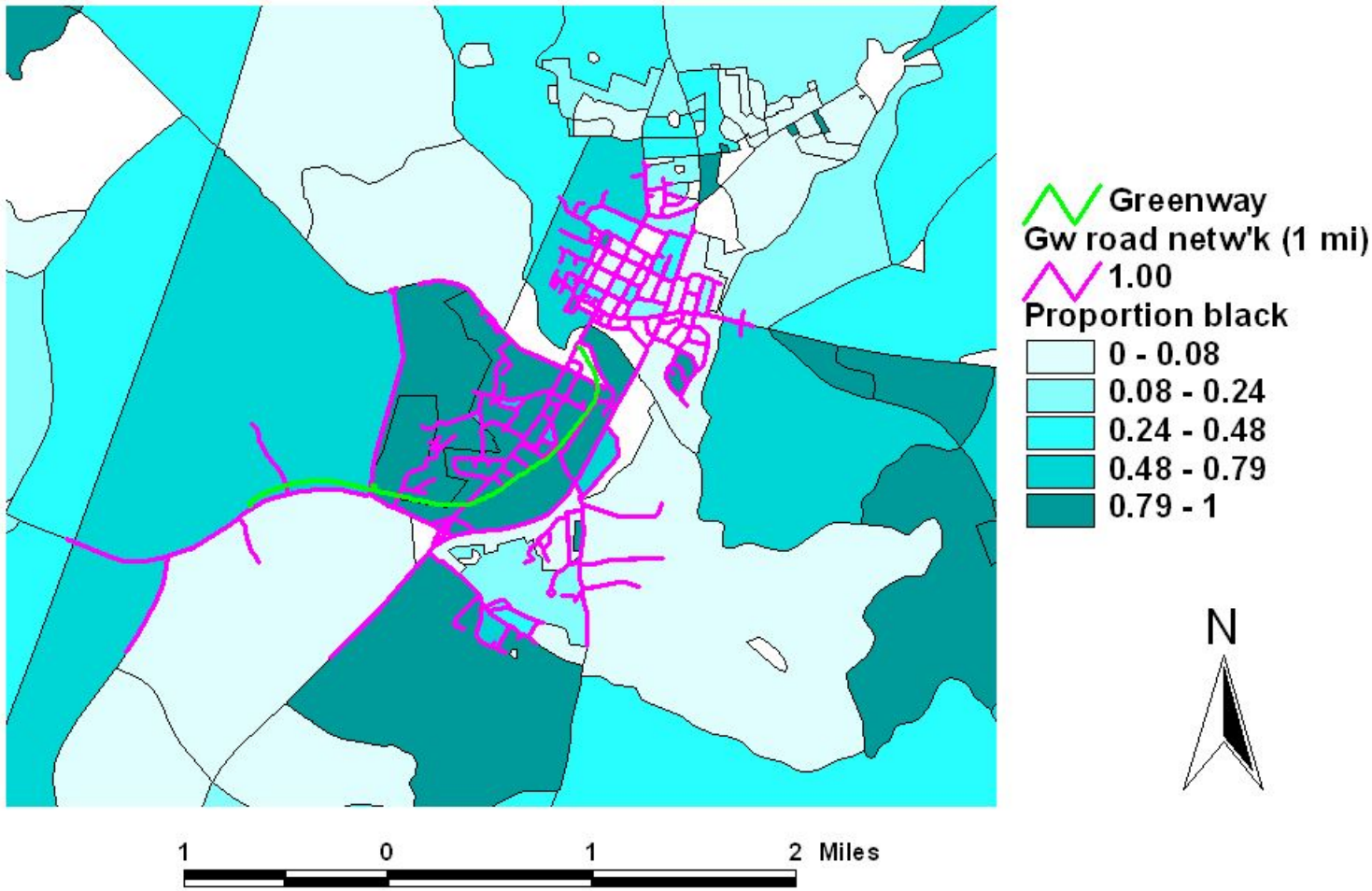

Map 10

# Town A: Greenway access (1/2 mile) and proportion black



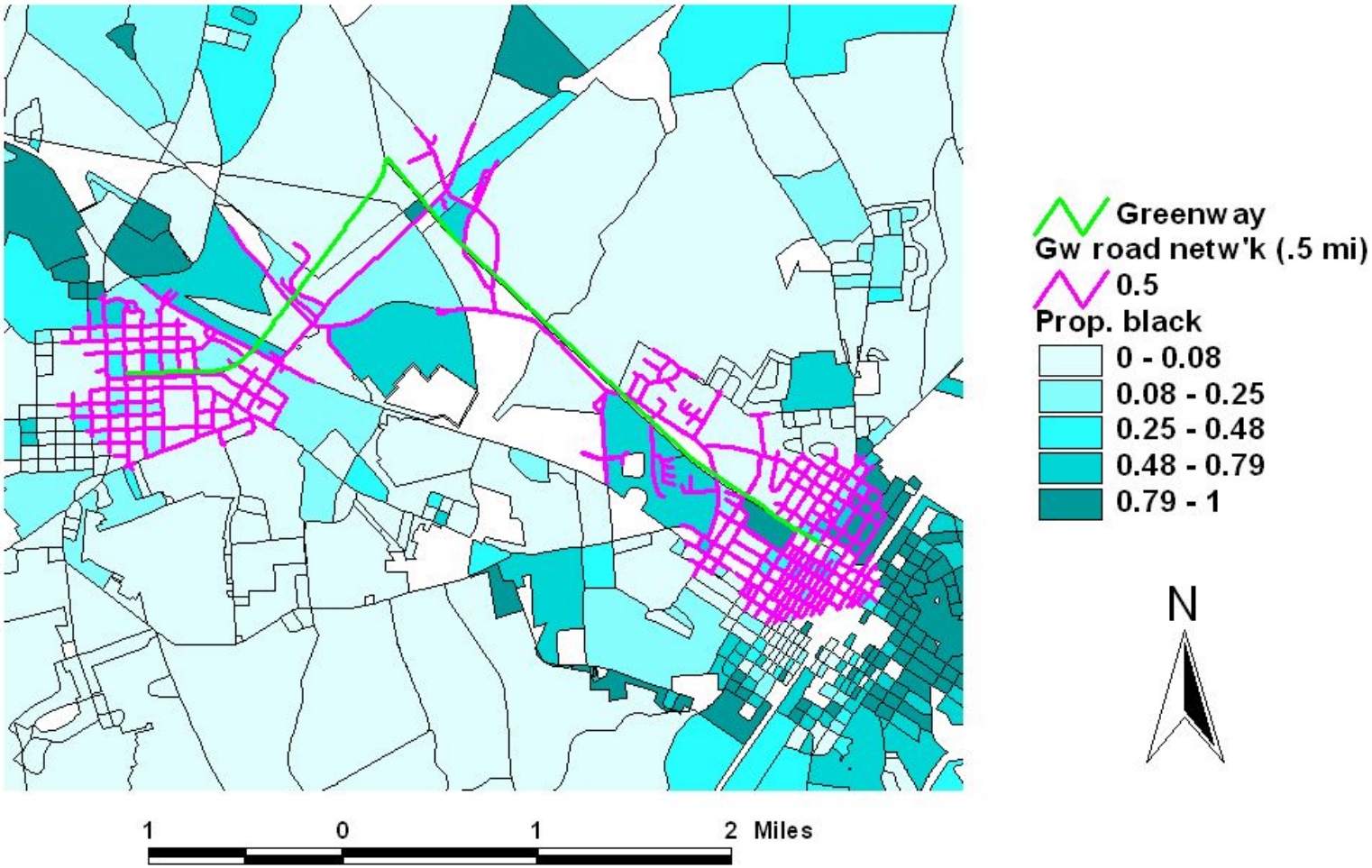

Map 11

# Town A: Greenway access (1 mile) and proportion black



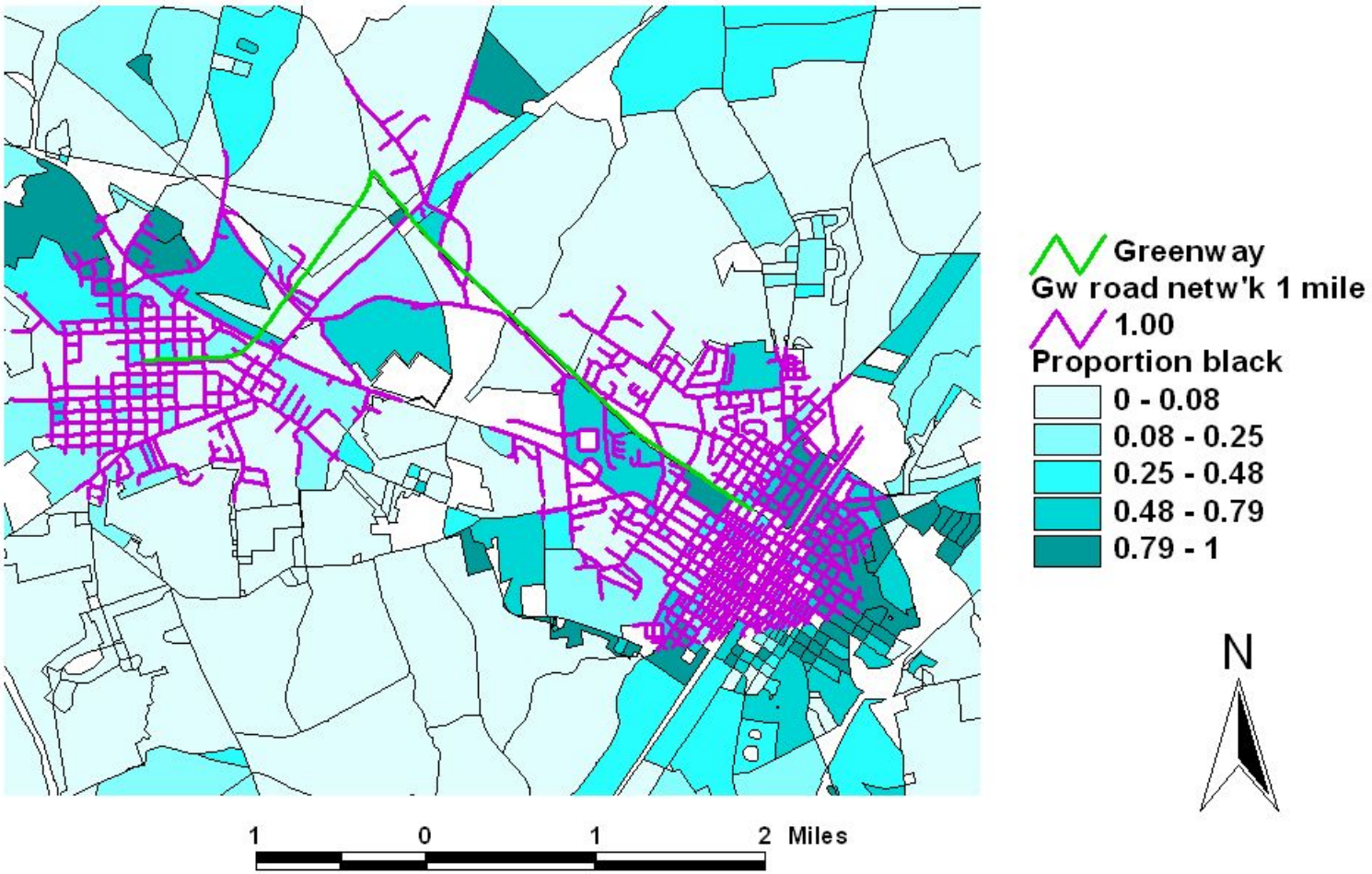

Map 12

# Town B: Greenway access (1/2 mile) and proportion black



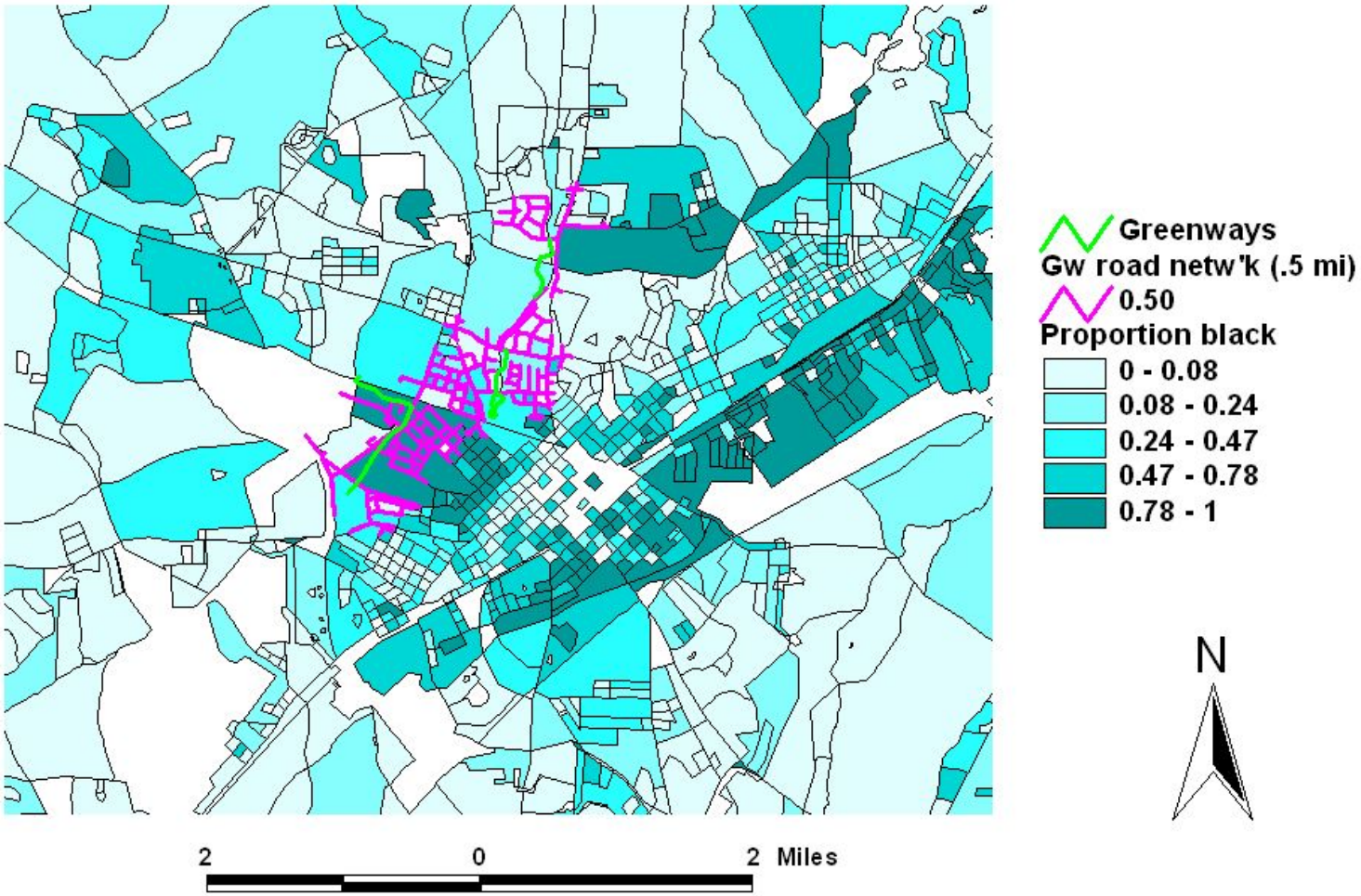

Map 13

# Town B: Greenway access (1 mile) and proportion black



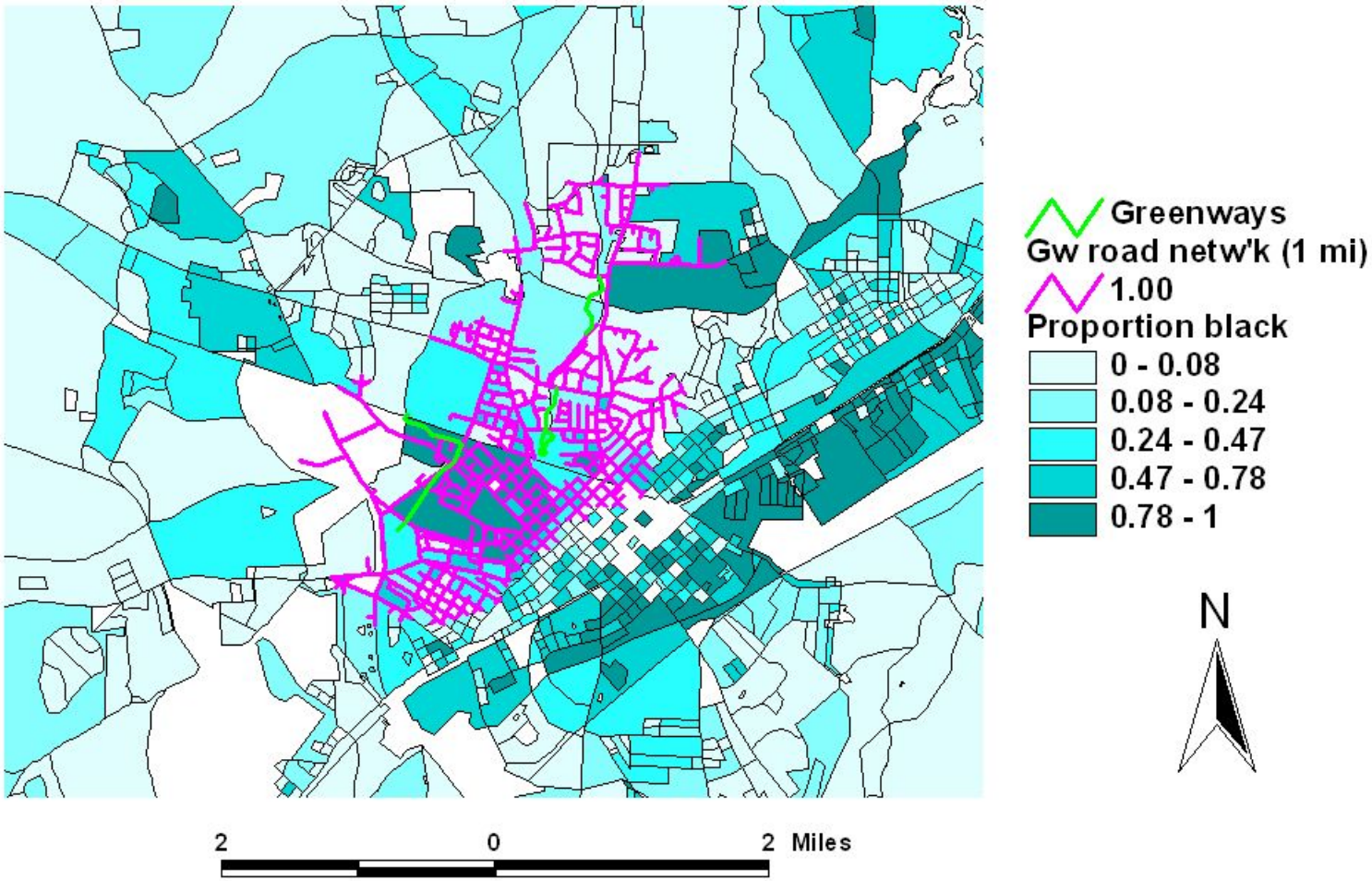

Map 14

# Town C: Greenway access (1/2 mile) and proportion black



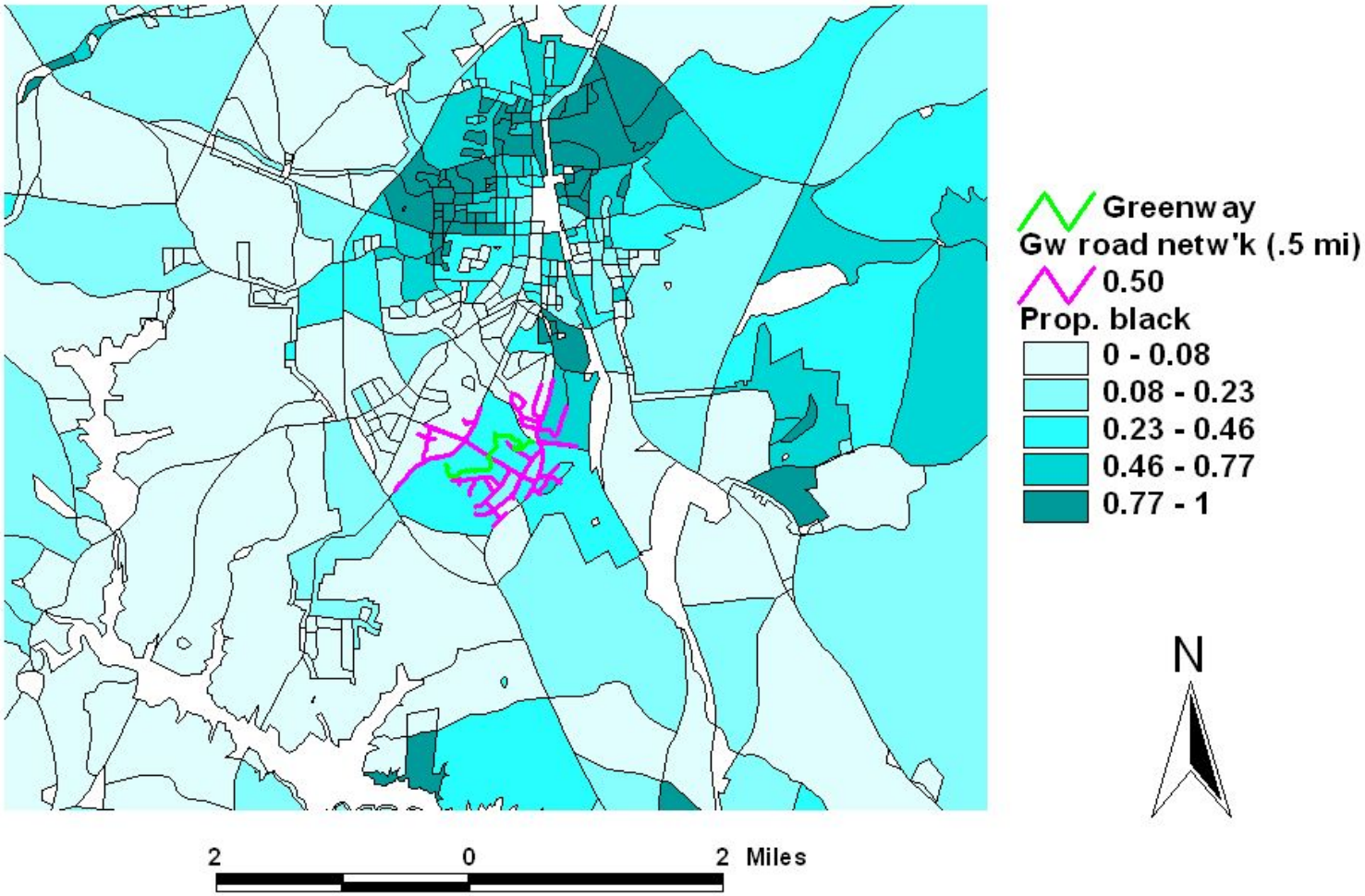

Map 15

# Town C: Greenway access (1 mi) and proportion black



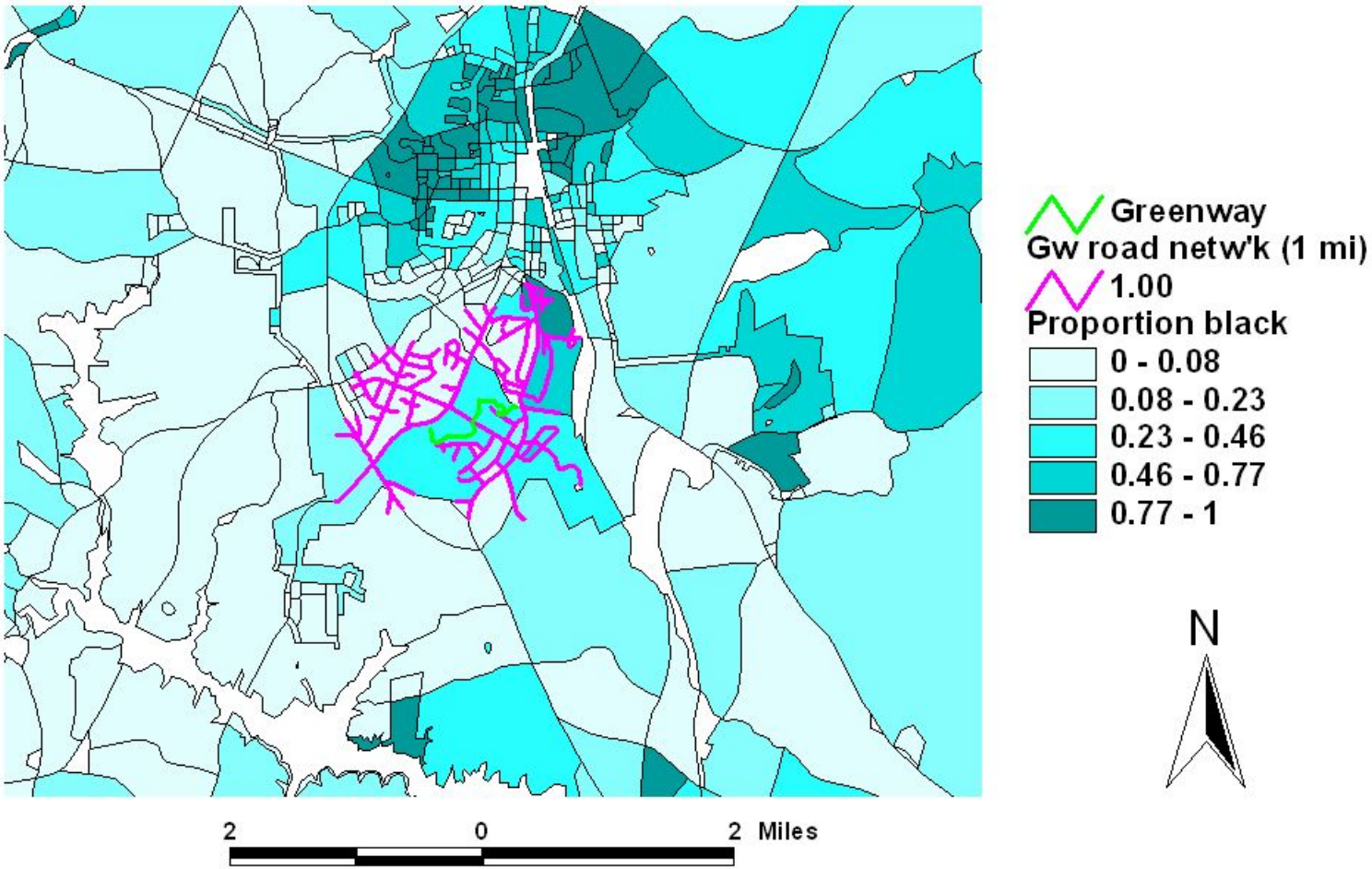

Map 16

# Town D: Greenway access (1/2 mile) and proportion black



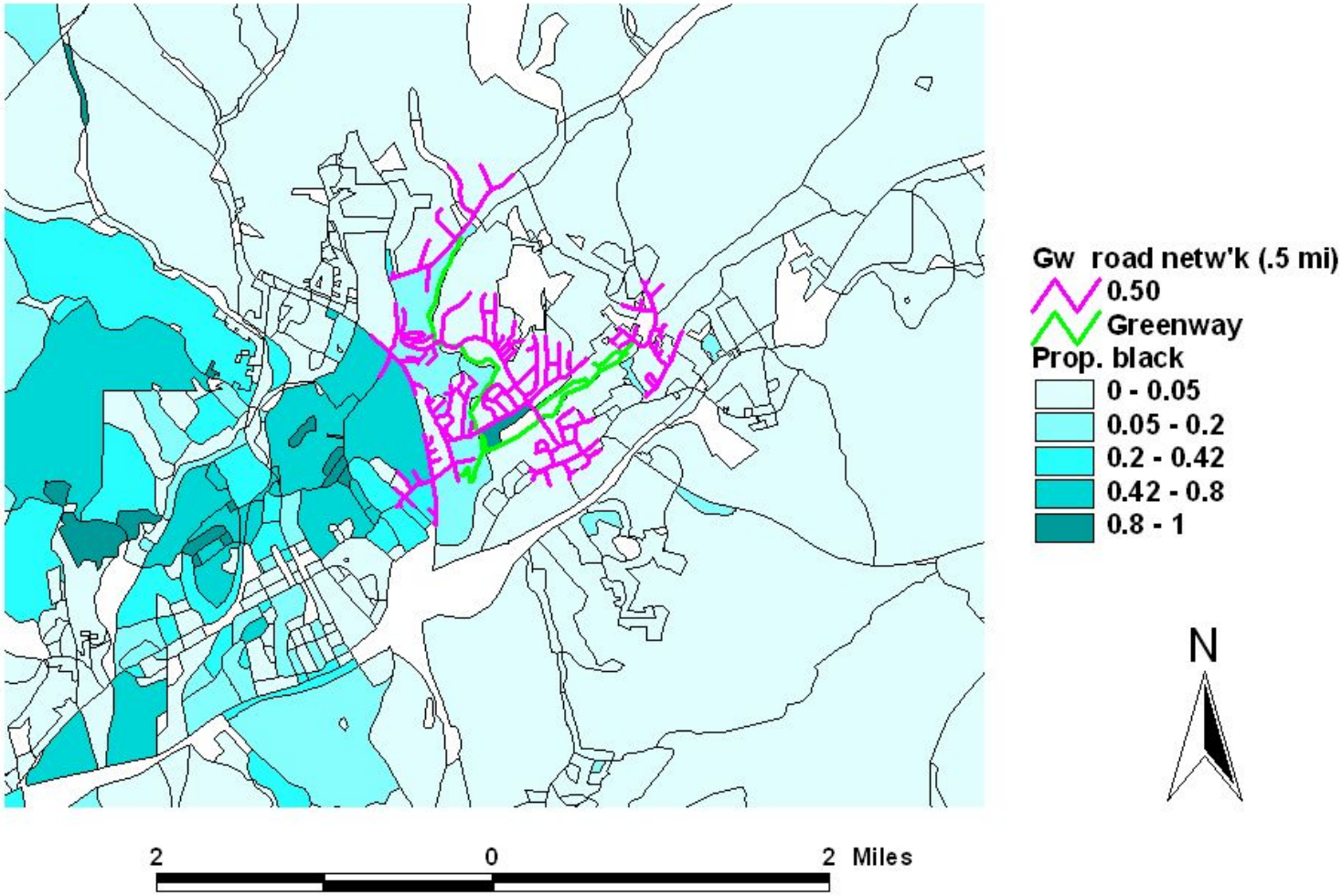

Map 17

# Town D: Greenway access (1 mile) and proportion black



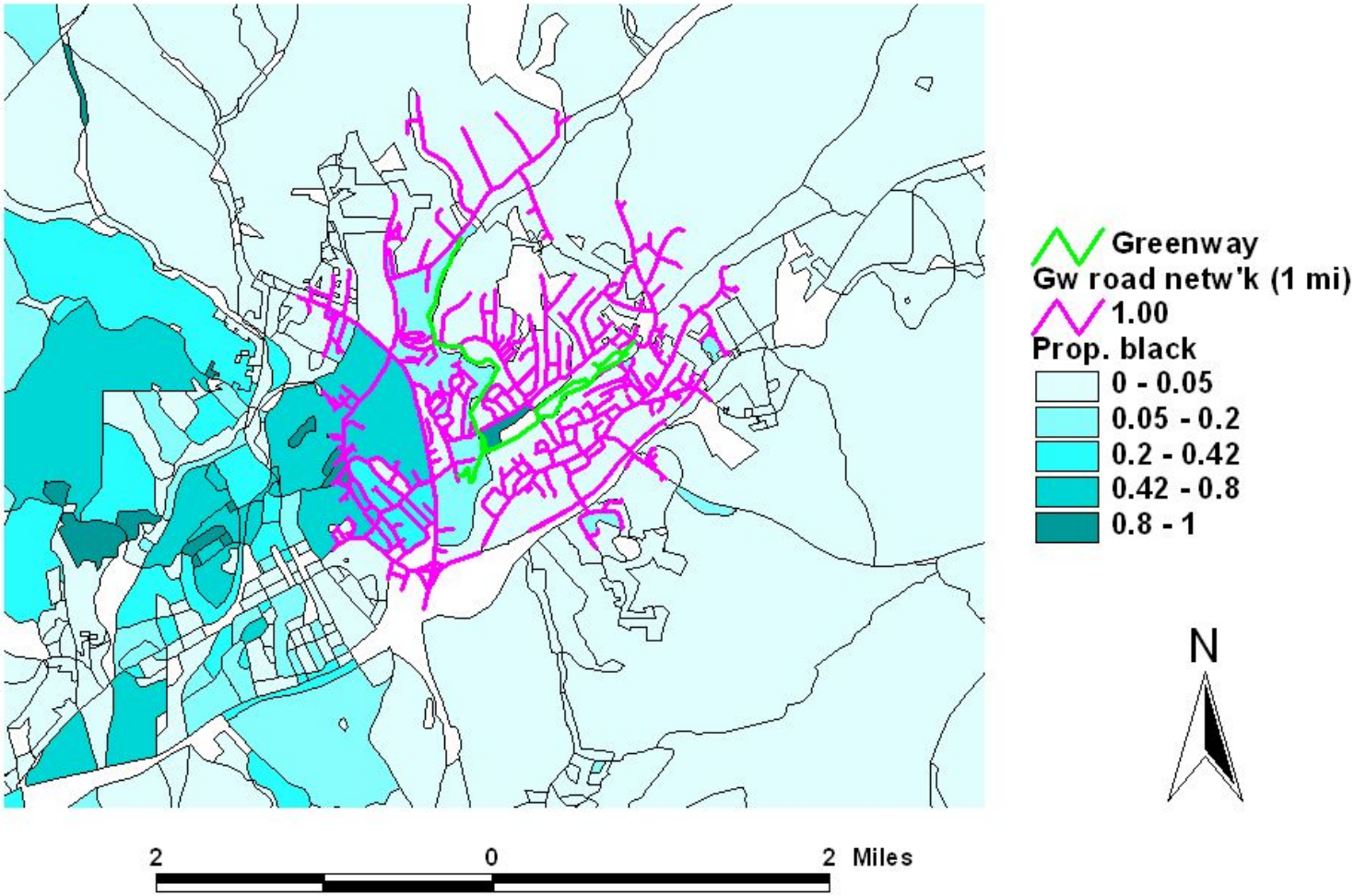

Map 18

# Town E: Greenway access (1/2 mile) and proportion black



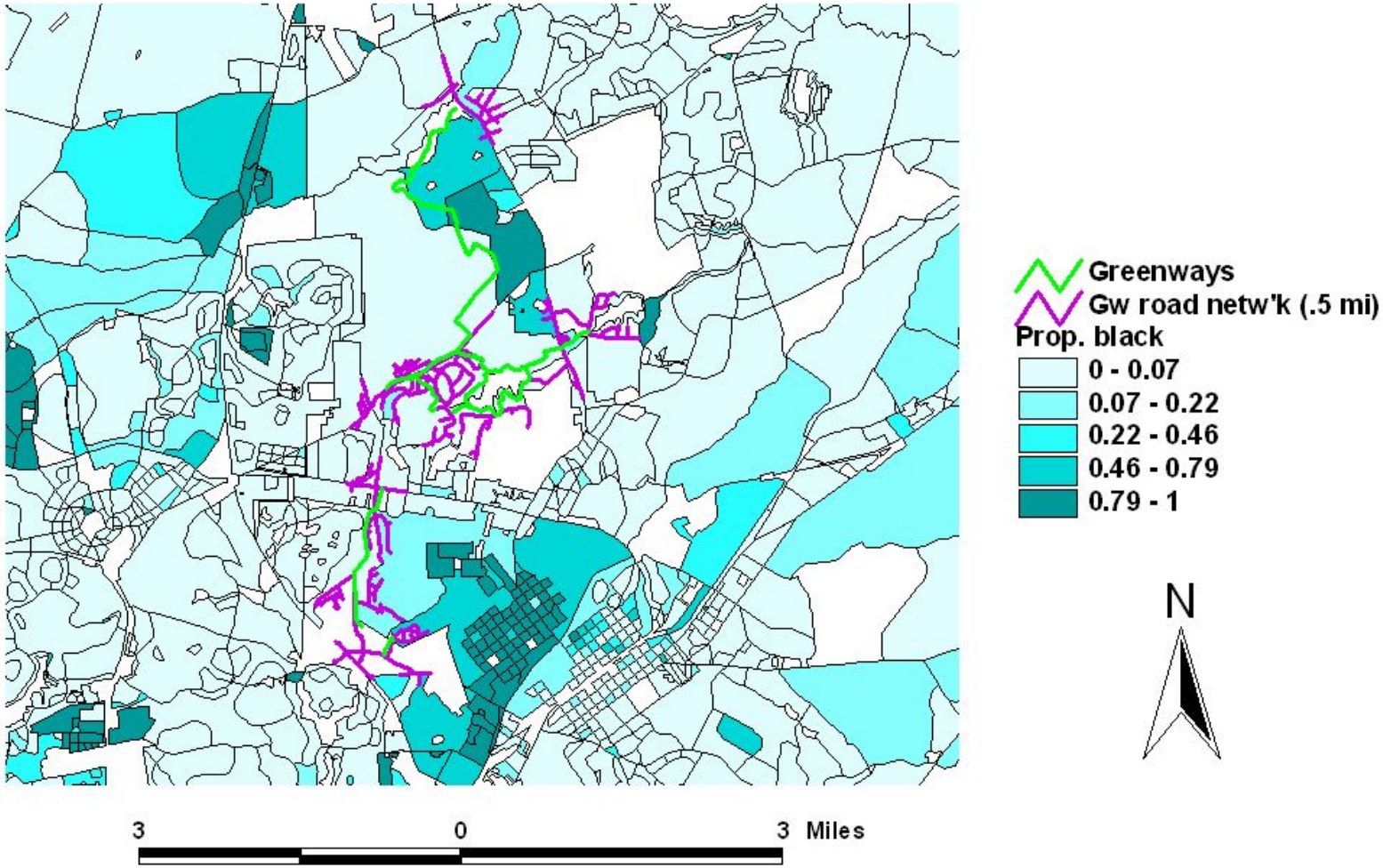

Map 19

# Town E: Greenway access (1 mile) and proportion black



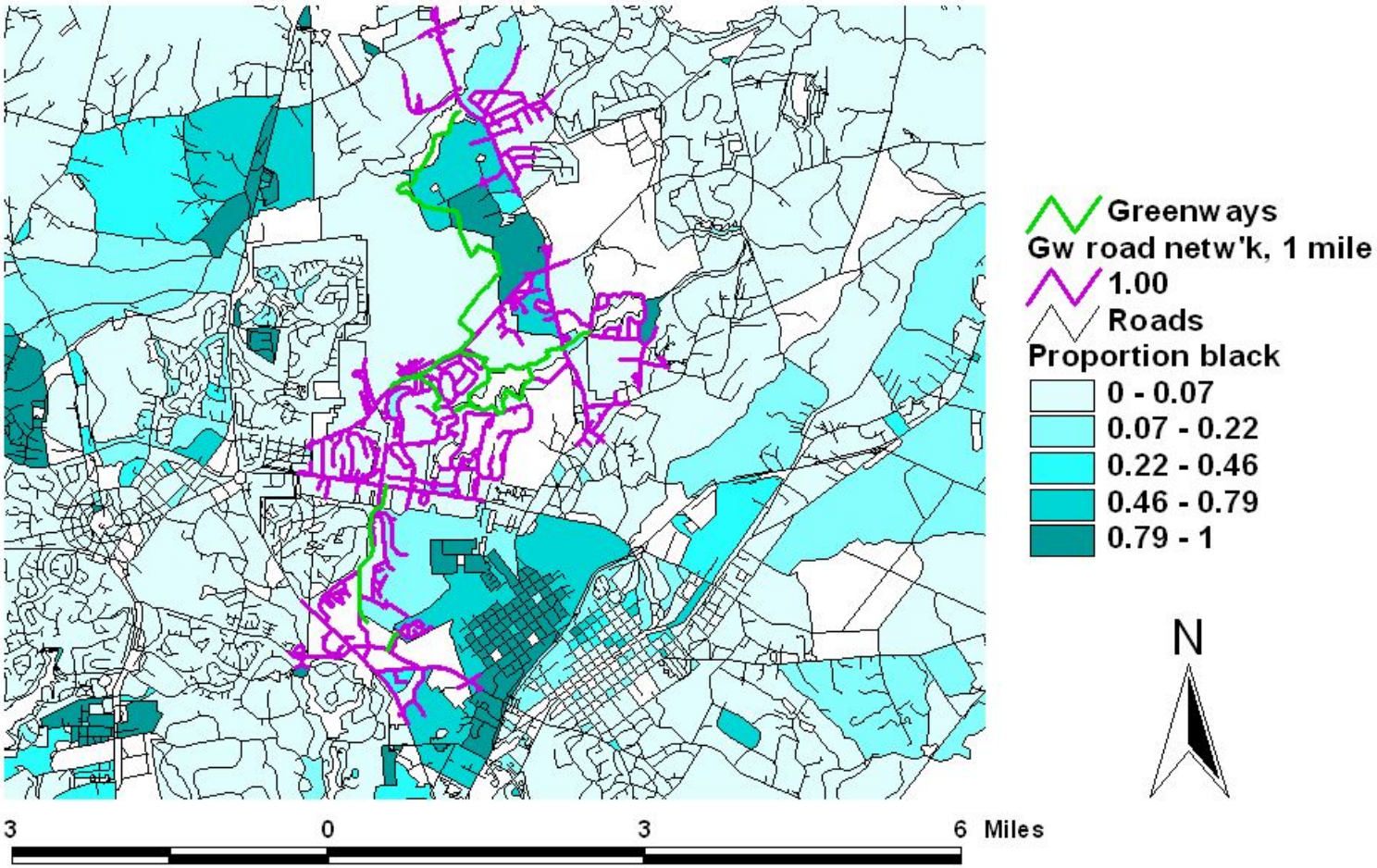

Map 20

# Town F: Greenway access (1/2 mile) and proportion black




Map 21

# Town F: Greenway access (1 mile) and proportion black




Map 22

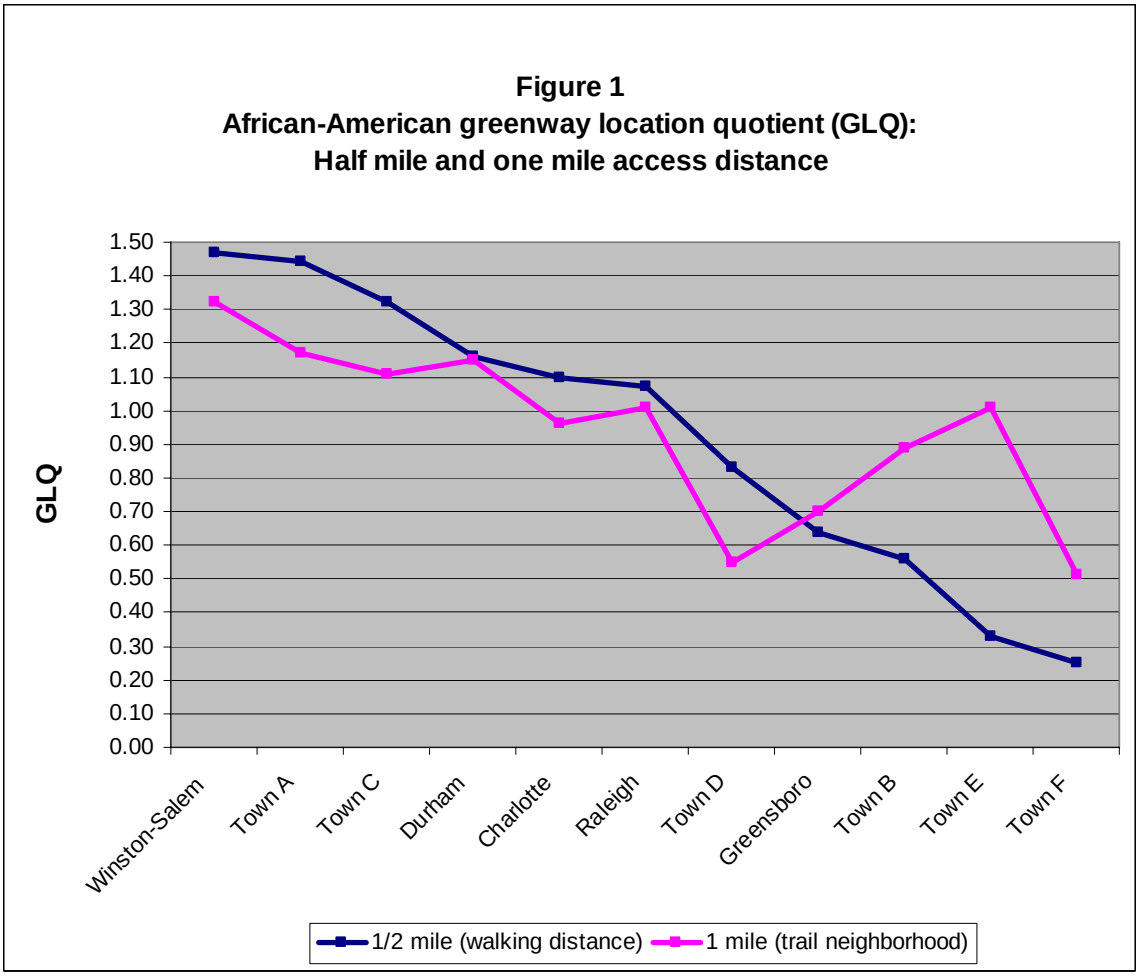


Figure 1
African-American greenway location quotient (GLQ):
Half mile and one mile access distance
GLQ
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Winston-Salem
Town A
Town C
Durham
Charlotte
Raleigh
Town D
Greensboro
Town B
Town E
Town F
1/2 mile (walking distance)
1 mile (trail neighborhood)

***GIS results overall – ½ mile street network***

In examining the table for greenway location quotients compiled from census 2000 demographic data and the GIS analysis (see Table 1), it appears that there is no overall systematic pattern of disproportionately good or bad access for African-Americans across the study towns. Of the 11 towns examined, there is a greenway location quotient (GLQ) of at least 1.0 for African-Americans in six of the 11 towns. In fact if Town D is included with its GLQ of 0.83, in seven of the 11 towns the greenway access could be considered equitable or better-than-equitable for African-Americans at a street network "walking distance" of a half-mile.

Four towns – Durham, Charlotte and Raleigh and one smaller town, Town D - have a greenway location quotient for African-Americans that is in the "most equitable" category, between 0.80 and 1.20, from Town D's 0.83 to Durham's 1.16. The corresponding location quotients for white residents in these four towns are also close to 1.0, ranging from 0.89 for Durham to 1.09 for Town D. The three named cities in this category – Charlotte, Durham and Raleigh - all have several decades of experience in greenway planning.

In the next three towns – Towns A, C and Winston-Salem - African-Americans appear to have disproportionately good ½-mile access to the greenways, with greenway location quotients of 1.32 for Town C to 1.47 in Winston-Salem. There are correspondingly disproportionately low figures for whites in two of those three towns: Town A (0.61) and Winston-Salem (.66). The reasons for high GLQs differ from town to town and will be discussed individually in the next part of the chapter.

In the remaining group of four towns – B, E, F, all relatively small, and Greensboro - the greenway location quotient for African-Americans at the ½ mile distance is below 0.75, ranging from 0.25 in Town F to 0.64 in Greensboro. Two of these four towns, Greensboro and Town F, also have relatively high location quotients for whites: 1.25 and 1.26 respectively. The other two towns are within the "equitable" range for white residents. For Town E this appears to reflect the small proportion of the town's residents who are black - about 15% - relative to the white population.

