PERCEPTIONS OF SAFETY ON THE NORTH OCONEE RIVER GREENWAY

by

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(Under the Direction of David Spooner)

ABSTRACT

This thesis examines whether negative perceptions of safety are affecting use of the North Oconee River Greenway (NORG). Previous research shows that negative perceptions of safety are obstacles to use for public outdoor spaces in both urban and natural settings. A review of relevant literature and theory indicates that perceptions of safety, fear of crime, and crime itself, can be influenced by physical site design. A survey questionnaire focused on trail use and perceptions of the NORG was distributed to people in Athens-Clarke County; survey results were analyzed, examined through the lens of relevant theories and previous research, and are discussed as to what they mean for the NORG. The survey results show that negative perceptions of safety on the NORG exist and may affect people's use and frequency of use of it. This thesis also shows how these perceptions can be ameliorated to an extent through environmental design measures.

INDEX WORDS: Landscape architecture, Greenways, Perception of safety, Safety, Fear, Crime, Defensible space theory, Crime Prevention Through Environmental Design, Survey, Questionnaire, North Oconee River Greenway, Athens, Georgia

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B.S., Virginia Polytechnic Institute and State University, 2006

A Thesis Submitted to the Graduate Faculty of The University of Georgia

in Partial Fulfillment of the Requirements for the Degree

MASTER OF LANDSCAPE ARCHITECTURE

ATHENS, GEORGIA

2011

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August 2011

DEDICATION

For my grandparents, Duke and Nancy Reed and Bessie Feagan, who always gave me encouragement and provided my life with joy. They will be forever greatly missed, but happily remembered.

ACKNOWLEDGEMENTS

Many people contributed to this thesis and helped me along the way, and therefore many heartfelt thanks go out to:

... my advisor, David Spooner, for guiding me through the thesis process and sticking with me as I found my way.

... my reading committee, for taking an interest in this research and taking time out of their busy lives to offer their thoughts and opinions for this thesis.

... the anonymous survey participants who so graciously took their time to thoughtfully respond to my questionnaire – this thesis is much more meaningful because of all of you.

... my friends and classmates, for their support and mutual understanding when no one else could, and for all the fun times we shared.

... my best friend for loving me and supporting me in any way he could during these last three years.

... my family for their constant love and for supporting me in everything I choose to do in life. Special thanks to my father, for helping me survive the toughest moments of graduate school, and to my mother and stepfather, for their caring and practical advice along the way.

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CHAPTER ONE: NATURE, SAFETY, & GREENWAYS

Society today is becoming more and more removed from nature as available land for development is decreasing and the need and desire for urbanization is increasing. The positive environmental, economic, and social goals of sustainability, which are now incorporated in business plans and mission statements of companies, large and small, across the world and in the strategic plans of federal and many state and local governments in this country, also encourage 'smarter', and oftentimes denser, urbanization. Focusing new development on already built areas can also mean that land left undeveloped may be preserved or conserved for limited use by people today as well as for future generations. There are many societal, economic, and certain environmental benefits to urbanization and 'smart' growth of cities, but an important disadvantage of urbanization is a disconnect between humans and nature. While it took thousands of years for humans to evolve in and adapt to natural environments, only a few, recent, generations of humans have inhabited urban places (Gullone, 2000; Maller, Townsend, Pryor, Brown, & St Leger, 2006). Exponential advancements in technology over the past two hundred years have facilitated this habitation and made it agreeable for many people. However, those technological advancements have also enabled humans "to plough and pave the most unlikely landscapes" (Gullone, 2000, p. 294), often leaving nature out of the urban built environments in which the majority of people live today – or at least making nature less accessible to urban dwellers.

GREENWAYS: NATURAL POTENTIAL

Fortunately, as part of an evolving world-wide greenway movement beginning about twenty years ago, greenway efforts have become a priority for planning departments of city, county, state, and federal governments (Fabos, 1995). Urban greenways allow for the conservation and preservation of open green space, the provision of accessible nature for city dwellers, increased opportunities for physical activity and outdoor recreation, and so much more.

Described later in further detail, greenways are generally defined as "linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland a railroad right-of-way converted to recreational use [or "rail-trail"], a canal, a scenic road, or other route" (Little, 1990). Greenways and urban trail systems, endeavors appropriately in the purview of landscape architecture and belonging to both natural and built environments, are a promising partial solution to these current issues. Especially in more urban contexts, greenways can fulfill not only the need for humans to have a connection with nature, but also the need for additional and accessible opportunities for physical activity. Directly relating the potential for greenways in urban contexts in his contribution to the 1995 greenway-dedicated issue of *Landscape and Urban Planning*, Robert Searns writes:

> More than just parks or amenities, greenways represent an adaptation—a response to the physical and psychological pressures of urbanization. They help mitigate the loss of 'natural space' owing to development and provide a counter-balance to an expanding human dominated landscape. Greenways, especially the newest generation of greenways, also offer an important way to preserve history and educate the public about nature and foster a broad-based sense of stewardship for the land. (pp. 65-66)

In addition to these important opportunities for individuals, greenways provide many benefits—based on environmental, economic, and social values—to the communities through which they run.

Because of their recognized value to individuals and communities, researchers from diverse disciplines have begun trying to identify what elements and features may affect the use of greenways. While studies have shown that multiple factors have been related to use, this thesis focuses on issues of safety – primarily personal safety – and perceived safety, using the North Oconee River Greenway (NORG) in Athens, Georgia as the subject greenway of the research in this thesis. The NORG is not a dangerous place frequented by criminals, in fact, according to the Athens-Clarke County Police Department, there have been very few incidents of crime along the Greenway since its opening in 2003 (David Griffith, personal communication, March 3, 2011). However, it appears that the NORG is not being used to its full potential. According to Melinda Cochran, Greenways and Riverside Parks Facility Supervisor, the NORG is used relatively often, but Cochran is continuously trying to educate people about the NORG and increase its use by organizing and implementing fun and educational events and programs on the greenway (personal communication, January 14, 2011). Cochran and colleague Mike Wharton, Leisure Services Division Administrator – Operations, agree that the lack of perceived safety is a significant inhibitor to greenway use for the residents of Athens (personal communication, January 14, 2011). Cochran and Wharton also believe that in the past there have been instances in which "persons of authority" in Athens (such as a police officer and an employee of the Athens Welcome Center) reinforced a negative perception of safety on the NORG by informing inquiring residents and visitors that the greenway is not safe (personal communication, January 14, 2011). Safety is also a frequent and common concern of attendees in community meetings for the future extensions of the NORG. Specific safety concerns in these meetings most often involve the belief that the NORG will bring potential criminals into the backyards and homes of trail-adjacent properties (Cochran & Wharton, personal communication, January 14, 2011). A general negative perception of the NORG, in

respect to safety, also seems to be spread by word of mouth in Athens, by family, friends, and co-workers; while this is difficult to prove, in the results from the survey conducted for this thesis, 25% of survey participants reported that they think the NORG is not safe because they have been told so by family members or friends.

Issues of perceived and actual safety are of interest to greenway advocates, planners, and managers in other parts of the country as well. In a 2007 Health Impact Assessment (Heller & Bhatia) of the East Bay Greenway in San Francisco, safety concerns—actual and perceived safety—were found to be the most important barrier to use of the greenway. In a report substantiating the potentials—economic, recreational, and environmental—of a greenway along Allen Creek in Ann Arbor, Michigan, the Allen Creek Greenway Task Force (ACGTF) opens their section on safety by writing, "In the public space of urban parks and greenways, personal security, both actual and perceived, is critical to users" (2007, p. 19). The authors claim that, based on their review of the literature, increased use of a public space often increases a perception of safety in that place, and they finalize these thoughts by stressing that "the perception of risk must be avoided, since a perceived lack of safety results in decreased use, which in turn can lead to actual risk" (ACGTF, 2007, p. 19). A third example involves a study focused on physical activity and levels of use of two new rail-trails in the more rural town of Morgantown, West Virginia. Looking at trail use by new and habitual exercisers, safety was a concern of both exerciser types, but was of higher concern to new exercisers using the trails. The researchers related this difference to encouraging use of the trails for physical activity by stating:

> Developing strategies to address safety concerns along with other negative perceptions may be necessary if individuals are to progress to being habitually active. As such, trail advocates should prioritize and address safety concerns among new exercisers to promote the appeal of a trail for the long-term pursuit of enhancing physical activity within a community. (Gordon, Zizzi, & Pauline, 2004, p. 6)

Along with the NORG in Athens, Georgia, these examples highlighting perceived safety as an influencing aspect of greenway use illustrate the importance of addressing, not only actual safety, but also the perception of safety on greenways so that individuals and communities may take full advantage of the benefits they offer.

Because the trails along the NORG provide a strong recreational component to the greenway, this thesis focuses on the human element of greenways by trying to better understand what factors may affect people's use of greenways. The NORG and its future offer many benefits to the Athens community and its residents, and yet it may not be used to its full potential. This thesis hypothesizes that negative perceptions of safety influence Athens residents' use of the NORG, and therefore bases its research on a twofold line of inquiry: Do people avoid the North Oconee River Greenway (NORG) because they perceive it as being unsafe, and if so, why do they think that? And, if negative perceptions of safety correlate with people's use of the NORG, what environmental design measures can be taken to ameliorate the problem?

The importance of understanding what affects people's use of recreational greenways lies with the benefits that they provide their users and the communities through which they run. A principle aspect of greenways is that they are innately comprised of natural environments, whether wholly or partially, and when greenways weave through or along urban environments, they make nature more accessible. The benefits of recreational greenways most pertinent to this thesis are that they provide an opportunity for users to experience natural environments as well as opportunities for outdoor recreation and physical activity.

A NATURAL RELATIONSHIP

Why is the concern of accessible and available nature to urban dwellers so important? Simply stated, humans need nature. In addition to decades of research on humans' preference for natural environments, views, and landscapes, more than twenty years of contemporary research and studies have led to recent findings suggesting that people "deprived of" access to natural settings are more likely to suffer from social, psychological, and physical health issues (Beals, 2009; Yates, 2009).

"The natural environment is increasingly a source of interest, fascination, and affection. In a wide range of settings, both at home and abroad, I have found the breadth and intensity of such feelings to be remarkable," (p. vii) writes Charles A. Lewis from The Morton Arboretum in the foreword of *The Experience of Nature*, an influential volume written by Rachel and Stephan Kaplan (1995) on their twenty years of comprehensive research of the human-nature relationship. Fifteen years later, Mr. Lewis's sentiment undoubtedly continues to be true, evidenced not only by people's growing concern for the environment, but also by the numerous books, articles, and studies about the subject. Past and current research of the human–nature relationship includes, but is not limited to, human perception and understanding of natural landscapes, human preference for natural settings, and human psychological and physical benefits from viewing natural environments and interacting with nature. Several researchers have spent their time inquiring about people's perception of and preference for natural environments. Research has shown that people have a strong preference for natural environments, and human perception of and preference for those environments are innately linked (R. Kaplan & Kaplan, 1995). Among other research, these topics have been connected to environmental stewardship, crime and perception of personal safety, and, more recently, public health promotion – all furthering their importance to and influence on today's society.

Most pertinent is the human–nature relationship research that involves the benefits of engagement with natural environments to human health. While scientific validation may still be desired, the empirically proven benefits are numerous – as are the research studies that support them – and they include benefits to the physical, psychological, and even social health of humans. Human contact with nature, in reference to benefit gain, can be divided into two general types: simply viewing natural scenes, like a view from a window, and physically being in a natural environment (Maller, et al., 2006). Viewing nature from a window, as opposed to an urban scene, has coincided with increased recovery rates as well as reduced need for painkillers for patients recovering from surgery (R. S. Ulrich, 1984). Another study measured physiological data, such as skin conductance, heart rate, blood pressure, and muscle tension, when viewing video of natural and urban environments after a stress-inducing event; the data from the viewing of natural environments correlated with faster and more complete stress recovery (Roger S. Ulrich, Simons, Losito, & Fiorito, 1991). Other research has shown that when employees have views of nature from their workplaces their levels of job satisfaction, general well-being, and overall life satisfaction are higher, while levels of job stress are much lower (R. Kaplan & Kaplan, 1995; Leather, Pyrgas, Beale, & Lawrence, 1998); employees from one of the studies also reported fewer headaches and illnesses (R. Kaplan & Kaplan, 1995).

In addition to the short list of examples above, the benefits people gain from being in nature are equally as impressive. Probably most relevant to today's work/job-focused society is the research involving mental fatigue, Attention Restoration Theory, and 'restorative environments.' While incredibly important to human effectiveness, prolonged periods of 'directed attention' (attention that requires voluntary action and effort by the human brain, like the attention needed to concentrate on a presentation or lecture) can lead to mental fatigue, no matter how enjoyable the activity (S. Kaplan, 1995). Based on their research and that of

others, Rachel and Stephen Kaplan (1995) conceptualized the idea of 'restorative environments,' and describe them as those that provide opportunities to recover from directed attention fatigue. Maller *et al.* (2006) summarize what constitutes a restorative environment according to studies done by the Kaplans and others:

> restorative environments require four elements: fascination (an involuntary form of attention requiring effortless interest, or curiosity); a sense of being away (temporary escape from one's usual setting or situation); extent or scope (a sense of being part of a larger whole); and compatibility with an individual's inclinations (opportunities provided by the setting and whether they satisfy the individual's purposes) (Kaplan and Kaplan, 1989; Hartig *et al.*, 1991). (p. 48)

Natural settings, like parks and greenways, are ideal restorative environments as they easily meet the four requirements and are often preferred environments (R. Kaplan & Kaplan, 1995; S. Kaplan, 1995). Based on Maller et al.'s (2006) review of previous research on the benefits of human contact with nature, they write "empirical, theoretical and anecdotal evidence demonstrates contact with nature positively impacts blood pressure, cholesterol, outlook on life and stress-reduction (Moore, 1981; Kaplan and Kaplan, 1989; Hartig et al., 1991; Ulrich et al., 1991a; Ulrich et al., 1991b; Kaplan, 1992a; Rohde and Kendle, 1994; Lewis, 1996; Leather et al., 1998; Parsons, et al., 1998)" and conclude their review with:

> Whilst the extent to which contact with nature can contribute to human health and well-being is in need of further investigation, the strength of this evidence alone is sufficient to warrant inclusion of 'contact with nature' within population health strategies, and for parks to be considered a fundamental health resource in disease prevention for urban populations worldwide. (p. 49)

SAFETY: AN INNATE HUMAN NEED

While recreational greenways are prime landscapes for physical activities like walking, running, or bicycling in restorative natural environments, they need to be safe places to go. Safety is a basic human need. Defined as "the state of being safe; freedom from the occurrence or risk of injury, danger, or loss" ("safety," n.d.), safety is believed to be one of

the first human needs that must be met before a person can concern themselves with more complex needs. Probably the most well-known model of human needs is Abraham Maslow's hierarchy of needs, part of his "theory of human motivations" (Lang, 1994). In his model, Maslow places safety and security just above the truly basic physiological needs of survival – food, water, warmth, etc. Only after the basics of survival and safety and security, can a person achieve higher levels of motivation such as belonging, esteem, and "self-actualization" (Lang, 1994). In addition to Maslow's model of human needs, those of sociologist and psychiatrist Alexander H. Leighton and social psychologists Hadley Cantril and Claude Steele also place safety, or "security", as one of the most immediate basic needs (Lang, 1994).

In the context of human needs, safety can be divided into psychological and physical safety. Psychological safety refers to the need for humans "to have control over their environment, to know where there are in space and in time, to not be socially or physically lost" (Lang, 1994, p. 218). Physical safety refers to a person's need to know that they are "safe from physical harm—from the natural elements, human elements, and from artificially created elements of the environments such as moving cars and structurally unsound buildings" (Lang, 1994, p. 218). For the purpose of this thesis, "personal safety" is a subset of this description of physical safety, and it focuses on being safe from physical harm due to "human elements" such as violence or crime.

The need for safety is innately understood by all humans, so it is not a surprising fact that safety is also a basic requirement for public places, and, in this case, public parks and trail systems. Partnering with the Rails-to-Trails Conservancy (RTC), the authors of *Trails for the Twenty-First Century: a Planning, Design, and Management Manual for Multi-Use Trails* state that "safety considerations should be given top priority when planning trail corridors" (Flink, Olka, Searns, & RTC, 2001, p. 35). The "safety considerations" to which they refer include

physical safety and security of trails (Flink, et al., 2001), but also commonly understood, a *perception* of safety is just as important as actual safety in influencing a person's decision as to whether or not they will go to a place – it is that perception, specifically a negative perception of safety, crime, or danger, that is the focus of this thesis.

THESIS STRUCTURE AND METHODOLOGY

Recognizing that actual and perceptions of safety are not the only factors that can affect use of greenways and urban trails, this thesis focuses on safety because it is a basic human need. Therefore, for any public landscape meant for recreational use, it is fundamental to achieve actual safety, and just as importantly, a positive perception of safety. Based on a review of previous research and relevant literature in the field of environmental design, this thesis proposes that negative perceptions of safety of the North Oconee River Greenway (NORG) can affect people's use of its recreational trail. According to the survey conducted for this thesis, both trail users and non-users have negative perceptions of safety for the NORG. While the survey's questionnaire was not designed to statistically prove that non-use of the trail is due to negative perceptions of safety or any one factor, responses to the questionnaire support the hypothesis that negative perceptions of safety of the NORG are real for some/many residents and students in Athens and that the perceptions may affect their use of the greenway.

After this introduction, the literature review in Chapter Two includes a brief history of the greenway concept and movement in the United States as well as history and a description of the North Oconee River Greenway (NORG) in Athens, Georgia. Chapter Three includes a synopsis of current research, which shows that safety issues and fear, perception of crime, and negative perceptions of personal safety are factors that may affect use of urban parks, campuses, and urban trail systems. It also presents a review of the relevant current theories in the field of environmental design, such as Rachel and Stephan Kaplan's research and theory of

human preference and perception of landscapes, Oscar Newman's defensible space theory, and Crime Prevention Through Environmental Design (CPTED). Chapter Four introduces the survey developed for this thesis in response to the previous research and current theories. The intention of the survey is to begin answering the question of what might be affecting use of the NORG, specifically addressing the hypothesis that negative perceptions of safety are an obstacle to trail use. The chapter will describe the methodology and results of the questionnaire, including pertinent subsets of data. Chapter Five presents a discussion of the questionnaire results and what they might mean for the NORG and its use, and it discusses the results as they relate to the previous research and theories from the literature review. Concluding the thesis, Chapter Six proposes recommendations, both design-specific and general, for the NORG and its future as part of a larger greenway network in Athens, and it also provides suggestions for further research.

CHAPTER TWO: THE GREENWAY CONCEPT, THE MOVEMENT, AND THE NORTH OCONEE RIVER GREENWAY

This chapter looks into the past and at the present, setting the scene for the future. It sets the scene with a brief history of the greenway concept in the United States and the modern greenway movement. Greenways are also described in further detail, particularly the innate advantages – edges and linkage – they have, which make them a valuable type of open space for conservation and preservation. The chapter concludes with a brief history and description of the North Oconee River Greenway in Athens, Georgia.

GREENWAY: A CONCEPT

The history of the greenway concept in the United States most distinctly began in 1865 with Frederick Law Olmsted and his work on, what is today, the University of California at Berkley's campus plan (Little, 1990). The plan included a "pleasure" drive and walk along public parkland (what we might refer to today as a linear park) and another drive through hills – not part of a park – that was meant for carriages and scenic experience (Little, 1990). In his frequently referenced book, *Greenways For America*, Charles E. Little argues that "if any single person 'invented' the idea of greenways, it was [Olmsted]" (1990, p. 7). The idea grew stronger in Olmsted's and fellow designer's, Calvert Vaux, work on Prospect Park in Brooklyn, New York during the 1860s. Their plan included the design of a "linear Park Way" meant to be the principle access corridor into the park; "a parkway, [Olmsted] believed could prepare the minds and hearts of visitors as they approached the park, creating an affection that would lead

to the fullest measure of peace and aesthetic appreciation once arrived within" (Little, 1990, pp. 10-11). From Prospect Park, Olmsted and Vaux realized that "no single park, no matter how large and how well designed, would provide the citizens with the beneficial influences of nature. Parks needed to be linked to one another and to surrounding residential neighborhoods" (Little, 1990, p. 11); this realization led them to suggest additional "pleasure drives" connecting the park to other places in New York (Little, 1990). While these linkages were not constructed at the time, Olmsted and Vaux created other linked park systems, most well-known of these plans being the "Emerald Necklace" in Boston (Little, 1990).

In addition to those of Olmsted, the "park-and-parkway" idea was employed in many American cities, one of which – designed by H.W.S. Cleaveland – "many believed to be the first and finest urban open-space network, the Minneapolis-St.Paul metropolitan park system [was] completed in 1895" (Little, 1990, p. 12). While these "early parkways and strip parks were for pedestrians, carriages, and horseback riders," (Little, 1990, p. 12) less than a decade after the introduction of the mass-produced automobile, work began on the Bronx River Parkway, which was primarily for "recreational motor use" (p. 12). From 1920 into the 1970s, Robert Moses, an ambitious and avid urban planner in the New York region, was responsible for the creation of a multitude of parks and automobile parkways – "parkways to link existing parks, [often creating] new parks to have a parkway to" (Little, 1990, p. 14).

Also important to the history of the greenway idea was the "greenbelt" concept – an originally British idea of maintaining open land, whether agricultural land or public parkland, between cities to prevent them from growing into one another. Ebenezer Howard's "garden city" concept is a prime example of this; Howard's 1903 plan for Letchworth, England led to the development of other small garden cities that "not only had an inner network of open spaces for amenity and recreation but a surrounding greenbelt as well" (Little, 1990, pp. 16-17).

Howard's ideas also inspired the creation of the London Greenbelt, which, beginning with the London Green Belt Act passed in 1938, brought the idea of a garden city to a much larger scale (Little, 1990). Back in the United States greenbelts were part of the New Deal in the 1930s; models of these towns still exist—Greenbelt, Maryland, and Radburn, New Jersey are probably the best-known examples—however, the "most germane adaptation of the British greenbelt theory of importance to modern greenway-making may well be found in the work of Benton MacKaye" (Little, 1990, p. 17), conceiver of the Appalachian Trail. In the 1920s, concerned with the potential for post-World War I urban development to sprawl out along the highways, "MacKaye suggested that dams and levees of open space be established, primarily along ridgelines, to contain and direct the outward metropolitan flow," but he also saw these "open ways" as "natural corridors that would provide necessary recreational opportunities to large metropolitan populations" (Little, 1990, pp. 18-19). While the two-thousand mile hiking trail was built, the 1972 Appalachian Trail Conference's proposal to establish an Appalachian Greenway that would include the trail and additional adjacent land to "provide a nationally significant zone for dispersed types of recreation, wildlife habitat, scientific study, and timber and watershed management" (Little, 1990, p. 19) – which would achieve MacKaye's true idea of the open-way greenbelt concept – has yet to be realized.

The ecologically based work of both Ian McHarg and Philip Lewis is also significant to the greenway concept history. In addition to the McHargian method of analysis, a well-known method for establishing "priorities for development (or nondevelopment) based on natural processes" (Little, 1990, p. 21), Lewis's work focuses on analyzing landscapes based on 220 environmental values—including everything from topographical values to the visual quality of space—in order to find "environmental corridors." Each environmental value has its own symbol that is placed on a regional map to be studied, and the symbols "tend to array

themselves in a linear fashion along natural corridors" (Little, 1990, p. 23). These methods have helped greenway planners by providing "persuasive evidence of the ecological value of greenways" (Little, 1990, p. 22)

Most likely the inventor of the term *greenway*, urban planner, journalist, and "people-watcher" William H. Whyte wrote about greenways in most of his books and papers on open space and helped to advance the basic concept of greenways (Little, 1990). In the chapter entitled "Linkage" in his book *The Last Landscape*, Whyte writes about the potential of greenways to incorporate the smaller, sometimes forgotten, open spaces in an urban context:

> There are all sorts of opportunities to link separated [open] spaces together, and while plenty of money is needed to do it, ingenuity can accomplish a great deal. Our metropolitan areas are crisscrossed with connective strips. Many are no longer used, or only slightly used for their original purpose ...But they are there if only we will look. (Whyte, 1968, p. 163)

It is this way of thinking about the combination of open spaces, especially in metropolitan areas, and the advantages of edges and linkages inherent to the linear nature of greenways that has carried the greenway concept into the modern greenway movement.