This is a diverse group, but it is notable that Greensboro and Town F have multiple trails, some of them quite long, and yet they both have unusually low location quotients for African-Americans both at the ½-mile and 1-mile distances. Again, this will be discussed later in the chapter.

***GIS results overall – 1-mile street network***

Extending the greenway access area out to a 1-mile street network, which is to say beyond convenient walking distance but still within a neighborhood, changes the figures somewhat so that more towns fall into the "most equitable" category. Towns that were not in this category at the ½-mile distance all have more equitable greenway location quotients for both blacks and whites, except for Town D (see Figure 1). Note that as the distance increases outward from the greenways, the location quotients should in theory approach 1, because more and more of the town's population will be covered until at a sufficient distance, everyone in town will have access to the greenway - at whatever that defined distance is. With the exception of town D, towns that were already close to 1.0 stay close to 1.0. Small towns in particular can see a considerable change in the GLQ at

the greater distance, because the shift to a greater distance can encompass a considerably greater proportion of the town than for large towns.

At the one-mile distance, greenway location quotients for African-Americans in 7 of the 11 towns are now close to 1.0 (from 0.89 to 1.17), up from 4 at the ½-mile distance, and an apparent indication that proximity to greenways in most of the towns is equitable for African-Americans and whites so long as one is prepared to drive to get to the greenway. Charlotte, Durham and Raleigh stay in the most equitable category; Towns B and E, both previously "less equitable", join them, along with Towns A and C, both of which had had disproportionately good access for African-Americans at the shorter distance. One town, Winston-Salem, still has markedly – or inequitably - good access for African-Americans, with a greenway location quotient of 1.32 versus 0.75 for whites, although it is more equitable at this distance than at the shorter ½-mile distance (see Figure 1). Three other towns – Greensboro, Town F and Town D - still have relatively poor access for African-Americans, with location quotients of from 0.51 to 0.70, versus 1.19 to 1.32 for whites. In one of these towns, Town D, the greenway location quotient for African-Americans has actually worsened, from the low side of equitable at 0.83 to 0.55, for reasons that will be discussed below.

The broader question of whether there is equitable access to greenways, or at least whether greenways are as likely to be in African-American neighborhoods as white neighborhoods, appears to have a positive answer, at least for the majority of the towns studied. However there are differences among the towns that bear closer examination, including the towns' history of greenway planning, the priorities within greenway planning, the role of greenways within the towns' overall plans, the attention paid to

neighborhood input and other features. The following section will examine the towns individually, using information from greenway planning documents, the interviews and other sources. They are grouped according to their GLQ categorization at the ½-mile distance since that distance is a more stringent requirement and several towns change categories as they change distances.