GREENWAY: THE MOVEMENT

According to Charles E. Little's extensive research on the greenway concept and movement, the greenway idea attracted such a diverse and dedicated group of supporters because of the decline of metropolitan areas – the location of most greenway projects (Little, 1990). Only twenty years ago he illustrates this decline by writing:

> In the cities, homelessness, crime, and physical decay have been increasing at an alarming rate. ...summertime park-sleepers and wintertime grate-dwellers, scarcely in evidence in [urban places] ten or fifteen years ago, are now common everywhere, even in small cities. On the industrial edges, an economic exodus has condemned waterfronts and riverfronts to abandonment and ruin. [Empty] industrial buildings...line the abandoned railroad tracks. The rivers themselves reek of the unspeakable urban fluids they are asked to absorb and drain away. (Little, 1990, p. 29)

Little also comments that suburbia is not completely exempt from this decline either, especially now that suburban places have become indistinguishable from one another due to undifferentiated development and are so often surrounded by commuter-packed highways, and the countryside once on the outskirts of cities is now non-existent, replaced by urban sprawl filled with "incredibly ugly commercial strips that run from the perimeters of one metropolitan area to the perimeters of the next" (Little, 1990, p. 29). These social and environmental issues informed and inspired a movement in "creative land conservation" (Little, 1990, p. 30) for which greenways are a great tool by virtue of their social, environmental, and economic benefits.

In addition to the benefits mentioned in the introduction, greenways can provide public access to natural settings and open space as well as improve urban recreational opportunities; greenways allow for the conservation of land for the protection of vital ecological functions of natural processes, especially along riparian arteries, while also offering corridors for wildlife in today's highly fragmented wilderness; and greenways can reduce public costs "by helping to eliminate bad development that can be a liability to a municipality" (Little, 1990, p. 30) and/or produce income for communities by "helping to attract new development that creates jobs and tax-ratables" (p. 30). Little introduces an interesting economic fact about the greenway movement by pointing out that:

> [the] movement was created because of, rather than in spite of, the lack of money for open-space preservation. It was the very lack of it, indeed, that forced conservationists to focus on land resources with inherent, broadly based environmental values rather than on lands whose conservation importance was often quite local. (1990, p. 33)

It is the linear nature of greenways that makes the necessary land acquisition often much more affordable for conservationists to acquire, while also benefiting a large number of people.

The two basic, yet extremely valuable, attributes of linear open spaces are *edge* and *linkage*. It is understood that when comparing two open spaces, one in the shape of a square and the other in the shape of a elongated rectangle, that are equal in overall area, the long

rectangular open space will have a greater perimeter, or more *edge*. The edges of open spaces are what people most often see and use for recreation; whether or not they break past the edge separating urban city and natural woodland, the visual edge allows for the appearance of more open space while also providing greater access to that open space (Whyte, 1968). While he mentions that there is a point of diminishing returns of getting to too narrow an open space, William H. Whyte refers to the benefits of linear open space in urban places when he writes:

> Per acre, however, linear strips are probably the most efficient form of open space, and there are plenty of practical examples on the ground to bear this out. When they are laid along the routes people travel or walk, or poke into the places where they live, the spaces provide the maximum visual impact and the maximum physical access. ...[the linear concept] provides us a way of securing the most highly usable spaces in urban areas where land is hard to come by, and in time, a way of linking these spaces together. (1968, p. 173)

This leads to the second valuable attribute of linear open space, *linkage*. While linking parks together with linear strips of open space is not a new idea, the somewhat recent rediscovery of linkage in the form of greenways has been of great interest to conservationists. Greenways connecting larger parks and open spaces allow for "species interchange," or movement of wildlife, including plants, along natural corridors that "is essential for the survival of some species, especially those fairly high up on the food chain" (Little, 1990, p. 36). Linking parks together also gives greenways a remarkable recreational advantage, allowing people to set out on foot or bicycle and travel to parks and places far from their homes without ever having to get in their cars.

The many social, economic, ecological, recreational, and aesthetic benefits and advantages of greenways are evident, but levels of these naturally differ based on the different types of greenways. While it is difficult for many greenways to be distinctly categorized, Little categorizes greenways into five "major project types:" urban riverside greenways; recreational greenways, featuring paths and trails of various kinds; ecologically significant natural corridors,

usually along rivers and streams; scenic and historic routes, usually along a road or highway; and comprehensive greenway systems or networks (1990, pp. 4-5).

These project types cover most greenways, but since Little wrote his book, other goals and objectives, such as routes for alternative transportation to reduce automobile use, have been included in some greenway projects. Robert Searns differentiates greenway types a little differently, basing his categorization on the evolution of greenways, dividing them into three "generations" (1995). In addition to serving the important human needs, like bringing nature into the city and trail-oriented recreation, on which Generations 1 and 2 focused, respectively, Searns's Generation 3 greenways "pursue multiple objectives such as habitat protection, flood hazard reduction, water quality, historic preservation, education, interpretation, and other purposes" (1995, p. 72). Needless to say, these Generation 3 greenways include the goals of all five of Little's greenway project types and truly are what today's greenway-makers are trying to accomplish – the North Oconee River Greenway in Athens, Georgia being one of these greenways.

NORTH OCONEE RIVER GREENWAY: HISTORY

While the history of the North Oconee River Greenway that follows will be quite brief, it is important to point out its impressive beginning in 1770 when well-known naturalist William Bartram described the Oconee River, which runs through Athens, as "that beautiful river [where t]he cane swamps, of immense extent, and the oak forests, on the level lands, are incredibly fertile; which appears from the tall reeds of the one, and the heavy timber of the other" (Murphy, 2005). Throughout Athens's history, the rivers that run through Athens were central to its growth. During the 19th century Athens became a major manufacturing center of the South; factories and mills were built along the riverways, one of which was Easley's grist mill

complex on Cedar Shoals that later became Athens Wool and Cotton Factory, and the fertile lands along the rivers were turned into cotton plantations – allowing sediment of the Georgia red clay soil to seep into the waterways (Murphy, 2005). With the addition of a waterworks and water mains to bring water directly to residents' homes and hydroelectric dams installed on the Middle Oconee River by the Athens Railway and Electric Company in the late 1800s, Athens' dependence on the rivers continued. The rivers continued to be "dumping grounds for raw sewage until 1962 when Athens built its first wastewater treatment plant on Bailey Street" (Murphy, 2005, p. 23). Despite the burgeoning industrial use of the rivers during the 1800s, William Manning, an associate of Frederick Law Olmsted, and his firm proposed a city plan for Athens in 1925 that recommended "protection of the Middle and North Oconee Rivers by establishing parks and conservation corridors along both rivers and all major tributaries" (Murphy, 2005, p. 101); however no greenway system was implemented at the time.

Fortunately, recognition of the aesthetic and ecological values and recreational potential of the Oconee Rivers was not completely forgotten, and was renewed in the early 1970s by Charles Aguar who, independent of Manning's plans, developed a greenway plan for the North and Middle Oconee Rivers (Murphy, 2005). In order to gain community awareness and support for the implementation of his greenway concept for the Oconee River Greenway, Aguar joined a citizen group that started Sandy Creek Nature Center, he enlisted the help of grassroots organizations and many of his students in the School of Environmental Design of the University of Georgia (UGA), and he cooperated with the Athens Recreation and Parks Department. Through the work and support of Charles Aguar, local volunteer groups, community activists, and Sandy Creek Nature Center (SCNC), official recognition was given to greenways in the Recreation-Open Space plan for Athens in 1974, and in 1976 North Oconee River Park, the first piece of the greenway proposal, was established (Murphy, 2005). During the 1980s and 1990s,

momentum continued for Aguar's Oconee River Greenway proposal. Funds from state and federal grants were used to purchase land along Sandy Creek and build a four-mile-long gravel and boardwalk trail, created by Walter Cook, linking the Nature Center and Sandy Creek Park (Aguar, Historical outline, 1996, see Appendix A). In 1985, the city of Athens adopted the Future Land Use Plan 1985-2000, which designated corridors along rivers and tributaries for "Parks and Public/Private Open Space" (Aguar, Historical outline, 1996, see Appendix A). An ad-hoc "Task Force" was organized in 1990 that included members representing Athens Parks and Recreation, Leisure Services, Clean and Beautiful Commission, Garden Clubs, Downtown Development Authority, The Georgia Conservancy, Students for Environmental Awareness, and news media; the task force presented recommendations to respective government bodies that an official Athens-Clarke County Greenway "Commission" be formulated (Aguar, Historical outline, 1996, see Appendix A). In 1991 the Oconee River Greenway Commission (ORGC) was established with members from Athens, Clarke County, and UGA, and was later chartered and reorganized in 1992 with ten members appointed by the Athens-Clarke County (ACC) Mayor and Board of Commissioners and five members appointed by the UGA President (Aguar, Historical outline, 1996, see Appendix A). According to the Athens-Clarke County Unified Government website, "[t]he general responsibility of the Commission was to develop a plan for a river-oriented greenway system in Athens-Clarke County and to recommend other measures to protect the resources of the Oconee Rivers and their tributaries" (2011) and the ORGC continues to support the greenway efforts for the Oconee Rivers, especially through procuring funds for the proposed projects as well as overseeing their construction and continual management.

Tangible movement of greenway implementation began with the 1994 Special Purpose Local Option Sales Tax (SPLOST), which allocated funds for the design studies and construction

plan of the Heritage Trail (three miles of the future greenway) and the North Oconee River Concept Plan for twelve more miles of greenway, and in 1995 Robinson Fisher Associates, Inc. of Athens was selected as the design firm to prepare the two plans (Aguar, Historical outline, 1996, see Appendix A). Rob Fisher, one of the firm's principals, invited Charles Aguar to be a member of the design team, and in December 1996 a concept design of the entire North Oconee River greenway was presented at two public hearings (Murphy, 2005).

While many Athens residents fully supported the greenway plans, some of the riverfront property owners vehemently voiced their concerns of having a public path built in their backyards. Most of the concerns were about property rights, privacy, and safety. Public opposition of landowners who would be affected by the greenway intensified during the time between the original unveiling of the plans and when they would be officially presented to the ACC Commission (Murphy, 2005). Glen Weaver, the owner of the land slated to be the end of the first phase of greenway development, where the North and Middle Oconee Rivers joined, stated that he could "...see why they want to put the greenway here. If I didn't live right next door, I'd be all for it" (Kinsler, 1997). One resident of the Red Fox Run subdivision, Bill Slack, stated that "[t]he trail will go right across my back yard. Someone could see right into our windows from that trail," and his wife intensified that sentiment, declaring that "[w]e'll never be safe again" (Kinsler, 1997). Because of the unwavering opposition of residents in the Red Fox Run subdivision and others near the east site greenway route, the ACC Mayor and Commission asked the ORGC and Rob Fisher to focus the first construction phase of the North Oconee River Greenway on the area north of downtown Athens (Murphy, 2005).

With much less opposition to the location of northern part of the North Oconee River Greenway and with funding from ISTEA grants and some matching funds and from SPLOST allocations, ground finally broke on the greenway in 1999. Four years later on June 14, 2003, a

dedication ceremony was held for the official opening of the North Oconee River Greenway and Heritage Trail, a three and a half mile section of the proposed greenway plan. The ceremony included a ribbon-cutting—or rather a ribbon-"breaking"—by Dick Field, fourth Chairman of the ORGC, and Heidi Davison, then mayor of Athens-Clarke County, on a tandem bicycle. Since then, the ORGC has continued to work towards the future expansion of the proposed greenway.

NORTH OCONEE RIVER GREENWAY: DESCRIPTION, CURRENT AND FUTURE

According to the Greenway Network Plan adopted in June 2003, which was developed by Athens-Clarke County Unified Government and the Department of Leisure Services Natural Resources Division, there are four main goals of the greenway network in Athens – of which the North Oconee River Greenway is a part. Conservation and Preservation is the first goal, and it includes providing a natural buffer system that enhances quality of life through the controlled use and systematic protection of "natural life support systems," or natural resources (ACC Unified Government & Department of Leisure Services, 2003). The second goal of Transportation includes "provid[ing] corridors and facilities that promote the use of non-motorized transportation" (ACCUG & Department of Leisure Services, 2003, p. 2). Education is the third goal which includes "provid[ing] opportunities for both self-directed and interpretative programs leading to a greater understanding of the natural environment, cultural heritage, and preservation/conservation efforts" (ACCUG & Department of Leisure Services, 2003, p. 2). The fourth goal, which is most pertinent to this thesis, is Recreation, and it states that the greenway network in Athens should "provide the community an opportunity to experience and enjoy the outdoors in a natural environment" (ACCUG & Department of Leisure Services, 2003, p. 2). Objectives stemming from the goal of Recreation really broaden its meaning and not only include providing opportunities for physical activity in the outdoors, but also "provid[ing] areas

for observation and study of the natural environment" as well as "an aesthetically pleasing environment" (ACCUG & Department of Leisure Services, 2003, p. 2). It is these goals and their accompanying objectives that designate the North Oconee River Greenway and the future Athens greenway network as belonging to Robert Searns "Generation 3" greenways and fitting at least three of Little's five greenway project types – giving the greenway a lot of potential to be really successful.

Today's Oconee Rivers Greenway system consists of Sandy Creek Greenway and Cook's Trail and the North Oconee River Greenway and Heritage Trail (Figure 2.1). Cook's Trail, a recreational trail within Sandy Creek Greenway, named after its creator Walter Cook, is a 4.1 mile-long mineral surface trail that connects Sandy Creek Park, in the northern part of the county, to Sandy Creek Nature Center. It follows Sandy Creek as a single track trail while crossing extensive wetland and a beaver dam swamp with a series of boardwalks and bridges, and also connects to the 3.5 mile paved concrete path of the North Oconee River Greenway. The concrete path picks up from Sandy Creek Nature Center heading south along the North Oconee River leading to its current southern-most destination point, just south of Dudley Park. Along those 3.5 miles the path also passes by and connects Riverside Park, East and West North Oconee River Parks, the Charles Aguar Memorial Plaza, and the Cook and Brother Plaza, a main feature of the Heritage Trail. The Heritage Trail is a specific piece of the North Oconee River Greenway that "illustrates the rich history of Athens… [with] over fifty interpretive panels along the trail describ[ing] activities related to the former Cook and Brother Armory and Chicopee Mill, the North Oconee River, Dudley Park, and the railroad" (Athens-Clarke County Unified Government, 2011).

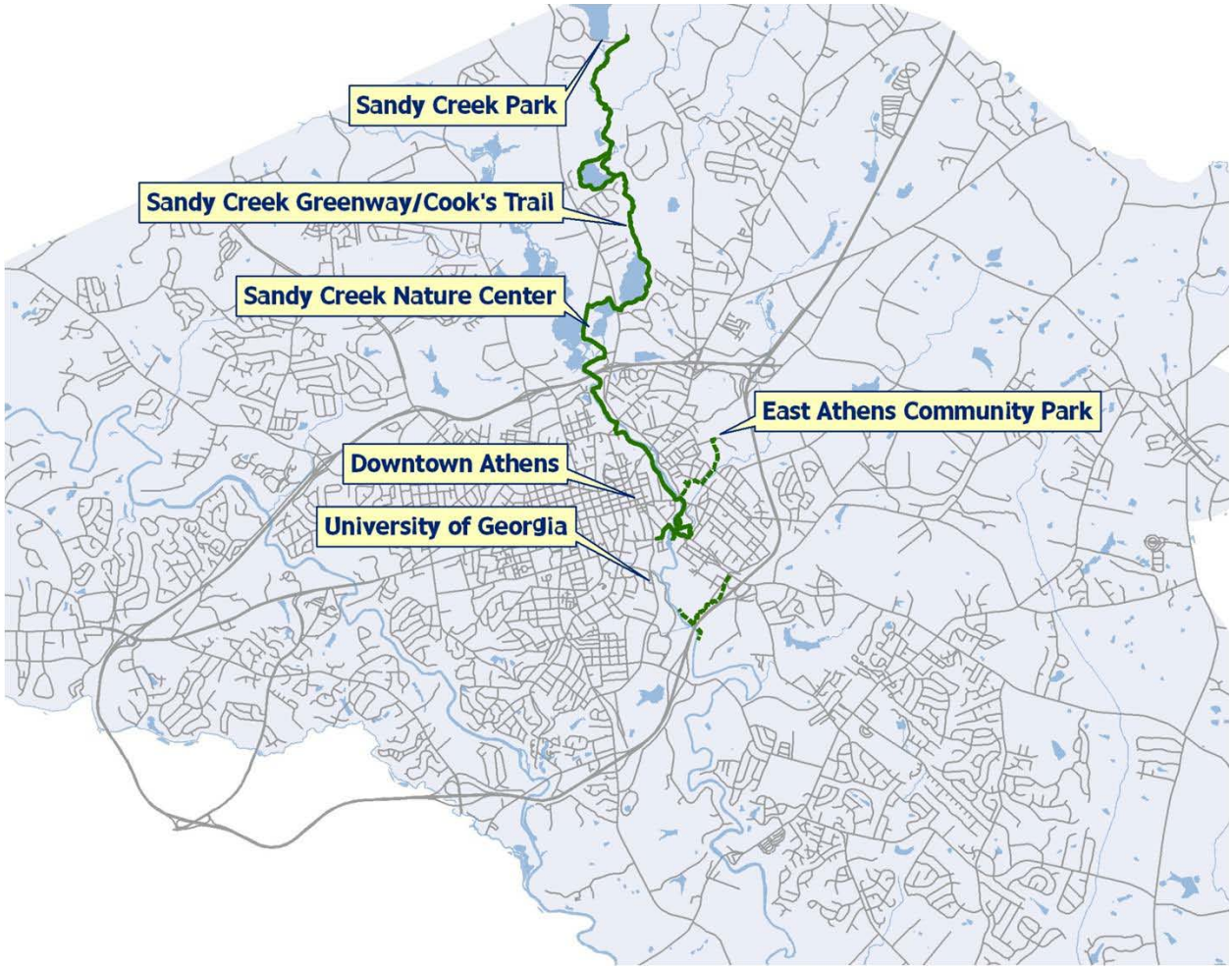


Figure 2.1: Current greenway route in Athens, GA. Solid line is existing built trail and path. Dashed line represents the funded, not yet built paths. (Spooner, 2010)

In addition to the current 7.6 continuous miles of greenway trail consisting of Sandy Creek Greenway and Cook's Trail and the North Oconee River Greenway and Heritage Trail, there are two funded, not yet built, spur trails – one that will serve as a connection to the future Park and Ride lot on Lexington Highway, the other serving as a path that will lead from the greenway to East Athens Community Park (Spooner, 2010). The future expansion of the North Oconee River Greenway and the Oconee Rivers greenway system (Figure 2.2) consists of four subprojects that, once built, will extend the trail another seven miles all the way to the

State Botanical Garden of Georgia, and a fifth subproject that includes the first section of a greenway along the Middle Oconee River.

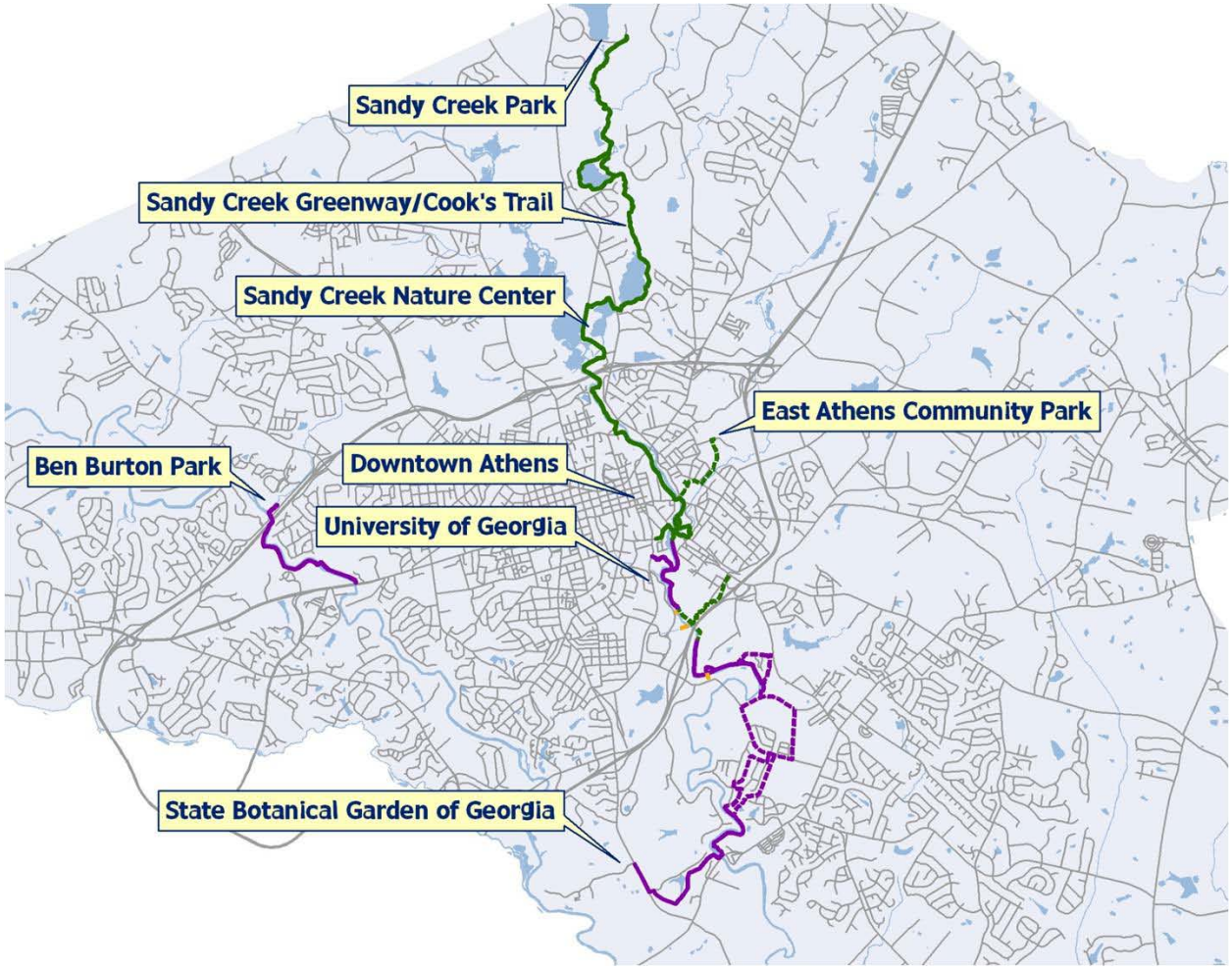


Figure 2.2 – Proposed future greenway routes in Athens, GA. Green is existing and/or funded trails. Purple represents the proposed future trail routes, dashed purple shows possible alternative routes through southeast Athens neighborhoods. (Spooner, 2010)

The five subprojects were presented to the ACC Mayor and Commission for consideration for 2011 SPLOST funding and were included in the ballot, and the 2011 SPLOST was passed by voters in November 2010. While the ORGC continues to procure additional funding for land acquisition and supplemental construction costs, the future of the North

Oconee River Greenway is bright, and given that the greenway is still in its early/young stages, now is the opportune time to try to understand which obstacles could be working against the greenway's ability to attract more users – specifically perceptions of safety.

CHAPTER THREE: PERCEPTIONS OF SAFETY IN NATURAL AND URBAN LANDSCAPE SETTINGS

This chapter presents a synopsis of current related research that combines research and studies focused on fear and perception of safety in the landscape with other studies focused on greenway and urban trail use. It also presents a review of relevant literature and theories in the field of environmental design, including landscape preference theory, defensible space theory, and Crime Prevention Through Environmental Design (CPTED).