***Greenway access and individual towns***

1. *Towns with most equitable access (closest to 1.0) at the ½-mile distance*

1 a) Charlotte

All Charlotte's greenway location quotients are very close to 1. At ½-mile they are 1.10 for African-Americans and 0.99 for whites; at 1 mile they are virtually the same though slightly reversed: 0.96 and 1.06 respectively. Charlotte is a large city with a population over 500,000, and with a multiplicity of trails. It has a greenway system that is also based on stream systems, but, within this framework, was designed – as set out in the original greenway plan (Sigmon, 1980) - for 1) recreation, prioritized by need and greatest population growth, 2) connections between destinations, including parks, 3) open space preservation and 4) alternative transportation. An early specific priority in the city's greenway planning was "the equitable distribution of parks and greenways" across the area, and equitable distribution is mentioned more than once. Linkage, or connections and potential connections to other destinations, was one of the more important considerations in deciding priorities for greenway construction. In a 1999 update to the plan, geographic equity is mentioned as one of the specific criteria for priorities in both land acquisition and trail development.

In addition, Charlotte is striking among the towns in this study in having frequent deliberately constructed access points – many short legs of paved trail that provide clearly signed links to individual neighborhood streets. Overall, this town has most of the hypothesized features that would promote equity, although there are still many residents who are not within easy pedestrian distance of a greenway: the greenway network areas only cover 5.5% of the city's population at the ½ mile distance and 18.1% at the 1-mile distance, and it has the lowest number of greenway miles per 1000 residents (see Table 1). The county is scrambling to build greenway as the population increases. Charlotte saw a real population increase of almost 145,000 from 1990 to 2000, which is more than twice as many new residents as the next closest, Raleigh.

1 b) Durham

Durham is another good example of equitable access. It has ½-mile greenway location quotients of 1.16 for African-Americans and 0.89 for whites, and 1-mile location quotients of 1.15 and 0.88 respectively. Durham has over 15 miles of trail, including an almost continuous paved trail that runs from one end of town to the other, passing close to the center of town, as well as several shorter trails that stand alone at present. The city has been planning greenways for over two decades, beginning in 1982 with the appointment of a subcommittee of the Public Works Committee to examine the feasibility of a trails and greenways system. Moreover, its greenway committee had, as its first priority, a network of trails for bicycles and pedestrians. Surveys and census data had indicated that many people in the town did not have cars and commuted to work by other means.

The plan from the start identified non-motorized ("alternative") transportation as the focus-; early trails connected destinations such as schools, parks and community centers. One of the first policies in the greenways master plan was "to establish trail development priorities that lead to balanced trail availability throughout the City, and that provide continuity rather than short segments" (p. 9) (City of Durham, 1988); an early specific priority was the north-south through-town route. The aim of continuity was intended to be achieved both through creating continuous trail networks, and through building sidewalk connections to destinations such as parks, shopping and schools. The long north-south route may have contributed to the relatively high proportion of the city's population that is within the greenway network area: 15% within the ½-mile distance and 41.4% within the 1-mile distance, second only to Raleigh among the named cities. Part of the north-south route is a rail-trail of significant length, the American Tobacco Trail, which goes from the center of town right to its southern edge. The trail continues south for another 16 not-quite-continuous miles, and it will be a continuous 22-mile trail in a few years when a pedestrian bridge over a freeway completes the largest gap in the trail.

Thus, on paper, Durham had aims that match the hypothesis that a specified goal of equitable access would be conducive to good access. It also specified connectivity, and it has a rail-trail that does run from the edge into the center of town. It has several trails. And at least at the census block level, it achieves equitable access for African-Americans and whites at walkable and neighborhood-level distances. It may be behind in constructing trails at the speed anticipated in the original plan, but delays in getting greenway on the ground seem to be standard everywhere.

1 c) Raleigh

Raleigh has greenway location quotients at ½ mile of 1.07 for African-Americans and .99 for whites, and at 1 mile 1.02 for African-Americans and 1.00 for whites. As well as having an equitably-distributed greenway system, Raleigh's greenway network areas cover the highest proportion of the population among the named cities in the study - 19.6% within the ½ mile distance, and 49.4% at the 1-mile distance.

Raleigh developed a greenway plan even earlier than Durham. The Raleigh Greenway Commission was created in 1974, two years after Bill Flournoy won a city prize for his master's thesis, a municipal greenway plan for the city. Two years later the city adopted a greenway master plan. Rather than coming out of a concern for pedestrian users' recreational or commuter needs and wishes, Flournoy's greenway project for the "Capital City Greenway", and the city's initial focus, addressed the common problems of development in flood-prone areas and flooding in developed areas, which in the early '70s were major and inadequately-addressed concerns for the city.

Raleigh's greenway plan evolved from the original focus on floodplain issues, but water- and land-protection concerns, including preserving riparian buffers and preserving stream corridors, remain prominent in the current (2004) plan (City of Raleigh, 2004). Recreational trails and alternative transportation have also been part of the list of priorities for years, but the system remains one whose first goal is stream and flood protection, and the greenway routes reflect that. A revised greenway plan now being developed for Raleigh places greater emphasis than previously on alternative transportation, so more connections are anticipated in a system that already has quite good connectivity, at least along the creeks.

Geographic equity for trail users, as in nearby access to trails throughout the city, does not seem to have been explicitly addressed as an aim in the original plan. It is implied in the 2004 plan, in that geographic equity is a specific recommendation for parks, and greenway corridors are categorized as natural areas within the parks system. However the greenway system includes several factors that seem to have been conducive to geographic equity with regard to trails.

Like most of the towns with equitable ratios, Raleigh has a significant greenway system with multiple trails. Interestingly, equity was addressed in a way from the start – but for riparian corridors, rather than for trail users. Significantly, of the two large creeks that were the initial priorities of the plan because they were deemed most at risk from development or from long abuse, one – Walnut Creek - runs for several miles through a predominantly African-American part of town. The two creek systems accounted for most of the greenway development by 1995. However Walnut Creek, part of which runs through the largely African-American southeast section of town, has also had dedicated and organized support and advocacy for years from a group of local residents and activists. This long greenway now extends from southeast Raleigh continuously west as far as NC State University although completion of the connection is quite recent. (This is a lovely trail, although at the time I mapped the completed section it had the most daunting access barrier I found on all the trails I traveled: a muddy, night-dark five-hundred-feet-long tunnel under a major road and the road's access ramps. The tunnel effectively separated the southeast Raleigh part of the trail from the remainder. Lights were installed in this tunnel some months after I went through it; lights are also present in the other tunnels in the city's greenway system.)

Finally, connectivity has been a declared priority throughout Raleigh's greenway development period. In the last year or two it has become possible to travel continuously in some directions for 10 or more miles on paved trails, although the city still has significant gaps in the system.

To sum up, among these three towns with the apparently most equitable access for its residents, all have a relatively long history of greenway planning. Perhaps the most important factor is that two have had specified as longstanding priorities equity for trail users as well as alternative transportation. The third, Raleigh, has achieved reasonably good equity for users apparently serendipitously, as a byproduct of aiming at equity for creek protection, although it now is focusing on transportation and connectivity for users as well.

1 d) Town D

Town D is a bit of an anomaly. The town, which has a population under 25,000, has one greenway on the ground and a greenway location quotient for African-Americans that is borderline equitable at easy walking distance - 0.83 at ½ mile versus 1.09 for whites - but surprisingly, considerably lower at 1 mile, 0.55 for African-Americans versus 1.32 for whites. It is the only town for which the GLQ is actually worse – i.e. further away from 1.0 - at the 1-mile distance. This appears to be because the main African-American neighborhood is a considerable distance from the greenway, more than a mile away, and the 1-mile street network around the trail encompasses a lower minority population than the ½-mile one. Correspondingly the location quotients for whites are higher at 1 mile than at ½ mile. Additionally Town D has the smallest proportion of its

population within the greenway network area at 1 mile, probably a function of the fact that the population density is lower in this area than the downtown to its north.

Given that only one greenway is on the ground so far, to classify this town on the basis of its one greenway as having either equitable or inequitable access is probably premature. The town has a greenway plan that shows a map including several proposed trails in different parts of town, from heavily African-American to heavily white. The one trail that has been built runs from a high school at one end to a park and a main street at the other, in predominantly but not entirely white neighborhoods; it was also a geographically logical choice for the first greenway in that it is placed centrally within the town, though south of downtown.

Regardless of how one classifies the town's greenway access for African-Americans or whites, Town D is an interesting example of the difficulties in trying to make trails accessible to everyone despite an awareness of the issue and conscientious efforts by staff and others. Town planners have struggled with attempts at geographic equity. The original plan was to connect destinations, and the first route that was chosen and built did just that, while running through land that was publicly available. The idea of connecting destinations, while an integral part of many greenway plans for obvious reasons, did not obviously point to trails in the lower-income, African-American side of town because that part of town has a historical lack of facilities, very likely because of race-related reasons. Hence there are fewer destinations to connect to, making this area less favorable for locating greenways. Added to that is the difficulty of the terrain – which may have been why African-Americans ended up on that side of town in the first

place given that the land was less favorable for development, but the terrain has also made the prospect of building a greenway there a greater challenge.

The town's planners soon realized that the initial plans did not have a greenway in the African-American side of town, but they met both topographic difficulties and resistance within the proposed neighborhood to the idea. Residents objected to the first greenway proposed in their neighborhood because of fears that it would be a magnet for undesirables in an already higher-crime area. A second proposal for a greenway in this side of town also was challenged on the grounds that it would be a greenway only in name: very short, and unconnected.

A different proposal for a trail that would connect an affluent neighborhood to a less affluent - and less white - neighborhood died in the planning office. After wealthy residents complained to the town administration, the planners were told to scuttle the plan for that trail. Several trails are still planned for the town, but the next two trails, as envisioned, are unlikely to improve access for African-Americans significantly. It appears that the town planners have made a real effort to include greenways in all areas, but they have been challenged in some of these efforts by the difficult combination of hilly topography, historical inadequacies and attitudes, and objections from residents.

2. *More-than-equitable greenway access for African-Americans*

2 a) Winston-Salem

Among the three towns with disproportionately good access for African-Americans, two have multiple trails and one has only one trail; two of the towns are relatively small and one is not. The first of the three, Winston-Salem, a city of over 185,000 in the last census, has disproportionately good access for African-Americans –

the greenway location quotient is 1.47 at ½ mile versus 0.66 for whites, and at 1 mile it is 1.32 for African-Americans versus 0.75 for whites – indicating that African-American neighborhoods are very well supplied with greenways and white neighborhoods are rather less so.

Winston-Salem has several greenways of varying length, some in neighborhoods with large minority populations. The greenway system began with a pilot project in the context of an effort to foster recreation and economic development. The first greenway, Winston-Salem's Salem Creek Trail, was a four-mile long riparian trail that traversed diverse neighborhoods and connected a park to a lake, with access to some important destinations, including a shopping mall and Winston-Salem State University. It was conceived as a route that would connect destinations for students, among others, but its location reflected the availability of public land.

Fortunately for the city, there was very little resistance from neighbors to the idea of creating this first trail. Upon its completion it was immediately popular, and it remains a trail that is heavily used by all demographic groups. Later trails constructed in other parts of town have sometimes met with stiff resistance, and plans for at least two trails, in both white and minority neighborhoods, have had to be put on hold, although the city continues to build greenways according to its comprehensive greenway plan. Given that there have been objections both in white neighborhoods and in minority neighborhoods that have caused planned greenways not to be built, it is hard to say how the equity of access figures would look if those trails had been built; there is also sometimes political pressure to build greenways to provide an amenity to a neighborhood. It is clear however

that the city has been willing from the start to put greenways into diverse neighborhoods and to connect neighborhoods that might be quite different, demographically speaking.

Since Winston-Salem's initial trail, an overall greenway plan has been created and close to 20 miles of greenway have been constructed in different parts of the town. Although most of the greenways are along creeks, creek protection has not been the main intent: the greenway plan focus has been primarily on recreation and alternative transportation. Connecting to major destinations, including schools and other educational institutions, shopping malls, and parks, has been an important aspect of the plan. The town is constructing greenways in newer sections of town but still adding to the greenways in the core of town. Winston-Salem's greenway plan and its emphasis on alternative transportation, among other things, probably bode well for equitable access for majority and minority populations in the future.

2 b) Town A

Town A, the second of the three towns with exceptionally good access for African-Americans is a small town – population under 10,000 – with a high proportion of African-Americans, close to 50%, and one greenway. The greenway location quotient for African-Americans is 1.44 at ½ mile versus 0.61 for whites, and at 1 mile it is 1.17 for African-Americans and 0.85 for whites, so African-Americans have appreciably better access within easy walking distance, and slightly better access at the 1-mile distance. In part because the town is so small and in part because the trail ends close to a dense street network downtown, 42% of town residents live within the ½-mile greenway network area, and 79% are within the 1-mile area, the highest proportion in all the towns studied.

This greenway follows the route of an abandoned rail bed, so its path was to a large degree taken out of the hands of the town. The trail, the only paved trail in town, evolved not out of a greenway plan but from a grant opportunity that town employees learned about that would provide funds for the construction of rail-trails. The town justified its application on several legitimate and logical grounds, including pedestrian safety, alternative transportation to important destinations, and others, but the application was prompted by the opportunity and there was not a greenway plan that preceded it. This particular trail runs from just south of the center of town to the edge of town, and it travels straight through the African-American side of town in the process. Essentially the entire trail was paid for with grant funds, without which the project would probably never have happened given the heated objections that the idea received in public meetings.

Town A is perhaps a special case: it was able to build a rail-trail – its route predetermined by the rail corridor - that connects major destinations and that just happens to run, along the original rail bed, through a heavily African-American neighborhood. This latter fact was one focus of much controversy and objections to the trail - which, contradictorily, included both "No one will use it" and "*Those people* will be on the trail" - largely from white residents, when the trail was being discussed, and the town officials deserve credit for persevering in the face of strenuous opposition. Their commitment to providing a facility that would benefit the African-American and low-income portions of the community is also consistent with other decisions that the town has made in the past, including developing a park and annexing part of the area to bring water and sewer to low-income residents. It is true that a smaller proportion of white residents are very close

to the trail, but it is also true that they are statistically more likely to be able to drive to reach it – and in a relatively small town, the distance is not very far.

2 c) Town C

Town C is of medium size, under 50,000 population, and has a greenway location quotient of 1.32 for African-Americans at ½ mile versus 0.83 for whites, and 1.11 at 1 mile versus 0.95 for whites. Hence African-Americans are favored at the shortest radius, but white and minority residents are served about equally within a mile of the greenways.

There are several short greenways. They do not all connect, but travel through town roughly from one side to the other. There is no written original greenway plan, but to judge from interviews, the original idea for the first greenway was to allow safe pedestrian transportation. This was influenced also by the nature of the grant that was applied for, but greenways had been contemplated before the funding source was identified. Connection to destinations was an integral part of the conceptual plan that was drawn up almost 10 years ago, after the first greenway was built. The destinations included educational institutions, community centers and parks. Even earlier, the town's comprehensive plan from a couple of decades ago includes a policy of encouraging pedestrian and bicycle facilities for alternative transportation. People who were involved in the original greenway planning process noted that one of the original aims was to have geographic equity and that there was discussion, at early meetings, about not wanting to have all the trails in one part of town. Most of the trails are riparian, and there are no rail-trails.

Town C has some similarities to Winston-Salem: it has made, and is making, an effort to have geographic equity of trails; it has a comprehensive plan that emphasizes the

value of pedestrian facilities; and for now, the greenways are somewhat more likely to be located near African-Americans than they are near whites.

It is hard to generalize about these three towns. However, one thing that the towns all share is that people involved in the greenway planning and approval did see value in having them in all parts of town, and then were committed to make that happen, with or without a written greenway plan.

3. *Less-than-equitable access for African-Americans*

The towns described in this section, although they all have low access to greenways for African-Americans at some distance, are also hard to generalize. Three of the five towns had greenway plans at the outset; two did not have an overall greenway plan when they set out to build the first trail. They vary in population size although most are relatively small. Although two of the five have only one greenway, three have multiple trails, and one of the single greenways is several miles long – a factor that in theory could promote connectivity between neighborhoods. The two with consistently poor access for African-Americans, Greensboro and Town F, are perhaps the most notable because they have multiple trails but relatively poor access for African-Americans at both distances. They also have focused until recently - or up to now, in the case of Town F - on recreational priorities.

3 a) <u>Greensboro</u>

Greensboro is a city with a population of over 200,000 in the 2000 census. It has quite poor greenway access for African-Americans, the relevant greenway location quotients being 0.64 at ½ mile versus 1.25 for whites, and 0.70 at 1 mile versus 1.19 for whites. In a large city with a large African-American population (37% in the last census:

U.S. Census Bureau, 2000) and a couple of decades of building trails, the figures do demand explanation. In brief, the city has a considerable number of trails and over 15 miles of greenways, but their distribution is clearly uneven, as was also noted in the city's recent comprehensive greenway plan (Greenways Inc., 2006). There are several trails towards the north and northwest of the city, a few elsewhere, but almost no greenways in the large southeastern section of town, which is overwhelmingly African-American. (Greenways Inc. used a different method to determine geographic equity of trails – using ½-mile buffers, rather than measuring distance along the street network – and the company included the large number of narrow unpaved trails that also exist primarily on the north side of the city as well as the paved greenways. Had I included the unpaved trails in my analysis, they would have produced an even more unequal greenway location quotient in favor of white residents than the figures I have calculated.) The city's new plan advocates many more greenways, in all areas of the town.

Greensboro came relatively late to having a comprehensive greenway plan. Trails were built for a number of years before there was any kind of overall greenway plan. The original trails, created to provide recreation opportunities, were designed to take advantage of available public land surrounding lakes on the north and northwest edge of town, areas which were sparsely populated at the time the trails began to be built, so objections would have been less likely. The idea that distance would not be an access issue - that people would be able to get to the trails even though these trails were miles away from many of the residents – seems to have been assumed. Later greenways have come in other areas of town, but there are still few in black neighborhoods, which are largely to the southern and eastern sides of the city.

The lack of good pedestrian facilities in the city generally is implicated in the finding, detailed in the new comprehensive greenway plan, that pedestrian and bicycle crashes, like pedestrian and bicycle activity, were concentrated in parts of the city including "Downtown Greensboro, near the colleges and universities, along bus routes, and in lower-income areas where fewer people have access to automobiles" (Greenways Incorporated, 2006). More than 70% of the crashes involved people who were either traveling in, or crossing, roadway travel lanes. Fifty-five percent of all pedestrian crashes, and 63% of all bicycle crashes, involved African-Americans. To Greensboro's credit and to the credit of Action Greensboro, an organization founded by business, foundation and civic leaders to ignite economic development and revitalize the downtown area, the city is making progress on plans for greenways as well as other pedestrian-oriented improvements, including a plan for a greenway that will circle the downtown area and connect a number of neighborhoods near the core. The new city greenway plan directly addresses the geographic access issue, and the new plan is much more comprehensive in its aims, with pedestrian safety and alternative transportation much more prominent.

3 b) Town B

Town B has a greenway location quotient for African-Americans of 0.56 at ½ mile versus 1.20 for whites, but at 1 mile the GLQ is 0.89 for blacks versus 1.07 for whites, so at least at the 1-mile distance, access is reasonably equitable. Again because the population is small, the trail covers a significant portion of town population: 24.6% at the ½-mile distance, and 63.4% at the 1-mile distance. Again, I do have some concerns about putting this town in the "less-than-equitable access" category.

Town B is really two neighboring small towns, each with a population under 10,000, with a rail-trail running from one to the other. Like that of Town A, Town B's route is thus inflexible and is owed to historical commercial rail reasons unrelated to pedestrian use. The greenway goes from the center of one town that has a small African-American population to the outskirts of a larger town that has a much larger African-American population, but one that is not really close to the trail.

Like many other rail-trails, this one came about as an opportunity to transform an abandoned, essentially derelict space into a usable pedestrian corridor. It was not preceded by a greenway plan for either town, and neither town had a greenway trail prior to the rail-trail's construction. There was some opposition to the idea and one or two alternative ideas for using the corridor, but the town officials were solidly behind the trail and it has proved popular with a variety of users. Road access to the greenway, particularly within the towns, is fairly dense. There are no immediate plans to extend the trail, although a riparian trail has been developed on the edge of the smaller town as part of a park.

3 c) Town E

Town E, which has a population between 10,000 and 25,000 and an emerging system of connecting trails, has a low access ratio for African-Americans at the ½ mile distance (0.33) versus 1.16 for whites, but it is equal at 1 mile (1.01 for African-Americans, 1.0 for whites). The relatively low proportion of African-Americans in the town – under 15% - means that even at ½ mile the greenway location quotient for whites is not far from 1.0, so it is debatable whether access is unfairly lopsided in favor of whites.

The greenway trail system is riparian and the next phase planned should extend closer to downtown destinations and to a somewhat higher proportion of African-Americans in the population near the trail, although this phase has been delayed because of objections in the proposed trail neighborhood to the trail extension. The county does have a greenway plan, including greenways planned for several towns, and the constructed greenway is part of that plan. The listed priorities in the plan include health, recreation and alternative transportation, all of apparently equal importance. The plan is in some ways an exception because it is on a county rather than a municipal scale, involving trails in different towns as well as (proposed) trails between towns; on this scale, access looks rather different, and connectivity is evidently a priority.

3 d) Town F

*Note:* On the map, the Census 2000 data appear to show, incorrectly, that a greenway crosses a road in a majority-black neighborhood in the northern portion of the town. When I looked at the GIS map I was surprised to see that I had apparently missed an access point because the trail appeared to cross a road, so I drove back to the town and re-rode the greenway trail. In fact the census road files are at fault at this point in the map: although internally consistent, they are locationally slightly off. There is no access on this trail to this majority-black neighborhood except at the northern trailhead, and the next access point is where it meets another trail some 3½ miles further south. The neighborhood is actually classified as part of the town's extra-territorial jurisdiction (ETJ) and sandwiched between Town F and a town to the north. It is a relatively low-income neighborhood. A gated community is to the west of it and there is access for that community to the trail through locked gates.

Like Town E, Town F also has a population over 10,000 but under 25,000. It has several greenways extending over 10 miles. A substantial portion of the greenways are riparian. The town has the highest ratio of greenway miles per 1000 residents among the 11 towns studied but, rather surprisingly, the lowest miles of public access road network per greenway mile. It has low greenway location quotients for African-Americans at both distances: 0.25 at ½ mile, meaning that the proportion of African-Americans in the population around the greenways is only ¼ of what it is in the town as a whole, versus 1.26 for whites, and at one mile the figures are 0.51 for African-Americans and 1.21 for whites. This is notable because the town has a significant black population – over 25 % - and there is significant mileage of greenways, in several parts of town. Interestingly, some long stretches of greenway have very few public access points. This is reflected also in Table 1 by the last column, in which the town has the lowest number of greenway road network miles to actual miles of greenway among all the towns: 5.3. Some trails, including the one described in the previous paragraph, have one-way access for residents in several gated communities that are on one or the other side of the trails, but public access points only at each end. The next planned trail to be built, as envisioned now and on the town greenway maps, will not make much difference in access for African-Americans.

Town F does have a greenway plan – part of a larger master plan for parks and recreation – and it built its first greenway, a trail that is popular and heavily used, close to two decades ago. The plan is very general, however. It notes briefly that greenways have various uses and that they can connect neighborhoods to various destinations, but it emphasizes the greenway's role as a way to preserve open space and provide

opportunities for recreation. The specific greenway system, or series of greenway trails, that was originally proposed suggested joining only parks as destinations, and did not address the use of greenways as transportation to or from anything else. This is understandable if recreation was the only aim, although it ignored the other uses that greenways commonly have and that were mentioned in the plan. The map that was created as part of the master plan did show proposed greenways connecting to destinations including a school and a community college, but the connections do not seem to have materialized: one greenway runs past the gates of the school grounds which open to bus parking lots, but there is no real pedestrian access to the school directly from the trail; neither is there direct greenway access to the local community college. The connectivity part seems to have been lost in translation to actual trails. There are few trailheads with dedicated parking.

Town F has been fast-growing, and unlike most of the towns in this study, nearly all of the public greenways have been built by developers of new subdivisions. This has meant that new greenways have largely appeared in newer areas, which are probably overwhelmingly white given that the African-American population declined by a few hundred between 1990 and 2000 - from almost 36% of the town's residents to under 27% - while the white population increased 30%. In addition, the town has made some concessions to developers in exchange for its requirements that they build greenways. If a greenway is planned in land that becomes a private gated community, the developer does not have to put it within the community but can route it along the edge of the development. Thus there are some long stretches of greenway that do not run along the creeks they were originally intended to border; instead they run beside a chain-link fence

that in places is topped with barbed wire, because paralleling the creeks would have meant the public having access to the gated community's land. The public still gets the mileage, but access is more restricted because only the residents in the gated communities have easy access, often through locked gates. Access, geographic or otherwise, is not addressed in the written greenway plan.

Greensboro and Town F have the lowest overall greenway access for African-Americans. Interestingly, both have multiple trails, which should make it easier to have geographic equity. Neither began with a greenway plan that actually specified priorities, but for both towns recreation was apparently the primary focus. Consideration of geographic equity has been absent. Rather, easy access or lack of interest on the part of African-Americans has been taken for granted, given that in Greensboro trails were so clustered in one end of town, and that in Town F there were unusually few access points - a few more if one lived in a gated community. As mentioned, Town F even has a several-miles-long trail that goes quite close to a majority-African-American neighborhood on one side of the trail, but the only real public access to that neighborhood is from the very ends of the trail. The gated community on the other side of the trail, however, has access - not shown on the map since it is not public access - from at least two points along the trail. Town F has a potentially very good greenway system, but appears to have ignored some of the people who could conceivably make use of its trails if simple access points were provided. Greensboro on the other hand has reexamined its policies and embarked on a much more equitable plan that addresses connectivity, equity and pedestrian safety (among other issues). Town F continues to have developers build its greenways and has indicated no new change of direction.

In sum, across the 11 study towns of different sizes, greenway access for African-Americans, measured using a location quotient and concentrating on the demographics of neighborhoods that have greenways, does not appear to be systematically inequitable when the towns are examined using data at the census block level. At the ½-mile distance, there are four towns that have very close to equitable physical access for black as well as white residents, and at the 1-mile distance, there are seven towns that fall into the most-equitable category for both blacks and whites. Given that whites are the majority in all of these towns, disparity in access that favors African-Americans is unfavorable to whites to a generally lesser degree; in addition, on average whites are more likely to have cars – although comprehensive data on car ownership is outdated - and hence to be able to drive to greenways than are African-Americans. Five of the towns with equitable ratios at the more stringent ½-mile distance have made some sort of equity a focus of their plans, whether geographic, riparian protection or demographic equity. A sixth town, town A, had its greenway route, which has particularly good access for African-Americans, predetermined by the rail corridor, but the town advocated forcefully to make it happen in the face of opposition.

Greensboro and Town F, at the other end of the scale, seem to represent examples of how if access is taken for granted it may not happen. Greensboro has begun to take steps to address its clearly inequitable distribution of greenways – as part of an overall strategy that also looks at the needs of pedestrians in general. Although Town F is adding sidewalks downtown, its greenway plan and trails to date show, at the very least, complacency or even deliberate ignorance regarding the barriers that its limited greenway access points may present for residents in African-American neighborhoods.

## Chapter 6: Greenway planning and interview results

In this section I examine first the original hypotheses about what influences greenway placement and equity of access, and then additional factors and issues that emerged in the interviews.[3]

### I. ***Hypotheses about greenway placement***

*Commitment as a reflection of the greenway plan – or vice versa*

One of my hypotheses was that having a professional greenway plan would facilitate equitable distribution of greenways. This seems to have been partially borne out, although it is complicated by the fact that "having a greenway plan" means different things in different circumstances and does not always imply what I had considered to be fundamental about greenway plans from the ones that I had read early on: in particular a commitment to connectivity (see the next subheading). Nearly all the study towns, with equitable or less equitable access, had some sort of plan that preceded the development of greenways. In some cases however, a "plan" really meant a map of possibilities, or a statement that described the uses or potential of greenways in very general terms, rather

[3] (Note: Since the dissertation is about equity of greenway access, a note is in order about how interview respondents viewed access, or barriers to access. It has been mentioned elsewhere in this document that "access" to a facility means more than simple physical proximity. However, in the interviews when asked about what they thought of as the biggest barriers or obstacles to people getting on the trail, by far the most common answer was lack of physical access, expressed either as the need for more trails within walking distance, or the need for better pedestrian infrastructure (e.g. sidewalks, pedestrian road crossings) so that people could safely get to a trail without having to drive a car to the access point. (Lack of knowledge of the existence of trails, often in concert with a lack of signs that drew attention to the trails, came second with fewer than half as many responses.) Hence "more access" or "better access" to most people meant having more trails, more access points to trails, or more sidewalks and safe road crossings to get to trails, as an alternative to driving there.)

than an expression of commitment to particular goals. Where a greenway plan exists, it reflects the town's priorities and expectations for greenways, but these priorities are very varied. They may include a combination of pedestrian transportation, riparian corridor and floodplain protection, economic development and recreational paths, or may only focus on one or two of these. Some priorities seem more conducive to promoting equitable access than others.

In particular, a commitment to connectivity and a commitment to geographic equity in some fashion seem to have been influential in whether greenways were distributed equitably within towns. All of the five large towns except Greensboro had early plans with specific priorities that addressed connectivity or equity or both in some way. These four towns do have relatively equitable access. Greensboro on the other hand focused for the first several years on recreation and came relatively late to a commitment to connectivity or redressing the geographic inequity that has resulted.

Of the six smaller towns, it is harder to make conclusions from the plans since only one of these smaller towns, E, had a plan that clearly expressed its priorities, and this was a plan that addressed the county overall rather than only one town. In addition some towns have only one greenway, and the greenways in two towns, A and B, had predetermined routes as rail-trails. However one of these, Town A, showed a strong commitment to equity in persevering with a trail that connected very different neighborhoods, despite strenuous opposition. Of the others, Town C, which has good access for African-Americans, did not have a written greenway plan but addressed equity in discussions of the greenway committee (and later on the ground). Towns A and C have equitable to high greenway access for African-Americans.

Town D's greenway so far is borderline equitable for African-Americans within the immediate neighborhood and worse at the 1-mile distance. The fact that its written plan lacked priorities may have hampered it as planners have struggled to provide routes in African-American areas of town. Meanwhile Town F, which has poor access for African-Americans at both distances, also has not expressed priorities in its plan, and the town has chosen to focus largely on recreational needs, without appearing to consider equity. My conclusion is that simply having a plan does not foster equity, but if there is a commitment to equity that is expressed either in the plan or in the town's practices, equity is more likely to follow on the ground.

*Having a focus on connectivity*

A second hypothesis was that a focus on connectivity would facilitate equity. Connectivity was mentioned as a fundamental part of classic greenway plans. Having plans that emphasized connectivity of destinations, or even without a previous plan, having a route that promoted connectivity such as a rail-trail, does seem to have made it more likely that a town would have more geographically equitable distribution of trails. This was one focus of five of the six towns that have more than borderline equitable access for African-Americans – all of the named towns except Greensboro, as well as towns A (with a rail-trail) and C (a string of greenways through town). Five of these six towns have built at least one long continuous length of greenway that travels several miles, and at least three extend across different neighborhoods in terms of income or ethnic demographics. Not all of the other five towns have multiple greenways, but the two that do and that have consistently inequitable access, Greensboro and Town F, also lacked - in Town F's case still lacks - a focus on connectivity.

Connectivity is not just about continuity, but about connecting to destinations, making connections across town and across neighborhoods. Most well-developed greenway systems aim to connect to schools, shopping and other major destinations. Parks are also destinations, but a system that connects only to parks fills only recreational needs, not those of alternative transportation. The towns that have addressed connectivity in their plans and in the constructed greenways all have greenways that connect to important destinations – downtown, major shopping malls, the YMCA, schools and colleges, cultural institutions such as museums, some important workplaces, as well as the usual parks through which many greenways thread along part of their length.

The three towns with the most equitable greenway access between blacks and whites all have multiple destinations within their greenway systems, in addition to the park connections. Bicycle and pedestrian transportation also becomes a possibility when there are multiple destinations. One of the best examples of greenways with multiple destinations is Durham's north-south greenway - actually a series of shorter greenways - which was the main priority of its greenway plan for a number of years and which now provides an almost continuous paved path from northern Durham to the southern end of the city and county through the center of town, providing important access to destinations along the way, including parks, schools, universities and shopping. Winston-Salem's Salem Creek trail, its own first greenway, is another excellent example that crosses through a diverse set of neighborhoods, connects numerous destinations and attracts users from a great variety of demographics. Winston-Salem's greenways are somewhat skewed in access in favor of minority neighborhoods, though this is not for lack of efforts to build greenways elsewhere. The city has proposed at least one greenway in the past in a more

majority-white area, a project that was unsuccessful because of opposition; more greenways are planned in both majority-white and majority-black neighborhoods.

On the other hand, plans that originally emphasized recreation as their only or chief reason seemed less likely to have even access. A focus on recreation does not imply connecting to anything, since the point of being on a trail for recreation – exercise and enjoyment of nature – is being out on the trail, not getting to shops, schools or churches. Among the town-produced plans, the ones with the least equitable access did not emphasize connectivity or pedestrian transportation.

The two towns that seem to have the most inequitable access overall - low greenway access quotients for African-Americans and correspondingly high ones for whites – are Greensboro and Town F, and both focused on recreation from the start. Greensboro did begin developing trails early on. They were viewed as "recreational trails", rather than greenways, so their intended role was clearly specific. The focus for some years was recreation, and the city built trails where space for recreational trails was easiest to find. This is understandable, although not conducive to equity for all the city's residents, and the potential problem of distance to the trails from other parts of town was not addressed. Town F seems always to have focused on recreation, although there is an early greenway planning map that shows potential destinations including schools as well as parks. On later maps the idea of connecting destinations seems to have been dropped; only parks and one educational institution - to which, ironically, the greenways do not go - are shown on the town's greenway map.

Both Greensboro and Town F have at least one long trail and some of the trails do connect to at least one significant destination, such as downtown or a public library.

Town F, which emphasizes recreation in its greenway plan, has 10 miles of trail - significant mileage and high in terms of miles per 1000 residents - but other than parkland, there is little to connect to, although one trail goes past a fence, with entrances for automobile parking, bordering a school on the far side of the road. Greensboro – also presumably reflecting its original emphasis on greenways as recreation – has more than half a dozen trails of varying lengths, but relatively limited current connections to practical destinations other than parks. That will change, reflecting this town's revised emphasis on pedestrian transportation, with a new greenway that will circle through the downtown area and in the process, connect quite different neighborhoods.

Overall, then, a commitment to connectivity, including connecting to a variety of destinations, seems to facilitate equity.

*Having a commitment to equity*

The cases do suggest that a commitment to equity facilitates equitable access. Equity appears to have been an issue for most of the towns one way or another – whether as a goal, or as a problem. Geographic equity was mentioned as a priority early on in two of the three towns with the most equitable access for African-Americans – Durham and Charlotte - and in two of the three towns with better-than-even access - Winston-Salem and Town C. All of the towns in which equity was listed as a priority, or discussed as a priority, at the municipal level have access ratios for African-Americans of at least 1.0. On the other hand, of the two towns with overall most inequitable access for blacks relative to whites, Greensboro and Town F, the first came late to the realization that trails were inequitably distributed through the town, although it has acknowledged this and is

now trying to rectify it, and the second seems not to have addressed geographic equity either in the greenway plan or on the ground.

Several of the other cases provide intriguing insights about commitments to equity. One of the three towns with the most equitable access for blacks and whites, Raleigh, appears to have promoted equity for trail users almost by accident. It did not have directly-people-oriented goals (i.e. trails for pedestrian use) as its first priority, but its original focus on the need to protect two large stream systems has apparently inadvertently promoted equity for trail users, since one of these systems, Walnut Creek, which had suffered long-term abuse including decades of waste dumping, runs through a predominantly African-American neighborhood. However this creek system has also benefited from strong support, political advocacy and even hands-on care (including a twice-yearly volunteer cleanup of the creek and the greenway) from a grass-roots organization and its members in Southeast Raleigh.

The plan that includes Town E addresses “accessibility” for everyone, but this plan is for the county as a whole and does not focus only on one town, so it may not be directly comparable. That and the fact that this town has proportionately the lowest number of African-Americans in a rather small town make assertions about inequitable access problematic. Viewed at the county scale, the town’s plan clearly shows an intent to have greenways throughout the area.

The town for which equity appears to have been a thorny issue is Town D, which currently only has one greenway on the ground although more trails are planned. It has borderline equitable access at the ½-mile distance and is worse at the 1-mile distance. Geographic equity with respect to greenway planning has been a recurrent issue for the

town, as was described in the last chapter. The original greenway map included greenways in all parts of town, but planners ran into both practical difficulties, including topography and cost, and political difficulties - from both white and black neighborhoods, about separate trails - after the first trail was in place. The planners are clearly in favor of having greenways in all areas, but have not been able to proceed with several of the originally envisioned trails that were in the first plan.

The summary conclusion here is that a commitment to equity often does facilitate equitable access. At the same time, equitable access can sometimes occur as a by-product of other goals, while barriers can arise even in cases when planners seek to promote equitable access.

*Rail-trails and equity*

The original hypothesis was that rail-trails would facilitate equity because they run directly from town to town, passing through neighborhoods in the process and cutting close to industrial or commercial parts of town, which were close to downtown when railroads were a common form of transportation in the U.S. Certainly the original rail routes came close to the center of town, but the available rail corridor has often been fragmented after abandonment by railroads, particularly so in North Carolina. Although six of the 11 towns studied have rail-trails as part of their greenway system, the trails do not all extend into the center of the towns: that is, the rail corridor was not always still available for the entire route.

The simplest pattern in the results is that rail-trails that extend into the center of town are more likely to provide equitable access than those that reach only the periphery. The four towns with rail-trails that that reach downtown or run very close to the center of

town have equitable or disproportionately good access for African-Americans; some of these trails are fragmentary, but the fragments are close to the center. In the two towns that have rail-trails and have relatively low access for African-Americans, fragments are separated from the cores. The rail-trail in Greensboro ends several miles from the center of town – though the original corridor did extend directly to the center - and Town B's rail-trail extends well into town at one end but only into the outskirts at the other end. In all of the towns studied, there is some residential segregation and African-American residents are often on one or the other side of town, but their presence extends into the center or close to the center of every town. So the hypothesis that rail-trails should facilitate equity appears only to be supported where the rail corridor still extends far into town.

As noted, abandoned rail corridors represent an initially obvious route for greenways because they were used as transportation corridors, and because they run a direct, rather than meandering, path. The fact that they generally travel straight through towns should give them the potential to traverse different neighborhoods, and hence promote equity of access. North Carolina was once crisscrossed by 5200 miles of rail lines that went through all the bigger towns and a huge number of small ones. As of 2001 there were fewer than 3400 miles in the rail system (North Carolina Rail-Trails estimate, 2001) and many rail corridors have fallen into disuse or vanished completely. Several towns in the study have greenways that run in part on a rail corridor or fragment; the shorter the fragment, the less likely the trail is to cross different neighborhoods. The Libba-Cotton Bikeway in Carrboro is a short local example of a rail-trail, or to be precise, a rail-with-trail since there is still a rail line in use beside the trail. The American

Tobacco Trail in Durham is a much longer rail-trail that was created from a short-lived rail line. There still exist many miles of rail corridor that are disused but still potentially valuable trail routes.

Transforming disused rail corridors into trails has been difficult for municipalities in North Carolina, which helps to explain why my rail-trail hypothesis has not been supported in all the towns that have them. Rail-trails are hard work to create. Part of this is because ownership of the rail corridors has frequently been unclear, owing in part, according to my interviews, to the way that many rail lines were built:

> North Carolina railroads did not obtain the kind of title that other…states did. The northeastern rail lines were very carefully planned… In North Carolina that was not the case. They were hastily put together, prior to and after the Civil War… to move goods and services - mostly goods - across the countryside. After the Civil War, there was so much chaos…and rail lines were just sort of plunked down throughout North Carolina….unfortunately we don't have a great legacy of rail corporations being existent and acquiring really good rights. (interview P3)

As a consequence of this, ownership of disused rail corridors in North Carolina has often reverted to the neighboring properties, and even where this is not the case, there is often significant objection to use of the rail corridor from the adjacent property owners. This has even led to a direct legal obstacle in this state. A couple of decades ago in the town of Newton, irate property owners opposed to the idea of a rail-trail in that town managed to push through a state law that prohibits any disused rail corridors that are state-railbanked (i.e. held by the state for future use) from having any interim use as trails. This is despite the fact that the state can choose instead to employ federal railbanking, which does allow interim compatible uses of the rail corridor, including use as rail-trails. Only about 100 miles of abandoned rail corridor are held by the North

Carolina Department of Transportation (NCDOT, n.d.).

Some railroads have held on to disused rail corridors for decades, apparently with no intent of using the corridor and an eye to bigger and bigger future profits: a proposed rail-trail from Durham north to Roxboro and one from Durham northeast to Henderson have gone nowhere as the railway company has waited for the price of the corridor to rise:

> Durham County asked Norfolk Southern not to abandon it, and - a year or so later - asked them to *sell* it! To the city! And the county! For $1.3 million dollars! - This is 1991….And Norfolk Southern said 'Oh!...Hmmm….Maybe.'
> Two, two years ago - was it '03, or '04?..NCDOT, the city of Durham, and the county of Durham, offered Norfolk Southern $6.3 million dollars for it, and they said, 'Hmmm….We think we'll hold on to it a little longer.'…
> [on the subject of the second corridor, regarding which there was considerable support for a rail-trail:] [advocates] got *senators* - Helms *and* Fairchild - to write Norfolk Southern, to tell them to do a railbank… it was a thirteen-and-a-half-mile rail line…using the old rail system. Norfolk Southern told both the senators [sharply, in a deep voice]:
> 'Hey! *We* run the railroad.' (interview P1)

Norfolk Southern is still dickering with the city of Durham over the price of yet another rail corridor, the Beltline, that the city would like to have as a loop trail around downtown. However, there is a decade-long plan backed by four states to implement a high-speed southeast rail corridor that would include part of the Henderson-to-Durham route as far as Raleigh, and a parallel trail within the high-speed rail corridor is in development – a hopeful prospect, if a distant one, to trail users, especially to cyclists.

Finally, railroad companies in North Carolina have frequently opposed, on a variety of grounds, the unused rail corridors having interim use as trails – either on or beside the actual rail bed. They are also often strongly opposed to the idea of trails crossing railway lines – even though roads frequently cross the same railway lines - and

have held up the development of such trails. People involved with greenway planning often noted the opposition of railroad companies both to rail-with-trail and to trails crossing railroads. In the context of barriers to getting on trails, one respondent declared that a significant one was

> A railroad. *Major* barrier. The railroad is just one of the most impossible agencies to deal with….They have all kinds of restrictions: insurance, development constraints, things that you have to do, like put a roof over the greenway, liability concerns - that's a major barrier. (interview P25)

A construction worker volunteered similar complaints when I chanced on a road crew at the end of a greenway segment in this particular town. Another person involved with greenway planning remarked about the objections that railroads raised to the prospect of trails crossing a railway line:

> If we could at *least* put the asphalt down - you know, so that there's *some* way to get across the rail, then we've got something. But they are pretty darn adamant. They own these rails - that they do not want a sidewalk going across them….You can *drive* across it, that's fine. There's still liabilities, and there are legal perspectives…But, from the pedestrian advocate standpoint, if you can drive across it, you can bike across it, why can't you walk across it? There's still liabilities. And I still don't understand it, and they're still pretty adamant that, 'No, we don't want a sidewalk.' (interview P28)

The outcome of all these obstacles is that North Carolina has very few miles of rail-trail compared to other states. However, it seems true that extensive rail-trails tend to promote equitable access, particularly when they extend well into town. Part of the challenge, then, is to gain increased access to abandoned rail beds in the face of the railroads' preference to retail rights to, or simply to warehouse, those unused corridors of land.

*Public input: the neighbors*

1) Nature and format of input

Before discussing the content of neighborhood input it is necessary to address who usually contributes it and why. Many of the respondents pointed out that it was difficult for local governments to solicit public input, either for greenway planning or for other municipal projects. “Usually the people you see at public hearings, and public meetings, are the same people - you know, it’s the same few,” remarked one respondent (interview P15). Another person noted that “it’s often the well-educated, well-informed…who show up at these things. And who also have the free time.” (interview P22). Several respondents remarked that minority and poorer members of the community were less likely to appear and some pointed out that they might have to clear more hurdles - lack of time, lack of transportation, and less access to information, which is particularly true for Hispanic immigrants - to get to meetings.

In addition the public process, as one respondent put it, “isn’t always friendly to the public” (interview P15), citing a meeting that ran until after 11 p.m. before citizen comment was solicited. Towns did sometimes go to considerable effort to get citizen input. A Greensboro respondent, for example, noted that to try to entice more people to the city’s greenway planning meetings, they offered free food and conducted some public meetings on weekends.

Some greenway planning processes were really intended to involve the public from the very beginning, with design “charrettes”, or idea-generating public meetings, with the public asked to suggest ideas about where greenways might go. However it was also common for a town’s planners to be charged with coming up with an overall

greenway plan and residents to be solicited for their opinions relatively late in the process, or, in some towns, solicited for their opinion only about where they would want the access points to be. One respondent pointed to the shortcomings, in terms of public involvement, of the planning process:

> And the *intention* is that the [greenway] committee takes the expert judgment of the planners and injects into that, you know, the community, what the broad-based community wishes are. And so it becomes - it's a vetting process that becomes more community-based. And then it goes into the community. But I think oftentimes, by the time the decisions are made and they hit the maps, even to the point of the [greenway] committee, those decisions are already made. So, were the greenway planners to go into the community at the meeting stage and say, you know, 'This is a plan but you still have an opportunity to have input in,'… You can look at it and you can say, 'Well, I don't like this or I don't like that,' but the route is set, basically the design is set, and you're pretty much - locked in…. And then there is a certain…elitism. Even if it's not intentional on the part of the planners…technology and professionalism always rule over, you know, passion and individual thinking. And then, part of the planner's job then is… in those neighborhoods, to help sell the concept to get it to overcome those issues of privacy, and crime, and crowding or whatever it's going to be. (interview P26)

Another respondent described the problems of bringing the public late to the process:

> It's easier to plan if you have planners…But our plans involve many different [people]. So we have a tendency to bring the planners together, to plan, and then we take our plans out to the locals and say, "Hey, look what we've done for you." …We've done exactly that. We've hired planners to do a master plan. And they have mapped out trails. And this place is used tremendously by equestrians and mountain bikers. And they've not been invited to the planning portion! They've been invited to the review of the plan… They were upset. *Whoo!* …they were mad. (interview P41)

Town staff and others with experience of past greenways often noted that local input about greenways has become more positive over the years, especially in larger towns that have been building them for 10 or more years so that residents have had an opportunity to see what greenways are about. Staff in these towns, all with long-popular

greenways, pointed out that opposition has diminished considerably and that it now tends to be very localized and based largely on opposition to having a greenway or greenway access right next to a particular property owner. One planner with considerable experience commented:

> When I began this…from the time we announced that we were beginning a project until we actually had it constructed on the ground, I would usually receive a lot of negative comments. 'I don't want the trail in my backyard.'... After we completed the trail, we…found that all of those people who were opposed to the greenway became advocates of that trail…Today, I can't keep up with the requests for additional trails. There are still isolated individuals that have the same concerns, but generally, I have found that most people…would like to see a greenway. (interview P38)

Almost half of the respondents spontaneously mentioned that greenway opponents changed their minds after the trail went in. One respondent, discussing a greenway that his town had, in construction, curved and narrowed from 10 to 5 feet for a short stretch because a few property owners in a wealthy part of town had refused to allow trail easements along the edge of their properties, noted:

> I was tired of listening to the neighbors. One of them called me after [the town built the greenway]. Said she really thought it was nice. - But that always happens. Everybody is convinced that it's the worst thing in the world, by the next day they've forgot that they said that, and they're out there using it!…they're so predictable. (interview P21)

This particular greenway, now completed, gets regular use, and several residents near the narrowed stretch have created private entrances to the greenway through the fences that the town agreed to build on their property lines.

Most, though not all, of the towns solicited public input when a greenway was in the planning stages, most commonly via a public meeting. In a pattern common to

planners proposing all sorts of projects, respondents said that local input was often minimal but controversy reliably provided attendees: “I can tell you when we get a hundred people in a meeting, it’s usually because it’s a *hot* topic and there are a lot of people who want to speak out against it.” (interview P27). Several planners mentioned that a small number of vehement objectors to greenways could make it seem as though there was no support:

> I would say there’s probably a handful of folks that didn’t want it, but it’s *amazing* how effective they can be in a gathering…[and the supporters] are like mice…we *do* get calls, afterwards, but you know, ‘I didn’t [oppose this plan]!’ … [or] people will come up and say, [very quietly] ‘Good presentation and [even quieter] *we love the idea.*’ (interview P4)

The influence of individuals sometimes operated in other ways against trails. One of the respondents remarked that in another North Carolina town not part of this study, an influential owner of several businesses had scuttled a plan for a greenway by suing to prevent it.

Because of the dynamics of public meetings and the potential for a small number of vocal objectors to outweigh an often silent group of supporters, one respondent now tries to hold small informational workshops instead of one public meeting, with several staffed stations or tables, so that each attendee can ask questions - or voice objections - without the risk that one or two vehement objections will intimidate other people into refraining from expressing their support.

However public meetings are still a common place for people to voice objections to greenways, and the most frequently-heard one is “Not in My Back Yard”. Multiple respondents noted that NIMBY objections fall into three general camps: 1) fear of

liability, for example should a greenway user get onto the property owner's land and drown in the owner's swimming pool or be bitten by the owner's dog; 2) perceived loss of privacy or property rights; and 3) fear of crime. Note that neighborhood objections to having a greenway are not couched in terms of opposing equity of access, but they do represent a general opposition to connectivity, and sometimes specific opposition to being connected to a neighborhood that is dissimilar to, and often less affluent than, their own.

1a) fear of liability

This first objection is rather a red herring because North Carolina law clearly states that property owners who allow a trail easement are not held responsible for injuries to members of the public who are walking across their land. Despite this, a plan for one proposed trail that would have run through several North Carolina towns was abandoned after a strenuous campaign against it that emphasized this non-existent risk (interview P36).

Liability fears in the other direction have also been expressed – e.g. in another small town, agricultural property owners objected to a proposed trail in part on the basis that they would be at risk from greenway users throwing lighted cigarettes or otherwise starting fires on their land. This and other objections doomed the trail. The North Carolina Farm Bureau has also maintained that trails constitute a fire hazard, though there does not appear to be any evidence that supports this and studies elsewhere, such as in Sonoma County, California (2003), have rebutted similar Farm Bureau objections. Several respondents indicated that they thought fear of liability was more of an excuse to have an objection than a real fear.