PERCEPTIONS OF SAFETY & URBAN GREENWAYS: A SYNOPSIS OF PREVIOUS RESEARCH & STUDIES

Research and studies on the topic of greenways and their use is limited and relatively new, with most research being done within the past ten years. A few journal articles specifically note the lack of research and studies focusing on greenway characteristics and physical design features in relation to patterns of trail use (Lindsey, Wilson, Yang, & Alexa, 2008; Reynolds et al., 2007; Wolch et al., 2010) and also state that little is known about how trails are perceived and used (Gobster, 2005). Consistently expounding the value of greenways and the benefits they provide, other articles simply express the importance for understanding people's perceptions of urban greenways and trails in order to properly plan for, design, and acquire funding for them (Frauman & Cunningham, 2001; Gobster, 2005; Shafer, Bong Koo, & Turner, 2000). Interestingly, though understandable due to this country's pressing obesity problems (CDC, 2011), some of the most recent studies about greenways and their use have

been done by researchers in the health profession who are interested in people's use of urban greenways because of the physical (active recreation) and psychological (stress reducing effects of natural settings) health benefits associated with their use (Fitzhugh, Bassett, & Evans, 2010; Gordon, et al., 2004; Reynolds, et al., 2007). However, while issues of safety are mentioned in many studies, only a few researchers have included a specified part of their study focused on perceptions of safety of urban greenways as a potential determinant of trail use. Because of this, the following synopsis consists of a variety of recent research and studies that all relate to perceptions of safety in the landscape – specifically urban parks, college campuses, and urban greenway trails – and factors of greenways, safety being one, that correlate with people's use of them. The first three studies look at landscape preferences and perceptions of safety, fear, and danger in urban landscapes other than greenways (Schroeder & Anderson, Nasar & Jones, and Herzong & Chernick), the latter five studies involve perceptions of and preferences in urban greenways specifically but are not as singly focused on perceptions of safety (Chon & Shafer, Gobster & Westphal, Reynolds et al., Luymes & Tamminga, and Wolch et al.).

In the article "Perception of Personal Safety in Urban Recreation Sites," Schroeder and Anderson describe their study as an "effort to identify characteristics that affect the user's perception of personal safety in public recreation sites" (1984, p. 178). While the landscape in this study was not a greenway or urban trail, it included urban parks, waterfront parks, forested paths and picnic areas – all of which are often linked to or by urban greenways, and therefore offer insight that could also be applied to a linear landscape or trailscape. The objectives of Schroeder & Anderson's study that pertain to this thesis are: "to use [judgments of personal safety in urban recreation sites] to identify park design features affecting perception of security in urban parks, and to identify the relations between visibility, perceived security, and perceived attractiveness of urban parks" (1984, p. 179). Photographs taken in sequences along specified

routes of outdoor recreation sites in Chicago, Illinois and Atlanta, Georgia were rated for perceived safety and scenic quality by college students; physical features present and compositional aspects of the scenes were also scored and were then correlated with the safety and attractiveness ratings (Schroeder & Anderson, 1984). The researchers found that "perceptions of both safety and aesthetics depend on specific manageable features of the recreation sites, including vegetation and manmade features" (p. 191) and, scenes that were open (free of dense vegetation), included long view distances, signs of development, access to near populated areas, and that were well maintained were perceived as safe, or places with high security (Schroeder & Anderson, 1984). While signs of development, such as manmade features and structures, decreased scenic quality, well maintained scenes (free of litter, graffiti) increased scenic quality and security (Schroeder & Anderson, 1984). Also important to note is that while undeveloped densely forested sites correlated with low security, scenes with lots of vegetation were rated as having high scenic quality—an oppositional relationship also revealed in some of the following research (e.g. Gobster & Westphal, 2004; Luymes & Tamminga, 1995).

Nasar and Jones's research focused on fear of crime in urban landscapes; their study looked at the perceptions of safety of college females walking a specified route through a university campus – a similar setting to an urban park – after dark (Nasar & Jones, 1997). Even though this study took place after dark and the North Oconee River Greenway and adjacent parks are closed past sunset, the information presented in the article is valuable in understanding fear in the landscape at any time of day. The study's results support two interrelated physical cues that can evoke fear – entrapment (physical barriers to escape) and concealment and blocked prospect (Nasar & Jones, 1997). "*Entrapment* refers to the difficulty a person would have when trying to escape if confronted by a potential offender" (Nasar & Jones, 1997, p. 294); even in the absence of a visible stranger, physical barriers to escape

would make a person feel less safe. On the other hand, *concealment* refers to the ability of a physical feature to hide a potential offender, and *blocked prospect* refers to the same physical feature interfering with a passerby's view of their surroundings. Trees, shrubs, and other objects large enough to hide a human being can all provide concealment for an attacker, while also blocking a trail or park user's view of their immediate surroundings.

The article also introduces the landscape preference of "mystery", found through Rachel and Stephen Kaplan's research, which refers to something in a setting that draws a person in and makes them want to explore further – much like a curve in a path that blocks the view to what lies ahead (R. Kaplan & Kaplan, 1995). While it has been shown that people prefer landscape scenes with an element of mystery, Nasar and Jones argue that in a "climate of fear" such as in a park after dark – or when in a park that is perceived by a community as being an unsafe place to go – the element of mystery would probably evoke fear instead of excitement (1997), and the potentials for entrapment and concealment become even more important elements to address in a public or urban park setting.

The results of their study confirmed that, in addition to potential victimization (presence of a stranger), and no possibility of obtaining help (no groups of people present), entrapment (barriers to escape) and concealment (blocked prospect) were elements that evoked fear in the participants (Nasar & Jones, 1997). It also showed that settings that have extensive views without hiding places, trees and shrubs not obstructing view, night lighting, and the presence of groups of people or large numbers of other people nearby would feel the most safe (Nasar & Jones, 1997).

Herzog and Chernick's study examined perceived tranquility (moderate fascination and aesthetic pleasure) and perceived danger in urban and natural settings (2000). According to their research for the study, "many of the same setting variables that have been investigated in

the environmental preference literature (for example, light, spatial arrangement, setting care, nature context) have been shown to be relevant in predicting either actual or perceived danger from crime" (Herzog & Chernick, 2000, p. 30). College students were shown images of urban and natural scenes and were asked to answer specific questions about the scenes to evaluate the variables of tranquility ("How much do you think that this setting is a quiet, peaceful place, a good place to get away from the demands of everyday life?") and danger ("How dangerous is this environment? How likely is it that you could be harmed in this environment?") in the scenes and rate them for the predictors of *openness* ("How wide-open is the space in this setting?"), *setting care* ("How well-cared-for does the setting seem to be?"), and *nature* ("How much foliage and vegetation is there in the setting?") (Herzog & Chernick, 2000).

The results of the study showed that the predictors of openness, setting care, and nature had a negative relationship with danger in both urban and natural settings, meaning that in both the urban and natural scenes, a more open, well-maintained area with the presence of vegetation would be perceived as less dangerous, or safer. However, the presence of nature in urban settings had a much smaller negative relationship with danger. To this point, the authors state that more nature is not always better in urban settings, and they suggest that the amount and placement of nature should be considered so that it does not become so dense that visibility becomes a problem.

Also examining the aesthetic variables and experiences of a landscape is Chon and Shafer's study, the purpose of which was to "examine aesthetic responses to greenway trails and better understand how such responses relate to the 'likeability' of these environments for potential users" (2009, p. 84). The study consisted of showing multiple panoramic images of eight viewpoints each along two urban greenways – the Town Lake Trail in Austin, Texas and the Buffalo Bayou Trail in Houston, Texas – to participants and having them take a survey

consisting of descriptive adjective pairs. Each of the viewpoints in the images represented primarily natural features, human-made features, or background city infrastructure.

The five aesthetic response dimensions that came out of the study's results were based on Nasar's and Lynch's ideas of likeability of a cityscape, applied to a specific piece of urban infrastructure, greenways. Because aesthetic quality, or the way a place looks, "can influence decision-making as to where people live, work, travel…" (p. 85) and because it relates to a sense of well-being, the researchers looked at perceived aesthetic quality, "which involves an assessment of the environment and of people's feelings about the environment" (Chon & Shafer, 2009, p. 85). Their study evaluated these perceptions by measuring perceptual/ cognitive and emotional/affective responses; perceptual/cognitive responses refer to "how people evaluate and begin to understand visual cues (e.g. the scene may appear complex or simple). Affective responses, on the other hand, represent emotional reactions to a scene (e.g. the environment makes one feel pleasant, excited or fearful)" (Chon & Shafer, 2009, p. 86). The aesthetic response factors shown to be the most influential in likeability of urban greenway trails were *maintenance*, *distinctiveness*, and *naturalness* (cognitive), and *pleasantness* and *arousal* (affective).

The dimension of *pleasantness* included perceptions of safety, and appeared to have the strongest influence on the likeability of a greenway trail scene; according to Chon and Shafer, "the stronger relationship with pleasantness indicated that the less stressful, hostile and dangerous a trail scene was scored by respondents, the more they felt it invited them in or the more likeable it was" (p. 95). Summarizing the results, based on all five aesthetic response dimensions, scenes with water, smooth ground, ordered elements, a high degree of vegetation management, and unobstructed views to immediate surroundings all increased likeability, while visually intrusive features, such as adjacent roadways and overpass bridges, decreased

likeability. The authors suggested that the scenes with overpass bridges over the trail might "possibly relat[e] a level of mystery that conveys an unknown presence and potential harm" (p. 96).

The research presented in Gobster and Westphal's article, *The human dimensions of urban greenways: planning for recreation and related experiences*, is a summary of "findings from a series of interrelated studies that examine" the 150 mile urban greenway along the Chicago River corridor in Chicago, Illinois; the studies included multiple perspectives and stakeholder viewpoints and used multiple methodological techniques (2004). "The results from these diverse studies...revealed a core set of human dimensions important to the evaluation of urban greenways that were held in common across stakeholders and localities. These dimensions were cleanliness, naturalness, aesthetics, safety, access, and appropriateness of development" (Gobster & Westphal, 2004, p. 148). These dimensions are interdependent (Gobster & Westphal, 2004), however the dimension of safety is most relevant to this thesis. Based on their review of the studies and related research, Gobster and Westphal point out that, while solitude is often welcomed by greenway users in some locations, solitude without isolation is necessary for safety purposes. Though somewhat counteractive to providing places for solitude, they also suggest a more proactive strategy of populating the greenway with other people to help with perceived safety. Vegetation management, to achieve a more open understory allowing for adequate lines of sight, could also help with safety perceptions, though they too discuss the conflict between managing vegetation for safety purposes and the desire for natural vegetation for aesthetic preferences.

Looking at greenway use from the angle of health promotion, Reynolds et al. examine built environmental features of three urban trails and attempt to correlate them with the use of the trails (2007). After the trails were chosen for the study, each was audited using "four main

environmental factors, including functionality (e.g., slope, surface materials), safety (e.g., freedom from crime, separation from traffic), aesthetics (e.g., absence of litter), and access to facilities (e.g., parks, shops)" (p. 340). Then trail user counts were conducted for each trail to estimate the amount and type (i.e., running, cycling, walking) of use as well as basic user information like age and gender. The results showed positive and negative associations with trail use. Positive associations included urban views and mixed (both urban and natural) views, streetlights, good trail condition, and presence of trailside amenities. The negative associations included litter, noise, higher vegetation density, drainage features, tunnel present, and natural areas adjacent to trail. The positive correlate of use of mixed and urban views and negative correlate of natural areas adjacent to trail seemed contradictory to the hypothesis that more natural settings would be most attractive to users; the authors suggested that "both urban and natural elements may provide a greater number of access points to the trail and thereby facilitate trail use" (p. 343). Reynolds et al. summarize the implications of their results by stating that "the coherent picture that emerges from these findings is that trails designed with the issues of visibility and safety in mind and with trailside services and amenities available will be used more heavily" (p. 344).

The next journal article, *Integrating public safety and use into planning urban greenways*, is a paper that provides insight specifically into the tension that innately comes with trying to design greenways that are both "green"—natural and environmentally beneficial—and "safe." Elaborating on this point, the authors write:

> Local residents' concerns for safety through clear sightlines and the use of lighting along trails may compromise the ecological integrity and natural character of urban greenways, whereas natural corridors in the city are often considered as being potentially unsafe, and therefore essentially inaccessible to use by many residents, particularly women, children, aging people and those with disabilities. (Luymes & Tamminga, 1995, p. 391)

Luymes and Tamminga present information gathered from their examination of environment–behavior research and the "safe communities" approach developed in the city of Toronto, Canada and "[apply] it to the planning and design of trails in urban greenway systems through a series of planning guidelines" (1995, p. 391). Rooted in the context of Jay Appleton's prospect and refuge theory, the principles they discovered to be key to the planning and design of "green" and safe urban greenway trails are *visibility of others*, *visibility by others*, *choice and control*, *environmental awareness and legibility*, and *solitude without isolation* (Luymes & Tamminga, 1995). The planning and design guidelines – influenced by the five principles and the "safe communities" approach – were directed towards greenways in the Toronto area, and while it is necessary to understand the local context of each different greenway project, the guidelines are broad enough to be applicable to any urban greenway trail. The guidelines include *community and stakeholder involvement*; *setting priorities within urban greenway systems*; and *design and management considerations*. The latter are most applicable to the purpose of this thesis and consist of *lighting*, *signs and maps*, *vegetation design and management* , *movement options*, *self-policing*, and *locating activity generators* (Luymes & Tamminga, 1995).

According to the Toronto Safe Cities Committee, trail users' perceptions of safety cannot be countered with, or simply ignored due to, crime statistics because that "denies the legitimacy of user experience, and leads to disenfranchisement of the local community" (Luymes & Tamminga, 1995, p. 396). Instead, the authors state that "when safety is a paramount concern in the greenway planning process, the community support necessary for the integration of natural areas within the fabric of urban and metropolitan areas is more readily realized" (Luymes & Tamminga, 1995, p. 400).

The final study included in this synopsis is that of Wolch et al. which focuses on individual and environmental determinants of urban trail use in Chicago, Dallas, and Los Angeles, each of which present diverse urban settings (2010). Recognizing the multiple benefits that urban trails can provide, the authors state that "urban trails represent a multidimensional type of public open space that can be expected to influence physical activity and health, as well as to shape urban form, enhance urban ecological functioning, and promote a sense of community pride and identity" (Wolch, et al., 2010, p. 58). In order to identify possible determinants of trail use, trail-adjacent neighborhoods were evaluated for social and physical characteristics, and their residents were surveyed about social and economic demographics, their patterns of trail use, self-reported health status and motivations for physical activity, and their "perceptions of the trail environment including distance to the trail, neighborhood safety, trail safety, access to services, social cohesion, and neighborhood surroundings" (Wolch, et al., 2010, p. 62). While a variety of individual, neighborhood, environmental, and physical characteristics were mentioned as potential predictors of trail use, the authors point out that "in many cases perceptions are as important as objective characteristics…and may be more predictive of trail use than data on land-use mix (LUM), socio-economic status, or crime rates" (Wolch, et al., 2010, p. 59).

The analysis of the data collected from the surveys focused on the perceptions and characteristics that appeared to be determinants of trail use and elaborated upon those that appeared to affect the probability of non-users to become users and those that might influence an increased length (in time) of trail use. Analytical model results indicated that "intrinsic motivation, perceived trail safety, and perceived distance (in miles) between home and trail were individual-level factors significantly related to the probability of trail use" (Wolch, et al., 2010, p. 71), but that "efforts to increase perceived trail safety and decrease perceived distance

to the trail would have the biggest influence in converting nonusers to users, while also having the largest influence on increasing the time spent per week on the trail among trail users" (p. 71). Though the authors state that it must be considered a rough estimate, their results suggested that an improvement in perceived trail safety could increase a user's time on the trail by almost one hour each week, and that same amount of improvement in perceived safety would increase the probability that non-users would begin using the trail by 10.4% (Wolch, et al., 2010). The results pertaining to perceived safety in this study are quite impressive, and they further support the importance and need to investigate the perceptions of safety relating to the North Oconee River Greenway.

This collection of studies and accompanying research presents the combination of human need and preference for nature and the need for physical activity opportunities with the issues of safety and perceived safety in landscapes, specifically greenways and urban trails. The work discussed in this synopsis comes from multiple disciplines and is part of the limited research focusing on use of recreational greenways and factors affecting that use. While not always the prime factor, issues of safety, and equally important, *perceptions of* safety, are factors shown to correlate with trail use. Table 3.1 shows a summary of the findings in each study included in this synopsis as they relate to issues of safety. This thesis and the survey described in the following chapter were influenced by the previous research and studies, in addition to some of the relevant environmental design literature and theory that are related to perceived and actual safety and crime.

Table 3.1 – Summary of findings from previous studies

	Factors that ENHANCE Safety or a Positive Perception of Safety	Factors that ENHANCE Fear or a Negative Perception of Safety
Schroeder & Anderson (1984)	• open • long view distances • signs of development • near populated areas • well-maintained	
Nasar & Jones (1997)	• presence of groups of people / large numbers of other people • extensive view/no hiding places • lights • trees and shrubs not obstructing view	• entrapment (barriers to escape) • concealment (blocked prospect) • mystery - when in a "climate of fear" • potential victimization (presence of a stranger) • no possibility of obtaining help (no groups present
Herzog & Chernick (2000)	• openness • setting care • natural settings	
Gobster & Westphal (2004)	• solitude without isolation • vegetation management: more open understory, allowing for adequate lines of sight • populate the area with other people	
Luymes & Tamminga (1995)	• visibility of others • visibility by others • choice & control • solitude without isolation • legibility	
Wolch et al. (2010)	• streetlights • access point signage • trails well landscaped and maintained • social interventions ('programming') like "walking clubs	
	Factors influencing an INCREASE in "likeability" of urban greenway/trail	Factors influencing a DECREASE in "likeability" of urban greenway/trail
Chon & Shafer (2010)	• water • smooth ground • ordered elements • high degree of vegetation management • unobstructed views to immediate surroundings	• visually intrusive features (i.e. overpass bridges, adjacent roadways), especially those that increase the level of mystery to a point where it becomes a negative element
	Trail Features with POSITIVE correlation to trail use	Trail Features with NEGATIVE correlation to trail use
Reynolds et al. (2007)	• good visibility • mixed and urban views • streetlights • good trail condition • presence of trailside amenities	• litter • higher vegetation density • tunnel present • drainage features • natural areas adjacent to trail

PERCEPTION OF SAFETY & ENVIRONMENTAL DESIGN: RELEVANT LITERATURE AND THEORY

The literature and theories relevant to this thesis are all based on a continually growing body of environment–behavior research, and include the Kaplans' research and theory of landscape preference, Oscar Newman's defensible space theory, and Crime Prevention Through Environmental Design—commonly referred to as CPTED. The review and discussion of these theories focuses on the thesis topic of greenways and urban trail landscapes.

Given that greenways today often have the dual purpose of conserving natural environments and providing humans with restorative environments for humans as well as opportunities for recreation and education, it is important to consider theories of landscape perception and preference. The landscape preference research and theory of Rachel and Steven Kaplan are well-known within the field of landscape architecture, and their work influenced many of the research studies previously discussed. Because their work is well-known and widely accepted, a detailed description is not warranted; however, it is important to briefly recall their understanding-and-exploration framework and Preference Matrix as they relate most directly to perceptions of safety and fear.

The Preference Matrix is "concerned with the two basic informational needs [of humans] – understanding and exploration – and with a dimension that considers how readily available the information is" (R. Kaplan & Kaplan, 1995); Table 3.2 shows this matrix. The matrix shows that a person's immediate understanding of a scene is based on the level of *coherence*—the amount of order, pattern, and/or uniformity—in the scene, while the level of *complexity*—the number of different visual elements, the intricacy, or richness—of a scene affects a person's immediate desire for exploration of the landscape. On the dimension of inferred, or predicted, understanding, *legibility* allows a person to easily understand and, more importantly, to

remember a landscape. Inferred or predicted exploration is based on the level of *mystery* in a landscape scene; elements of mystery draw a person in and give a promise of further information if they continue into the landscape.

Table 3.2 – The Preference Matrix (R. Kaplan & Kaplan, 1995, p. 53)

	Understanding	Exploration
Immediate	**COHERENCE**	**COMPLEXITY**
Inferred, predicted	**LEGIBILITY**	**MYSTERY**

The four informational factors in the matrix act simultaneously as a framework for the prediction of preference for natural scenes. While this framework has been well-used as an analysis tool for understanding the general human preference of natural scenes, the level of a person's preference for nature is dependent upon each individual's familiarity and comfort level with different levels of nature (R. Kaplan & Kaplan, 1995). It could be these differing levels of comfort and familiarity with nature that enhance the paradoxical relationship between the visual and physical elements in a natural landscape that increase a person's preference for it and those that may increase a person's fear in the landscape. This contradiction is also posed in three journal articles previously discussed, particularly Schroeder and Anderson's study of rating landscape scenes for levels of "scenic quality" and "security"—difficult to achieve high levels of both in one natural scene (Schroeder & Anderson, 1984).

In their book *With People In Mind: Design and Management of Everyday Nature,* the Kaplans, and colleague Robert Ryan, write that "a feeling of fear or comfort can be produced by the physical layout of a setting… When the needs of understanding and exploration are not met, people feel frustrated and even threatened, adding to their fears and apprehension"

(1998, p. 31). People make decisions about places that translate to fear or comfort without even realizing it, and *visual access,* or what people can see, and *locomotion,* the ability to move through a space, are directly related to those decisions and are most important when trying to understand or design a landscape that is meant for people's use (R. Kaplan, et al., 1998). Visual access and locomotion are the bases for the patterns of fears and preferences, which the Kaplans and Ryan present. The basics of these patterns are shown in Table 3.3, and because the issues they concern are closely related, many of the patterns could fit under either heading (R. Kaplan, et al., 1998).

Table 3.3 – Patterns of fears and preferences, from R. Kaplan et al., 1998

FEARS	
Visual access	Visual access increases confidence.
Enhancing familiarity	Familiarity helps people feel more comfortable.
Human sign	Although indicators of human presence, like graffiti or litter, can be a source of concern, human sign is often reassuring.
PREFERENCES	
Coherent areas	A small number of coherent areas makes a setting easier to understand.
Smooth ground	Ground texture impacts preference.
Mystery	Mystery encourages exploration.
A sense of depth	Layers and landmarks enhance the sense of depth.
Openings	Openings in the woods are comforting both when one is in them and when one can look into them.

The other set of patterns that can affect fear in natural settings are those of way-finding. "Being lost can be terrifying. Fears of getting lost can contribute to people's decision to avoid unfamiliar natural settings," and elements of way-finding can reassure a potential trail

user that they will be able to find their way, “increas[ing] the quality and potential benefits of nature experiences” (R. Kaplan, et al., 1998, p. 49). The patterns of way-finding address a few issues: way-finding needs to be communicated directly; visitors need an understanding the spatial organization of the setting they are to enter, including potential destinations and routes to get them there; and way-finding can be enhanced by effective use of signs and maps—portable and posted (R. Kaplan, et al., 1998). The requirements of these issues can be met through patterns of environmental design and maps, which are shown in Table 3.4.

Table 3.4 – Way-finding patterns of design and maps, from R. Kaplan et al., 1998

DESIGN	
Regions	Coherent regions are helpful in way-finding.
Landmarks	Landmarks are most useful in way-finding when they are distinctive and not too many.
Paths and signs	Getting there and back can be aided by paths and signs.
MAPS	
Orientation for the new visitor	Key decision points need to be easily identified.
Mapping for the mind’s eye	Avoiding the accuracy hang-up leads to a more easily remembered map.
Labels and symbols	Maps are more helpful if the information is where one needs it.
Which way is north?	Align a posted map with the viewer’s position.
Check it out	Reactions from potential users can lead to surprising insights.

A few other patterns R. Kaplan et al. present in their book, which are pertinent to greenway trails and perceptions of safety are those of gateways, and trails and locomotion. Gateways can be used to define entrances to a particular landscape as well as providing elements of orientation and interest (Table 3.5). The design of trails can also provide many

elements of interest for a person experiencing the trailscape; at the same time, the design can aid in orienting a user and the overall functionality of the trail (Table 3.6).

Table 3.5 – Patterns of gateways, from R. Kaplan et al., 1998

GATEWAYS	
Gateways need partitions	Partitions create opportunities for gateways.
Gateways and orientation	A gateway provides information about what lies ahead.
The view through the gateway	A well-designed gateway can provide both information and mystery.

Table 3.6 – Patterns of trails, from R. Kaplan et al., 1998

TRAILS	
Trails, narrow and curving	The promise of discovering what lies just beyond the bend in the road greatly increases preference.
Views, large and small	What can be seen from the trail makes all the difference.
The trail surface	Trail surfaces are important, both visually and functionally.
The trail's path	Helping people stay oriented is an important function of a trail.
Points of interest	Stopping points along the way can provide opportunities for resting and observing.

The patterns that the Kaplans and Ryan present and suggest in their book incorporate their many years of research into people's landscape preferences and directly relate them to the design and management of natural settings and places for people's use. Many of the patterns could be beneficially applied to a greenway trail setting, and many of them relate to issues that can affect perceptions of safety in such a setting. Unfortunately, some of the patterns relating to fear and those of preference for nature can work in opposition of one another—as mentioned

earlier, especially those related to the "informational factor" of mystery in the Kaplan's Preference Matrix. The NORG's trailscape consists of both natural and urban/built environments, and users will experience the mix of both. Ensuring that the landscape of the NORG is coherent and legible would allow users to understand how to move through the landscape and remember it – increasing their level of familiarity with the trailscape. Elements of complexity and mystery can interest users and attract them into the landscape. Many of the patterns that the Kaplans and Ryan suggest in their book – such as "visual access," "a sense of depth," wayfinding, "points of interest," etc. – could be directly applied to the NORG and future greenway trails.

While the Kaplans' theories and patterns relate directly to natural landscape settings, the following two theories concern crime and fear of crime in urban settings and how physical design can influence and reduce both; the first is Oscar Newman's theory of *defensible space*. Defensible space came about as a reaction to noticeably rising crime rates in cities and to the increase in urban population in the United States at the time. In 1972, Newman wrote that "We are witnessing a breakdown of the social mechanisms that once kept crime in check and gave direction and support to police activity. The small-town environments, rural or urban, which once framed and enforced their own moral codes, have virtually disappeared" (p. 1). He claimed that a method for bringing communities together in joint action must be found and that, where it can be, the physical design of living environments must be exploited for this purpose (1972). Defensible space was meant to provide a way to restructure urban residential environments, through physical design, so that they become livable and controlled by a community of people who share common places (Newman, 1972).

The residential environments on which Newman's research and defensible space work focused were public housing projects, as they were the residential areas of cities most affected

by and related to increasing city populations and rising crime rates. While the theory addresses architecture and building layout, it also speaks to the relationship between buildings and their surrounding site grounds. It also addresses the continuum of public to private space within the site and how buildings and site interact with adjacent public streets and sidewalks. Because of this, and the fact that defensible space theory is accepted in the fields of crime prevention and environmental design, it is important to explore for its potential as part of this thesis.

"Defensible space is a surrogate term for the range of mechanisms—real and symbolic barriers, strongly defined areas of influence, and improved opportunities for surveillance—that combine to bring an environment under the control of its residents" (Newman, 1972, p. 3). The individual, yet also interdependent, elements of defensible space that allow architects and designers to create a clear understanding of the function of a space, and who its users are and ought to be, are *territoriality*, *natural surveillance*, *image*, and *milieu* (Newman, 1972). These characteristics are briefly described and examples of mechanisms are shown in Table 3.7.

Table 3.7 – Defensible space characteristics and mechanisms, information from Newman, 1972

Elements/ characteristics of defensible space	Description	Mechanisms to create defensible space
TERRITORIALITY	The capacity of the physical environment to create perceived zones of territorial influences.	• Subdividing the residential environment into zones toward which adjacent residents easily adopt proprietary attitudes • Defining a hierarchy of increasingly private zones, going from public streets to private apartments through the use of real & symbolic barriers

Elements/ characteristics of defensible space	Description	Mechanisms to create defensible space
NATURAL SURVEILLANCE	The capacity of physical design to provide casual and continual surveillance opportunities for residents and their agents.	• Positioning apartment windows to allow residents to naturally survey the exterior and interior public areas of their living environment • Facing building entrances and windows along the public streets to allow for passersby "surveillance" of residents entering buildings, while also allowing people inside to survey the adjacent sidewalks and streets
IMAGE	The capacity of design to influence the perception of a project's uniqueness, and stigma.	• Adopting building forms and idioms which avoid the stigma of peculiarity that allows others to perceive the vulnerability and isolation of the inhabitants • Using building materials and designs that are similar to higher income residential buildings, making them appear less institutionalized
MILIEU	The capacity of design to influence the perception of a project's isolation, and stigma.	• Enhancing safety by locating residential developments in functionally sympathetic urban areas immediately adjacent to activities that do not provide continued threat • Juxtaposing area of interest with other "safe" functional facilities or areas of activity

While the elements and mechanisms of defensible space were designed for urban residential environments, the general intent behind them may provide insight into the prevention of crime, and fear of crime, in other urban environments as well. For example, the true meaning behind *territoriality* might not work for a "public" urban greenway, but when

combined with the meaning behind *image*, the "territory" of the NORG could be defined through the use of identifiable materials, patterns, and signage.

Developed as an extension of Newman's defensible space concepts additional applied to commercial retail, industrial, institutional, and low-density residential environments, Crime Prevention Through Environmental Design (CPTED) is a contemporary approach for using physical design of the built environment to reduce crime and fear of crime, and improve quality of life through the implementation of three main strategies (Crowe & Institute, 2000). CPTED has a multi-disciplinary background of criminology, environmental psychology, crime prevention, and environment–behavior research, and it is based on the premise that "urban environments can influence criminal behavior in particular and behavior in general in two ways—physically, by providing the physical surrounds to which individuals respond; and socially, by providing the social relationships to which individuals respond" (Jeffery, 1971). Designed for implementation in many different urban environments, "CPTED is an attempt to reduce crime and fear in a target setting by 1) reducing criminal opportunity and 2) fostering positive social interaction among the legitimate users of that setting. The emphasis is on prevention rather than on apprehension and punishment" (Wallis, Ford, & Justice, 1981, p. 3).

In the most recent book written about CPTED, which also serves as a training course textbook, Timothy Crowe shares concepts of and questions raised by CPTED as they apply to the built environment. Crowe's writing suggests that understanding an environment at the level of crime and crime prevention may be overlooked or dismissed in the design and management process. Potentially because of this, Crowe lists three points that are made at each CPTED seminar (seminars are meant to assist the builders, planners, architects, and police and security consultants who make decisions about individual projects): "1) Never look at the environment the same way again; 2) Question everything, no matter how trivial; and 3) Learn the language

of the professions you are working with and you will understand their motivations" (2000, p. 2). While landscape architects and urban designers often collaborate with other professions and are trained to look at an environment and see it on many different levels, it is fair to say that looking at an environment through the lens of preventing crime and fear of crime is less commonly a designer's focus. To that point, a review of the concepts and strategies of CPTED is included in this thesis.

The concept of CPTED is based on the idea that manipulation of the physical environment can affect behavior so as to reduce the incidence and fear of crime, thereby improving quality of life (Crowe & Institute, 2000).

> CPTED involves design of physical space in the context of the needs of bona fide users of the space (physical, social, and psychological needs), the normal and expected (or intended) use of the space (the activity or absence of activity planned for the space, and the predictable behavior of both bona fide users and offenders). (Crowe & Institute, 2000, p. 35)

CPTED also works on the premise that environmental cues affect normal and abnormal users of a space. Cues that tell a normal user that he/she is unsafe in a particular space will most likely have the opposite effect on an abnormal user who will perceive those same cues as an indication that there is a low risk of being detected; the opposite works as well, cues that tell a normal user that he/she is safe will increase the perception of risk for an abnormal user (Crowe & Institute, 2000).

The three overlapping concepts and strategies in CPTED are *natural access control*, *natural surveillance*, and *territorial reinforcement* (Figure 3.1). Access control and surveillance are mutually inclusive and certain strategies can achieve both, but they operate differently. Strategies of access control, such as spatial definition, are meant to "deny access to a crime target and to create a perception of risk in offenders" (Crowe & Institute, 2000, p. 36), while strategies of surveillance, such as the particular placement of windows, is meant to keep

intruders under observation. Access control and surveillance can be achieved through three different strategies classified as organized, mechanical, and natural; organized and mechanical strategies are the traditional crime prevention techniques, whereas natural strategies result as a byproduct of the normal and routine use of a physical space (Crowe & Institute, 2000). It is the *natural* approach of access control and surveillance that are most important to the design of the built environment. Strategies of natural access control and natural surveillance mutually contribute to the concept of territorial reinforcement by creating or extending a sphere of influence in an environment so that users develop a sense of proprietorship—or territorial influence—and potential offenders perceive that territorial influence (Crowe & Institute, 2000).

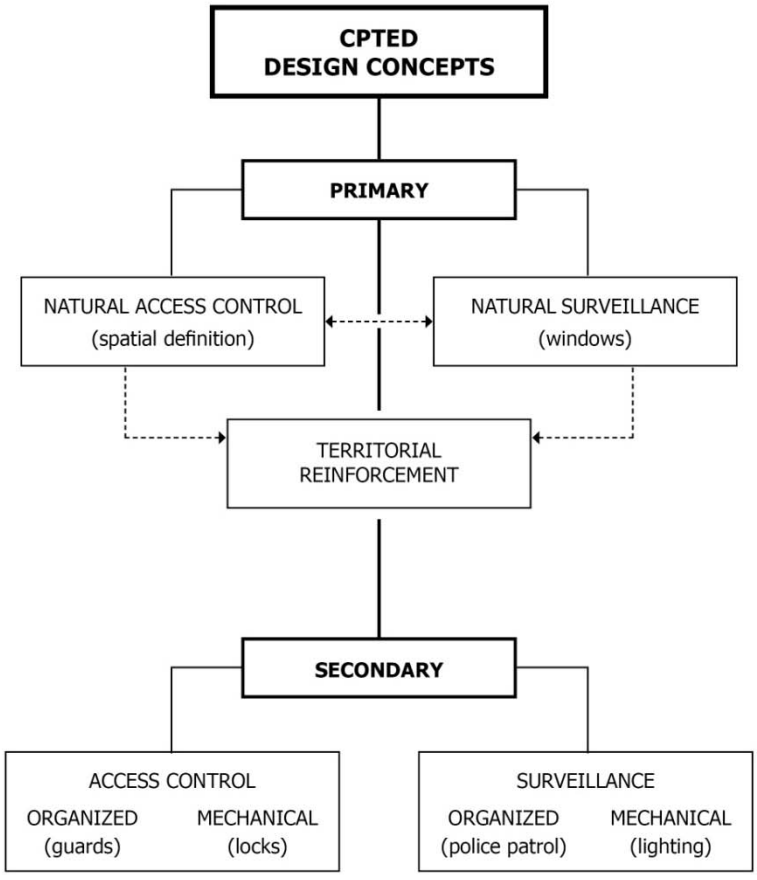


Figure 3.1 – Primary and secondary CPTED design concepts, figure adapted from Crowe & Institute, 2000

Because the concepts of CPTED are only successful when they are practical for and understood by the normal users of a space, Crowe offers a "Three-D approach" to space assessment that is meant to be a guide for determining the appropriateness of how a space should be designed and used. The Three-D approach is based on the following concepts: all human space has some *designated* purpose; all human space has social, cultural, legal, or physical *definitions* that prescribe the desired and acceptable behaviors; and all human space is *designed* to support and control the desired behaviors (Crowe & Institute, 2000). Questions related to designation, definition, and design of a space can be asked in order to understand which strategies of territorial reinforcement, natural access control, and natural surveillance might be best (see Appendix B for list of Three-D questions).

Also important to decision-making when using CPTED for an environment is the gathering and use of information; "the five basic types of information that are needed for good CPTED planning are crime analysis information, demographic information, land use information, observations, and resident or user interviews" (Crowe & Institute, 2000, p. 41). Crowe states that the information gathered does not have to be sophisticated, but rather it should be available in simple, useable formats. He admonishes that:

> Any attempt to skip the basics in favor of more complex forms of information gathering or analysis often obscures the picture. Professionals often suppress the active participation of residents or space users by relying on complex modes of analysis. This is dangerous because it can cause some very basic ideas or explanations to be overlooked. (Crowe & Institute, 2000, p. 43)

Use of these types of information and collaboration with users of a space will allow CPTED planning to be more comprehensive and ultimately successful.

Lastly, not only is CPTED a set of concepts, strategies, and guidelines, it is also a program. While the implementation process of the CPTED program is outside the scope of this thesis, it is important to note that a program can be started by grassroots organizations

(bottom–up) or initiated through top–down approaches of a governing body, and its process of implementation can be applied to many types and sizes of spaces (Wallis, et al., 1981).

SUMMARY OF THREE THEORIES

The Kaplans' theory differs from defensible space and CPTED in that it does not relate to crime, but rather to how the design of natural settings for human use can influence fears in a landscape. Defensible space and CPTED directly relate to crime, fear of crime, and even the prevention of crime. While defensible space was intended for highly built, urban residential environments, it was a major influencing theory from which CPTED was developed. CPTED breaks away from purely residential situations, opening up its application to additional types of urban environments, and raising questions meant to help distinguish, define, and design spaces so as to reduce opportunity for and fear of crime. Defensible space theory and CPTED provide strategies that can give legitimate users of a space proprietary influence of it while also using the physical design of a space to influence the action of abnormal users. The Kaplans' theories and strategies also give control and confidence to users of designed natural environments, so as to alleviate fears in and increase preference for them.

Urban greenways are a combination of both urban/built and natural environments; they are also public recreational spaces, the use of which has been shown to be affected by fear and perceptions of safety. The Kaplans' theories most naturally fit to an urban greenway setting in that they address human fears and preference of nature for people's experience of a landscape. Defensible space and CPTED deal with prevention of crime and fear of crime in urban settings, ranging from private to public spaces. Some of defensible space theory and CPTED's characteristics and strategies may be applicable to an urban greenway, and combining these

with the Kaplan's theories may lessen fears and negative perceptions of safety in both natural and urban/built environments.

CHAPTER FOUR: SURVEY METHODOLOGY, QUESTIONNAIRE, AND RESULTS

In order to address the research discussed in the previous chapter within the context of the North Oconee River Greenway (NORG) and to gain information specific to the greenway, this thesis's research includes a survey of residents and college students in Athens, Georgia. Before this survey was conducted, perception of safety was only presumed by the researcher and managers of the greenway to be a significant obstacle to trail use. The purpose of the survey was to provide support for the argument that perceived safety is in fact a reason why people do not use the greenway. Because there has not been any trail use data collected prior to this thesis, a secondary purpose of the survey was to be the first instance of use-related data gathering for the NORG. The process of developing this survey began before the in-depth literature review, however, the final survey design and content of the questionnaire was influenced by the prior studies, research, and theory previously described.

QUESTIONNAIRE

The survey consisted of a questionnaire distributed in person and online over a period of ten days in mid-April, 2011. The questionnaire (Appendix C) consisted of 6 to 16 questions depending on whether or not the participant had ever used the NORG – 16 for "yes", 11 for "no", and 6 for "I didn't know Athens had a greenway." It included questions about facts and demographics, the participants' attitudes and beliefs, and their behaviors. While each participant was asked questions about general outdoor recreation and demographics (age,

gender, ACC residency status), most of the questions were directly related to the participant's perception of safety and elements/situational aspects of the trail that might indirectly affect one's perception of safety—these questions were informed by the research and literature review. The questionnaire consisted of mostly close-ended questions for their ease of coding, consistency of response alternatives for all participants, and the desire to keep the participation process brief (Cozby, 2007). Participants answered multiple questions about the level of safety on the greenway in a few different formats; these questions included two different types of scaled questions, several yes/no questions, and a few multiple choice/multiple answer questions with the option of an open-ended "other" answer choice, as well as one open-ended follow-up question. The participants who have used the NORG were asked to rate their level of agreement on a Likert attitude scale to eleven different statements; the question included statements about safety on the trail directly as well as about how well-maintained the trail was, how busy/active with other people it is, and how clear the pathway/route of the trail is, among others. Another question used a *semantic differential scale* which "can be selectively used to identify the *quality* and *intensity* of meaning that [environment–behavior] topics such as environments, persons, places, and situations hold [for a person]" (Zeisel, 2006, p. 268); in this question both participants who have and have not used the NORG were presented the same set of eight bipolar adjective pairs on a 5-point scale as they applied to the greenway for each participant. These two types of scaled questions were chosen in the hope of understanding the degree of safety related perceptions of the greenway. The direct question: "Do you think the North Oconee River Greenway is safe?" and its follow-up question to the "No" answer were expected to gain a more straightforward understanding of the reasons why some participants have that belief. Questions specifically for participants who have not used the NORG were intended to find out whether or not perceived safety was a reason, in addition to any other

potential reasons. Understanding that perceived safety issues may not be the only inhibitor to greenway trail use or frequency of use, the questionnaire covered a range of safety-related questions so that if perceived safety is not a significant factor, other factors could still surface.

PARTICIPANTS & DISTRIBUTION

The intended target population for the survey was the general, adult population of Athens, Georgia; however, in addition to participants randomly recruited in public locations of the city, participant groups more available to the researcher were also used so as to increase the number of participants recruited within a relatively short period of time. Questionnaires were distributed in person to willing survey participants along College Avenue in downtown Athens, at the five-point street intersection in the Five Points area of Athens, outside of the Georgia Square Mall in western Athens, and at the Georgia State Botanical Gardens (free admission to the public) in the southern part of Athens-Clarke County (ACC). Additional questionnaires were distributed in person at Terrapin Beer Co.'s local brewery after their third annual Terrapin Beer 5K Plus One More Mile run/walk road race in Athens, as well as before and after a morning Jazzercise class in Watkinsville, Georgia. A recruitment letter and hyperlink to the online questionnaire was emailed to the students, faculty, and staff in the College of Environment and Design (CED) via the CED listserv and to the ACC Federation of Neighborhoods—a coalition of neighborhood and citizens' groups in Athens-Clarke County—by the administrator of their listserv. A brief announcement for and hyperlink to the online questionnaire was also posted on the Athens-Clarke County Greenways and Riverside Parks Facebook page by Melinda Cochran, the greenway coordinator. Overall, 163 questionnaires were started, and 155 questionnaires were completed—43 from the in-person distribution

(28%), and 112 from the online questionnaire (72%); see Table 4.1 for a breakdown of the completed questionnaires by participant groups.

Table 4.1 – Questionnaire distribution

Physical locations and electronic means of questionnaire distribution	Number distributed	Percent of total
Public places in Athens, GA	17	11%
Terrapin Beer Co. (3rd Annual Terrapin 5K+1mi Race)	17	11%
Jazzercise (in between two busy classes)	9	6%
ACC Greenway and Riverside Parks Facebook page & College of Environment & Design listserv	89	57%
ACC Federation of Neighborhoods member listserv	23	15%

RESULTS

Focusing on issues of perceived safety, while trying to be open to other potential factors of trail use, the questionnaire was somewhat multifaceted and, likewise, so are the data retrieved from the questionnaire. In order to organize the data for use in this thesis, the results are discussed in the following order: demographic and general information, results specific to non-users, results specific to trail users, results specific to perceptions of safety, results specific to how active with other users the trail is, the semantic differential scale (bipolar adjective pairs) question, specific areas of the greenway that are thought of as unsafe and some of the reasons behind the thoughts (both based on open-ended responses), and finally variations in the results of males and female participants, a comparison of students versus non-students, and finally two pertinent subsets of users.

Demographic and general information Out of the 155 completed questionnaires, 62% (96) of the participants were female and 38% (58) were male. Ages of the participants ranged

from 19 years to 70 years of age; the median age was 31, and 60% of the participants were of age 23 to 39 years (see Table 4.2). Seventy-eight percent of the participants reported living in Athens-Clarke County (ACC), of that 78%, 50% were permanent residents of ACC, 15.6% were both permanent residents and students, and 34.4% were only students living in the county (see Table 4.3). There was a flaw in the question about residency; the participants who marked themselves as living outside of ACC were not given the option to say whether or not they were also a student. However, if every student who answered a questionnaire lives in ACC, then only 39% of the total 155 participants were students. While 5% of the participants were unaware that Athens has a greenway (8 people), of those who were aware of it, 22% (34 people) have never used it (*non-user*), and 73% (113 people) have used it at least once (*user*). The last piece of general information that relates to all participants is general outdoor recreation, and 91.6% of the participants do participate in outdoor recreation activities other than on the NORG. See Table 4.4 for a breakdown importance factors respondents consider when choosing a place for outdoor recreation, which will be referred to again later.

Table 4.2 – Age distribution of survey participants

Age in years of participants, combined into age groups	Response count	Response percent
18–22	16	11%
23–24	15	10%
25–29	32	22%
30–34	27	18%
35–39	14	10%
40–44	10	7%
45–49	8	5%
50–54	8	5%
55–59	8	5%
60–64	5	3%
65 and older	4	3%

Average is 35 years; median is 31 years; mode is 23 years

Table 4.3 – ACC residency status of survey participants

Place of residence for survey participants, and the number of responses for each category	ACC permanent residents	Students	Percent of all participants
Athens-Clarke County (ACC)	121		78%
Permanent resident of ACC	61		39%
Permanent resident of ACC & a student	19		12%
Student living in ACC	42		27%
Outside of Athens-Clarke County	34		22%

80

61*

*If every student who participated in the survey lives in ACC, then 39% of all participants were students

Table 4.4 – Factors used when considering a place for outdoor recreation

Factors used when considering a place for outdoor recreation	Level of importance on a scale of 1.00 to 5.00, as reported by survey participants					Average rating
	Not at all (1.00)	Slightly (2.00)	Moderately (3.00)	Very (4.00)	Extremely (5.00)	
Natural features	1	2	30	51	63	4.18
Safety/Security	0	7	31	62	47	4.01
Ease of access	0	5	42	66	34	3.88
Distance from your home	3	14	36	59	35	3.74
Level of care/maintenance	2	9	43	66	26	3.72
Ease of use, provision of park/trail maps	4	12	40	66	25	3.65
Type of activities available	3	20	43	48	29	3.56
Size (of park)/Length (of trails)	5	16	55	50	21	3.45
Number of other people using same location	4	27	58	45	12	3.23
Amenities (restrooms, food stands, parking, etc.)	11	39	46	31	18	3.04
Amount of privacy/aloneness you would have	12	36	52	32	13	2.99

Non-user information The gender distribution of non-users is 67.6% female, 32.4% male, and the median age is 29 years—both demographics similar to the overall participant group. When compared to the total participants, a higher percentage of non-users, 35%, do not live in ACC, however 65% do live in the county. Non-users were asked how far access to the NORG is from their home. While 23.5% did not know, out of those who could estimate a distance, 69% of them listed the greenway as being more than 2 miles away. Non-user participants were also asked why they do not use the NORG and were allowed to choose multiple answers and provide others. The answer choice, “I never think about it / it doesn’t occur to me to use it / I forget that it exists” was the most common answer, followed by “I live

too far away from it, it's not convenient for me." However, 37% of non-users also chose the statement "It is not safe." See Table 4.5 for more detail and Appendix D for the open-ended responses to this question.

Table 4.5 – Explanations for not using the NORG

Explanations indicated by non-user survey participants for not using the NORG	Response count	Response percent
It is not easy for me to access	10	29%
It is not safe	13	37%
I live too far away from it, it's not convenient for me	16	46%
The trail is too short for the activities for which I would want to use it	0	0%
I never think about it / it doesn't occur to me to use it / I forget that it exists	20	57%
Other (see Appendix D)	4	11%

User information The gender distribution of trail users is 60% female, 40% male, and the median age is 31—also both demographics similar to the overall participant group. Most (86%) of the trail users live in ACC, and 42% reported using the NORG monthly or a few times per year. Table 4.6 shows the specific distribution of answers, and while 29% of users frequent the NORG monthly, 24% have only ever used the trail one time.