1b) Perceived loss of property rights

This is a complicated issue. Several respondents mentioned having heard concern by landowners that they would have their property taken away, and that eminent domain might be used against them if they objected. However planners noted that eminent domain is the last of last resorts; one of them described it as a "nuclear option" (interview P27) and another expressively described it as "you shoot yourself in the foot" (interview P36). Towns are extremely reluctant to exercise eminent domain, for obvious reasons. In any case, what municipalities are usually after is not all the rights to the land, but only a greenway easement to allow public access along the trail.

A related issue is that frequently people who have been complaining that their property would be intruded upon are simply unaware or unwilling to acknowledge that they themselves have intruded on to publicly owned land. This can be a common occurrence with disused rail corridors as well as municipally owned greenway easements before any greenway construction. After several years people begin to think of the land at the back of their property in particular as their private domain, as the following two quotes indicate:

> People love [the undeveloped land behind their property] when they're there, but - what happens is if you have your easements for years, back yards creep over into the easements. And so they think it's their property. It's *not*, but they've become accustomed to it, so your challenges are much greater. (interview P42).

> We put in a new trail…This particular homeowner was *very* annoyed, we were called about the trail - people looking into her back porch, or whatever. Turns out, she had been cutting trees down to widen her back yard, and cut into the city's right-of-way. And the fact that there was no buffer was her damn fault.
>
> So, you know - we went back in as part of the trail construction - actually, we didn't charge her a fine, we didn't make her pay to replant - we could have, but she was an elderly lady and…either she wasn't aware,

> [or] it was so long ago she didn't know she shouldn't have been doing it, so we just did some replanting. On our property. Trees that she had cut. (interview P9)

Respondents mentioned people having built everything from garden sheds to parking lots on what they erroneously viewed as "their" property, and correspondingly homeowners would display righteous anger – and when they acted in concert, sometimes enough anger to derail the project - at the thought of giving it up. A rail-trail proposed in Wilmington, for which the city, the county and the rail company CSX had agreed that CSX would sell the rail corridor for $1000, went down to failure when adjacent property owners objected and brought heavy legal backup to a public meeting:

> There were *50* of the property or adjoining property owners with *five* attorneys, threatening to take the city to court, denying them their private property rights, by not allowing them to get the rail bed….The new city manager said [lowering voice to a whisper] 'Well, we really ought to do this railbank, we really ought to.'
>
> And the attorneys said, 'Well - I *guess* we can –' They voted not to… Six to one they voted not to receive the railbank.…(interview P1)

Wilmington's backing down on its agreement had expensive unintended consequences. The city realized, too late, that included in the rail corridor were over $200,000 worth of drainage easements or ditches that it had always taken for granted. Because Wilmington failed to buy the rail corridor, all the property reverted to the adjacent landowners and the city had to spend $200,000 on buying only the drainage ditches back from the landowners when they could have owned the entire corridor for $1000.

1c) Crime

Despite the common assertion from people opposed to greenways that they will bring crime, the rate of crimes appears only to reflect and not to exceed crime in the neighborhoods around the greenways. For instance a national study of 372 rail-trails indicated that serious crimes were much lower on urban, suburban and rural greenways than national rates of those crimes nationally in urban, suburban and rural areas (Tracy and Morris, 1998) and rates of minor crimes on the trails were also low. More localized studies have found similar results, for example regarding Seattle's Burke-Gilman trail (Puncochar and Lagewey, 1987), where the trail's opening did not lead to increased levels of burglaries or vandalism near the trail, a result – or lack of result - that police attributed to the absence of automobiles. More recently, in Charlotte, North Carolina, Martin et al. (2004, unpublished study) examined properties adjacent to the 14 Charlotte greenways between 2000 and 2003 and found the rates of property crimes to be either insignificantly different or lower than the rates in the surrounding neighborhoods. They did not study violent crime because the numbers of such crimes on and around greenways were too low to allow a meaningful analysis.

The studies' results are unsurprising when one considers how unsuited a greenway is to allow criminal entry to homes and a safe getaway. Given that motorized traffic is forbidden and often made very difficult by the use of bollards at greenway entrances, and that greenways are seldom more than eight or 10 feet wide, using them to get quick access to people's homes to commit crimes is manifestly impractical. Crime is mentioned so often by greenway opponents, however, that five of the interview

respondents gently mocked this vision with the identical metaphor: “We tell the joke, somewhat tongue in cheek, that we have yet to see a fleeing burglar with a television set on his back running down the greenway - there are other ways to get away much faster.” (interview P29).

Additionally, greenway advocates point out – echoing Jane Jacobs (1961/1993) on the related subject of successful city streets - that plenty of pedestrians provide plenty of eyes and a greenway with pedestrians frequently passing by is much more likely to deter crime than to encourage it. However, several respondents pointed out that opponents seldom changed their minds until the greenway actually materialized and they saw how different the reality was from their apprehension of it.

In summary, neighborhood input follows several well-used arguments. In most neighborhoods, two of these arguments, liability and crime, are often borne of misconceptions – high-crime neighborhoods have more understandable, although probably overrated, concerns. The third one, concern for property rights/privacy, is understandable but almost always recedes after a greenway goes in – which, in a sort of Catch-22, it does only if the adjacent landowners are willing to grant easements.

2) Crime and “those people”

Property owners’ objections are regularly expressed as a fear of the people from other neighborhoods than their own who would appear on the greenway if it were built. Frequently what is said is “I don’t want *those people* in my neighborhood” (the term “*those people*” was invoked repeatedly in interviews) or “*They* will come into the neighborhood and bring crime”. One of the respondents made allusion to a related issue

in his town when asked about whether there was still suspicion of a greenway in the town after it was constructed:

> You can't - you can't *not* put park benches out because you're afraid somebody'll sit on it. That came from [another municipal project in which] we put brick sidewalks around the courthouse and all that, and we were going to put park benches out, and I had people - literally - say [adopts a suspicious voice] 'Do you know who's going to sit on those things?' *Do I care?* I said [laughing], 'If they're doing something wrong we'll lock 'em up, otherwise they're welcome to sit there!', you know. 'How dare you put a park bench out! Do you know who's going to sit on this?' (interview P19)

While discussing objections to greenways, several respondents also mentioned that they had experienced objections to building *sidewalks* on public neighborhood streets because of the possibility that strangers would use the sidewalks – despite the fact that those same streets regularly carried motorists who were also strangers. Perhaps what is most important to people is that a stranger who is a pedestrian is visible as a stranger for longer than the one who is a motorist, although one can also interpret it as suspicion of pedestrians in general.

One of the questions in the interviews was about whether there were objections from more affluent neighborhoods to being connected to less affluent neighborhoods. Not every town had experienced this, in part because not every town had greenways that were long enough to link different neighborhoods and their different demographics – but the towns that had such greenways usually had experienced this objection. A couple of respondents mentioned that very wealthy neighborhoods could be especially vehement. One municipal employee said that in his experience the biggest objections, which he had experienced on several occasions, came from people in million-dollar homes "and they're concerned about their neighbors in half-million-dollar houses" (interview P38).

There were differing opinions about whether objection to connecting disparate neighborhoods through a greenway was based on assumptions about lower-income people or based on assumptions about race – understandable given the frequent overlap. Several respondents said their understanding was that objections to "those people" almost always meant opposition to African-Americans. Interview respondents pointed out that the public did not often voice race-based objections so candidly - although more than one respondent had heard such candid objections, occasionally even in public meetings:

> Of course there are some folks who, racially, have some problems with going through a black neighborhood. - In the white community… One of our council members [who is African-American]… lives in the…part of our town [through which part of the trail goes, which] is predominantly, almost 99%, black. Someone made some comment about it not being safe, and she took *great* offence, to that... As she *should* have, to it, and took it as a racial thing. Boy, she was mad. (interview P18)

One respondent with knowledge of greenway planning brought up the issue of connecting disparate neighborhoods even before I had broached a question about it, and, mentioning a planned greenway project in his town that would connect more affluent (and whiter) neighborhoods to a less affluent (and more African-American) neighborhood, said the town had received many e-mails and calls that "would break your heart that…people still think like that" (interview P29).

A respondent in Town F, which has an unusually low greenway location quotient for African-Americans, when asked the question about objections to connecting affluent to less affluent neighborhoods, did not say whether there had or had not been objections, but responded by referring to a historically black section of town that had been annexed long ago, though the fact that it was a historically black town was not mentioned. There is no trail in that area that connects directly to the neighborhood. Another respondent in

another study town obliquely referred to racism in the same context, attributing objections experienced in his town to a proposed trail that would have connected a wealthy neighborhood to a less affluent one, to “the prejudices and preconceptions of a small Southern town” (interview P32). In this town, the proposed greenway was quietly dropped from the plans after people in the wealthy neighborhood complained to the town administration about the greenway route.

In yet another town with a plan to construct a greenway that would lead from a park into a residential area, residents along the proposed route had expressed fears that Hispanic residents who played soccer at the park would “slide up… and start creeping around in their backyards” (interview P7). In all these towns the term “those people” seemed to have racial or ethnic meaning and people who were objecting did not want African-Americans (or, depending on the area, Latinos) in their neighborhood because they saw them as a threat, or at least contended that they could be a threat, to the neighborhood’s safety. There were, however, some other respondents who viewed the issue of complaints about connecting neighborhoods as largely one about income, or occasionally as multi-family connecting to single-family.

In summary, race may not always be the issue, and it is often confounded by income, but it is hard not to conclude that references to “those people”, with their allusions to “the other”, are more likely to be race-based than simply to refer to people - white or not - with less money. Thus it is probable that objections to connecting disparate neighborhoods, which is part of what connectivity is all about and which is conducive to equity, are often borne of racism.

3) Town response to opposition:

3a) Dropping the proposed greenway

Opposition to a given greenway may not derail its construction, at least where trails are popular, but it still happens, just as has happened in the past. Concerted opposition to Mecklenburg County's second proposed greenway in 1981 delayed construction for months (Brunnemer, 1988). A more long-term result was cited by several interview respondents: the cautionary example of the town of Matthews, in Mecklenburg County. (This was not one of the study towns, but several respondents mentioned it, and since greenway planning is a county responsibility, Matthews greenways were part of the county greenway plan.) In 1999 there was a plan for a greenway in Matthews, the route of which was clearly shown on the relevant subdivision plats that people received when they bought new houses in the subdivision.

However real estate developers never mentioned, and residents maintained that they had not known of, the proposed plan. When the town announced it was going to build the greenway - admittedly one in a rather narrow buffer – there was furious opposition. The town took the position that it wouldn't go ahead until the residents were satisfied. One person with knowledge of the situation commented on the problem of municipal officials making decisions to avoid controversy in the short term:

> Now you can't do that, because you'll never - they'll *never* be satisfied. *You've* got to make a commitment as a municipal corporation, that this is the correct thing for you to do…Elected officials generally know that in today's political climate that voter turnout is very low. Therefore…they don't want to take on unpopular issues… They themselves are not making a value judgment on whether they support the project, think the project's a great idea, or don't. They just simply don't want to get involved in controversial projects. So they're a bunch of wimps! (interview P3).

Matthews caved in to the objections of residents. The project was shelved for years while attitudes gradually changed. Only now is the project being revived, and construction has not yet started on this, the town's first greenway. Elsewhere in Mecklenburg County, response to greenways has become steadily more positive, although there continue to be some objections by individuals, most commonly adjacent property owners, to specific routings.

A more recent, longer greenway project that was scuttled in Rowan County would have run through several towns. The project had a coalition of supporters from different organizations, as well as the adjoining counties and several small municipalities. However, according to two respondents with knowledge of the proposed project, there was intense opposition, largely from rural landowners, to the idea of having people from the town - one respondent said African-Americans were implied or mentioned - being out on the greenway. There was a mixture of the usual safety and liability objections: landowners voiced concern that people would set fires, drive ATVs, etc., on the trail. Around the same time, maps of a prospective open space plan for the county were published. Two people familiar with the situation, and other respondents discussing greenway projects elsewhere, remarked on the potential for misunderstanding caused by printing rather precise maps of greenway routes that were only proposed, given the assumption that a map reflects reality, or in this case a fixed future reality:

> I think if something could be said that could give somebody an idea of what not to do…if you're going to do a master plan, and it's going to be printed in local media, then either a) at least be so ambiguous that people don't say 'That's my back yard!' - or, you need to have a [ ] understanding up front, of what a master plan is. You know, when you've printed it in the paper, it suddenly becomes gospel, and then [people think] there is an underground conspiracy to take my land away from me. (interview P36)

In the end, a combination of the objections from the conservative and rural voices and an unrelated political upheaval that led to a more conservative set of county commissioners with more interest in individual rights and less interest in planning doomed this trail. Notably, this trail would have occurred in a county that has never had a comprehensive land use plan. Hence the commission had not set priorities that could have guided them. The same respondent noted the problem, which also has plagued planning for the statewide Mountains-to-the-Sea Trail in areas where growth has come suddenly and rapidly such as Johnson County, just east of Raleigh:

> You've got this old conservative guard of people, in a low-population community, and when immigration and just growth happens, you get to a certain level and you start to see change, I think, that we're on the tip of that. It happened in Raleigh and – unfortunately… sometimes you're behind the curve on it, because sometimes people don't start worrying about things like open space, and [sighs] managing traffic, and schools, and all those sorts of things until it's - difficult to do! (interview P36)

3b) Commitment to the greenway project

In contrast to the above outcomes, the decision-makers' commitment to the project can be vital in the face of objections. Essentially there are two facets of this. First, as mentioned before, a greenway plan can clearly reflect the priorities of the municipality (e.g., an intent to acquire or conserve open space), assuming the municipality has developed those priorities, and there is then something to guide greenway development. Second, even without a written greenway plan, if there is strong support from individuals or organizations, the support may override opposition.

An example of the first approach is Charlotte. The city/county Charlotte-Mecklenburg 2015 Plan has as a goal "to significantly increase the availability of greenways throughout the County" (Haden/Stanziale and Greenways Inc., 1999). The

assumption therefore is that the city/county values greenways, and will build them. Within Charlotte itself there is now widespread support for the idea of greenways. The greenway plan itself includes specific criteria for prioritizing both land acquisition and trail development; geographic equity is a criterion in both categories. Connectivity is also important. The city's solution to neighborhood objections to having a neighborhood accessible to a greenway is that the city will oblige by not putting in a connection from the neighborhood to the greenway, but it is committed to building the greenways themselves, because the local government is committed to the plan:

> And oftentimes you'll get citizens that'll show up and say - and I've been in meetings where a regular area would be 300 folks that show up at the first meeting and say, you know, 'You're not going to build this greenway.' And what we've had the ability to share with them in the past is that 'Folks, with all due respect, the ship sailed about 10 years ago on whether or not we were going to build a greenway. It's going to happen. We're providing the opportunity for you to come and help us make it a better greenway, by giving us your input at these community workshops.' (interview P29)

Having a greenway plan shows some intent and it displays something about a town's priorities and the value it places on open space and greenways, but as mentioned before, not all greenway plans are equal, and having a greenway plan is not the same as putting greenways on the ground. One North Carolina town not part of this study commissioned not one but two comprehensive greenway plans and has built one greenway, but according to two respondents the town has dragged its heels on doing any more than plan - or, as one of them put it, "we've led the horse to the water several times, but it simply doesn't want to drink!" (interview P3) - because of a lack of commitment and of good policies for getting land, and because of resistance from developers).

The second important facet, especially without a written greenway plan, is advocacy by either individuals or organizations – “a greenway champion” as it is sometimes described. Advocacy is crucial. Numerous respondents cited the influence of greenway advocates who had promoted greenways, smoothed the path with contacts to officials, looked for grant money, donated money themselves, and helped in many other ways to get trails on the ground. Vocal greenway supporters have sometimes swum against the current in even introducing the idea to a sometimes bemused local government. One respondent described the challenge of presenting the initial idea of a greenway to the local leadership in a small town more than a decade ago - the greenway in this town is only now being developed, but the greenway supporters, all volunteers, have generated considerable credibility for related work here and in other towns:

> The concept of a greenway was simply - it was just - laughed at. It simply carried no merit in the minds of those who believed it was simply a waste of money. No one would want to go follow a sewer line through the woods...and be attacked; you could get… poison ivy or, you know – and…their argument was, there are parks that are well maintained and funded, that are existing; they had trails in them; it just made no sense, for there to be an expenditure of this kind. (interview P7)

In small towns the administration and elected officials have sometimes showed their commitment by advocating a greenway despite strenuous opposition. Town A is a prime example. The town’s proposed greenway, that wound partly through a predominantly black, low-income area, experienced ferocious opposition in the local newspaper and some heated opposition at public meetings as well. This was in large part over fear of crime but also over a perceived waste of funds that was repeatedly misrepresented as such in the media, since almost all of the funds would come from grant money that could not be applied to any other project. Despite the objections the town

administration saw considerable benefits to the project and stood behind it. Today the trail, while still viewed as a boondoggle by some of the early opponents, gets regular use from a diverse group of people. This town was fortunate to have not just planners but decision-makers who valued and worked hard to provide amenities that sometimes get short shrift in rural areas. The greenway was approved despite a prevailing attitude in the area that was described by a respondent:

> But rural voters *think* a little differently…I can remember [making a recreation] presentation to [a county commission in the 1970s] and a county commissioner said, 'What do we need recreation for? I played with tobacco sticks. These kids can too.'…It's like, 'Well, if they're tired enough working on the farm all day, then they're not going to need any recreation hardly'… I came from [a different North Carolina community] where, if you built a high school, *of course* you built a track. I mean, you wouldn't think of *not* doing it. I came here, and - you have to *fight* for basic facilities…It's because people that have not been exposed to things don't know what they're missing. (interview P19)

It can be difficult for town officials to sell the idea of a greenway, especially in smaller towns where not only is the idea more novel but there are fewer people to draw upon for support in the first place. One small North Carolina town, whose mayor had successfully applied for grant funds to help build a greenway, hovered on the brink of giving back the grant funds after the mayor stepped down and a new mayor with no interest in or appreciation of trails was elected. Other supporters had to ask the grant provider to come and sell the grant proposal – already approved by the funder! - to the new town council. Like the town just mentioned, essentially all of the cost would have been funded by the grant, and in this town the entire section for which funding was sought was on the land of a trail supporter. The new mayor, who had the deciding vote, reluctantly decided to agree to support the trail.

Sometimes towns have been prodded by greenway support from other local organizations. Many North Carolina towns' greenways have come to fruition because of help from organized advocates, such as Caldwell County Pathways – a countywide group organized to promote and facilitate the building of greenways – Friends of the Greenway in Franklin, NC, Partners for Environmental Justice in Raleigh, North Carolina Rail-Trails (across North Carolina), and the Catawba Valley Heritage Alliance.

Sometimes when there is considerable and apparently intractable opposition, it is most practical simply to turn to another previously planned trail and leave plans for the controversial one on the back burner for a while. Town commitment may not be enough if someone such as a developer or large landowner refuses to allow access. Even some larger towns where greenways are popular and there is a documented commitment to greenways have found this to be the case. There are almost always more plans for greenways than there is money to construct them, so there is always another trail that could be constructed elsewhere instead.

However, given the nature of neighborhood opposition, if a town consistently bows to local opposition to a greenway, valuable opportunities to connect destinations and to join neighborhoods – including very different neighborhoods – are likely to be lost. Equitable access is also likely to be a casualty.

Some of my hypotheses, I think, have been borne out. From the results above, I conclude that a commitment to connectivity and a commitment to equity, expressed in a greenway plan or elsewhere by planners and the municipal administration, are important in achieving equity. A greenway plan is conducive to achieving equity only insofar as it expresses the priorities of the town. Rail-trails have the potential to promote equitable

access – *if* the rail corridor is preserved in more than fragments. And neighborhood input is frequently at odds with the idea of building a greenway. The idea of connecting disparate neighborhoods is particularly likely to be opposed even as it is likely to facilitate equitable access. This is not an argument not to invite the public to have its say, but it does speak to the need to involve the public early and educate it about what a greenway can offer.

II. *Other issues regarding greenway routing*

Although this dissertation began with a series of hypotheses about what may make the routing of greenways more or less equitable, other factors also emerged during the interviews. Note that "greenway routing" is also about whether a greenway goes in – or not. Sometimes the result is no greenway at all.

*Availability of land*

This is crucial. From the outset, towns considering the development of greenway trails as pedestrian routes are considerably constrained by the availability of land. Unless a greenway is to be constructed in a still-to-be-built subdivision, there is an immediate problem: most of the land is already in use, because the town was built before anyone thought of greenways. Thus what is left is what is most likely to provide the greenway route. As several respondents remarked, the most common corridors chosen for greenways are along rivers, streams and creeks, for the obvious reason that they are not developable. As a trail activist also noted,

> It's much easier to get rights-of-way and easements and land donated in floodplains than it is anywhere else. Because people can't use it, to do anything else, usually. Anyways, it's a lot less expensive to build a trail there, too. In most cases. (interview P7)

Additionally, pointed out another respondent, “they are prime areas to protect for habitat and watershed. Not to mention people like to walk next to creeks.” (interview P9) Finally, creek corridors may offer less of a topographic challenge for trail users – as one noted, “You can’t get more than a certain grade percent change and expect people to be able to use it.” (interview P12) The great majority of the towns in this study used, for the majority of their greenways, riparian corridors.

Creeks may be the most common greenway route for most towns, but they are not obvious routes for pedestrian transportation because in a given watershed the creeks all run in one general direction. Most towns are within only one watershed, so as several respondents noted, the available corridors may not link destinations easily: “We look at greenways along rivers and creeks and everything, but we don't always look at them with a system of transportation. I think I heard someone say that rivers and creeks generally don't take you to your workplace." (interview P15). Generally for good cross-town transportation, some overland connectors must be built between creek routes.

A second, less-often used choice is utility corridors such as power lines or sewer lines. One respondent pointed out that power lines tend to march in straight lines without regard for the terrain, which can make trails more difficult to use.

Available land also means publicly owned land. Towns with greenways have often started on land they owned - again, often along creeks or beside lakes - a practical way to reduce the potential for objections to greenways by circumventing the need to acquire easements, especially when greenways are a novel concept to the townspeople.

Finally, abandoned rail beds are commonly used in some other states, but as discussed earlier, it can be very difficult to create rail-trails in North Carolina.

Hence from the start, especially where the town infrastructure (particularly residential development) is already in place, the concept of greenway routes as anything other than recreational paths for trail users is often confined by the reality of what is already on the ground. This may be especially true when there are not clear priorities about what the greenway is supposed to provide, other than recreational trails. The land that is easily available – again, most likely riparian land because it is unsuitable for other development - is most likely to be the next greenway.

*New subdivision development*

This is of note because new subdivision development could be expected to offer the most options for a town with a greenway plan, since by definition, there is no previous development in a new subdivision. Town F is exceptional in having had developers build most of its greenways, but towns with significant growth and with an interest in greenways often require developers to provide space for greenways. At least eight of the 11 towns studied, including all of the named ones, have some sort of open space requirement that can be used for greenway development, from the provision of an easement (for a greenway or simply for open space), especially when there is subdivision or rezoning on land that has a stream on it, to a requirement that the developer actually build a greenway. Such requirements are most often used in the process of new development subdivision. Sometimes a town offers a direct incentive for a developer, such as allowing denser development on the remaining developable land in exchange for the greenway easement. One town with many high-end residential subdivisions requires developers to put in – and pay for - a public greenway if it is already in the greenway plan (i.e. if a greenway is planned for that area).

Several people mentioned that a developer's response to a request to dedicate land for greenways depended on that developer's experience elsewhere and also on the type of town. For example in one small town, it could be problematic:

> It's a real challenge as a planner to convince *some* developers that that's an amenity and not an expense….It depends on the type of neighborhood that the developer's trying to put in. Something that's a high-end type of development…clearly you're going to have a clientele that demands that type of amenity. But at the lower end, I mean you're just going to have to increase the prices of the adjacent housing to compensate for that loss of land…in areas like where we are, which are kind of on the fringe, [that] may make it less attractive for them. So it's a very complex calculus. Certainly it's the right public goal, but from the developer's perspective it's a difficult cost calculus. (interview P17).

Some, but not all, of the larger towns with long experience with greenways indicated that most developers were positive about the idea of greenways. On the other hand a respondent in one large town that has successful greenways, and that does ask for greenway easements along creeks, said: "Even asking someone when they are building something and it's on the greenway plan, 'Will you build a greenway?' Well, you don't ask a developer that, you know." (interview P15).

The value to the developer of trails might seem slight, but many developers see greenway trails as a major amenity and do choose to build their own. A 2002 survey on the importance of community amenities conducted by the National Association of Home Builders and the National Association of Realtors found that "walking/jogging/bike trails" were "important" to "very important" for 36% of respondents, second only in importance to highway access (at 44%) (National Association of Homebuilders and National Association of Realtors, 2002). Not surprisingly, mention of the presence of a nearby trail or trail system is common in developers' efforts to promote residential

development:  as one respondent said, “developers always advertise greenways” (interview P40), since they are seen as a draw and houses adjacent to a greenway can command a premium (e.g. Nicholls and Crompton, 2005). (Homes-for-sale signs, placed by several homeowners, an apartment owner and at least one developer, were placed facing several greenway trails in the towns studied, clearly advertising their proximity for greenway users.) One respondent noted that a new house backing up to forested land was a draw, but that building a greenway was a way to maintain a buffer of at least 100 feet from the inevitable subsequent development going up back-to-back with the first one (interview P29).  This respondent also commented on the premium that developers can gain with houses located next to a greenway.