Trail users were also asked what days of the week and times of the day they use, or have used, the NORG, and according to their answers, the trail is used most often on Saturdays and Sundays, having relatively consistent use during all times of the days, slightly more around the mid-day hours. Use is much less, but consistent throughout the weekdays, with use increasing later in the day (Figure 4.1). While this data cannot act as a substitute for official user counts conducted over time, it does provide an indication of when people most use the trail. The top

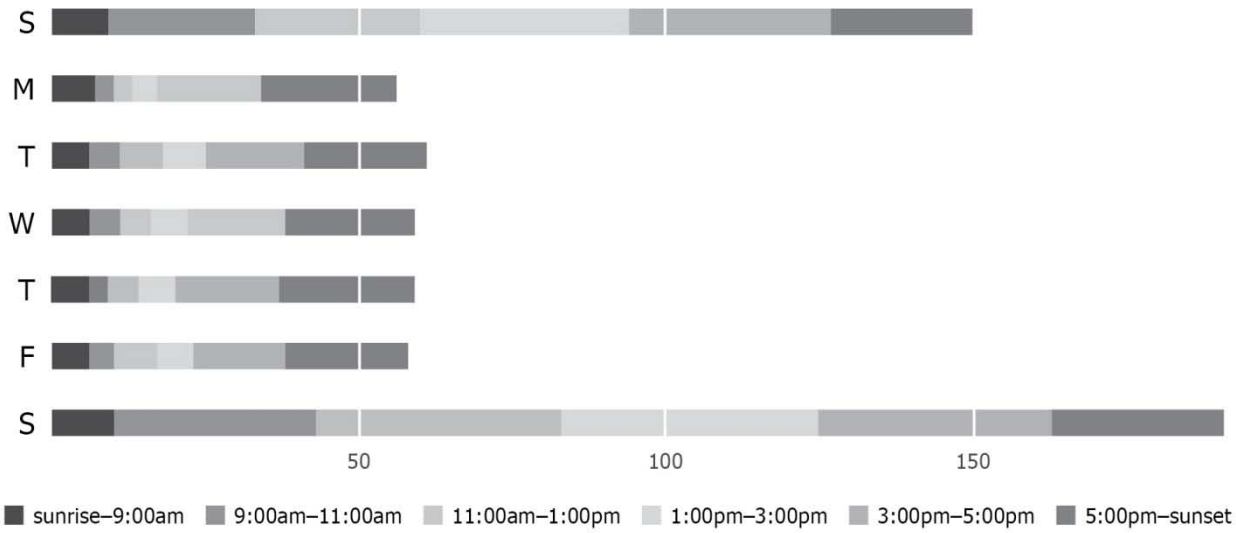
three most common uses for the NORG were hiking/walking, appreciating nature/the outdoors, and biking (Table 4.7).

Trail users were also asked a few questions relating to wayfinding along the greenway. It was unclear to almost 50% of trail users how to get onto the NORG the first time they used it, and 40% of users thought that there are not enough informational signs or orientation devices to aid them in staying on the trail. According to the Likert scale question (Table 4.8), users appear to be somewhat uncertain (shown by the statement's rating of 3.35 out of 5) as to whether or not they would be able to get off the trail if they needed or wanted to. Lastly, none of the trail users who participated in the survey have ever used an emergency blue light phone along the trail, and only 20% of them even remember seeing one.

Table 4.6 – Frequency of use for all trail users

Frequency of use for all trail users	Response count	Response percent
Daily	8	7%
Weekly	16	14%
Monthly	33	29%
A few times per year*	15	13%
Only once	27	24%
Other (see Appendix F)	15	13%

*based on open-ended "other" responses, "a few times" refers to at least 2 times per year up to about 8 times per year



Note: numbers of people for each day of the week and time of day consist of how many people indicated that they have used the NORG during a particular day of the week or time of day; the numbers do not coinside with the total number of times survey participants have used the NORG (not a substitute for a trail user count)

Figure 4.1 – Indication of trail use by day of week and time of day

Table 4.7 – Activities for which survey participants use the NORG

Activities for which survey participants use the NORG	Response count	Response percent
Hiking/Walking	76	67%
Appreciating nature/the outdoors	61	54%
Biking	51	45%
Running	39	35%
Spending time with family	38	34%
Spending time with friends	36	32%
Dog walking	34	30%
As a route for transportation	14	12%
Canoeing or kayaking	5	4%
Other (see Appendix F)	13	12%

Table 4.8 – Likert rating scale, question for trail users

Statements about the NORG, rated by trail users	Level of agreement on a scale of 1.00 to 5.00, as reported by survey participants					Average rating
	Strongly Disagree (1.00)	Disagree (2.00)	Uncertain /Neutral (3.00)	Agree (4.00)	Strongly Agree (5.00)	
It is important to me to have outdoor recreational opportunities, like the NORG, close to my home.	1	2	2	22	86	4.68
I would recommend using the NORG to my family and friends.	3	9	16	52	33	3.91
The NORG appears to be well-maintained.	1	11	16	61	23	3.84
When on the NORG, it is clear what the pathway/route of the greenway is.	3	20	13	49	28	3.70
The NORG is easy for me to get to.	3	24	15	33	37	3.69
I feel safe/secure when I am on the NORG.	3	18	24	54	14	3.51
The NORG is safe.	4	12	37	48	12	3.46
The parks along the NORG are safe.	1	15	45	40	11	3.40
When on the NORG, I feel I could easily get off of the trail if I needed to or wanted to.	2	29	25	42	15	3.35
The NORG is busy/active (many other trail users).	7	41	37	19	8	2.82
A lot of people use the NORG.	9	35	43	19	6	2.80

Safety specific results Both trail users and non-users were asked the question: "Do you think the NORG is safe?" Out of all survey participants, 57.5% answered "Yes," and 42.5% answered "No." When dividing the participants' answers to this question by users and non-users, the resulting percentages were almost exactly opposite for the two groups: 63.7% of users think it is safe and 36.3% think it is not safe, whereas 36.4% of non-users think it is safe and 63.6% think it is not safe. Participants who indicated that they do not think the NORG is safe were also asked why they think so and could give multiple answers. Table 4.9 shows the breakdown of the answers based on user or non-user, but overall, out of the close-ended choices, 56% of the participants listed the NORG "goes through parts of town that are not safe" as a reason; 47% listed "It is not well used (not many people use the greenway);" 25% listed "I've been told by my family members and/or friends that it is not safe;" and 3% listed "I've been told by a person of authority that it is not safe." Forty-four percent of the survey participants listed "other" as a reason; the detailed open-ended responses are shown in Appendices D and E, and common trends from the answers are described later in this chapter.

Regardless if trail users think the NORG is safe or not, they answered a follow-up question as to whether or not they have ever felt unsafe while on the NORG. At one point or another, 36% of trail users have felt unsafe on the greenway; the detailed open-ended responses related to this question can be seen in Appendix E, and common answers are described later in this chapter. Also, the first three statements included in the Likert scale question (Table 4.8) directly related to safety on the greenway and its riverside parks; the statements received ratings of 3.46, 3.51, and 3.40, respectively, out of 5.0. These scores also show that a highly positive perception of safety on the greenway is not apparent for users of the NORG.

Table 4.9 – Trail users vs. non-users, responses to "why do you think the NORG is not safe?"

Explanations indicated by survey participants for why they think the NORG is not safe	Percent of *users* (number of responses)	Percent of *non-users* (number of responses)
It is not well used (not many people use the NORG)	49% (22)	43% (10)
It goes through parts of town that are not safe	58% (26)	52% (12)
I've been told by my family member and/or friends that it is not safe	24% (11)	26% (6)
I've been told by a person of authority that it is not safe	4% (2)	0% (0)
Other (see Appendices D and E)	51% (23)	30% (7)

Results related to trail activity level Trail users and non-users each answered a question relating their frequency of use and inclination to use, respectively, to the number of other people using the NORG (questions 3 and 15, Appendix C). The two questions were slightly different from one another, but the intent of both was the same – whether or not trail use by other people would affect the participant's current amount of use. Of both trail users and non-users, 37.7% indicated that they would use the trail more often than they currently do (or use it at all if they hadn't before). Adding the number of non-users who said they *might* be ("Maybe") more inclined to use the NORG, if they knew it was used by a lot of people, that number increases from 37.7% to 48%. Only 10% of all survey participants indicated that they definitely would not use the NORG more often if they knew a lot of other people used it, however 54% of trail users said that it would make no difference in their current use of the NORG. Also, out of the 68 participants who do not think that the NORG is safe, 47% of them listed that the NORG is not well used as a reason for why they do not think it is safe. Based on the Likert scale question (Table 4.8), trail users perceive the NORG as not being used by a lot of

other people, and not very busy/active with other trail users – 2.80 and 2.82, respectively, out of 5.0 on the scale.

Semantic differential scale Intended to ascertain general perceptions of the NORG by both users and non-users, the semantic differential scale (bipolar adjective pairs) question did not result in significantly positive or negative data. The adjective pairs *boring/fun* and *stressful/revitalizing* relate to humans' preference for and benefits from nature, while the pair *neglected/well-maintained* relates to how well-cared for the landscape is. The pairs *uninviting/inviting*, *dangerous/safe*, and *alone–isolated/public–open* relate to perception of safety of the NORG, and the pairs *inconvenient/convenient* and *far away/nearby* relate to how easy it might be to use the NORG. Figure 4.2 shows the results of the question for trail users and non-users (it should be noted that non-users had the option of choosing "I don't know" instead of responding on the given scale for each adjective pair). To generalize the results, both users and non-users think of the NORG as somewhat fun and revitalizing and equally alone/isolated and open/public, whereas non-users think of the NORG as less convenient, less well-maintained, farther away, and much less safe.

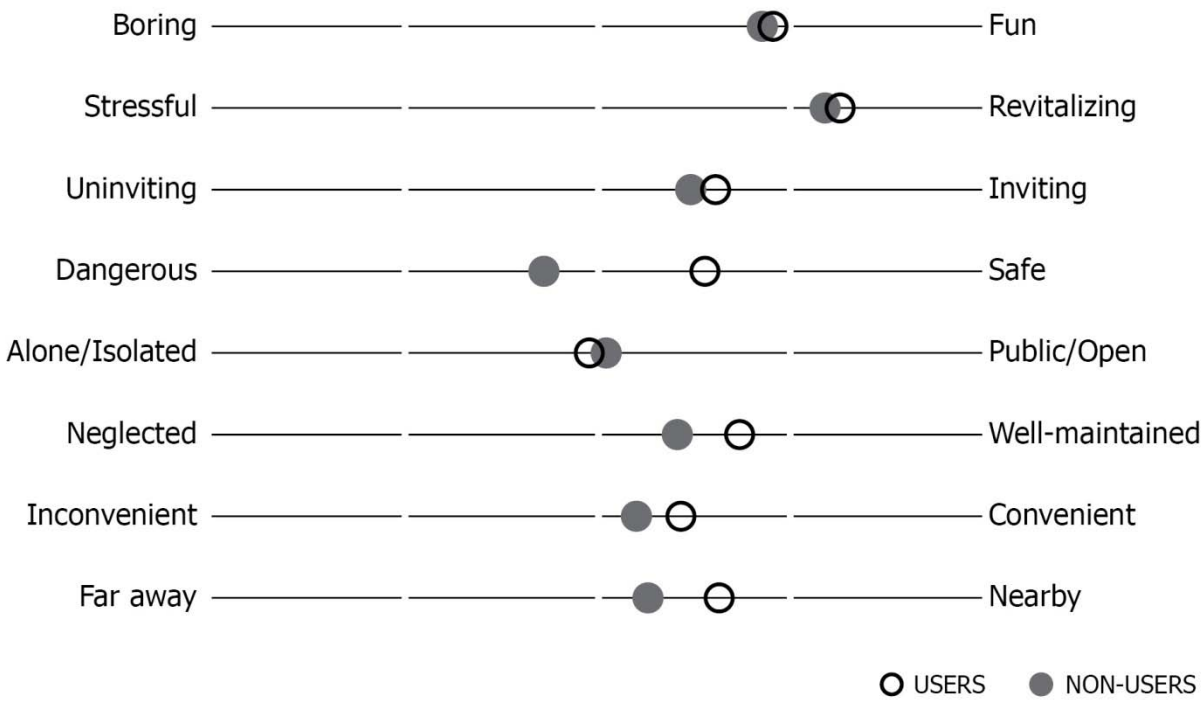


Figure 4.2 – Perceptions of trail users vs. non-users, based on the average ratings on the semantic differential scale (-2.00 to 2.00) of bi-polar adjective pairs

Open-ended responses As mentioned earlier, all of the open-ended responses are included in Appendices D, E, and F. From these responses, a few specific areas/sections of the NORG were identified as being unsafe by the survey participants, and several common factors and elements that led to some participants feeling unsafe while on the greenway were also identified. Specified areas and sections of the greenway were: the North Avenue bridge area, North Oconee River Park, Dudley Park, the corner of North Ave. and Dr. Martin Luther King (MLK) Parkway, the Loop 10 overpass on the northern part of the trail, the section along Willow Avenue between North Ave. and College Avenue, and sections with dense and tall vegetation on either side of the trail (see Figure 4.3). Common elements of areas indicated as being unsafe were: homeless people in parks and along the trail, homeless encampments visible from the trail and sidewalks connecting to the trail; drug addicts and prostitutes hanging out at the

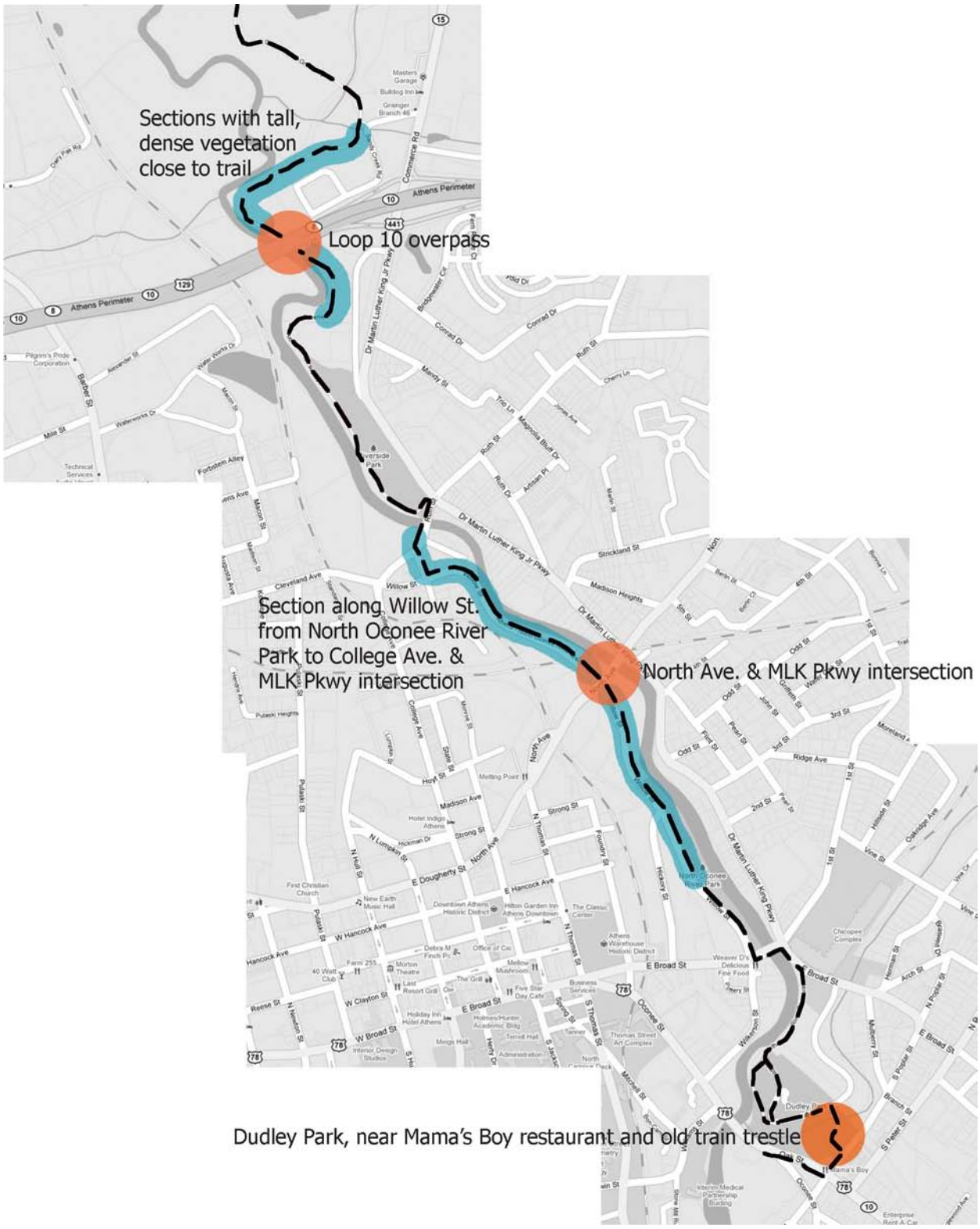


Figure 4.3 – Map of NORG trail, specific areas (orange) and sections (blue) identified as 'unsafe' by survey participants in open-ended responses

corner of North Ave. and MLK Pkwy and along the Willow St. section; robberies and assaults in the parks and areas along the greenway; deserted areas, inactivity of the trail, or lack of other people using the trail; feelings of isolation, and the lack of easy escape routes.

Females vs. Males The percentage of female and male users and non-users were quite similar – females: 74% users, 26% non-users; males: 80% users, 20% non-users. Female trail users are more likely to think that the NORG is not safe than male users, and females are more likely to have felt unsafe while on the NORG than males (Table 4.10). Also, a much higher percentage of female non-users (73%) think that the NORG is not safe than male non-users (40%). Of the non-users, in contrast to 18% of males, 43.5% of females listed "it is not safe" as a reason why they do not use the NORG.

Table 4.10 – Female vs. male survey participants, safety-related questions

		Percent of *females* (number of responses)	Percent of *males* (number of responses)
All survey participants		62% (96)	38% (58)
Users		74% (67)	80% (45)
Do you think the NORG is safe?	Yes	57% (38)	73% (33)
	No	43% (29)	27% (12)
Have you ever felt unsafe on the NORG?	Yes	40% (27)	30% (13)
	No	60% (40)	70% (31)
Non-users		26% (23)	20% (11)
Do you think the NORG is safe?	Yes	27% (6)	60% (6)
	No	73% (16)	40% (4)

Students vs. Non-students To simplify the comparison of students versus non-students, only those participants who reported living in ACC are considered. Tables 4.11, 4.12, 4.13, and

4.14 show the details of all the compared answers. Most of the student survey participants were female (77%), while the gender distribution of the non-students was near equal. As expected, the age distribution of the students (ranging from ages 20 to 45 years) was overall younger than that of the non-students (ranging from ages 25 to 71 years). Of the trail users, students reported feeling unsafe while on the NORG slightly more than non-students (44% and 35%, respectively), but of the non-users, a higher percentage (75%) of non-students think the NORG is not safe compared to students (54%).

Table 4.11 – Students vs. non-students, demographic information

	Percent of *students* (number of responses)	Percent of *non-students* (number of responses)
Age group		
18–22	25% (14)	0% (0)
23–24	25% (14)	0% (0)
25–29	28% (16)	20% (12)
30–34	16% (9)	20% (12)
35–39	4% (2)	10% (6)
40–44	2% (1)	8% (5)
45–49	2% (1)	5% (3)
50–54	0% (0)	10% (6)
55–59	0% (0)	12% (7)
60–64	0% (0)	8% (5)
65 & older	0% (0)	5% (3)
Gender		
Male	23% (14)	53% (32)
Female	77% (47)	47% (28)

Note: these comparisons of students vs. non-students only include the participants who reported living in ACC.

Table 4.12 – Student vs. non-student survey participants, safety-related questions

		Percent of *students* (number of responses)	Percent of *non-students* (number of responses)
Users		79% (48)	82% (50)
Do you think the NORG is safe?	Yes	60% (29)	64% (32)
	No	40% (19)	36% (18)
Have you ever felt unsafe on the NORG?	Yes	44% (21)	35% (17)
	No	56% (27)	65% (32)
Non-users		18% (11)	18% (11)
Do you think the NORG is safe?	Yes	46% (5)	25% (3)
	No	54% (6)	75% (9)

Note: these comparisons of students vs. non-students only include the participants who reported living in ACC.

Table 4.13 – Students vs. non-students, responses to "why do you think the NORG is not safe?"

Explanations indicated by survey participants for why they think the NORG is not safe	Percent of *students* (number of responses)		Percent of *non-students* (number of responses)	
	Users	Non-users	Users	Non-users
It is not well used (not many people use the NORG)	59% (13)	83% (5)	32% (6)	44% (4)
It goes through parts of town that are not safe	55% (12)	67% (4)	63% (12)	56% (5)
I've been told by my family member and/or friends that it is not safe	32% (7)	50% (3)	16% (3)	22% (2)
I've been told by a person of authority that it is not safe	9% (2)	0% (0)	0% (0)	0% (0)
Other (see Appendices D and E)	41% (9)	33% (3)	63% (12)	33% (3)

Note: these comparisons of students vs. non-students only include the participants who reported living in ACC.

Table 4.14 – Students vs. non-students, explanations for not using the NORG

Explanations indicated by non-user survey participants for not using the NORG	Percent of *students* (number of responses)	Percent of *non-students* (number of responses)
It is not easy for me to access	27% (3)	25% (3)
It is not safe	36% (4)	50% (6)
I live too far away from it, it's not convenient for me	18% (2)	42% (5)
The trail is too short for the activities for which I would want to use it	0% (0)	0% (0)
I never think about it / it doesn't occur to me to use it / I forget that it exists	82% (9)	33% (4)
Other (see Appendices D and E)	18% (2)	0% (0)

Note: these comparisons of students vs. non-students only include the participants who reported living in ACC.

Users Subset: users who have felt unsafe while on the NORG As mentioned earlier, 36% of the users (40 people) have felt unsafe at one time or another while on the NORG. Users in this subset tend to be more infrequent users, but they do cover the full range of frequency of use; see Table 4.15 for a detailed breakdown. Like the complete users group, this subset reports using the NORG during all days of the week and at all times of the day, and they too use it more frequently on the weekends and later in the day. The gender distribution in this subset is 67.5% female, 32.5% male; 92.5% of these users live in ACC (60% permanent residents, 52.5% students), and the subset covers all of the age groups, however 72% of them are ages 24 to 39. Of the users who have felt unsafe while on the NORG, 57.5% of them think that it is not safe – a higher percentage than that of all users (36.3%). According to the answers to the semantic differential scale question (bi-polar adjectives), *and* according to the Likert scale question (rating the level of agreement to a set of statements), this subset of users appears to have more negative perceptions of the NORG; comparisons of this subset and all users are shown in Figure 4.4 and Table 4.16. Interestingly, the users who have felt unsafe

while on the NORG reported thinking of it as much more “alone/isolated” on the semantic differential scale than did all users combined (ratings of -0.76 and -0.05, respectively).

Table 4.15 – Frequency of use for trail users who have felt unsafe while on the NORG

Frequency of use for *users who have felt unsafe while on the NORG*	Response count (compared to *all users*)	Response percent
Daily	7 (8)	18%
Weekly	3 (16)	8%
Monthly	10 (33)	25%
A few times per year*	5 (15)	13%
Only once	12 (27)	30%
Other (see Appendix F)	3 (15)	8%

*based on open-ended “other” responses, “a few times” refers to at least 2 times per year up to about 8 times per year

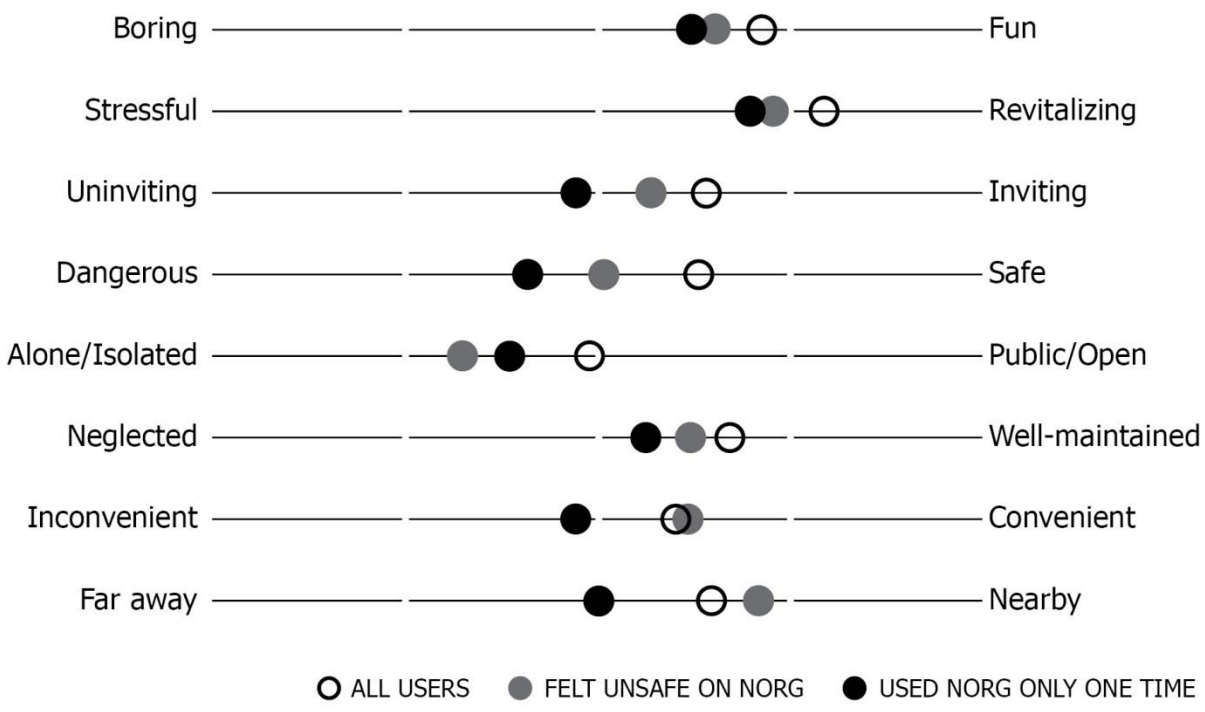


Figure 4.4 – Perceptions of users and two subsets of users, based on the average ratings on the semantic differential scale (-2.00 to 2.00) of bi-polar adjective pairs

Table 4.16 – Likert rating scale, trail users vs. two subsets of users

Statements about the NORG, rated by trail users	Average rating for level of agreement on a scale of 1.00 (strongly disagree) to 5.00 (strongly agree)		
	All users	*Users who felt unsafe on NORG*	*Users who only used NORG one time*
The NORG is safe.	3.46	2.95	2.70
I feel safe/secure when I am on the NORG.	3.51	2.93	2.78
The parks along the NORG are safe.	3.40	3.05	2.88
It is important to me to have outdoor recreational opportunities, like the NORG, close to my home.	4.68	4.70	4.22
The NORG is easy for me to get to.	3.69	3.95	3.08
The NORG appears to be well-maintained.	3.84	3.68	3.37
The NORG is busy/active (many other trail users).	2.82	2.68	2.48
A lot of people use the NORG.	2.80	2.53	2.67
When on the NORG, it is clear what the pathway/route of the greenway is.	3.70	3.63	3.37
When on the NORG, I feel I could easily get off of the trail if I needed to or wanted to.	3.35	3.33	3.11
I would recommend using the NORG to my family and friends.	3.91	3.63	3.07

Number of survey participants: all users, 113; users who felt unsafe on the NORG, 40; users who only used NORG one time, 27

Users Subset: users who only used the NORG one time As mentioned earlier, 24% of all users have only ever used the NORG one time (27 people). The gender distribution of this subset is 59% female, 41% male, and 81.5% of these users live in ACC (78% permanent residents, 43.5% students). There is a relatively even age distribution among these users ranging from 22 to 68. Of these users, 68% of them think that the NORG is not safe—much

higher than the 36.3% of all users who think the same. Also higher than the percentage of all users (36%), 46% of this subset of users (12 people) reported having felt unsafe while on the NORG. This fact is important because it means that the one time these 12 people used the NORG, they felt unsafe while on the trail. According to the answers to the semantic differential question (bi-polar adjectives), *and* according to the Likert scale question (rating the level of agreement to a set of statements), this subset of users has more negative perceptions of the NORG; comparisons of this subset and all users are shown in Figure 4.4 and Table 4.16 above.

While the questionnaire collected data quantitatively, it provided more qualitative information and simple descriptive statistics. The results of the survey support the argument that issues of perceived, and perhaps actual, safety concern both users and non-users of the North Oconee River Greenway. Although not the only reason, factors influencing perceived safety are verifiable reasons why people do not use the greenway. The open-ended responses begin to identify specific areas that are considered unsafe and situational elements that add to feelings of danger or fear. The discussion in the following chapter examines what the results of the survey mean for the NORG and attempts to relate the results to the previous studies and research, and the environmental design theory and literature review.

CHAPTER FIVE: DISCUSSION

In this discussion, the survey results are first examined generally as to their connection to and meaning for the North Oconee River Greenway (NORG). The results are then viewed through the lens of the theories presented in the literature review (the Kaplans' research and theories, defensible space theory, and CPTED), and the applicability of each theory to the NORG's trailscape is discussed. Lastly, results and conclusions from the previous research and studies described in the synopsis in Chapter Three are revisited and discussed as to how they relate to the NORG and how they compare to and support this thesis's survey results.

The purpose of the survey described in the previous chapter was to gather information about people's perceptions of the North Oconee River Greenway in Athens, GA – focusing on perceptions of safety. The hypothesis was that negative perceptions of safety exist for people in the Athens community and that those perceptions are an obstacle to use for non-users, whether or not there are tangible reasons for those perceptions. While the results from the survey were not definitively conclusive, many of the results support the hypothesized negative perceptions of safety for the NORG. According to the survey, both users (36%) and non-users (64%) feel that the NORG is unsafe, and non-users are more likely to feel that way. Whether or not trail users think the NORG is safe, many users (36%, 40 survey participants) have felt unsafe while on the NORG at one point or another, which could affect their decision to use the NORG more frequently. While a negative perception of safety did not result as the definitive reason for people's non-use of the greenway, it did show to be a strong factor for many (37% of non-users). These results add to the previous research and studies' findings that perceived

safety is a factor that affects use of urban greenway trails, and they serve as the first set of information specifically related to the NORG and its use by residents of and visitors to Athens, GA.

Another expectation of the survey results was that there would be more non-users than users; this was not the case. In review, the fact that 73% of the survey participants had used the NORG at least once is not a surprise given that many of the participant groups included people who are probably more interested in the natural settings in their surrounding environment than the average person (i.e. students and faculty of the College of Environment and Design), physically active people (i.e. Jazzercise members, participants in a 5K run/walk race), and people who are interested and/or involved in their community (i.e. ACC Federation of Neighborhood members). Because many of the survey participants were "users" of the NORG, it is understandable that the overall survey results showed that only 42.5% of participants think that the NORG is not safe. People who use a trail on any type of regular basis will become familiar with it and its surroundings, and familiarity with a place increases one's perception of safety of that place (R. Kaplan, et al., 1998). While only about 36% of trail users think the NORG is not safe, 68% of the users who have used the NORG only one time think it is not safe – this could be a strong reason why they have not used the NORG a second time.

Almost all survey participants (91.6%) reported that they participate in general outdoor recreation and NORG trail users strongly agree (average rating of 4.68 on a scale of 5.00) that it is important to have outdoor recreational opportunities like the NORG close to their homes. These responses positively reflect the preference of humans for nature and natural settings. Participants may also recognize that natural settings provide restorative environments for them – shown by the adjective "revitalizing" receiving the highest positive rating on the semantic

differential scale question for both users and non-users (Figure 4.2). The six "most important" factors reported by the survey participants when they consider a place for outdoor recreation in order were: natural features, safety/security, ease of access, distance from home, level of care/maintenance, and ease of use/provision of park and/or trail maps (see Table 4.4). The NORG fulfills some of these factors, but may be lacking on the others. The NORG has large sections of trail that follow the North Oconee River and pass through natural and forested areas (natural features), and according to the survey, is thought of as being relatively well-maintained. While it is certainly not within walking distance for most people in the county, ACC is relatively small, and compared to many other types of outdoor recreation sites in the region, the NORG is one of the closest to Athens residents (distance from home). However, issues of perceived safety on the NORG are of concern to many survey participants (safety/security) (see Tables 4.5, 4.9, Figure 4.2 and "safety specific results" section in Chapter Four), and half of the trail users think that there needs to be more orientation devices or informational signs to help people stay on/follow the trail (ease of use).

Shown most directly by open-ended responses related to issues of safety, a recognizable trend for both users and non-users is their observations and opinions that the NORG is not well-used. One trail user stated simply, "I would feel completely safe if only more people used it. I wouldn't care what neighborhoods it goes through if more people were on it." Seventeen responses specifically mentioned lack of people on the trail, and twelve responses specifically described feelings of isolation (see Appendix E). Even though most of the survey participants are considered trail users for the purpose of the survey analysis, only 21% of them reported using the NORG on a daily or weekly basis. Elements and characteristics of the three theories and specific results of the previous studies reviewed in Chapter Three indicate that the presence of many other people using a space and/or within view from or with easy access to that space

can greatly increase perceptions of safety, and even actual safety, of the place. While this concept is can be considered common knowledge and is understood and employed by managers of the NORG, it is probably the most important factor to work towards for increasing perception of safety for the NORG, however it is not the simplest factor to achieve. Many of the strategies and mechanisms used to carry out the main elements of the three environmental design theories previously reviewed—the Kaplans' landscape perception and preference theories, defensible space theory, and Crime Prevention Through Environmental Design (CPTED)—support the achievement of activating a space/place with people, while also working towards other factors that can increase perception of safety.

KAPLANS: LANDSCAPE PERCEPTION AND PREFERENCE

Of the three reviewed theories, the Kaplans' theories of landscape perception and preference and their suggested related design patterns apply to the NORG's trailscape most directly. Referring to their Preference Matrix (Table 3.2), humans prefer landscape scenes that are coherent and legible in order to understand the scene, but ones that also contain some level of complexity and mystery, which provides interest and a desire to explore the landscape. However, the Kaplans' theories and patterns concentrate most on factors that influence and impact human preference of a landscape, and less on fears. Because of this, care should be taken when applying them to an urban greenway trailscape; the elements that may increase preference may also increase fears – especially along the most natural, "green" sections of the trail. The following are some ways, based on the survey results, in which the Kaplans' theories and patterns could be applied to the NORG, while remaining particularly sensitive to elements that may invoke fear and those that may increase perceptions of safety.

Survey participants seemed to think that the NORG appears to be somewhat cared for and well-maintained (see Table 4.8 and Figure 4.2). The pattern of "Human Sign," meant to decrease fear in a natural setting, can be simply accomplished on the NORG by keeping the trail and adjacent parks well-maintained – turf areas consistently mown, well-tended landscape planting areas, litter and graffiti free, general upkeep of site furnishings, etc. Signs of consistent trail maintenance may reduce fears associated with the more isolated and highly vegetated sections of the NORG. Five of the open-ended responses specifically indicated areas of the trail with high, dense vegetation promoting users to feel unsafe, mostly because of the limited views to one's surroundings (Appendix E). The Kaplans trail pattern, "Views large and small," is related mostly to people's studied and shown preference for a mix of different types of views in a natural scene. Not only could applying it to the NORG's trailscape, but it could also increase viewsheds in those areas by requiring the opening up of view into and through the dense vegetation.

Of the open-ended responses addressing why trail users think the NORG is not safe and describing the areas and situations in which they have felt unsafe while on the NORG, sixteen responses included comments about isolation (Appendix E). The isolation mentioned in the responses appears to be based on factors of an absence of other trail users, no escape routes, or not being able to reach other people if assistance were needed. Accompanying these responses is the Likert scale rating of how important "the amount of privacy/aloneness" relates to choosing a place for outdoor recreation. The overall rating for this factor, 3.0 on a scale of 5.0, indicated that it is "moderately important" to the survey participants; however, this averaged rating was the result of high ratings by some participants and very low ratings by others. This could mean that either the participants did not understand the meaning of the factor as it was stated on the questionnaire *or* that opinions were split, with some people who

like some level of isolation or solitude in an outdoor recreation site versus those who may feel uncomfortable with high levels of isolation or solitude in natural settings. Looking to the Kaplans' theories for suggestions, a combination of some of their design patterns may benefit both types of users – "trails, narrow and curving;" "a sense of enclosure;" "orientation for the new visitor;" "labels and symbols;" and "openings" (R. Kaplan, et al., 1998, pp. 47, 57, 62, 91, 119). Allowing for some narrow, curving trail sections that provide mystery and interest, and at least apparent solitude, while also keeping those sections shorter in length and/or including well-marked and understood exit routes for people who want to the ability to "escape" the more isolated areas, and mixing in some visual openings, could appease both groups of people. Based on the survey results, none of the trail users have ever used an emergency blue light phone on the NORG, and only 20% of users stated that they have noticed one, but strategically placing emergency phones along the more isolated and densely vegetated sections of the trail may also calm fears from isolation and serve as a type of "human sign." One survey participant stated, "The section that goes from MLK-SCNC could use a call box midway. I know there are already a billion, but that's the only section that's secluded and doesn't offer any easy 'escape routes' but it is also the nicest to travel BECAUSE it's secluded and not a glorified sidewalk!" Also, a map could be placed at each emergency phone, giving trail users multiple opportunities to orient themselves as to where they are along the trail and what else is nearby.

The survey results also showed that 48% of users thought that it was unclear how to get onto the NORG the first time they used it and that 40% of trail users do not think that there are enough orientation devices/informational signs to help people stay on the NORG. One survey participant stated, "I think the new medallions help with navigation, but there are so many turns and it is so far from the river at parts that it is still hard to follow in places." Addressing the Kaplans' Preference Matrix factors of *coherence* and *legibility*, the "way-finding"

patterns could be useful to the NORG. "Orientation for the new visitor" and "paths and signs" most directly address the issues included in the survey. A comprehensive map of the NORG, the trail and parks, at main entrance spots can help orient new users and show them all the places the trail connects, and thoughtful placement of conspicuous signs/indicators alerting users to unobvious changes in trail direction/route would allow users to more easily follow the path.

The final pertinent element and pattern is that of "mystery." Mystery is not only a suggested design pattern, but is also one of the four main factors in the Kaplans' Preference Matrix that specifically addresses inferred/predicted exploration of a natural setting. Because mystery is noted by the Kaplans and many of the previous studies' researchers as both an element of preference and interest *and* an element capable of evoking fear in landscapes, it is important to note a detail of "mystery" specified by R. Kaplan et al. Mystery is best achieved when there is a small amount of view to what lies ahead; providing a glimpse of what lies ahead is more intriguing than a completely blocked view because it shows the promise of further information (R. Kaplan, et al., 1998). This intricacy of the mystery element might mean that some level of mystery could be employed along the NORG to provide interest to and opportunity for exploration by trail users, but in a way that still allows for unblocked prospect.

DEFENSIBLE SPACE THEORY AND CPTED

Defensible space theory and CPTED are much less directly applicable to the NORG given that their mechanisms and strategies are intended for highly built, urban environments. Mechanisms of defensible space are even less directly applicable to the NORG because they are specifically designed for the urban residential environments of public housing developments. The more "urban" sections of the NORG do not pass through or by highly built urban areas of

Athens, nor may future sections. However, the four characteristics of defensible space and the three elements/strategies of CPTED, may be generally applied to the NORG. Because there is significant overlap between the general intent and meaning behind defensible space theory's *territoriality* and *natural surveillance* and CPTED's *territorial reinforcement* and *natural surveillance*, the following discussion often merges these elements when relating them to the survey results and the NORG itself.

Several open-ended responses relating to questions about safety on the NORG claimed that the presence of homeless people, and the loitering of apparent drug addicts and prostitutes along sections of the trail, in adjacent parks, and on nearby street corners were common factors that evoked negative perceptions of safety. A major goal of defensible space is to support a change in communities and cities for people to protect themselves as a community rather than as individuals to fight battles against crime. The NORG already is an element of pride for many members of the Athens community, but if they were also able to develop a strong sense of ownership over it, then the community as a whole can keep its use from being controlled by illegitimate users or influenced by the presence of homeless people, drug addicts and prostitutes.

Achieving and also displaying ownership—a key ingredient in the element of territoriality—is challenging (and near impossible) for an intentionally public place such as the NORG's recreational trails and parks. The mechanisms supporting territoriality, such as creating identifiable or perceived zones of territorial influence, ranging from private to semi-private to public, cannot be directly accomplished in purely public environments where there is no single owner or easily defined group who controls it. One way some sense of "private" ownership for the NORG could be achieved might be implementing an "adopt-the-trail" program, which gives control over portions of the trail to private entities for conducting invasive plant "pulls" or

keeping it litter-free. Even if this type of program were implemented, the recreational entities of the NORG, such as the trails and parks, are meant for everyone's use; however, there are certain intended purposes and accepted uses for the trails and parks. Another way to think of territoriality, or "ownership," of the NORG is that assuring confidence in the legitimate users of the trail and parks that they belong there and it is there for their use may give them more control over the use of it. This level of territoriality could be achieved by identifying the NORG as a truly public place and making its users and visitors aware of the designated and accepted uses.

An element of defensible space theory that could support this level/type of territoriality is *image.* While the survey did not address the aesthetics of the NORG (other than site maintenance characteristics), defensible space's element of *image* speaks to making the built environment of housing visually distinct, but in a positive way (not making public housing look institutional, but like the other middle-class and high-end residential environments in the area so that its visual elements do not add to the social stigma already attached to public housing). In the case of the NORG, the trail might fit in too well, meaning, its urban sections getting visually lost and sometimes unidentifiable – this is especially true for the section of the trail that is simply a widened sidewalk along Willow Street. If the pathway of the NORG along this section had a distinctive appearance, making it recognizable as something unique, then people who happen to use that sidewalk, currently unaware that they are on a greenway trail, would be visually alerted to this "special" trail. A visually distinctive NORG trailscape (or trail surface) may raise awareness of the NORG to otherwise non-users – they can't use it if they don't even know that it exists (5% of the survey participants did not know what the NORG is or that Athens had a greenway).

The *natural surveillance* element of both defensible space theory and CPTED also involves the situation of a highly built environment, unlike most of the NORG. Natural surveillance, especially that of defensible space, comes from the ability of people inside buildings to survey the outdoor surroundings as well as that of people on the street to see the happenings of the indoors. If the "urban" sections of the NORG were visible to people in nearby buildings and on roads, natural surveillance could be achieved; however, the more urban sections indicated as unsafe by survey participants are positioned at the backsides of the few adjacent buildings. For example, the large apartment building on the corner of Broad St. and Willow St. (909 Broad Street Apartments) does have windows facing the trail, but no street-level entrances on that side; also the small development of townhouses on Willow St. about 1000 feet south of the North Ave. intersection (Whistlebury Walk townhouses) sit elevated and back off the road, not providing surveillance for the trail. Across from the intersection of Elizabeth St. and College Ave., on the site currently belonging to the ACC Recovered Materials Processing Facility (RMPF), there is a large, vacant, windowless building (and expansive empty parking lot, both surrounded by chain-link and barbwire fencing) adjacent to the trail. One survey participant described the feeling she had on the NORG around the intersections of Willow St. and Elizabeth St. and Elizabeth St. and College Ave. as, "I just wasn't comfortable with the surrounding housing and empty buildings along the trail at those points... I felt a little out of place in that part of town…."

Approaching natural surveillance from another angle, if the NORG trail were to become well-used and had a prominent placement (in terms of good viewsheds) overseeing the parks through and by which it runs, the trail itself could allow for surveillance of the parks. Based on results of the survey, many users and non-users (48% combined) would be more likely to use the NORG, and use it more frequently, if more people used the trail too. A highly active, well-

used, trail is probably the most effective way to achieve natural surveillance for the NORG and its users. Higher levels of use would ensure that there are "eyes on" the trail at many times of the day, and a secondary effect would be that trail users themselves would provide surveillance for the parks, residential, and urban areas through and by which it runs. Increased legitimate activity on the NORG will also contribute to CPTED's strategies of natural access control and territorial reinforcement by the simple fact that a person not dressed in walking/running gear, on a bicycle, walking a dog, nor maintaining some level of active travel along the path would most likely elicit "disapproving" looks from normal trail users – making the apparently abnormal user feel out of place.

Strategies of *natural access control*, an element specific to CPTED, are somewhat vague and are described as mechanisms meant "to deny access to a crime target and to create a perception of risk in offenders" (Crowe & Institute, 2000, p. 36) through the "spatial definition" of an area. One way that this could apply to the NORG is if trail users had longer and more open views within the NORG trailscape, allowing them to notice a potential offender sooner and providing more risk to that offender of being seen. Also, providing more (and "safe") exit routes along isolated sections of the trail could give users more control and options for accessing help. Like territoriality/territorial reinforcement, defining the areas belonging to the NORG and visually distinguishing the trail from its neighboring areas could also add to natural access control.

Another major part of natural surveillance is effective lighting – areas lit after dark allow for continued surveillance during nighttime hours. Providing lighting along the NORG, especially along sections that do not follow already lit streets, could have distinctly different results based on "operating hours" of the trail and its adjacent parks. In the survey's open-ended responses related to perceived safety, some participants reported feeling unsafe when using the trail at

dusk. Currently, the NORG is "closed" after dark, and the provision of lighting could make people think that it is "open" at all times of the day and night – potentially attracting unintended nighttime use. The idea behind natural access control also supports not providing nighttime lighting on the NORG because non-lit areas could keep legitimate, or normal, users away during inactive and potentially dangerous times of the day/night. Once the future extensions of the NORG are built and if the ACC Greenway Network Plan's goal of using greenway trails to provide opportunities for *transportation* becomes more desired and practical, then the "operating hours" of the NORG may need to be reconsidered and nighttime lighting may then be necessary.

Milieu, an element specific to defensible space theory, is probably the most directly applicable to the NORG out of the four defensible space elements. According to defensible space, milieu involves juxtaposing urban residential environments with other urban locales that are already perceived as safe. These "safe" areas are ones with positive activities and are consistently activated throughout most of the day (and sometimes night). These types of areas "provide a number of possible witnesses who might choose to come to the aid of a victim," and the "presence of a lot of people is seen as a possible force for deterring criminals" (Newman, 1972, p. 109). The element of milieu could be easily applied to the NORG, especially where its path must divert away from the river's edge and enter urban environments, by weaving the "urban" sections of the trail along already safe, active places. If the NORG's adjacent parks became consistently active places, they could provide milieu for some of the "greener"/more natural and vegetated sections of the trail.

FINDINGS FROM PREVIOUS RELATED STUDIES

Many suggestions/conclusions related to safety and perceptions of safety from the results of previous studies are also applicable and valid to the NORG. Because many of them share similarities with this thesis's survey results, they are worth mentioning as part of this discussion. For more detailed descriptions of the previous studies, refer to Table 3.1 in Chapter Three.

Participants of the survey reported that the NORG is generally well-maintained (see Figures 4.9 and 4.11), and well-maintained parks and urban trails and high levels of setting care were shown to support preference, use, and perceived safety of those parks and trail in most of the studies in the synopsis (Herzog & Chernick; Shroeder & Anderson; Chon & Shafer; Gobster & Westphal; Reynolds, et al.; and Wolch et al.). Based on the open-ended responses, physical presence and signs of the homeless and vagrants make some NORG trail users feel unsafe (17 responses, see Appendix E); Nasar and Jones's study found that the presence of a stranger evoked fear for people walking through a park-like urban environment. Other open-ended responses from the survey specified the areas of the NORG trail that pass under the Loop 10 overpass and the train trestle near the intersection of North Ave. and MLK Pkwy as being places for homeless encampments and general "questionable activity" (see Appendix E for detailed responses). Chon and Shafer's study of likeability of urban greenway trail scenes found that scenes including overpass bridges decreased likeability, potentially because the bridges could create a level of mystery that coveys an unknown presence or potential harm (2009).