Developers also can impose requirements. Respondents in two towns mentioned instances in which developers successfully resisted the original intent of putting a previously planned greenway through what became gated communities. At least one of these greenways would have been in a riparian buffer. The greenways were built, but on the outside of the communities, and for long stretches they were separated from the gated community by chain-link fences. One of these rerouted greenways, in Town F, retained its original creek name, but because the trail has been rerouted to be outside and on the other side of a fence from the gated community, the creek that named the greenway is now out of sight and out of earshot for greenway users. In Town F, developers have built nearly all of the public greenways; it saves the town money and hence allows more miles to go in than would otherwise be the case, but the developer obviously has more influence in the greenway routing as a result.

In the other town, a developer based his objections to a greenway going through a gated development – he was successful in preventing it - on the contention that this would make his development less marketable, notwithstanding the Association of Home Builders survey mentioned above.

> [The developer] said, 'If you put a greenway here I will not develop the property.' And he kind of held…[the town and its planners] hostage. And then people said, 'Well, we've got to have the development.'…And I think that was *so wrong* to wrap it around a property just because it was a gated community. (interview P13)

Yet another developer refused to let a previously planned greenway go through a retirement community. A respondent in this town noted that most developers' objections to greenways centered around the idea that they didn't want non-residents walking on their property. The respondent discussing the retirement community project, however, noted that after the meeting in which the director of the community refused to let the greenway go through, many residents "came up to me and said [lowering voice], 'Please build the greenway. Or just build me a park bench so I can sit and watch all the people going by.'" (interview P12). The director prevailed, and the greenway stopped at the gates of the community.

A completely different approach was taken by the developer of another planned retirement community in a different town. The developer was an open supporter of the town's only greenway, allowing a public trail parking lot to be built on his own land next to the community. His website advertises the trail's proximity to the development, and members of the retirement community do use this long peaceful trail with a rural feel. (I stopped to talk with one of them, an older woman out on her bicycle, who said that she liked to come out by herself on the trail because she could see more wildlife on her own,

and that she felt safer by herself than she did cycling with other residents in their 80s who ignored the traffic rules at intersections!)

Overall, not surprisingly, planners and other respondents said that getting greenway easements was easiest with new subdivisions, i.e., before there were residents in place, and that easements were not usually very difficult to get if they were for otherwise undevelopable land such as along creeks. There were some objections from builders – usually where the developer had limited experience with greenways – and developers in some towns leaned on the town to concede on the whereabouts of the trail, especially with some more "exclusive" developments where they asserted either that access for the public would endanger the residents, or that the prospect of public greenway access would dissuade prospective residents. Some towns resisted this approach more forcefully than others; commitment of towns is discussed later in this chapter.

*African-American input: greenway planning*

Aside from attendance at public meetings where, as noted before, they were less visible than white residents, African-Americans and other minorities were a relatively small fraction of the people involved in the formal greenway planning process. One of the interview questions addressed the presence of minorities on greenway committees or other greenway planning groups, and when they were mentioned I tried to contact them, but as mentioned earlier, only four of the 41 people interviewed were African-Americans. None of the respondents was a member of any other ethnic minority group.

Although several greenway planning committees or groups involved with greenways had minority representation, in terms of ethnic minorities this was relatively

small and generally speaking, ethnic minorities were underrepresented and there tended to be no more than one on any greenway planning group. The four interview respondents, each from a different study town, who were African-Americans had all been or continued to be involved in greenway planning in some capacity for their towns. Two of them have been involved for decades in issues related to greenways and pedestrian issues. All of the four respondents were eloquent on the needs of the community as they saw them, including but not confined to the needs of African-Americans in the community – and each respondent's interest or involvement in greenways stemmed from a particular vision, whether it was about better health, better access to safe pedestrian facilities for African-Americans and others, environmental concerns, or for other reasons. They all valued and had supported greenways as potentially important aspects of better local environments – while observing that many minority neighborhoods needed more wide-ranging improvement than a greenway might provide.

Most of the people interviewed from the other seven study towns said there had been some but not a lot of minority presence on committees or other groups that were part of greenway planning. Several respondents remarked that they tried to include a diversity of opinions on greenway committees. (Interview respondents interpreted diversity in various ways, including diversity of gender, of race, of geographic representation within a town, and of interest - environmental, public health, cycling, etc., but they were usually very aware of the presence or lack of ethnic minority participation). In most cases people on greenway committees or involved in greenway planning were very mindful of the need to have different perspectives, including the perspectives of people from minority neighborhoods. Sometimes respondents mentioned that they had

tried to attract more of a minority presence but had not been successful. A number of times people pointed out that minority residents often had additional concerns or time constraints such as working more than one job that made it more difficult to be engaged in outside-of-work causes. One African-American respondent who had been a particularly energetic and successful advocate for his community mentioned the problem, in the context of getting facilities for the neighborhood: "I've been crying out for people like me to be on committees and commissions, and stay there" (interview P39) but he said the energy needed was "enormous" given how much change was needed.

Simply having a minority representative at some level does not mean that the representative always channels the wishes of the community. In at least one instance, a planner said that African-American town council members had sometimes advocated greenways for African-American neighborhoods because they also felt it would be something to bring the neighborhood, even though it was something that the neighborhood had no particular interest in because it wanted amenities that it felt were more valuable or useful to it than a greenway that it had not asked for. However, minority representation on committees can, as described in the last paragraph, may provide a voice from the community and allow that community access to the process that it would not otherwise have, similar to the role that minority planners can have (Thomas, 2008). Unsurprisingly in the study towns there was sometimes a similar disconnect between what greenway planners – who in this study were all white - thought would benefit a minority community and what the community thought.

*African-American input: neighborhood input and attitudes towards trails*

Especially in low-income, often minority neighborhoods, greenway trails may just not be seen as a priority when the community has many unmet needs. In neighborhoods with higher crime, there may be outright opposition that may even lead to jettisoning a plan for a trail. Winston-Salem, for example, had a plan for a greenway on the northeast side of town that would have served a population with considerable numbers of African-American and Hispanic residents, but the plan had to be shelved because of neighborhood opposition. Residents, many of them elderly, felt they had enough crime already and feared that the greenway would bring in more of it. The Winston-Salem trail may still be built in the future but will need more favorable neighborhood response for that to happen.

Another town (Town D) planning a trail in a poorer and heavily minority part of town also experienced opposition from the neighborhood that the trail would have run through. Once again, the opposition in this instance was in part because of concerns about crime. The greenway would have been relatively secluded as well, potentially a particular cause for concern for African-Americans (Elmendorf et al., 2005). The plan for this trail was shelved although the town is seeking another route that would have more support.

In relation to the point about secluded greenways, some types of greenways may seem threatening or dangerous to African-Americans when they would not to whites. Several people in the interviews remarked on the nervousness that African-Americans had about being “in the woods”: “it's amazing how much larger percentage of the [African-American] population is traumatized with the idea of going into the woods or going into a swamp. It's just - not - done.” (interview P40) One of the African-American respondents commented on this attitude:

> We don't often think of environmental projects, and what they mean, to the quality of life in our community… How can [black people] appreciate it when they have never had it, been exposed to it. It's a sad commentary, that we're beginning to think that we need that in the community, in the area, in 2007. We're just *beginning* to get exposed to it, educated to it…Experiencing [it]. (interview P39)

The concern about safety and "the woods" on a greenway is in keeping with research about African-American preferences for more open, formally maintained green spaces (e.g. Elmendorf et al., 2005, Kaplan and Talbot, 1988), and it certainly speaks to the necessity of soliciting input from neighborhoods if a planned greenway is to satisfy the residents, because greenways can differ greatly in their openness, visual field and urban versus rural or "woodsy" feel, and there is no point in having a greenway that does not get use from the neighboring residents (see the next section).

A different issue is that there may be a misguided perception among African-Americans and others that greenway trails are simply a recreational amenity and as such, one that is only of use to the white middle class. According to one planner,

> One of the things we found, we were collecting data from NCDOT, doing…our first bike and ped plan, was the highest accident rate, for pedestrians and cyclists, are both in the African-American communities. So they tended to happen, like, at 7:30 in the morning and 5:30 in the afternoon. You say, 'Well God, these are people who are riding their bikes to work, you know!' And walking at [sic] work. - But when we presented the bike-ped plan to the council and asked for funding, to help us do some of the features, we had to very much overcome the perception of some of the African-American city council members at that time, that this was, you know - that bikers were Lycra-clad, spandex-clad white yuppies. And that of course no one biked. And we said, 'But – but - but look at the accident data! Obviously people are biking!' (interview P9)

African-Americans who opposed greenways in historically black neighborhoods also may have had suspicions of plans advocated by white people – with good reason. As one greenway advocate discussing another town in the study remarked, "The black

community's not always been a beneficiary of great planning by white planners" (interview P39). People in five of the 11 study towns mentioned, in passing, this kind of suspicion. They remarked on the fact that historically, black neighborhoods had been neglected by planners or they had had land taken away from them before and they feared being "railroaded", as one respondent put it, by the majority white community. There are plenty of cautionary examples. The advent of "urban renewal" in the 1950s had a particularly great impact on black communities: in North Carolina, Greensboro's widening of East Market Street and the attendant displacement and loss of black businesses is one example (Shipp, 1997); the wide swathe that NC-147 cut through Durham's thriving Hayti neighborhood, with a similar effect on black businesses and neighborhood institutions, is another.

Such concerns still surface today in towns over other planning issues. In one of the study towns, a respondent noted in passing that his town was planning, in an African-American neighborhood, a widening of the main street that included the first-time construction of sidewalks. The town viewed this as an aesthetic and safety improvement, but it would inevitably mean that residents on the main street would lose part of their front yards, something about which they were understandably not happy. In Greensboro in September 2008, there was heated opposition in the Greensboro neighborhood of Warnersville to the purchase of land, including a historically African-American school, for conversion to a sports complex for Greensboro College. Much of the opposition revolved around fears that the neighborhood's history would be obliterated. Eventually a deal was worked out that would preserve the school (Ewing, 2008; Seals, 2008).

At the same time, where residents can see immediate benefits, planners' ideas may meet with approval. A greenway trail built by Winston-Salem in the majority-Hispanic neighborhood of Waughtown was received enthusiastically by the neighborhood. Prior to the trail's appearance, the area had long been a dumping ground for trash. Construction of the trail meant that this site was cleaned up, attractively landscaped and completely transformed.

African-American involvement, or lack thereof, in the planning process is an issue that begs the question of whether minority neighborhoods have an interest in trails and greenways. One of the interview questions was about who, if anyone, was left out of the greenway planning process. African-American, Latino, less-educated, and lower-income residents were mentioned a number of times by respondents. One interviewee said of African-Americans,

> It's just not their issue. It's not so much that I think they're being left out, it's just that they've got bigger problems, is my impression…They're very, very concerned about recreation centers, and parks. They're very concerned that the children have programs and somewhere to go to. They're just not particularly concerned about greenway trails, so that causes them to be locked out of the discussion. (interview P12).

Several respondents including two of the four African-American respondents said that black residents were more likely to be dealing with other issues such as working several jobs or having other bigger needs that made it hard, had they been interested, to attend public meetings.

Respondents, in discussing minority attitudes to trails, sometimes remarked that in less affluent neighborhoods, trails were just not as high a priority as other unfulfilled needs, which of course were higher in lower-income neighborhoods. Respondents in

three towns where minority neighborhoods had had reservations about or were opposed to trails in their neighborhoods noted that sometimes the African-American parts of town had an overall lack of good recreation and other facilities. In two of the 11 study towns, respondents described incidences in which advocates for the black community had had to press forcefully to get other recreation facilities that a municipality or the state had initially turned down or refused to consider. One of these was a park on a river near an African-American neighborhood, and the state initially denied funding to the municipality for the park, asserting, among other things, that black people wouldn't use it (interview P19).

Lack of facilities in a neighborhood, in turn, reduce the probability that a trail can connect destinations – especially a short trail - and make it less likely that it would have potential for anything other than recreational use: if there are few destinations in the neighborhood, what is the point of a trail from nowhere to nowhere, and if there is only a tiny greenway, is it worth building? Town D created a plan to build a trail in an African-American neighborhood after the residents rejected a first plan's secluded routing owing to safety and crime concerns, but the second, extremely short, trail would not have connected to significant destinations and was seen as a greenway in name only; this idea was also dropped.

*The relevance of trails and greenways to African-Americans*

As indicated in an earlier chapter, the theoretical literature includes a host of theories about why African-Americans participate less in outdoor recreation, including being on trails (Elmendorf et al., 2005), from historically having fewer resources to participate to historical discrimination and environmental injustice (e.g. West, 1989;

Floyd and Johnson, 2002), or having different preferences from whites regarding recreation (e.g. Shinew et al., 2004). Each of these theories was supported, at different times, by respondents in the study interviews; several of them speculated about why there were so few African-Americans on trails and in national parks.

Safety, or perceived safety, was brought up by some respondents as a concern for African-Americans. On this subject, research by Lindsey et al. (2008) indicates that openness of "trail viewsheds", i.e. the amount of open space that one can see around one, is one of several factors associated with more trail use; they note that one's feelings about visual magnitude or its inverse, limited lines of sight, can be context-dependent, so in certain settings - they suggest curves in a forest trail - low visual magnitude can bring an enjoyable sense of "'mystery' about what lies ahead on the trail" (p. 61), but in other settings – they suggest corners in an alley – people may instead feel anxious and be deterred from using that path. They note that mystery on urban trails can be inviting or a deterrent to potential users depending on those users' preferences - and, one could logically infer, their life experiences. Such differences in life experiences could explain African-Americans' preferences for more open settings, such as – as one respondent attributed it - not having been exposed to trails and to nature earlier in life. Reasons for this are  not well explained either. At this point it is hard to know what is the most important influence.

However this does not mean that African-Americans do not use trails for recreation or exercise, or for that matter commuting. Greenways such as the Salem Creek trail in Winston-Salem, which traverses several different neighborhoods and connects to several significant school, shopping, recreation and work destinations, cater to an

extremely diverse group of users, including many African-Americans, Latinos and whites of various ages. A number of popular trails in other cities and towns also see diverse user groups. Several respondents from a small town with a large African-American presence remarked that the trail drew African-Americans and Hispanic users as well as whites, and I have noticed the same thing on all of these trails while out on my bicycle. Additionally, different opinions emerged among the study respondents about whether the perceived lower use of trails by African-Americans was really an income issue rather than an ethnic issue, although this was not the focus of the interview questions.

(In my own experience traveling greenways on my bicycle, trails that are popular with all demographics of users tend to be long, paved, and have plentiful access points to a variety of destinations; lake trails are also very popular. In predominantly African-American neighborhoods I was less likely to see users on greenways that felt secluded, for example surrounded by bushes with no view of the surrounding streets, or that felt open but that had long stretches without access points. In majority-black neighborhoods that were middle-income, on greenways with many access points that did not feel "woody", I generally saw a number of African-American users, i.e. actually walking/cycling/running on the greenway. However in a low-income black neighborhood on another open, park-like greenway on a warm sunny day mid-week, there were several people present near the greenway but mostly they were young men standing around at the edge of it. I was warned by an African-American woman my age – the only person who was actually walking on the greenway - that the neighborhood was not particularly safe. Her warning was echoed a few minutes later by a white construction worker doing work

on an extension of the greenway. The greenway did not feel less safe than the surrounding streets, but the streets also had young men loitering.)

III. *Greenway routes, pedestrian infrastructure and environmental justice*

*Greenways as pedestrian infrastructure*

Although greenway trails may not seem at first glance to be part of a transportation system, the large cities in this study all have produced pedestrian plans that aim to use both sidewalks and greenways as integral and complementary parts of the pedestrian and bicycle transportation system, and are trying to implement these plans by improving the infrastructure for alternative transportation, including building more sidewalks, constructing more miles of trail, and making sure that there is connectivity between the two systems. In this context, greenway trails are much more than a middle-class amenity. However, putting greenways on the ground is about fitting a piece of infrastructure that serves pedestrians into a previously existing infrastructure, and fitting one into the other is rarely seamless.

Greenways do have a perception problem when it comes to alternative transportation. However much one would like to see them as important in terms of transportation as roads are, the truth is that this is rarely true, for now. One of the reasons is their routing. Because of the limited available land, most greenways in this study, and perhaps most greenways elsewhere, are situated along riparian buffers. Water in the form of creeks or streams is a popular aspect of the scenery on many greenways, but routing a greenway along creeks, which pay no attention to the routing of roads and often meander, makes it more difficult to view the greenway as a logical pedestrian or cyclist

transportation and commuting route. Roads, on the other hand, are all about connecting A to B in an efficient manner, and planners give them the most direct route that is possible.

A related issue is that towns commonly and understandably tout greenways as recreational amenities, among other things. Nearly all of them also house greenways administratively as part of parks and recreation, for maintenance and other reasons. But as a result greenways are frequently viewed as recreational facilities foremost, rather than transportation corridors. Even when a greenway route is direct and connects destinations, it may not be viewed as a legitimate transportation corridor. One respondent noted that his town's engineers and planners had explicitly said that they viewed roads and sidewalks, but not greenways, as the components of the town's transportation systems – this despite the fact that the town has multiple greenways, and is working on connecting them to improve the pedestrian infrastructure.

In addition, governments generally attach more importance and much more money to roads than to pedestrian projects – a 75-to-1 ratio at the federal level (Pucher and Renne, 2006). Given the view of greenways as a recreational amenity rather than an integral feature of a sustainable transportation policy, there can sometimes be furious opposition when building a trail is seen, rightly or wrongly, as in conflict with building roads. Two of the study towns experienced this, both of them for greenways that provided legitimate alternative transportation corridors. In one, a project that removed one lane of a lightly-used three-lane road to replace the lane with a greenway path – removing a lane of a road and converting it to another purpose is sometimes called a "road diet" - prompted a barrage of strongly negative mail:

> We got *lambasted* for a fact…the letters to the editor that came in - all complaining about that project. And it's honestly the most input that city

> council has got on *any* topic! They can go out and spend 4 million dollars, of water and sewer improvements, and nobody questions it. But - we take this one project, to build a greenway trail… (interview P37)

Another town experienced vociferous opposition to a trail and the trail's proponents in part because the trail was incorrectly portrayed as using money that could have gone to fund a popular proposed road-widening project. A respondent discussed this and the problem of finding money for more than the most obvious basics in a small municipality:

> And that's part of it…that people are afraid of things…and they look for the negative in everything you do. *Particularly* [sighs] something to do with parks and greenways, where it's *clearly* something you don't have to spend money on. But *clearly* what you're doing without a police car in the budget the same time you put money in for a greenway - it's an *easy* first cut. And so you've *got* to have elected officials with a mindset of improving livability. And …you've got to be working on *everything* simultaneously. You can't spend a million dollars on a fire truck and do absolutely nothing else. And so - you've got to do it all simultaneously. (interview P19)

The academic literature echoes this potential pitfall for greenways. When the subject is parks and recreation – and as noted, greenway trails tend to be both categorized administratively and promoted as recreational features - interest groups are likely to have a disproportionate impact. Folz and French (2005) found that when the issue under discussion related to parks and recreation, interest groups were most likely to be able to influence the decisions of managers and mayors of small towns (under 25,000) probably reflecting the presumed discretionary nature of projects that are put in this category. (Almost all of North Carolina's towns fell into the small-town category in the 2000 census.) This might be less of an issue for towns where the intent was really only to have a recreational trail, but the perception of greenways as solely a recreational amenity is

likely to be a problem for a town with a good-faith plan that aims to create connectivity in order to create genuine pedestrian/bike transportation options for everyone, in all neighborhoods. A municipality may need to be exceptionally committed to get a greenway on the ground, particularly when that greenway will connect demographically different neighborhoods.

As transportation corridors, trails and greenways and sidewalks do remove pedestrians and cyclists from the hazard of motorized traffic and offer them a safe route. A greenway is not the only, or necessarily the best, form of pedestrian infrastructure, as already mentioned. However it does add to that infrastructure – one whose lack is a particular problem for African-Americans in this state. Although there is very little data about who is a pedestrian, we do have information about pedestrians who are injured by motorists. Data from North Carolina shows that black cyclists and pedestrians are almost twice as likely as whites to suffer an accident encountering a motorist. African-Americans, who make up almost 22% of the state's population, accounted for 41% of the North Carolina bicycle crashes and almost 45% of the pedestrian crashes from 1997 to 2006 (UNC Highway Safety Research Center, 2006). Similar disproportionate rates were repeated in city after city in the state. This is likely to be partly because African-Americans are less likely to own a motor vehicle and more likely to use other forms of transportation such as walking or bus (Raphael and Stoll, 2001). Elsewhere, a Transportation Board case study notes in a study of Chicago-area pedestrian-vehicle crashes, that there are proportionally more such crashes in census tracts that have high proportions of ethnic minorities and/or low median incomes. Without apparent irony, the

authors remark in passing that such areas are often called “environmental justice areas” (Cottrill and Thakoriah, 2008).

Greensboro, whose latest greenway plan notes that most pedestrian and bicycle crashes occurred along or while crossing road lanes (Greenways Inc 2006), and that most roads in the city were graded ‘D’ or poorer as facilities for cyclists – miles of sidewalks were also needed - is not the only town where there may be a mismatch between the location of pedestrian/cycling facilities and the location of pedestrians or cyclists. A recent study done by the Minnesota Department of Transportation, looking at the impact of increased bicycle facilities on bicycle commuting rates in six cities across the country, found that in Orlando, Florida, - where bicycle commuting rates declined – one factor may have been that the bicycle facilities were mostly constructed in middle- and upper-income areas, while the city’s metro bicycle coordinator believed that bicycle commuters were mainly people from low-income groups (Douma and Cleveland, 2008).

Trails and greenways complement sidewalks. Sidewalks are the other most obvious part of the pedestrian infrastructure, but here there is a huge need for improvement. Charlotte for example has sidewalks that were built in the original town (now at the center), then a large “doughnut” of sidewalk-less streets outside the center, dating from post-World War II when sidewalks were not required, and only recently have sidewalks begun to be seen again as necessary. Decades of lack of attention to the needs of the pedestrian in many cities have resulted in a situation in which, for example in Durham as of 2006, there is a ratio of only one mile of sidewalk for every 2.7 miles of road, or a ratio of 0.36:1 sidewalk miles to road miles, in a city which has an above-average rate of workers who commute to work by foot or bike (City of Durham, 2006).

Sidewalk infrastructure may be even more problematic for African-American neighborhoods. One recent study of the St. Louis metropolitan area found that sidewalks in census block groups that were predominantly African-American were almost 30 times as likely to have a lot of “unevenness” such as cracks, alignment problems, broken sections and/or weeds. Poverty seemed to have little association with sidewalk condition. (Kelly et al., 2007) There is not much data about where sidewalks are relative to African-American neighborhoods in other cities, but it is very likely that the state of the infrastructure is worse than it is for white neighborhoods.

# Chapter 7: Conclusions

*Equity of access and influences on greenway placement*

In this dissertation I tried to answer two questions: whether greenway trails in North Carolina towns were equitably distributed, specifically with regard to African-American residents versus white residents; and what factors influenced the placement of greenway trails within those towns. The dissertation results do not show a systematic inequity in distribution of greenways across the towns studied – indeed the majority of the towns are making efforts to have equitable distribution. However the results do show spatial inequities in a few towns, and in particular one town, Town F, that appears not to have acknowledged or addressed the inequities, some of which could be quickly rectified by adding access points.

The study suggests some tentative conclusions. A commitment to geographic or demographic equity and a commitment to connectivity promote equity of access. Choosing land only according to where it is conveniently available does not, and neighborhood opposition is likely to work against equity of access, especially if it is in opposition to connecting disparate neighborhoods. Developers' interests may not always be in concordance with a plan for a greenway if access to the public beyond the development is an issue.

Awareness that equity of access is an issue is the first step. Some towns have wrestled with the issue. Greensboro has acknowledged that inequity of access is a

problem and now has resolved to address it; at least one of the smaller towns intended a greenway in a minority neighborhood that would have connected to a wealthier whiter one, but dropped it after objections from influential town residents; other towns have withstood sometimes fierce opposition to building greenways that would connect disparate neighborhoods. There is still resistance to the idea of connecting white to black neighborhoods, and wealthier to poorer ones. Neighborhood input is the strongest influence here, and not all the towns have had the boldness, the commitment or the political support either to proceed with plans or to be able to assuage people's concerns.

There turned out to be a host of factors that influence greenway planning. Some of these work against equitable distribution, although others, notably a commitment to equity or to connectivity, encourage it.

Convenience is one of the most significant considerations in placing greenways because so often all the developable space was built on before a greenway was ever considered. However the results of this approach, and of a late arrival to the idea of greenways as pedestrian transportation, are exemplified in Greensboro. The city for years built trails as a recreational amenity on the basis of land availability and public ownership of land, largely in one end of town, assuming that people could drive there from other parts of town and only belatedly addressing the possibility that some people who lived at a greater distance might have difficulty getting access to the trails.

Convenience and the influence of developers also are factors in the inequitable distribution of trails in Town F, which has had miles of greenway built but which has relied heavily on developers for construction. One of the results is a lack of good access for the public. A factor that I had anticipated would be conducive to equitable distribution

of trails – the construction of rail-trails - turns out to be less so than I thought, largely because rail-trails are often only fragments of the original rail corridor routes. On the other hand, municipal, and individual advocate, commitment to the connecting role of greenways is expressed both in greenway plans that address connectivity and geographic equity, and on the ground.