According to the survey, 40% of trail users think that the NORG could use more orientation devices or signage to aid in navigating the trail's path in certain areas, and three open-ended responses of users and non-users (see Appendix D and E) alluded to the fact that there needs to be more connections to and from the NORG along more sections of the trail,

providing linkages to more of the surrounding areas. Findings from the study conducted by Wolch et al., which concluded that an increase in perceived safety would greatly increase use and duration of use of an urban greenway trail, reported access point signage as one specific way to increase perceived safety. Also, Luymes & Tamminga suggest that giving users choice and control through movement options could aid in creating a safe greenway.

Indicating that a more active, well-used trail would make NORG users feel safer, findings from the studies of Nasar and Jones, Shroeder and Anderson, Gobster and Westphal, and Luymes & Tamminga include specfic elements of nearby, people-activated places, the presence of other users or groups of people, and visibility of and by others as increasing feelings of safety in urban natural settings, all of which support the survey results of this thesis. Finally, like the open-ended responses from the survey commenting on the tall and densely vegetated sections of the NORG, all eight of the previous studies in the synopsis found that openness, open or at least unobstructed views, long view distances, vegetation management to provide adequate lines of sight, and overall good visibility are all factors relating to postitive perceptions of safety in and preference for natural settings.

The perception of safety for the NORG is undoubtedly important to address. The review of previous research and studies shows that these perceptions are real for people using outdoor recreational places—specifically urban greenways, and the survey conducted for this thesis shows that negative perceptions of safety are real for the NORG. The discussion of the relevant theories and some of the previous studies presented here suggests that there are ways that fear and negative perceptions of safety can be ameliorated through environmental design measures.

CHAPTER SIX: RECOMMENDATIONS AND CONCLUSION

The results of the survey conducted for this thesis showed that there are negative perceptions of safety of the North Oconee River Greenway (NORG). Because the survey cannot be statistically generalized to the larger population of Athens, management of the NORG would benefit from official trail user counts and directed interviews of users and non-users of the trail. However, whether or not the NORG is actually used by a large percentage of the Athens community, the survey did show that there is also a perception that the NORG is not well used – a perception of both users and non-users. Because the NORG provides the numerous benefits of greenways to the Athens community, and its future extension will add mileage while reaching a much larger population of Athens-Clarke County (ACC) residents, including many more university students, both of these negative perceptions are very unfortunate for the NORG. This final chapter discusses the possible implications of these negative perceptions for the NORG and its future growth. It also introduces some design-related recommendations for the NORG, meant to alleviate negative perceptions of safety, based on the discussion in the previous chapter as well as some broader suggestions for the NORG and the future network of greenways in ACC. Lastly, it suggests opportunities for further research that could benefit the NORG by further understanding people's perceptions of it and finding more specific ways to increase use.

DESIGN-RELATED RECOMMENDATIONS

As mentioned in Chapter Three, CPTED also includes an approach to evaluate a space for how well it is designated, defined, and designed, and is referred to as the "Three-D

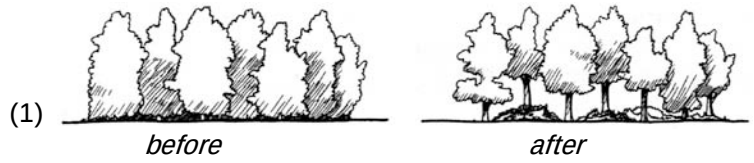
approach to space assessment." This approach includes a list of questions (see Appendix B) that can be asked about a space, and when they are asked in relation to the NORG, the greenway's trailscape seems to positively answer many of the questions. The designated purpose and use of the NORG is simple and clear, and the trail is used as it was intended; however, periodic loitering of drug addicts, prostitutes, and/or homeless people is not an intended use of the greenway and, according open-ended survey responses, is obviously a conflict of use for legitimate trail users. The trailscape is well-defined in the natural, non-built, sections of the greenway, but is much less defined along its more urban sections, especially where the trail is simply a widened sidewalk along Willow Street. The urban sections could benefit from more visual definition, and the "legal or administrative rules," such as intended uses and operating hours could be more overtly advertised and reinforced by authorities. The design of the NORG and its trail is naturally simple and certainly supports its intended functions and use. Given that there are not many built elements of the trailscape, physical design has less ability to control behavior than in a highly built environment; however, the NORG's physical design could be enhanced to better define its designated purpose and intended uses to both normal and abnormal users of the NORG.

While design alone may not alleviate negative perceptions of safety for the NORG, based on the survey results, research, and the three theories described and discussed in previous chapters, there are design elements of an urban greenway trail that should be considered. Presented below (Table 6.1) are some design-related recommendations specific to the NORG derived from the discussion of the Kaplan's theories of landscape perception and preference, defensible space theory, and CPTED. Each recommendation is accompanied by a letter representing which theory or main element(s) of a theory it most directly addresses ("K" is for the Kaplans' theories and patterns; "T/TR" is for defensible space theory's "territoriality" and

CPTED's "territorial reinforcement," respectively; "NS" is for "natural surveillance;" "NAC" is for "natural access control;" "M" is for "milieu" and "I" is for "image.").

Table 6.1 – Design-related recommendations for the NORG based on the survey results, research, and the Kaplans' research and theory, defensible space theory, and CPTED

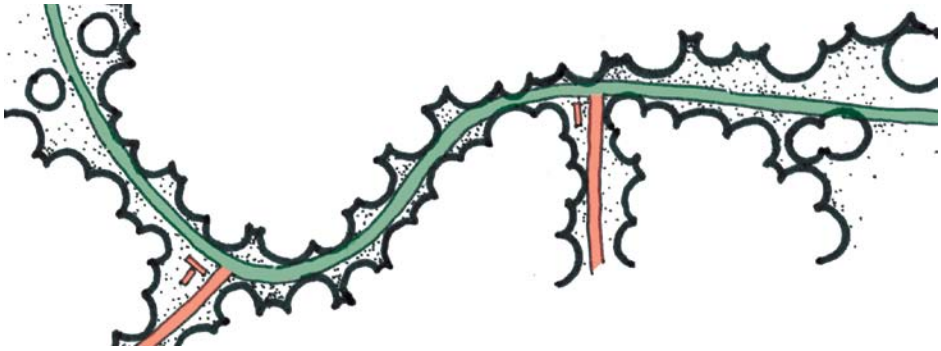
Theory or main element	Recommendation	Description and examples of recommendations as they apply to the NORG
K	***Site maintenance***	Keep the trails and parks of the NORG well-maintained – turf areas consistently mown, well-tended landscape planting areas, litter and graffiti free, general upkeep of site furnishings, etc.
K	***Visual openings in areas of dense vegetation***	(1) Along trail sections surrounded by dense vegetation, increase visibility of the surroundings and provide more sight lines for trail users by providing strategic openings in the vegetation between knee-height and eye-level, without removing all understory plantings. (2) Also, introducing a few openings at points along extended narrow sections of trail can reduce concealment/blocked prospect while adding interest to the visual trail experience.



(2)
Opening in narrow highly vegetated trailscape

Sketches: *With People in Mind*, R. Kaplan, Kaplan, & Ryan (1998) pp. 34, 48

K	***'Safe' solitude***	Allow for some narrow, curving trail sections that provide mystery, interest, and visual solitude, but keep those sections shorter in length and/or include well-marked and understood exit routes for users who want to the ability to "escape" the more isolated areas.



K	***Emergency blue light phones – strategic placement & an orientation device***	Strategically place blue light phones along the more isolated and densely vegetated sections of the trail. (One survey participant suggested: "the section that goes from MLK [Blvd.] and SCNC could use a call box midway".) Place a map at each emergency phone, allowing trail users multiple opportunities to orient themselves as to where there are along the trail and to what else is nearby.
K	***NORG maps at all entrances***	Place maps showing the entire NORG, the trail and adjacent parks, at parking lots and at other main entrance spots. Orient posted maps to the viewer's position, regardless of the cardinal direction.

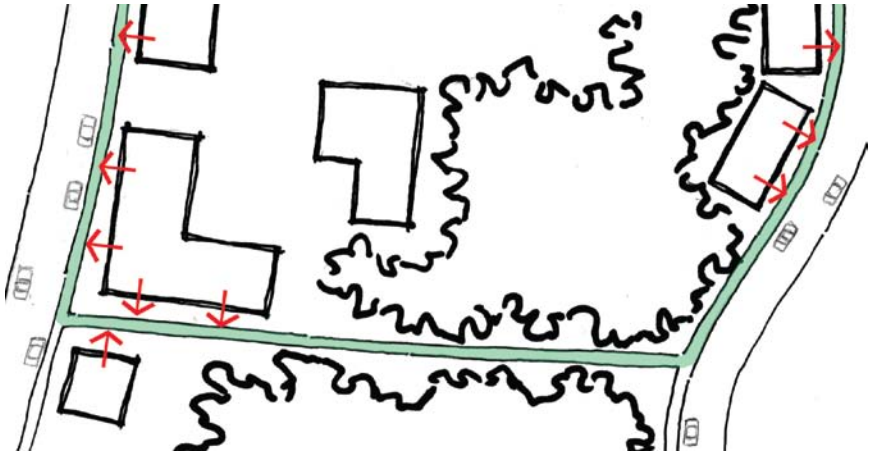
K	***Orientation, navigation devices***	In addition to the existing dragonfly NORG medallions set in the paved trail surface, a more conspicuous type of wayfinding should be used at points along the trail where unobvious changes in trail direction/route occur. This could be equivalent to a "trail blaze" placed at eye-level and/or a more eye-catching element on the trail surface (a change in material or color) at each navigation medallion.
K T/TR NAC	***Gateways***	Make entrance points onto the NORG, and at the beginning of a special section of the trail (like the Heritage Trail section), distinct by providing a physical or visual gateway element.

Sketch: *With People in Mind*, R. Kaplan, Kaplan, & Ryan (1998) p. 85
Photos: Legacy Trail Public Art Master Plan, Bressi, T. W., & Levy, S. (2010), pp. 25, 32

T/TR	***Highlight intended uses***	At main entrance points, include a list of suggested uses for the NORG, making sure to highlight the positive (versus listing the prohibited uses), and use this as an opportunity to advertise the many activities that can be experienced on the NORG.

T/TR	***Policing to discourage illegitimate use***	Formal or informal policing should be employed along the NORG on a consistent basis, so as to keep some level of authoritative "eyes" on the trail and to discourage illegitimate use of the trail.
NS	***Operating hours***	Make sure that trail users know that the trail is closed between sunset and sunrise, so as to discourage use after dark. This could be accomplished through signage at entrance points and/or advertising on websites describing the trail and other types of published descriptions.

NS NAC	***Potential for nighttime lighting***	If, in the future, the NORG remains "open" at all hours of the day and night, and using it for transportation purposes is highly encouraged, at least some nighttime trail lighting will be needed. However, lighting and the placement of lighting should be used carefully so that people are not attracted to places along the trail that are not safe (or are not easily surveyed) after dark.
NS	***Natural surveillance from nearby buildings***	To improve natural surveillance along the more urban sections of the NORG that pass by buildings, the trail should be placed on the front side of the buildings so that building entrances and windows face the trail. If buildings are added trailside in the future, encourage facing the buildings to the trail.



M NS	***Milieu and natural surveillance***	When possible, direct trails along or within view of already consistently active public places, such as well-used parks/playgrounds, active commercial/shopping areas, and safe public streets, so that they can provide surveillance of the trail.
T/TR	***Public/Private land distinction***	At areas of trail where public trail space abuts private property, provide a visual distinction between the public NORG and the private neighboring land (this may also help NORG neighbors to perceive the NORG as an acceptable neighbor). This distinction could be defined with plantings, short walls, or fencing.

I T/TR	***Distinct and identifiable trail "image"***	Make the trail surface visually distinct (especially along urban sections or when sharing its route with an existing sidewalk) through the use of identifiable materials, colors, and/or painted "lane" lines. Creative and distinct orientation devices used only for the NORG trail could also provide the NORG with an identifiable image. Allow for public art along the NORG, or some other type of public involvement in the trail's visual/aesthetic image.

semi-permanent art and paintings on trail surface

visually distinct trail crossings at intersections with streets

vertical orientation devices ("blazes") that also add a visual image to the trail

Photos and sketches: Legacy Trail Public Art Master Plan, T.W. Bressi, & Levy, S. (2010), pp. 16, 18, 20-21

This set of recommendations is intended for both the existing trail and the future extensions. Some recommendations maybe used to retrofit the existing trail (such as "Visual openings in areas of dense vegetation" and "Emergency phones – strategic placement"), whereas other recommendations are much more conducive to applying to the future extensions (such as "Natural surveillance from nearby buildings" and "Milieu"). In an effort to suggest application of the recommendations to the existing NORG trail, Figure 6.1 shows the same map presented previously in Chapter Four (showing the specific areas and trail sections indicated as 'unsafe' by survey participants) with an overlay of several of the design-related recommendations pinpointed to specific areas and trail sections.

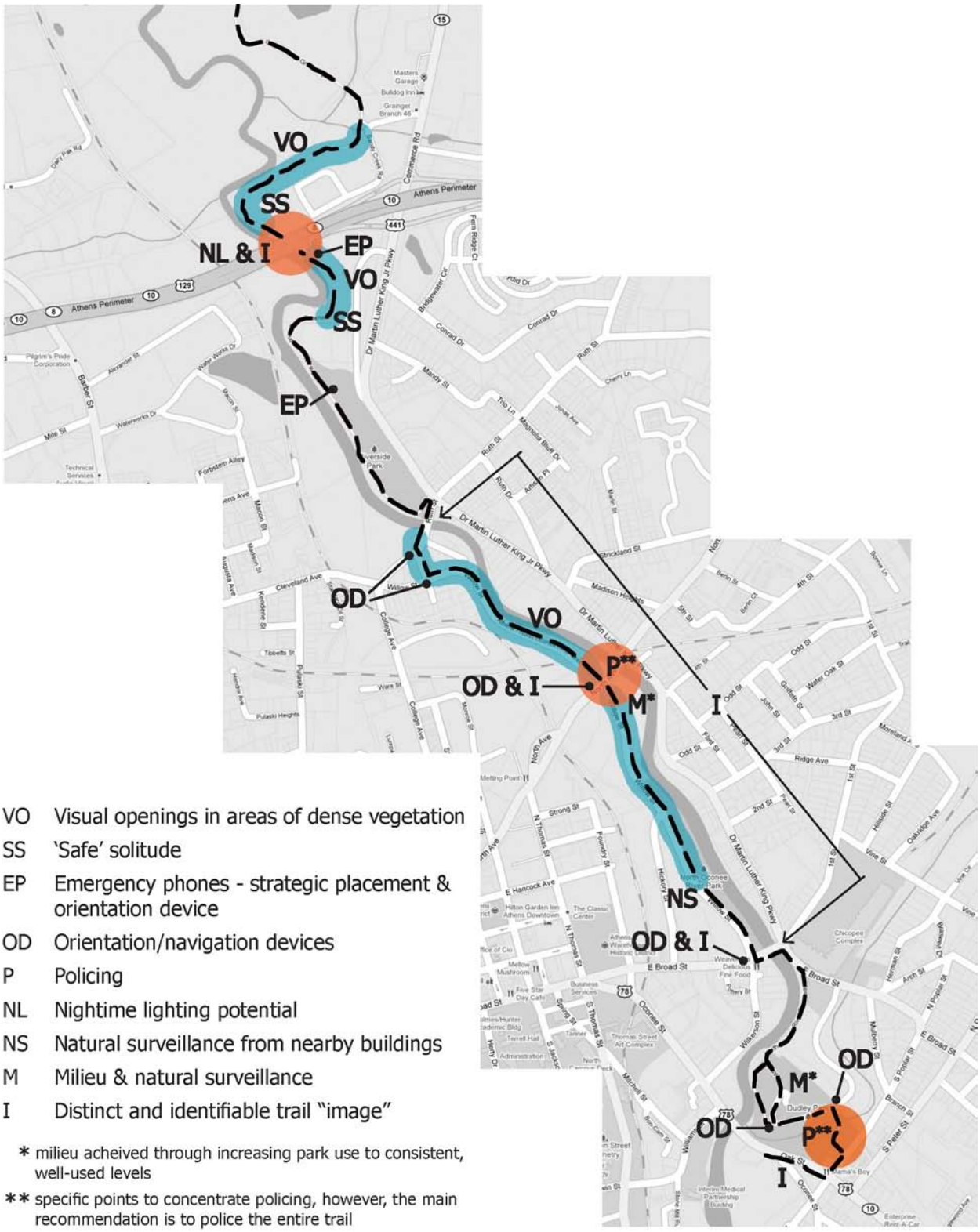


Figure 6.1 – Map of NORG trail, design recommendations pinpointed to existing trail and the specific areas and sections identified as 'unsafe' by survey participants

OTHER SUGGESTIONS AND EXAMPLE STRATEGIES

While there are some safety-related design aspects of the NORG that could be improved or implemented, the most beneficial strategy for alleviating people's negative perceptions of safety is to increase use and frequency of use of the NORG. While this idea is a simple one, achieving it may require the collaboration of multiple ACC Government departments and the combined efforts of any interested constituents, such as the Oconee Rivers Greenway Commission, UGA, BikeAthens, ACC Federation of Neighborhoods, and other community groups.

The North Oconee River Greenway and its future offer Athens, Georgia many of the environmental, economic, and social benefits greenways can provide a community. The fact that members of the Athens community and government lobbied for and implemented the design and construction of the NORG, and is continuing to do so, shows that the benefits it can provide are important to the people of Athens. In other words, the NORG is a feature and amenity that the people of Athens can easily support and use and should take ownership of, but how is every resident of and visitor to Athens supposed to reap those benefits if they do not use it or even know that it exists? Some of the following suggestions include increasing the current amount/levels of promotion for and programming of activity on the NORG, instituting formal and informal policing of the NORG's trail and parks, prioritizing planning and design efforts to increase pedestrian and bicycle connectivity to the NORG, and hiring more staff in order to achieve these.

Promoting the NORG, its trail, parks, and conserved green space, could help attract users of the greenway as well as organizations who might want to use it for weekly, monthly, or annual events. The Athens Greenways and Riverside Parks Facebook page is an existing promotional opportunity where people can get up-to-date information about the NORG online, but consistently updating information about the NORG on the websites of national trail

organizations such as the Rails-to-Trails Conservancy and American Trails (and including a link to the Facebook page) has the ability to reach a more geographically broad group of interested people. Information about the NORG in publications of tourism groups such as the Athens Convention and Visitors Bureau, the Athens Welcome Center, and the University of Georgia (UGA) Visitors Center is valuable; for those groups who provide tours for visitors, the NORG could be a tour feature.

Working with other existing organizations in Athens to promote and program activities on the NORG is another potential strategy. For example, BikeAthens, an organization that "promotes transportation and land-use policies that improve alternative modes of transportation, including pedestrian, cycling, and public transit options" and whose mission is "to make alternative transportation a practical, convenient, and safe option for all citizens of Athens-Clarke County" (BikeAthens, 2011), could be a prime partner in not only advocating for the NORG, but also increasing its use. BikeAthens hosts a monthly "group ride" for people of all ages and skill levels on varying routes around Athens; the NORG could be included in their routes. Members of BikeAthens could also help managers and planners of the NORG better understand what cyclists need and want for a greenway trail. Encouraging official and unofficial running and walking clubs or groups to use the NORG and even to develop a weekly set day and time to run or walk on the NORG could increase frequent use of the trail.

Programming additional monthly and annual events on the NORG could also be beneficial. Given that the trail is intended for walking, running, and biking, an annual health fair to encourage physical activity could be hosted by ACC and one of the hospitals or other health organizations along the greenway or in one of its adjacent parks. Concerns of childhood obesity and Nature Deficit Disorder could be combated by programming monthly activities to get children out walking and biking along the NORG. A children's version of the annual Eco-

Adventure hosted by the Leisure Service Department and UGA's recreation and leisure studies department could also be held annually on the NORG. Promoting use of the NORG by children means that not only are children getting out on the trail, but so are their parents – it becomes a whole family activity, further increasing the number of people using the NORG. Also, by formally advertising how organizations interested in hosting a 5K run/walk as a fundraising event can do so on the NORG could increase current use while also making wider-ranging groups of people aware of the NORG.

The Neponset River Greenway Festival, held annually for the past sixteen years, provides a wonderful example of an event that brings many people onto a greenway throughout the summer season. According to a public relations press release for the 13th Annual Neponset River Greenway Festival in 2007, the "Boston Natural Areas Network [(BNAN)] and MA Department of Conservation & Recreation are enticing individuals and families to visit and enjoy urban wilds and parks through more than two dozen free events" (Boston Natural Areas Network, 2007, p. 1). While it does not appear to have been continued into the 2010 festival, the BNAN added a way to win prizes as part of the 2007 festival; "for the first time, participants of festival events [were] eligible to win prizes by obtaining a "Passport" and having it stamped at any five events throughout the summer" (BNAN, 2007, p. 1). The 2010 festival events were held throughout the months of July and August and included multiple opportunities for canoeing, biking, and walking along the greenway, as well as arts and nature workshops and a family movie series shown outdoors in riverside parks (see Appendix G for brochure of events).

The Rails-to-Trails Conservancy (RTC) and American Trails both provide numerous resources for planners and managers of greenways. AmericanTrails.org provides several examples of and articles about art on trails and greenways, many of which describe the

combination as a way to promote trail use and the connection of art and community with the trails. One article, *Artful Ways: enhancing trails and greenways with art and artists*, writes about the American Trails "Artful Ways" program, which is a partnership with the National Park Service Rivers and Trails Program, the USDA Forest Service, and Bureau of Land Management, meant to "encourage creative ways of enhancing trail interpretation and trail-related facilities on National Recreation Trails using temporary and permanent site-based art" (Tracy, 2004). The author writes that "art is one of the best ways to strengthen the connection between people and trails" (Tracy, 2004). Another article describes the comprehensive plan for the integration of public art along the Legacy Trail in Lexington, Kentucky. The trail planners looked to greenways and trails of Louisville, KY, Chattanooga, TN, and Indianapolis, IN for inspiration and developed a master plan for art along the trail (Bressi & Levy, 2010). The vision for this plan states:

> Art along the Legacy Trail will reveal the trail's presence in the landscape; explore the community's culture, history and environmental character; and provide opportunities for artists in the Bluegrass and beyond to explore how their work can interact with this unique landscape. Art along the Legacy Trail will be evolving, consisting largely of original works that result from creative exploration and dialogue about art, community and landscape. (Bressi & Levy, 2010, p. 6)

The master plan includes a detailed description of projects in each of the three layers of art that will be incorporated into the trailscape; the plan also describes how these multiple types and layers of public art will be commissioned, implemented, and managed for the long-term. While the Legacy Trail example is very comprehensive, many other greenways and urban trails around the country have also incorporated art into the users' trail experience.

Given that there is a strong artist community in Athens and that UGA has a large fine arts program, incorporating art along the NORG could not only attract users, but also get other community members involved in the creation of a distinct image for the NORG. Artworks along the trail could include a mix of permanent and temporary works that focus on more nature-

based subjects or they could highlight Athens's impressive music history and culture. Almost every event in Athens includes some amount of music performance, whether it is a local fundraiser or a well-known annual event like AthFest; incorporating the local music culture and history of Athens on the NORG would certainly attract residents and visitors. If music and art became integrated into the greenway, an annual "music and arts greenway tour" could be included in the event schedule for AthFest, a well-known annual music, arts, film and kids festival, with a high level of attendance, that has been held in late June for the past fifteen years.

Whichever strategies are employed to increase use of the greenway through further promotion of and programming activity for the NORG, more staff would most likely be required. Currently, nestled within the Parks and Facilities division of the ACC Leisure Services Department, the Greenway and Riverside Parks Facility Supervisor, or "greenway coordinator", Melinda Cochran, is the only person in Athens-Clarke County responsible for the NORG on a day-to-day basis. The Leisure Services Department does have a public relations employee who the Parks and Facilities division is supposed to use for promoting the facilities, but the greenway coordinator position could benefit from additional staff working directly for the promotion of and programming of activities on the NORG in order to most successfully increase use. A potential way to officially/formally advocate for additional staff dedicated to the greenways could be for the Parks and Facilities Division and the ORGC to integrate issues of safety and strategies to increase use in the form of policy or objective statements in the Greenway Network Plan.