Neighborhood objections, especially when a greenway may connect one neighborhood to another that is different demographically, are likely to work against equitable distribution. If there is sufficient commitment – a town that has a serious consensus on building greenways, often backed up, especially in the bigger towns, by a specific greenway plan – greenways are likely to go in. In other towns with a more powerful group of opponents and less committed support to the greenway, there may be less success in connecting neighborhoods, although as people learn about greenways and begin to use them, objections become less common.

The issues in deciding a greenway's route are intertwined. Connectivity, municipal commitment and neighborhood input, for instance, all interact with each other. A town's plan for connectivity, especially if that connectivity will link disparate neighborhoods, is likely to bring public objections. Commitment by the town and/or by greenway advocates becomes even more important in the face of these objections. Greenway advocates see the value of connectivity and have to explain it to the public - and sometimes the town administration. Connectivity promotes equity of access, but there has to be commitment to the concept because the implications of connectivity can be seen at least initially as a threat by a greenway's nearby and adjacent neighbors. Nearly all the successful objections to greenways (i.e. that rerouted them, or, more often,

stopped them from being built) addressed private landowner rights from the perspective of either owner's liability, or perceived loss of land, or crime – essentially, private land that the landowners considered themselves to be losing, and the people to whom they thought they would be losing it.

The results of GIS and the interviews show the inherent tension between town plans that propose greenways – in effect, creating new routes for pedestrians and thus new public spaces – and residents who want the spaces to remain private or even if publicly owned, at least out of bounds to the public. Because the kind of land that is carved out for greenways is often undevelopable and near residences, it may have been perceived by its next-door neighbors as private space, whether accurately or not, and so its conversion to a public greenway is similarly likely to be seen as a loss of private space. Greenways may have multiple purposes, but as pedestrian corridors they are, fundamentally, public space, and wherever they are proposed there are likely to be objections to them on the grounds mentioned above.

Behind nearly all the arguments about where greenways should go – leaving aside the infrastructure constraints that may be the most influential in this regard – is a fundamental conflict between the desire to expand a type of pedestrian infrastructure which is public space, promoted by planners and greenway advocates, and the desire of individuals to conserve private space or what they perceive to be their private space. The often-stated concerns about crime and liability, and probably some of those about private property rights, reflect a concern about the nature of the people who would "intrude" on that space.

*Greenways, streets and the nature of public space*

This study began with an interest in environmental justice, but it also bears on issues around public space. Because greenways are a form of pedestrian infrastructure that have close ties to sidewalks in their role, and because towns sometimes reported conflict and objections to having sidewalks for some of the same reasons that there were objections to greenways, there are also parallels in the nature of both as public space.

Cesnik (2001) quotes two dictionary definition of "street", a first, inclusive one, and a second definition that indicates the priority that automobiles have on modern streets: "'the strip of public thoroughfare reserved for vehicular traffic: <a pedestrian was killed while crossing the ~ >'" (p. 147). Streets have become less and less comfortable or safe places for pedestrians to travel or to meet. This is owing to a series of 20th century policy efforts, including widening streets to allow more automobile traffic, and from post-World War II until relatively recently, frequently failing to include sidewalks, that have focused on the street-as-automobile-transportation function. Such policies have until recently ignored the street-as-social-space function, not to mention the street-as-pedestrian-conduit function. To a considerable degree, greenways are an after-the-fact attempt to recreate a lost space for pedestrians in an environment that has not paid them much attention. Only now are we beginning to develop "complete streets", or streets that are designed for and intended to be used by all users, including pedestrians, cyclists, bus users, and people with disabilities (McCann, 2005).

As public space, greenways also sometimes come under suspicion *because* they constitute a social space or at least have the potential to constitute one. The public street, as Cesnik (2001) notes, has other functions than transportation, and there is a tension

between the street's role as a transportation route for automobiles and its role as a social space. He writes that the street "can be conceived as a place where the individual is not sheltered from strangers, and where the most powerful right in the bundle of property rights – the right to exclude others – does not apply" (p. 148). This is a concept that has centuries of understanding behind it, and the concept has direct parallels to public greenways. Greenways may not be as "social" a space as a street given that there is not much to do on them but look at the scenery and go for a walk – there are no shops, there are no people selling newspapers or handing out flyers, there are usually no advertisements - but because a greenway is public, and because it often extends outside one's immediate neighborhood, there is a good likelihood that one will encounter strangers there. Because a greenway trail is explicitly designed for non-motorized traffic and is often wider than many sidewalks, it has the potential to draw at least as many pedestrians, including strangers, even if they are just passing through – as a nearby street with sidewalks might do.

Moreover, as Forsyth and Southworth (2008) note, walking is socially equitable, so just as with a public street, almost anyone who is in reasonable health can walk on a greenway, regardless of his or her age, race, income or education. Of course, Cesnik notes, the poor have always depended more on public space than the rich, who have more private space at their disposal. Hence improving public space is likely to benefit the poor more than it will benefit the wealthy. Regarding urban greenways, this is despite the fact that their creation has sometimes created tensions between the people for whom the greenways were intended and middle-class greenway advocates, as Salazar (2005) notes on greenways in urban Detroit.

Parallels between greenways and sidewalks emerged in the interviews when a number of planners remarked that they had experienced objections to sidewalks, sometimes with very similar rationales: they would bring crime, no one would use them, people did not want strangers in front of their houses. This in turn invites comparisons with early views about who was an appropriate user of a sidewalk. In Los Angeles in the late 19th and early 20th centuries, pedestrians gradually became the sanctioned user of sidewalks, while street vendors, advertisers, soapbox speechmakers, and so on, who were originally just as common and as accepted, became gradually restricted in their occupation of the same public space (Ehrenfeucht and Loukaitou-Sideris, 2007). A century later there are fewer non-pedestrians on the sidewalks, and many fewer pedestrians, but pedestrians themselves are sometimes suspect while the proper role of a street, as Cesnik remarks, is often seen only as a conduit for vehicular traffic.

Greenways differ from sidewalks in a particular way that adds to the concerns of adjacent landowners because of greenway infrastructure. Usually when towns begin to build greenways, there are already streets and houses in place. The houses face on to streets, while utility corridors and creek buffers are very often adjacent to back yards. Thus greenways in residential areas nearly always run along the back boundaries of property, as Drew et al. (2001) note. Although homeowners generally own land in front of their houses as well as behind, the land behind their houses tends to be considered more private, presumably because it is less visible from the front, which faces the (public) street. This is likely to be true even when the space at the back is actually public - as with a utility corridor or a town-owned riparian buffer - as long as there are no buildings in sight. So to a homeowner whose house backs on to land that becomes a

greenway, it may seem that his/her private space is being intruded upon – whether or not that space actually belongs to the homeowner. In an era in which public space has been increasingly privatized, as mentioned earlier, including corporate plazas, gated communities and shopping malls (Bannerjee, 2001; Kirby, 2008), greenways can create public spaces that are not isolated but that can instead extend into other neighborhoods. The prospect of the greenway drawing strangers – the public - from other neighborhoods often rattles adjacent landowners before a greenway goes in.

*Who's on the greenway*

"Who will be on the greenway" is a significant part of the objections to greenways before they go in. As outlined above, the objections to greenways chiefly turn on the prospect that adjacent landowners will lose their private space rights, real or imagined, and on the people to whom they will lose these rights: the initially unknown users. The prospect of one's property being passed or even trodden on by "those people" – variously interpreted by the interview respondents as African-American, Hispanic and/or low-income, but unvaryingly implying "Not like me", was quite enough for some residents to object to the whole idea of a greenway. This was particularly true with greenways that extended into other neighborhoods.

The fact that these unwelcome strangers were often understood to mean minorities, particularly African-Americans, is consistent with studies on fear of strangers in public space. People are more likely to be feared if they are black or Hispanic than white (Day, 2006, 1999; St. John and Heald-Moore, 1995), and while blacks' fear of other blacks is situation-specific, whites are more fearful of encountering blacks

regardless of the characteristics of the white person, the black person or the circumstances: in other words, with no logical rationale.

Because greenways have the potential to connect different neighborhoods, even if many towns do not yet have much of this sort of network, they are seen as potential conduits for undesirable strangers – often black undesirable strangers. This is despite the fact that greenways are no more likely to be havens for crime than are the surrounding neighborhoods; they are clearly less efficient as conduits for criminal activity than roads, which are rather less likely to experience this particular objection. Moreover, respondents in the interviews repeatedly pointed out that people who object initially almost always change their minds and stop complaining when they discover who is really on the greenway - chiefly people out for some exercise - and what their real intent is: innocent.

*The role of greenways in the context of environmental justice*

Aside from the issue of who is using public space, though, there remains the role of greenways as a public good and why they are there in the first place. The interviews also provided clues as to the value – or lack of value – of greenways to African-Americans. There were essentially two strands on the issue. First, the more popular greenways tended to attract a considerable diversity of users, including Latinos and African-Americans. Greenways such as the Salem Creek trail in Winston-Salem, which traverses several different neighborhoods and connects to several significant school, shopping, recreation and work destinations, cater to an extremely diverse group of users, including many African-Americans, Latinos and whites of various ages. A number of popular trails in other cities, such as the Shelley Lake trail in Raleigh, also see diverse

user groups. Several respondents from a small town with a large African-American presence remarked that the trail drew African-Americans and Hispanic users as well as whites. Additionally, different opinions emerged among the study respondents about whether the perceived lower use of trails by African-Americans was really an income issue rather than an ethnic issue, although this was not the focus of the interview questions.

Second, however, planners and others involved with greenways mentioned that greenways were not as important an issue in African-American neighborhoods as things like adding park programs, lowering crime, fixing up streets, and other more "critical" issues. There are sometimes misconceptions, in minority communities and elsewhere, about whether greenways are there for any other reason than to provide places for the middle class to exercise, although if strategically placed they clearly have the potential to help create a safe pedestrian infrastructure that benefits the whole community: white and black, low- and middle- and upper-income. In a lower-income community it may not even be the paved path itself that is initially what people value most. Notably, the construction of a greenway that received a uniformly enthusiastic response in a lower-income minority (Hispanic) neighborhood, in Winston-Salem, was unambiguously viewed as an improvement to the neighborhood because the site had previously been used for dumping and the greenway's construction meant that the garbage disappeared.

Relevant to this discussion are articles by Jones (1998) and Jones and Carter (1994). They examined research about environmental issues and African-American involvement and concern and concluded that although African-Americans as well as whites had strong "environmental concern", whites were more likely to be involved in

“environmental activism”. However a lack of environmental activism did not mean lack of concern. Jones notes that blacks have a set of concerns that were even more serious, such as issues of crime, health care and substance abuse, and that African-American concerns for the environment have to be viewed in that larger context. He describes the issue of priorities as the “environmental concern gap assumption”, with blacks having a higher priority for social issues than environmental issues because they may simply be more urgent in the black community than they are in a predominantly white neighborhood. This is consistent with several of the remarks made in the interviews. Although the African-American respondents in the interviews were also advocates of greenways and talked about their associated benefits – having safe routes to walk to school, places to get exercise, peaceful green spaces within a city setting - they and the others pointed out that minority neighborhoods often have many more pressing infrastructure and social needs to deal with as well.

Like any other public work project, greenways are a form of community development. In the most practical terms, they can be a significant element of the pedestrian infrastructure. However in lower-income and minority neighborhoods, what greenways offer may be secondary to other needed improvements. This does not mean that there is no value to a greenway in the neighborhood, but it does speak to the need for close attention to the needs of the people in the neighborhood.

Salazar (2005), discussing greenway projects in two Detroit neighborhoods, one mainly Latino and one mainly black, notes that although many of the ideas about greenways promoted by professional greenway planners are good ones, “their predominant interpretation of greenways can often be formulated without a lot of

attention to the issues and needs of city residents." (p. 120). She remarks on the consensus of people involved in the greenway planning, both black and white (including greenway activists as well as residents) that greenways should "contribute to more equitable redevelopment" (p. 125) in the city. True equity, she points out, goes beyond physical access to the greenways, to promoting community development: to the Detroit communities this meant, among other things, improving physical health; improving the quality of the environment; and strengthening the community and its sense of history and culture by linking neighborhoods. She concludes that "effective and participatory greenways" (p. 224) must be rooted in a community redevelopment context – i.e. one meant to develop the community, rather than attract outsiders with a recreational amenity. One of the study respondents with a long history of activism regarding trails and greenways, an African-American, said that his involvement with trails began decades ago when he wrote a letter to City Hall urging that the city build a trail along a sewer easement in his neighborhood because to get to school, the local children had the choice of jumping the creeks on a makeshift trail, or walking the long way round on a busy street without sidewalks. Eventually the city did build a trail, which became part of its (commendably equitably distributed) greenway system and the overall pedestrian infrastructure. For this resident, a trail - later a paved greenway - that connected the community to the school was part of improving his community. Equity for the neighborhood is certainly about more than physical access to greenways, but given that greenways help level the playing field for pedestrians, physical access to greenways and the connectivity to other destinations that they offer are also fundamental features of that equity.

*Where to go from here?*

The writer Jane Jacobs (1961/1993) talked of foot people and car people; we have spent decades accommodating the latter and ignoring the former. The sooner towns recognize the huge potential of better facilities for pedestrian and bicycle transportation, the better. At a societal level we still do not place as much value on non-motorized transportation as would be good for our health and our cities. This is slowly changing but there is a long way to go to make greenways, and other parts of the bicycle / pedestrian infrastructure, easily available to everyone. Some of the things we might focus on are listed below, first in research and then in policy.

*Research:* There are plenty of gaps in our knowledge, just as there are great gaps in the pedestrian / bike infrastructure. A fundamental issue is that we still have very little current data about pedestrians and pedestrian behavior – except, as mentioned earlier, about pedestrians who are involved in pedestrian / vehicle collisions. We know little about who uses greenways and on whether greenway users or their motives are different from those of people who use sidewalks – often a more utilitarian but less winding alternative - in the same neighborhood. More research on why pedestrians and cyclists use greenways and sidewalks, and on what would help planners decide how to accommodate them. We could also use research specifically on rail-trails and their uses and users, especially for rail-trails within cities.

*Policy:* 1) *A greater role for greenways and for bike / pedestrian facilities.* Early in Chapter 6, I noted that the most common response from interview respondents about what would improve access to greenways was better physical access – via more trails and/or more pedestrian infrastructure - so that people would not have to drive to get to a

place where they could bike or walk. Greenways by themselves don't make a pedestrian transportation infrastructure or even the most obvious part of it. Cities are also slowly returning to building and requiring sidewalks. These, and bike lanes, and streets that are designated for bicycles preferentially, among other facilities, all need to be seen as part of a transportation system that includes greenways. Considering all pedestrian facilities part of the transportation system should also contribute to equitable distribution. Improvements to all these facilities will of course require increased funding.

*2) More collaboration.* More collaboration between city transportation planners and parks and recreation staff, including greenway planners, would also help. This needs to start with a recognition that greenways are or can be part of the transportation infrastructure – a recognition that has sometimes been lacking. Some towns such as Charlotte already have close collaboration between transportation departments and greenway planning. Municipalities need this good communication to help ensure that transportation planners do not focus only on the needs of drivers, and that non-motorized transportation does not remain the poor stepchild of the transportation system.

At the same time it is important to solicit input from people in the neighborhoods that will be affected by bike / ped transportation developments. The interview results illustrate how hard and sometimes unrewarding this can be for planners, but it is still necessary to involve people, educate them about what greenways and other pedestrian improvements can offer, and try to make the proposed projects ones that the neighborhood can appreciate.

3) *A focus on connectivity and on equity.* Although this dissertation research did not find inequity overall among the towns, it did find that equitable distribution cannot be

taken for granted. Hence equitable distribution of greenways, as with other pedestrian / bike facilities, should be an explicit goal.

Greenways that are designed to connect destinations across a town are more likely to be equitably distributed. Plans that focus on greenways' role as part of the transportation system, assuming the town is committed to this, are more likely to achieve that aim. This is not to downplay the tremendously valuable role that recreational spaces, including recreational trails, provide, but the linearity of greenways, in combination with an intent to have this transportation route available to many, should make equitable distribution more probable. In addition it is worth noting that even neighborhoods without many "destinations" are still destinations or trip origins for the people who live there, so these neighborhoods also could benefit from being on a greenway route or otherwise easily accessible to and by pedestrians and cyclists.

4) *Rail corridors.* If we really want greenways to be a fundamental part of the transportation infrastructure, and if we intend pedestrian / bicycle transportation itself to be a fundamental part of that infrastructure, we should also examine disused rail corridors and see whether we can make them more available. Rail corridors are among the most direct transportation routes, and disused corridors still have great potential for pedestrian / bicycle use. Making sure that federal railbanking, which permits interim compatible uses such as trails, is put into place whenever a disused rail corridor is abandoned would improve the potential for some extremely functional and still scenic pedestrian / bicycle transportation routes. At the state level, stronger support for preserving and creating rail-trails, including support for railbanking that allows interim compatible use, is needed.

.

## Appendix A: Initial contact letter

Dear _____,

My name is Dilys Bowman and I am a graduate student at UNC-Chapel Hill in the geography department. I am studying greenway access and greenway planning in North Carolina. (Generally speaking, by "greenway" I mean what the NC Department of Transportation calls a "multi-use path", most often (although not always) a paved one, and not simply a separate lane on a roadway.)

As a preliminary part of my research I would like to take a look at municipal greenway plans (or pedestrian/transportation plans that include greenway plans) in towns like _____ that already have a greenway or greenways. I would also like to be able to map current greenway trails. I am hoping that you can help me with this. Hence, I have two requests to make:

1) If you have one, I would very much appreciate it if I could get a copy (mailed or e-mailed) of your current or past municipal greenway **or** pedestrian plan. I am especially interested in plans that preceded the current greenways but also in more recent plans that include greenway trails not yet built. I would like to know what the greenway plan says in its mission or vision statement, and what led to the town's first greenways being built where they were.
2) If you have a GIS (ArcView or ArcMap) shapefile of your current greenway(s) that you could send, or if you could direct me to another department (municipal, county etc.) that could send one to me, I would appreciate that as well.

Please don't hesitate to ask if you would like more information from me. If I should be directing my request to a different department or person I would appreciate if you could forward this e-mail.

Thanks for your help with these requests,

Sincerely,

Dilys Bowman

(address, e-mail)

## Appendix B: Consent form

**University of North Carolina-Chapel Hill**
**Consent to Participate in a Research Study**
**Adult Participants**
**Social Behavioral Form**

---

**IRB Study #___06-0911_____**
**Consent Form Version Date:** 9 November 2006

**Title of Study:** Are greenways for everyone?

**Principal Investigator:** Dilys Bowman
**UNC-Chapel Hill Department:** geography
**UNC-Chapel Hill Phone number:** (see below: study contact phone number)
**Email Address:** dmbowman@email.unc.edu

**Faculty Advisor:** Melinda Meade

**Study Contact telephone number:** _____
**Study Contact email:** dmbowman@email.unc.edu

---

**What are some general things you should know about research studies?**

You are being asked to take part in a research study. To join the study is voluntary.
You may refuse to join, or you may withdraw your consent to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study.
You will be given a copy of this consent form. You should ask the researcher named above any questions you have about this study at any time.

**What is the purpose of this study?**

The purpose of this research study is to learn why greenways within municipalities are sited in equitable or inequitable ways and to what extent different factors in the planning process influence where greenways are placed within a given municipality.

You are being asked to be in the study because you have been involved, either professionally or as a town resident, in the greenway planning process for your municipality.

**How many people will take part in this study?**

If you decide to be in this study, you will be one of approximately 30 people in this research study.

**How long will your part in this study last?**

Your part in the study, if you consent, will include an interview of about an hour's length; no follow-up is anticipated at this time.

**What will happen if you take part in the study?**

If you consent to taking part, you will be interviewed about your experiences with greenway planning. The interview, which will last about an hour, will be held in a place and at a time of your choosing. The interview will include questions about, among other things, development of the greenway master plan (if any), how the plan was created, neighborhood and other interest group involvement, funding, and social, political and environmental considerations in planning local greenways. If you permit, your responses will be tape recorded.

You may refuse to answer any question or questions, and if you do not want to continue the interview you are free to stop it at any time. If you want the tape recorder to be turned off at any time you may tell the researcher to stop recording.

**What are the possible benefits from being in this study?**

Research is designed to benefit society by gaining new knowledge. You may not benefit personally from being in this research study.

**What are the possible risks or discomforts involved from being in this study?**

The risk to you should be minimal. The most likely risk is from loss of confidentiality if sensitive information should be disclosed. The researcher will take every effort to prevent loss of confidentiality (see below).

**How will your privacy be protected?**

Participants will not be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies for purposes such as quality control or safety.

Your name will not be used in any documents transcribed from the interview or in the published research. Names of interviewees will be coded and the key to the code will be held separately by the researcher in a locked cabinet. Only the researcher will have access to the data. In addition, care will be taken to disassociate your identity from that of the municipalities involved in the study. You, and people mentioned by you, will be described in only the most general terms that cannot be used to identify them. In the

completed research, answers to questions will not be grouped in such a way that your identity could be determined from references to your position or your town.

If you are not comfortable having the interview taped, you can ask to have the tape recorder turned off at any time. If you agree to having the interview taped, the tape will be destroyed once it has been transcribed, which will be within a short time after the interview.

**Will you receive anything for being in this study?**

You will not receive anything for taking part in this study.

**Will it cost you anything to be in this study?**

There will be no costs for being in the study.

**What if you have questions about this study?**

You have the right to ask, and to have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researchers listed on the first page of this form.

**What if you have questions about your rights as a research participant?**

All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Participant's Agreement:**

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

(check ONE of the boxes):

☐ I agree to have this interview audio-recorded.

☐ I do not agree to have this interview audio-recorded.

______________________________________ ________________

Signature of Research Participant Date

______________________________________

Printed Name of Research Participant

## Bibliography


Active Living Research (2005). List of grants awarded (2nd round.) (Walkability and physical activity: what is the impact?) Retrieved online September 15, 2005 at http://www.activelivingresearch.org/index.php/Correlates_of_Physical_Activity/246.

Ahern, J. (2004). Greenways in the USA: theory, trends and prospects. *In* Jongman, R., and Pungettie, G. (eds.), *Ecological networks and greenways: concept, design, implementation*. Cambridge, U.K.: Cambridge University Press.

Ahern, J. (2002). *Greenways as strategic landscape planning: theory and application*. Doctoral dissertation, Wageningen University, the Netherlands.

Andrews-Crotwell, L.D. (2000). *The Hillsborough River Greenways Task Force: An ethnographic study of collaboration for the love of a river*. University of South Florida. Retrieved from ProQuest Doctoral Dissertations (AAT 9984557).

Arnold, M.L., and Shinew, K.J. (1998). The role of gender, race, and income on park use constraints. *Journal of Park and Recreation Administration*, 16, 39-56.

Banerjee, T. (2001). The future of public space: beyond invented streets and reinvented places. *Journal of the American Planning Association*, 67(1), 9-24.

Bauer, W.S. (1980). *A case analysis of Oregon's Willamette River Greenway program*. Oregon State University. Retrieved from ProQuest Doctoral Dissertations (AAT 8021932).

Beauregard, R.A.(1989). Between modernity and postmodernity: The ambiguous position of U.S. planning. *Environment and Planning D (Society and Space)*, 7, 381-295.

Berke, P.R., and Conroy, M.M. (2000). Are we planning for sustainable development? An evaluation of 30 comprehensive plans. *Journal of the American Planning Association*, 66(1), 21-33.

Biesecker, M. (2006, September 6). Durham bridge will be removed. *Raleigh News & Observer*, p. A1.

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

Brownson, R.C., Housemann, R.A., Brown, D.R., Jackson-Thompson, J., King, A.C., Malone, B.R., and Sallis, J.F. (2000). Promoting physical activity in rural communities: walking trail access, use, and effects. *American Journal of Preventive Medicine*,18(3), 235-241.

Brunnemer, Nancy (1988). Building public support for Mecklenburg County's greenway system. Unpublished master's thesis, University of North Carolina at Charlotte.

Bullard, R.D. (1994). Overcoming racism in environmental decisionmaking. *Environment,* 36, 10-44.

Cedar Grove Institute for Sustainable Communities (October 28, 2004). *Incorporation, annexation and extra-territorial jurisdiction: a double standard? Predominantly-minority towns struggle*. Retrieved online June 25, 2006, from http://www.mcmoss.org/CedarGrove/Docs/anns_10_24.pdf

Cesnik, E.A. (2001). The American street. *Urban Lawyer,* 33(1), 147-187.

Chad, K.E., Reeder, B.A., Harrison, E.L., Ashworth, N.L., Sheppard, S.M., Schultz, S.L., Bruner, B.G., Fisher, K.L., and Lawson, J.A. (2005). Profile of physical activity levels in community-dwelling older adults. *Medicine and Science in Sports and Exercise,* 37(10), 1774-1784.

Chon, J.H. (2004). *Aesthetic responses to urban greenway trail corridors: Implications for sustainable development in tourism and recreation settings*. Texas A&M University. Retrieved from ProQuest Doctoral Dissertations (AAT 3172129).

City of Durham (2006). Durhamwalks Pedestrian Plan (section 4). Retrieved online October 15, 2008, at http://www.durhamnc.gov/durhamwalks/pdf.

City of Durham (1988). Durham urban trails and greenways masterplan. Durham, NC: Durham City-County Planning Department.

City of Raleigh (2004). Parks, Recreation and Greenways Plan. *In* Raleigh Comprehensive Plan. Retrieved online December 4, 2008, from http://www.raleighnc.gov/portal/server.pt/gateway/PTARGS_0_2_108391_0_0_18/CP-Parks_Recreation_and_Greenways-Text.pdf

Conine, A., Xiang, W-N., Young, J., and Whitley, D. (2004). Planning for multi-purpose greenways in Concord, North Carolina. *Landscape and Urban Planning,* 68(2-3), 271-287.

Cottrill, C.D., and Thakuriah, P. (2008). Evaluating pedestrian risk in environmental justice areas. Paper presented at the Transportation Research Board's 87th annual meeting (report #08-2698).

Coutts, C.J. (2006). *Greenway accessibility and physical activity behavior in two Michigan cities*. University of Michigan. Retrieved from ProQuest Doctoral Dissertations (AAT 3237936).

Crespo, C.J., Smit, E., Andersen, R.E., Carter-Pokras, O., and Ainsworkth, B.E. (2000). Race/ethnicity, social class and their relation to physical inactivity during leisure time: results from the third National Health and Nutrition Examination Survey, 1988-1994. *American Journal of Preventive Medicine,* 18(1), 46-53.

Day, K. (2006). Being feared: Masculinity and race in public space. *Environment and Planning A,* 38, 569-586.

Day, K. (1999). Embassies and sanctuaries: Women's experiences of race and fear in public space. *Environment and Planning D: Society and Space,* 17(3), 307-328.

Denton, G.F., Berrigan, D., Ballard-Barbash, R., Graubard, B.L., and Atienza, A.A. (2008). Social and physical environments of sports and exercise reported among adults in the American Time Use Survey. *Preventive Medicine*, 47(5), 519-524.

Douma, F., and Cleveland, F. (2008). The impact of bicycling facilities on commute mode share: final report. Minnesota Department of Transportation report #MN/RC 2008-33. Retrieved from the Web on 6th November, 2008, at http://www.lrrb.org/PDF/200833.pdf

Drew, J., Hurst, S., and Galloway, S. (2001). Summary Report: Indiana Trails Study – A study of trails in 6 Indiana cities. Bloomington, Indiana: Eppley Institute for Parks & Public Lands, Indiana University.

Dwyer, J.F. (1994). *Customer diversity and the future demand for outdoor recreation*. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. General Technical Report RM-252. Retrieved online December 13, 2005, at http://ncrs.fs.fed.us/pubs/gtr/gtr_rm252.pdf

Elliott, M.R., Wang, Y., Lowe, R.A., and Kleindorfer, P.R. (2004). Environmental justice: frequency and severity of U.S. chemical industry accidents and the socioeconomic status of surrounding communities. *Journal of Epidemiology and Community Health*, 58(1), 24-30.

Elmendorf, W.F., Willits, F.K., and Sasidharan, V. (2005). Urban park and forest participation and landscape preference: A review of the relevant literature. *Journal of Arboriculture*, 31(6), 311-317.

Erbil, A. (2005). *An inquiry of adaptation of greenway planning strategy to the Istanbul metropolitan area, Turkey: Towards an understanding of differences in environmental discourses in industrialized and developing countries.* University of Massachusetts – Amherst. ProQuest Doctoral Dissertations (AAT 3193898).

Erickson, D.L. (2004). Connecting corridors: implementing metropolitan greenway networks in North America. *In* Jongman , R., and Pungetti, G., eds., *Ecological networks and greenways: concept, design, implementation*. Cambridge, UK: Cambridge University Press.

Estabrooks, P.A., Lee, R.E., and Gyurcsik, N.C. (2003). Resources for physical activity participation: does availability and accessibility differ by neighborhood socioeconomic status? *Annals of Behavioral Medicine*, 25(2), 100-104.

Evenson, K.R., Herring, A.H., and Huston, S.L. (2005). Evaluating change in physical activity with the building of a multi-use trail. *American Journal of Preventive Medicine*, 28(2S2), 177-185.

Ewing, B. (2008). Price School's fate remains uncertain. *Greensboro News & Record* September 3, 2008. Retrieved November 6, 2008, at http://www.news-record.com/content/2008/09/02/article/price_school_s_fate_remains_uncertain.

Eyler, A.A., Brownson, R.C., Bacak, S.J., and Housemann, R.A. (2003). The epidemiology of walking for physical activity in the United States. *Medicine and Science in Sports and Exercise*, 35(9), 1529-1536.

Fábos, J.G., (2004). Greenway planning in the United States: its origins and recent case studies. *Landscape and Urban Planning*, 68(2-3), 321-342.

Fabos, J.G., and Ryan, R.L. (2004). Editorial. *Landscape and Urban Planning*, 68(2-3), 143-146.

Fainstein,S.S., and Fainstein, N. (1996). City planning and political values: an updated view. In Campbell, S., and Fainstein, S.S. (Eds.), *Readings in planning theory*. Cambridge, MA: Blackwell.

Flink, C.A., and Searns, R.M. (1993). *Greenways: a guide to planning, design, and development.* Washington, D.C.: the Conservation Fund.

Floyd, M.F. (2001). Managing national parks in a multicultural society: searching for common ground. *George Wright Forum*, 18(3), 41-51.

Floyd, M.F., Bocarro, J.N., and Thompson, T.D. (2008). Research on race and ethnicity in leisure studies: A review of five major journals. *Journal of Leisure Research*,40(1), 1-22.

Floyd, M.F., and Johnson, C.Y. (2002). Coming to terms with environmental justice in outdoor recreation: a conceptual discussion with research implications. *Leisure Sciences*, 24, 59-77.

Folz, D.H., and French, P.E. (2005). *Managing America's small communities: people, politics, and performance*. Lanham, MD: Rowman & Littlefield.

Forsyth, A., and Southworth, M. (2008). Cities afoot – pedestrians, walkability and urban design. *Journal of Urban Design,* 13(1), 1-3.

Frank, L.D., Andresen, M.A., and Schmid, T.L. (2004). Obesity relationships with community design, physical activity, and time spent in cars. *American Journal of Preventive Medicine,* 27(2), 87-96.

Frank, L.D., Schmid, T.L., Sallis, J.F., Chapman, J., and Saelens, B.E. (2005). Linking objectively measured physical activity with objectively measured urban form: findings from SMARTRAQ. *American Journal of Preventive Medicine,* 28(2S2), 117-125.

Furuseth, O.J., and Altman, R. E. (1991). Who's on the greenway: socioeconomic, demographic, and locational characteristics of greenway users. *Environmental Management,* 15(3), 329-336.

Garcia, R., Flores, E.S., and Chang, S.M. (2004) Healthy children, healthy communities: schools, parks, recreation, and sustainable regional planning. *Fordham Urban Law Journal,* 31(5), 1267-1291.

Giles-Corti, B., Broomhall, M.H., Knuiman, M., Collins, C., Douglas, K., Ng, K., Lange, A., and Donovan, R.J. (2005). Increasing walking: how important is distance to, attractiveness, and size of public open space? *American Journal of Preventive Medicine,* 28(2S2), 169-176.

Giles-Corti, B., and Donovan, R.J. (2002). Socioeconomic status differences in recreational activity levels and real and perceived access to a supportive physical environment. *Preventive Medicine,* 35(6), 601-611.

Gobster, P.H. (2005). Recreation and leisure research from an active living perspective: taking a second look at urban trail use data. *Leisure Sciences,* 27(5), 367-383.

Gobster, P. H. (1995). Perception and use of a metropolitan greenway system for recreation. *Landscape and Urban Planning,* 33, 401-413.

Godbey, G., and Blazey, M. (1983). Old[er] people in urban parks: an exploratory investigation. *Journal of Leisure Research,* 15(3), 229-245.

Gordon, P.M., Zizzi, S.J., and Pauline, J. (2004). Use of a community trail among new and habitual exercisers: a preliminary assessment. *Preventing Chronic Disease,* 1(4), 1-8.

Gordon-Larsen, P., Nelson, M.C., Page, P., and Popkin, B.M. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. Pediatrics, 117(2), 417-424.

Greenways Incorporated and the Toole Design Group (2006). Chapter 3: Needs assessment. *Greensboro urban area bicycle, pedestrian and greenway master plan.* Retrieved online November 1, 2008, at http://www.greensboro-nc.gov/departments/GDOT/divisions/planning/bicycleandpedestrian/bipedplan/

Haden/Stanziale and Greenways Incorporated (1999). *Mecklenburg County greenway master plan, 1999-2009.* Prepared for Mecklenburg County's Park and Recreation Department, Park and Recreation Commission, Greenway and Trails Advisory Council, Greenway Steering Committee, and the Board of County Commissioners.

Handy, S.L., Boarnet, M.G., Ewing, R., and Killingsworth, R.E. (2002). How the built environment affects physical activity: views from urban planning. *American Journal of Preventive Medicine,* 23(2S), 64-73.

Harnik, P. (2003). *The excellent city park system*. San Francisco, CA: The Trust for Public Land. Retrieved online December 15, 2005, at http://www.tpl.org/content_documents/excellent_city_parks.pdf

Harris, E.L. (1997). Solo faces. *Outside*. December.

Harvey, D. (1996). *Justice, nature and the geography of difference*. Cambridge, MA.: Blackwell Publishers.

Hellmund, P.C., and Smith, D. (2006). *Designing greenways: sustainable landscapes for nature and people*. Washington, D.C.: Island Press.

Howard, D.R., and Crompton, J.L. (1984). Who are the consumers of public park and recreation services? An analysis of the users and nonusers of three municipal leisure service organizations. *Journal of Park and Recreation Administration,* 2(3), 33-48.

Huston, S.L., Evenson, K.R., Bors, P., and Gizlice, Z. (2003). Neighborhood environment, access to places for activity, and leisure-time physical activity in a diverse North Carolina population. *American Journal of Health Promotion,* 18(1), 58-69.

Ivy, M.I. (2001). *Predicting attitudes towards a proposed greenway trail: The role of past experience.* North Carolina State University. ProQuest Doctoral Dissertations (AAT 3005372).

Jacobs, Jane (1993). *The death and life of great American cities*. New York: Modern Library. (Original work published in 1961.)

Johnson, C.Y., Bowker, J.M., Bergstrom, J.C., and Cordell, H.K. (2004). Wilderness values in America: does immigrant status or ethnicity matter? *Society and Natural Resources*, 17, 611-628.

Johnson, C.Y., Bowker, J.M., and Cordell, H.K. (2001). Outdoor recreation constraints: an examination of race, gender, and rural dwelling. *Southern Rural Sociology*, 17, 111-133.

Johnson, J.H., Parnell, A., Joyner, A.M., Christman, C.J., and Marsh, B. (2004). Racial apartheid in a small North Carolina town. *Review of Black Political Economy*, 31(4), 89-108.

Jones, R.E. (1998). Black concern for the environment: Myth versus reality. *Society and Natural Resources*, 11(3), 209-228.

Jones, R.E., and Carter, L.F. (1994). Concern for the environment among black Americans: An assessment of common assumptions. *Social Science Quarterly*, 75, 560-579.

Kaczynski, A.T., Potwarka, L.R., and Saelens, B.E. (2008). Association of park size, distance, and features with physical activity in neighborhood parks. *American Journal of Public Health*, 98(8), 1451-1456.

Kaplan, S. (1995).The restorative benefits of nature: toward an integrative framework. *Journal of Environmental Psychology*, 15, 169-182.

Kaplan, R., and Talbot, J.F. (1988). Ethnicity and preferences for natural settings: a review and recent findings. *Landscape and Urban Planning*, 15, 197-117.

Kelly, C.M., Schootman, M., Baker, E.A., Barnidge, E.K., and Lemes, A. (2007) The association of sidewalk walkability and physical disorder with area-level race and poverty. *Journal of Epidemiology and Community Health*, 61, 978-983.

King, W.C., Brach, J.S., Belle, S., Killingsworth, R., Fenton, M. and Kriska, A.M. (2003). The relationship between convenience of destinations and walking levels in older women. *American Journal of Health Promotion*, 18(1), 74-82.

Krumholz, N. (1982). A retrospective view of equity planning: Cleveland 1969-1979. *Journal of the American Planning Association*, 48(2), 163-173.

Laurian, L. (2008). Designing greenways: sustainable landscapes for nature and people (book review). *Journal of the American Planning Association*, 74(1),145.

Lee, R.E., Booth, K.M., Reese-Smith, J.Y., Regan, G., and Howard, H.H. (2005). The Physical Activity Resource Assessment (PARA) instrument: Evaluating features, amenities and incivilities of physical activity resources in urban neighborhoods. *International Journal of Behavioral Nutrition and Physical Activity*, 2(1), 13.

Lewis, P.H. (1966). *Tomorrow by design: a regional design process for sustainability*. New York: Wiley.

Lindsey, G. (1999). Use of urban greenways: insights from Indianapolis. *Landscape and Urban Planning*, 45, 145-157.

Lindsey, G., Maraj, M., and Kuan, S. (2001). Access, equity, and urban greenways: an exploratory investigation. *Professional Geographer*, 53(3), 332-346.

Lindsey, G., Yang, J.A., Wilson, J., and Alexa, C. (2008). Urban greenways, trail characteristics and trail use: Implications for design. *Journal of Urban Design*, 13(1), 53-79.

Little, C.E. (1990). *Greenways for America*. Baltimore: Johns Hopkins University Press.

Loewen, J.W. (2005). *Sundown towns: a hidden dimension of American racism*. New York: New Press.

Lucas, J.W., Schiller, J.S., and Benson, V. (2004). Summary health statistics for U.S. adults: National Health Interview Survey, 2001. National Center for Health Statistics. *Vital Health Statistics*, 10(218), 1-143.

Lusk, A.C. (2002). *Guidelines for greenways: determining the distance to, features of, and human needs met by destinations on multi-use corridors*. University of Michigan. ProQuest Doctoral Dissertations (AAT 3042121).

Martin, W., Ludden, T., Furuseth, O., and Nixon, S. (2004). Preliminary assessment of crime risk along greenways in Charlotte, North Carolina, 1994-2004. Unpublished UNC-Charlotte study.

McCann, B. (2005). Complete the streets! *Planning*, 71(5),18-23.

McHarg, I.L. (1969). *Design with nature*. New York: Natural History Press.

Meade, M.S., and Earickson, R.J. (2000) *Medical geography*. New York: The Guildford Press.

Melekian, B. (September 7, 2006). Physical culture: From kitchen to the wild in 30 seconds. *New York Times*, p.G1.

Merom, D., Bauman, A., Vita, P., and Close, G. (2003). An environmental intervention to promote walking and cycling - the impact of a newly constructed Rail Trail in western Sydney. *Preventive Medicine,* 36, 235-242.

Miles, M.S., and Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebo*ok (2nd ed.) Thousand Oaks, CA: Sage Publications.

National Association of Homebuilders and National Association of Realtors (2002). Study on "The Importance of Community Amenities" cited by National Rails-to-Trails Conservancy at *http://www.americantrails.org/resources/benefits/homebuyers02.html* (unavailable on National Association of Homebuilders website).

Nicholls, S. (2003). Measures of success: measuring park accessibility using GIS. *Parks and Recreation,* August, 53-55.

Nicholls, S., and Crompton, J. (2005). The impact of greenways on property values: Evidence from Austin, Texas. *Journal of Leisure Research,* 37(3), 321-341.

Nilon, C., and Huckstep, S. (1998). Analysis of Chicago River recreation habitats. *In* Gobster, P.H., Westphal, L.M., (eds.), *People and the river: perception and use of Chicago waterways for recreation*. USDI National Park Service Rivers, Trails, and Conservation Assistance Program, Milwaukee, WI, pp. 161-172.

Noonan, D.S. (2005). Neighbours, barriers and urban environments: Are things 'Different on the other side of the tracks'? *Urban Studies*, 42(10), 1817-1835.

North Carolina Department of Transportation (NCDOT) (2007). Bicycle facilities guide: Types of bicycle accommodations. Multi-use pathways definition. Retrieved online December 30, 2008, at http://www.ncdot.org/transit/bicycle/projects/project_types/Multi_Use_Pathways2.pdf

North Carolina Department of Transportation (NCDOT) (n.d.). *Corridor preservation.* Retrieved online February 5, 2009, at http://www.bytrain.org/corridor/.

North Carolina Greenways advisory panel (1994). Report to the governor. NC Department of Environment, Health, and Natural Resources.

North Carolina Rail-Trails (2001): estimate of mileage of NC rail corridors.

Omi, M., and Winant, H. (1994) *Racial formation in the United States: from the 1960s to the 1990s.* New York: Routledge.

Parks, S.E., Housemann, R.A., and Brownson, R.C. (2003). Differential correlates of physical activity in urban and rural adults of various socioeconomic backgrounds in the United States. *Journal of Epidemiology and Community Health*, 57, 29-35.

Payne, L.L., Mowen, A.J., and Orsega-Smith, E. (2002). An examination of park preferences and behaviors among urban residents: the role of residential location, race, and age. *Leisure Sciences*, 24, 181-198.

Payne, L., Orsega-Smith, B., Godbey, G., and Roy, M. (1998). Local parks and the health of older adults. *Parks and Recreation*, 33(10), 64-70.

Powell, K.E., Martin, L.M., and Chowdhury, P.P. (2003). Places to walk: convenience and regular physical activity. *American Journal of Public Health*, 93(9), 1519-1521.

President's Commission on Americans Outdoors Report (1987). Report and recommendation. Reprinted as: *Americans Outdoors: the Legacy, the Challenge*. Washington, D.C.: U.S. Government Printing Office.

Pulido, L., Sidawi, S., and Vos, R.O. (1996). An archaeology of environmental racism in Los Angeles. *Urban Geography*, 17(5), 419-439.

Puncochar, B., and Lagerwey, P. (1987). Evaluation of the Burke-Gilman Trail's effect on property values and crime. Seattle, WA: City of Seattle Engineering Department.

Raphael, S., and Stoll, M.A. (2001). Can boosting minority car-ownership rates narrow inter-racial employment gaps? *Brookings-Wharton Papers on Urban Affairs*, 2001, 99-145.

Reed, J.A., Arant, C.A., Wells, P., Stevens, K., Hagen, S., and Harring, H. (2008). A descriptive examination of the most frequently used activity settings in 25 community parks using direct ovservation. *Journal of Physical Activity and Health*, 5(Suppl. 1), S183-195.

Rubin, H.J., and Rubin, I.S. (1995). *Qualitative interviewing: The art of hearing data*. London: Thousand Oaks.

Saelens, B.E., Sallis, J.F., and Frank, L.D. (2003a). Environmental correlates of walking and cycling: findings from the transportation, urban design, and planning literatures. *Annals of Behavioral Medicine*, 25(2), 80-91.

Saelens, B.E., Sallis, J.F., Black, J.B., and Chen, D. (2003b). Neighborhood-based differences in physical activity: an environment scale evaluation. *American Journal of Public Health*, 93(9), 1552-1558.

St. John, C., and Heald-Moore, T. (1995). Fear of black strangers. *Social Science Research,* 24(3), 262-280.

Salazar, M.P. (2005). *Promises and challenges of urban community-oriented conservation: The case of greenways in Detroit.* Michigan State University. Retrieved from ProQuest Digital Dissertations (AAT 3204791).

Scott, D., and Munson, W. (1994). Perceived constraints to park usage among individuals with low incomes. *Journal of Park and Recreation Administration,* 12(4), 79-96.

Scott, R.V. (1979). Land use and American railroads in the twentieth century. *Agricultural History,* 53(4), 683-703.

Seals, R. (2008). College will save J.C. Price School Greensboro News & Record October 22, 2008. Retrieved November 6, 2008, at http://www.news-record.com/content/2008/10/22/article/college_will_save_j_c_price_school

Shinew, K.J., Floyd, M.F., and Parry, D. (2004). Understanding the relationship between race and leisure activities and constraints: Exploring an alternative framework. Leisure Sciences, 26(2), 181-199.

Shipp, S.C. (1997). Winning some battles but losing the war? Blacks and urban renewal in Grenesboro, NC, 1953-1965. In Thomas, J.M., and Ridzdorf, M., eds., *Urban planning and the African American community.* Thousand Oaks, CA: Sage Publications.

Sigmon, J. (1980). Final report of the greenway site selection committee. Mecklenburg County Parks and Recreation Commission.

Sonoma County Regional Parks Department, California (2003). The value of recreation to Sonoma County. *Outdoor Recreation Plan – Volume I.* Retrieved November 1, 2008 at http://www.sonoma-county.org/parks/outdrpln.htm

Stutts, J.C., and Hunter, W.W. (2002). Bicycling and walking in North Carolina: results of a year 2000 survey. Produced for the North Carolina Department of Transportation. Retrieved online October 24, 2005, at http://www.ncdot.org/transit/bicycle/safety/bikeandwalk_2000.pdf

Takano, T., Nakamura, K., and Watanabe, M. (2002). Urban residential environments and senior citizens' longevity in megacity areas: the importance of walkable green spaces. *Journal of Epidemiology and Community Health,* 56, 913-918.

Talen, E. (2002). Pedestrian access as a measure of urban quality. *Planning Practice and Research,* 17(3), 257-278.

Talen, E.(1998). Visualizing fairness: equity maps for planners. *Journal of the American Planning Association*, 64(1), 22-38.

Talen, E., and Anselin, L. (1998). Assessing spatial equity: an evaluation of measures of accessibility to public playgrounds. *Environment and Planning A*, 30, 595-613.

Tarrant, M.A., and Cordell, H.K. (1999). Environmental justice and the spatial distribution of outdoor recreation sites: an application of geographic information systems. *Journal of Leisure Research*, 31(1), 18-34.

Thomas, J.M. (2008). The minority-race planner in the quest for a just city. *Planning Theory*, 7(3), 227-247.

Tinsley, H.E.A., Tinsley, D.J., and Croskeys, C.E. (2002). Park usage, social milieu, and psychosocial benefits of park use reported by older urban park users from four ethnic groups. *Leisure Sciences*, 24(2), 199-218.

Tracy, T., and Morris, H. (1998). Rail-trails and safe communities: The experience on 372 trails. National Rails-to-Trails Conservancy. Retrieved November 3, 2008, at http://www.railstotrails.org/resources/documents/resource_docs/Safe%20Communities_F_lr.pdf.

Troped, P.J., and Cromley, E. (2004). Developing and evaluating objective measures of outdoor walking facilities: project overview and update. Presentation at Active Living annual conference, January 30-31, 2004. Retrieved online September 15, 2005, at http://www.activelivingresearch.org/downloads/troped_presentation.pdf

Troped, P.J., Saunders, R.P., Pate, R.R., Reininger, B., Ureda, J.R., and Thompson, S.J. (2001). Associations between self-reported and objective physical environmental factors and use of a community rail-trail. *Preventive Medicine*, 32, 191-200.

Troutman, P. (2004). *San Diego growth wars: a critique of public participation in California land use politics*. University of California at San Diego. Retrieved from ProQuest Doctoral s (AAT 3142450).

Tucker, D. (1993). *Contingent valuation and greenways: Rationalizing the local decision-making process.* North Carolina State University. Retrieved from ProQuest Doctoral Dissertations (AAT 9407187).

Turner, R.S. (2002). The politics of design and development in the postmodern downtown. *Journal of Urban Affairs*, 24(5), 533-548.

Ulrich, R.S., and Addoms, D.L. (1981). Psychological and recreational benefits of a residential park. *Journal of Leisure Research*, 13(1), 43-65.

United Church of Christ, Commission on Racial Justice (1987). *Toxic waste and race in the United States: a national report on the racial and socioeconomic characteristics of communities sourrounding hazardous waste sites*. New York: United Church of Christ.

U.S. Census Bureau (2000). Population data from the decennial census. Retrieved online 2006-2008 from http://factfinder.census.gov/home/saff/main.html?_lang=en.

U.S. General Accounting Office (GAO) (2000). Community development; local growth issues – federal opportunities and challenges. Report to Congressional requesters. GAO/RCED-00-178. Retrieved online May 20, 2006, at http://www.gao.gov/archive/2000/rc00178.pdf.

UNC Highway Safety Research Center (2006). Statewide North Carolina bicycle crash data. Data retrieved using the Pedestrian and Bicycle Crash Analysis Tool (PBCAT) on November 1, 2008, at http://www.pedbikeinfo.org/pbcat/bike_main.htm

Walmsley, A. (2006). Greenways: multiplying and diversifying in the 21st century. *Landscape and Urban Planning*, 76(1-4), 252-290.

Walmsley, A. (1995). Greenways and the making of urban form. *Landscape and Urban Planning*, 33, 81-127.

West, P. (1989). Urban region parks and black minorities: subculture, marginality, and interracial relations in park us in the Detroit metropolitan area. *Leisure Sciences*, 11, 11-28.

Wilson, D.K., Kirtland, K.A., Ainsworth, B.E., and Addy, C.L. (2004). Socioeconomic status and perceptions of access and safety for physical activity. *Annals of Behavioral Medicine*, 28(1), 20-28.

Wing, S., Cole, D., and Grant, G. (2000). Environmental injustice in North Carolina's hog industry. *Environmental Health Perspectives*, 108, 225-231.

Wolch, J., Wilson, J.P., and Fehrenbach, J. (2005). Parks and park funding in Los Angeles: an equity-mapping analysis. *Urban Geography*, 26(1), 4-35.

World Commission on Environment and Development [WCED] (1987). *Our common future*. London & New York: Oxford University Press.