An increase in staffing may also be required in order to provide the NORG with formal policing (or formal police patrols). Having consistent, while not excessive, police presence along the greenway's trails and parks could be highly effective in reducing illegitimate users while also showing trail users and potential users that the ACC government cares about their

safety. Many urban trails and greenways have police officers who patrol the trails by bicycle; the RTC states that "[w]orking with police is an important part of ensuring that a trail is safe to use. Regular police involvement—especially patrols by bike—can deter crime and improve traffic safety both on and near a trail" (Rails-to-Trails Conservancy, 2007). Beginning in 1987, Sandy Creek Greenway was delegated a patrol of five mounted police officers, however the patrol was disbanded in 1996 and those officers were moved into downtown because there was a much higher concern of crime in downtown Athens than out in the parks (Mike Wharton, personal communication May 3, 2011). Shortly after the first section of the NORG was completed, the Leisure Services Department proposed a policy to the ACC Mayor and Commission for a patrol of two to three police officers designated for policing the North Oconee River Greenway and parks, but the proposal was turned down (Mike Wharton, personal communication May 3, 2011). Based on the survey and many of its open-ended responses, the negative perceptions of the NORG could be ameliorated by acquiring the funding for and instituting a trail/park bicycle patrol division within the police department. In conjunction with formal policing, volunteer patrols offer additional opportunities for policing by providing an extra set of eyes on a greenway trail and empowering the community to ensure safe use of the trail. A good example of this is the Trail Watch program on the Midtown Greenway in Minneapolis, Minnesota for which interested volunteers are asked to commit to a weekly scheduled night to serve as a Trail Watcher. The Trail Watchers ride in groups along the greenway during two hour shifts; they "do not intervene in incidents they come across in the Greenway, rather they're a friendly presence on the trail and report criminal or intimidating behaviors that are noticed during the shift" (Midtown Greenway Coalition, 2008). The program also includes incentives, offered by several local businesses, for people to become a Trail Watcher based on the number of rides attended each season.

A final recommendation for the NORG, and future greenways in ACC, is to increase the level of connectivity to the greenway trails from the surrounding areas and neighborhoods. Two survey participants specifically mentioned issues of connectivity in relation to the NORG. One non-user of the NORG wrote that "[w]e need longer connected greenways that form a network from places like Watkinsville, Hull, all the way to Atlanta without having to use the side of a freeway as the 'greenway'" in response to the question inquiring why he/she does not use the NORG. Another survey participant, responding to the question "why do you think the NORG is not safe wrote:

> It doesn't have a continous [*sic*] sidewalk along MLK (especially the segment between North Avenue and Conrad Rd) and pedestrians are forced to walk over the right-of-way. The bike lane along MLK is dangerous since the two lanes were never expanded to make room for a bike lane. They just painted a line and make room (took off space) from the existing width of the road...so it is not a real designated bike lane persee [*sic*]. New sub-divisions and lofts have been built along MLK with no pedestrian access..i.e. no sidewalks running along the MLK street with properly designated pedestrian crossing. North avenue is also a missed opportunity since their [*sic*] is no continous[*sic*] sidewalk running along the avenue. Sidewalks could be used to connect the surrounding communities with the greenway.

While this participant reported using the NORG only one time, the description of a need for safe connections, for pedestrians and bicyclists, to the NORG from surrounding areas is quite thorough and thoughtful. The response comes from one viewpoint and relates to one specific area of the NORG, but ensuring safe, established connections to the NORG from surrounding areas and neighborhoods along the full length of the trail could increase trail use simply by making it more accessible to a greater number of people. This thesis does not mean to suggest that connectivity is not being considered by the planners and managers of the greenway network in Athens, rather it proposes that connectivity to the NORG, not only connectivity of the NORG itself, also become a priority in the design and planning phases for the future extensions of the NORG and other future greenways in ACC.

SUGGESTIONS FOR FURTHER RESEARCH

While connectivity is indirectly related to perceptions of safety for the NORG, it could be a potential subject for further research to benefit the NORG and other future greenways in ACC's Greenway Network Plan. This might include studies of the areas of Athens underserved by the NORG and/or physical connections to it or a study inventorying and examining current and potential connections to the NORG from surrounding areas in the form of sidewalks and designated bike lanes. Also, conducting a study similar to Chon and Shafer's study of "likeability" of two urban greenways, which focused on the aesthetic quality of a greenway trail setting, for the NORG might result in more detailed design suggestions for the future extensions or other greenways. This type of study could also provide information about how residents of Athens perceive the NORG outside of their perceptions of safety. Another, more design-related, suggestion is researching the feasibility of and then developing a design plan for the integration of permanent and or temporary, land-based and/or experiential, art into the greenway.

Other research with the possibility to directly benefit the NORG are general use studies. Detailed user counts and user surveys, over multiple seasons and during many times of the day and days of the week, that collect information about the number of people using the trail and parks as well as (in-depth) demographic information would be extremely helpful to managers of the NORG. Also, directed interviews with users, and even non-users, that include specific questions regarding safety, connectivity, trail features and amenities, etc. would be beneficial and could provide more detailed information about what the users need or want for a recreational greenway. Interviews and surveys that address other issues such as connectivity or environmental stewardship could result in a broader view of the NORG and/or future greenways in the network. Any additional surveys conducted about the NORG should strive to collect statistically-significant data so that it could be generalized to the greater population of

Athens. Given that two survey participants noted a concern for the impact the recreational trail along the NORG may have on the natural areas meant for conservation and preservation in their open-ended responses, the NORG may also benefit from a study focusing on the impact recreational use may have on the riparian ecosystems.

CONCLUDING THOUGHTS

Greenways, whether they focus on one goal or many, have the potential to embody an intricate web of environmental, economic, and social values (Murphy, 2005). These values become direct benefits for the communities who embrace the integration of a greenway, or even more so a greenway network, through urban areas. With its goals and objectives of the conservation and preservation of land for open space and the provision of opportunities for transportation and recreation, the North Oconee River Greenway offers numerous benefits to the residents and community of Athens, Georgia.

The NORG provides residents the opportunity for nearby and accessible outdoor recreation, and it gives them an opportunity to connect, or rather reconnect, with nature. A connection with nature, whether it is personal interaction with nature or simply the knowledge that natural areas are close by, can be revitalizing, stress-relieving, and even comforting. The NORG, along with other existing and future greenways in Athens-Clarke County, not only conserve and preserve open space to help support the riparian ecosystems of the many streams and rivers in the county, but it also allows people to experience those ecosystems. That experience can be educational and promote environmental stewardship in trail and park users.

Physical health and issues of obesity are currently a major concern in the United States, and First Lady Michelle Obama's *Let's Move!* initiative is a prime example of a nationwide effort to address these concerns. The recreational trail along the NORG is a perfect place for physical

activities like running, walking, and biking for people of all ages, and the fact that the trail weaves through urban areas allows it to be easily accessible (and with suggested improvements would make it more visible) to Athens residents. Frequenting the NORG trail can not only improve users' physical health, but because the trail directs users through natural areas and along the river also means that users can boost their mental health by spending time in the restorative environment nature provides.

Once the future extensions are completed, the NORG will be easily accessible to a greater number of Athens residents, including many more students, and will add over seven miles of trail, doubling the overall length of continuous trail along the NORG and Sandy Creek Greenway. This is important and impressive for many reasons, but one to note is the NORG provides excellent off-street routes for pedestrian and bicycle transportation in Athens. The extended trail length of the NORG, along with safe and accessible connections to the greenway, and the completion of future greenways in the ACC Greenway Network Plan, will make the NORG and other Athens greenways a significant addition to the network of transportation choices for which organizations like BikeAthens and the ACC Planning Department are striving to achieve.

All of these benefits, and more, that the NORG offers the Athens community make it an exceptional amenity and source of pride for Athens-Clarke County – one that can be used to promote tourism and attract new businesses and potential residents. However, perceptions of public outdoor spaces have been shown to influence people's use of parks and trails, and a negative perception of safety of the NORG is an issue that, based on this thesis, is affecting the use of it by visitors, students, and residents of Athens. While there are some ways to ameliorate the negative perception of safety through physical design and by employing strategies of environmental design theories like defensible space and CPTED, achieving

consistent, weekly use of the NORG by members of the Athens community will likely be the most advantageous to increasing perceptions of safety. Because of the wonderful benefits the NORG (and using and experiencing it) can provide ACC and its residents and visitors, ensuring a positive perception of safety for the NORG and placing an emphasis on increasing its use is vital to the continual success of the North Oconee River Greenway and future greenways in Athens.

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Appendix A – Historical outline, adapted from Murphy, 2005

Appendix B – Historical Outline written by Charles Aguar and given to Author by Berdeana Aguar

HISTORICAL OUTLINE OF LONG-TERM EFFORT THAT HAS BEEN INVESTED TRYING TO PROTECT THE OCONEE RIVER

1800-1960s	Oconee River used as open sewer, dumping ground for refuse and industrial waste.
1925	Initial city plan for Athens prepared by Manning firm of Boston recommends protection of the Middle and North Oconee Rivers by establishing parks and conservation corridors along both rivers and all major tributaries. (Few parks and golf courses were located where recommended, and no official action on river protection was recorded.)
1970s	Last "official" landfills on river banks are closed, but "wildcat" dumping into river continues.
1972-1974	UGA students from the School of Environmental Design begin series of detailed studies of one-mile-wide corridor along the Middle and North Oconee Rivers, with public presentations at Athens Regional Library.
1974	Official recognition first given to Greenways in Recreation-Open Space Plan for Athens-Clarke County (ACC).
1975	"HANDS," an umbrella organization of Athens Garden Clubs, works with SED, American Red Cross, news media, etc. on the first River Recognition Day by hosting a bus tour, followed by river walks, canoe trips. Annual Oconee River clean-up float trips are initiated. A "Support Oconee River Greenways" bumper sticker is sold for 50ç to help fund expenses.
1976	North Oconee River Park established in central Athens, funded through "Model Cities." Becomes first new unit in Oconee Greenway proposal.
1980s	State and federal grants obtained to purchase land along Sandy Creek to link the Nature Center and Park with a 4-mile-long gravel and boardwalk hiking path named "Cook's Trail" when built with great deal of back-breaking volunteer effort.

1985 Future Land Use Plan 1985-2000 for ACC adopted. Corridor along both rivers and tributaries shown as light green, the color designation for "Parks and Public/Private Open Space." (River Oaks was not yet in existence. This area is shown as dark green, the color designation for "Institutional, Public and Semi- Public," that included the UGA golf course.)

1990 An ad-hoc "Task Force" was organized to include members representing ACC Parks and Recreation, Leisure Services, Clean and Beautiful Commission, Garden Clubs, Downtown Development Authority, The Georgia Conservancy, Students for Environmental Awareness, and news media. Recommendations presented to respective government bodies that an official ACC Greenway "Commission" be formulated.

1991 Oconee River Greenway Commission organized with five members each from Athens, Clarke County, and UGA plus ex-officio members from ACC agencies and UGA.

1992 Following governmental reorganization, ORGC was chartered and reorganized, with ten members appointed by the ACC Board of Commissions and five members appointed by UGA President Knapp.

1994 SPLOST voted upon and approved by citizenry includes a multi-million-dollar allocation for Heritage Trail Design Studies and Construction (3 miles) and a North Oconee River Concept Plan (12 miles). 1995 Robinson Fisher Associates, Inc. of Athens selected as design firm to prepare plans.

1996 Series of four public workshops (including one held at Barnett Shoals Elementary School on May 30) conducted for citizen input prior to initial planning stage. Special public meetings held on December 2 and 9 to explain work to date and "incorporate suggestions into the concept plan."

CEA/ba

Appendix B – CPTED Three-D approach to space assessment

By using the Three-Ds as a guide, space may be evaluated by asking the following types of questions:

Designation

- What is the designated purpose of this space?
- What was it originally intended to be used for?
- How well does the space support its current use? Its intended use?
- Is there conflict?

Definition

- How is the space defined?
- Is it clear who owns it?
- Where are its borders?
- Are there social or cultural definitions that affect how that space is used?
- Are the legal or administrative rules clearly set out and reinforced in policy?
- Are there signs?
- Is there conflict or confusion between the designated purpose and definition?

Design

- How well does the physical design support the intended function?
- How well does the physical design support the definition of the desired or accepted behaviors?
- Does the physical design conflict with or impede the productive use of the space or the proper functioning of the intended human activity?
- Is there confusion or conflict in the manner in which the physical design is intended to control behavior?

(Taken directly from Crowe, 2000, pp. 39-40)

Appendix C – Survey Questionnaire

NORTH OCONEE RIVER GREENWAY USE SURVEY

1. Have you ever used the North Oconee River Greenway (NORG) in Athens, GA?

   ☐ Yes ☐ No, **skip to #12** (page 3) ☐ I didn't know Athens had a greenway, **skip to #17** (page 4)

   If YES, about how often do you use it?

   ☐ Daily (more than once a week) ☐ Weekly (more than once a month) ☐ Monthly

   ☐ I've only ever used it one time ☐ Other, please describe: _____

2. What day(s) of the week and time(s) of the day do you/did you use the greenway? **(mark all that apply)**

	SUN	MON	TUES	WED	THURS	FRI	SAT
Sunrise - 9:00am							
9:00am - 11:00am							
11:00am - 1:00pm							
1:00pm - 3:00pm							
3:00pm - 5:00pm							
5:00pm - Sunset							

3. If you knew or saw that the North Oconee River Greenway (NORG) was used by a lot of other people, would you use the NORG more often than you currently do?

   ☐ Yes ☐ No ☐ Doesn't make a difference to me

4. For what activities do you (or did you) use the greenway? **(mark all that apply)**

   ☐ Hiking/Walking
   ☐ Biking
   ☐ Dog walking
   ☐ Running
   ☐ Canoeing or Kayaking
   ☐ As an alternative route of transportation
   ☐ Appreciating nature/the outdoors
   ☐ Spending time with my family
   ☐ Spending time with friends
   ☐ Other(s), please list: _____

5. In general, how do you think of the **North Oconee River Greenway**?

   Please indicate how, for you personally, the following terms apply to the North Oconee River Greenway:

	Mostly	Somewhat	Neutral/ Some of both	Somewhat	Mostly	
Boring	☐	☐	☐	☐	☐	Fun
Stressful	☐	☐	☐	☐	☐	Revitalizing
Uninviting	☐	☐	☐	☐	☐	Inviting
Dangerous	☐	☐	☐	☐	☐	Safe
Alone/Isolated	☐	☐	☐	☐	☐	Public/Open
Neglected	☐	☐	☐	☐	☐	Well-maintained
Inconvenient	☐	☐	☐	☐	☐	Convenient
Far Away	☐	☐	☐	☐	☐	Nearby

2

6. Please rank the following statements about the North Oconee River Greenway (NORG) on the given scale:
(Circle ONE response per item.)

	Strongly Disagree	Disagree	Uncertain/ Neutral	Agree	Strongly Agree
The North Oconee River Greenway (NORG) is safe.	1	2	3	4	5
I feel safe/secure when I am on the NORG.	1	2	3	4	5
The parks along the NORG are safe (Dudley Park, North Oconee River Park, etc.).	1	2	3	4	5
It is important to me to have outdoor recreational opportunities, like the NORG, close to my home.	1	2	3	4	5
The NORG is easy for me to get to.	1	2	3	4	5
The NORG appears to be well maintained - free of trash & graffiti, consistently mown turf areas, clean parking areas, etc.	1	2	3	4	5
The NORG is busy/active (many other trail users).	1	2	3	4	5
A lot of people use the NORG.	1	2	3	4	5
When on the NORG, it is clear what the pathway/route of the greenway is.	1	2	3	4	5
When on the NORG, I feel I could easily get off of the trail if I needed to or wanted to.	1	2	3	4	5
I would recommend using the NORG to my family and friends.	1	2	3	4	5

7. Was it clear to you how to get onto the North Oconee River Greenway (NORG) the first time you used it?

☐ Yes ☐ No

8. Do you feel like there are enough informational signs/orientation devices to help you stay on the NORG?

☐ Yes ☐ No

9. Have you ever used a blue light phone to call the police while on the NORG?

☐ Yes If so, what for? _____

☐ No If not, have you ever noticed a blue light phone when on the trail? ☐ Yes ☐ No

10. Do you think the North Oconee River Greenway is safe?

☐ Yes ☐ No

If you answered "No," why do you think the greenway is not safe?

☐ It is not well used (not many people use the greenway)

☐ It goes through parts of town that are not safe

☐ I've been told by my family members and/or friends that it is not safe

☐ I've been told by a person of authority that it is not safe

☐ Other(s), please list/explain: _____

_____

_____

11. Have you ever felt unsafe while on the North Oconee River Greenway?

☐ Yes ☐ No

If you answered "Yes," please describe the area(s) of the greenway where you felt unsafe: _____

_____

_____

_____

What about that area(s) and/or the situation at that time made you feel unsafe?

_____

_____

_____

_____

_____

• • • • **PLEASE SKIP TO QUESTION #17, page 4** •

If you answered "No" to question #1, please continue at this point:

12. What is the approximate distance between your home and where you could access the North Oconee River Greenway?

☐ less than 1/4 mile ☐ 1/4 – 1/2 mile ☐ 1/2 – 1 mile ☐ 1 – 2 miles ☐ more than 2 miles ☐ I don't know

13. In general, how do you think of the **North Oconee River Greenway**?

Please indicate how, for you personally, the following terms apply to the North Oconee River Greenway:

	Mostly	Somewhat	Neutral/ Some of both	Somewhat	Mostly		Don't know
Boring	☐	☐	☐	☐	☐	Fun	☐
Stressful	☐	☐	☐	☐	☐	Revitalizing	☐
Uninviting	☐	☐	☐	☐	☐	Inviting	☐
Dangerous	☐	☐	☐	☐	☐	Safe	☐
Alone/Isolated	☐	☐	☐	☐	☐	Public/Open	☐
Neglected	☐	☐	☐	☐	☐	Well-maintained	☐
Inconvenient	☐	☐	☐	☐	☐	Convenient	☐
Far Away	☐	☐	☐	☐	☐	Nearby	☐

14. Do you think the North Oconee River Greenway (NORG) is safe?

☐ Yes ☐ No

If you answered "No," why do you think the greenway is not safe? **(mark all that apply)**

☐ It is not well used (not many people use the greenway)

☐ It goes through parts of town that are not safe

☐ I've been told by my family members and/or friends that it is not safe

☐ I've been told by a person of authority that it is not safe

☐ Other(s), please list/explain: _____

_____

15. If you knew that the NORG is used by a lot of people, would you be more inclined to use it yourself?

☐ Yes ☐ No ☐ Maybe

4

16. Why do you not use the North Oconee River Greenway? (**mark all that apply** and then please add any other thoughts and/or comments that you have to fully answer the question)

☐ It is not easy for me to access
☐ It is not safe
☐ I live too far away from it, it's not convenient for me
☐ The trail is too short for the activities for which I would want to use it
☐ I never think about it / it doesn't occur to me to use it / I forget that it exists
☐ Other(s), please list/explain: _____
_____

Any other comments/thoughts to further answer the question: _____
_____
_____

PLEASE CONTINUE HERE

17. Do you participate in outdoor recreation activities (other than on the Greenway)? ☐ Yes ☐ No, **skip to #19**

If YES, what type? **mark all that apply**

☐ Hiking ☐ Mountain biking ☐ Canoeing or Kayaking
☐ Running/Walking ☐ Road biking ☐ General appreciation of nature/the outdoors
☐ Other(s), please list:_____

18. How IMPORTANT are the following factors when you are considering a place for outdoor recreation? **(Circle ONE response for each item.)**

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Type of activities available	1	2	3	4	5
Safety/Security	1	2	3	4	5
Natural features	1	2	3	4	5
Ease of access	1	2	3	4	5
Size (of park)/Length (of trails)	1	2	3	4	5
Amount of privacy/aloneness you would have	1	2	3	4	5
Distance from your home	1	2	3	4	5
Number of other people using the same location	1	2	3	4	5
Level of care/maintenance of site	1	2	3	4	5
Ease of use, provision of park and/or trail maps	1	2	3	4	5
Amenities (restrooms, food stands, parking, visitor centers, etc.)	1	2	3	4	5
Other, specify: _____	1	2	3	4	5
Other, specify: _____	1	2	3	4	5

19. What is your age? _____ 20. What is your gender? ☐ Male ☐ Female

21. Do you live in Athens-Clarke County (ACC)? ☐ Yes ☐ No

If YES, please mark the statement that applies to you:

☐ I am a permanent resident of ACC ☐ I am a student living in ACC
☐ I am both a student & permanent resident of ACC

THANKS AGAIN FOR YOUR TIME!!!

Appendix D – Non-users open-ended responses

If you answered "No," why do you think the greenway is not safe?

"Other(s), please list/explain:"

1. I live in Oconee Co.
2. i've also been told that if i do use it, that i should not be alone
3. i don't know - have never been or heard anything positive or negative either way
4. I've not been but my perception of open spaces in Athens are that vagrants/poor can gather there even in the day and make me uncomfortable - but that's just based on perceptions of other places in Athens since I've not been to the greenway.
5. [biggest reason: It goes through parts of town that are not safe] * * *
6. not big enough; too close to the road
7. I answered 'no' because I don't have a good sense of it's safety.

Why do you not use the North Oconee River Greenway? (mark all that apply and then please add any other thoughts and/or comments that you have to fully answer the question)

"Other(s), please list/explain:"

1. We need longer connected greenways that form a network from places like Watkinsville, Hull, all the way to Atlanta without having to use the side of a freeway as the 'greenway'.
2. small children, worried that there are not bathrooms nearby or they would be bored; safety a bit
3. I've heard that it is not a safe place to go, especially for a female alone
4. I am content with the public roads.
5. It seems like a lot of homeless people congregate there.

Appendix E – Users open-ended responses

If you answered "No," why do you think the greenway is not safe?
"Other(s), please list/explain:"

1. I feel unsafe on the more inactive days...no matter what part of town it goes through, I don't like to be isolated from people
2. As a female I would not venture along any part of the greenway alone at any part of day. It does go through some areas of town that i deem unsafe due to the homeless/ prostitute thoroughfares. The isolation of some areas along the greenway are not safe. There are places offenders can hide easily. The intermittent use of these areas would make it an easy place to target someone.
3. documented incidence of rape
4. Robbery\assault occurs consistantly in the area of town around the North Avenue bridge. Dudley park has a colorful history of robbery and assault. The police\paramedics are constantly being called to the North Avenue bridge to deal with the people that live under it. The soil of the section of the NORG directly below the classic center is contaminated with carcinogenic substances due to past industrial usage of the land.
5. It doesn't have a continous sidewalk along MLK (especially the segment between North Avenue and Conrad Rd) and pedestrians are force to walk over the right-of-way. The bike lane along MLK is dangerous since the two lanes were never expanded to make room for a bike lane. They just painted a line and make room (took off space) from the existing width of the road...so it is not a real designated bike lane persee. New sub-divisions and loft have been built along MLK with no pedestrian access..i.e. no sidewalks running along the MLK street with properly designated pedestrian crossing. North avenue is also a missed opportunity since their is no continous sidewalk running along the avenue. Sidewalks could be used to connect the surrounding communities with the greenway. The major issue is that the greenway at night is now home to homeless, drug users, and prostitutes...specially the corner of North Avenue and MLK.
6. Gangs seem to use the greenway as "their turf."
7. I have a friend who was attacked on the Greenway.
8. I just don't generally agree that any such space is inherently safe or not. Criminal elements can render a "safe" space unsafe rather quickly. Unless we want to live in a hyper-surveyed, police state, we have to accept or acknowledge a certain degree of risk. For me this is not a use deterrent.
9. While the above statements are true, I only travel on it in a group during daytime, so it does not bother me.
10. Dense vegetation surrounding and low siting near river means limited view sheds, enclosed feeling
11. Alone, especially being female I would not consider safe. If with a group in the daytime, I feel the NORG and Dudley Park and North Oconee Park are safe.
12. I would feel completely safe if only more people used it. I wouldn't care what neighborhoods it goes through if more people were on it.

13. I think of it as likely to be safer than people perceive it to be. I have heard about how dangerous it is though and if I were female I would probably feel less safe.
14. The greenway seems safe to me as it is open and well used, but the park by North Ave. (North Oconee River Park?) always has vagrants there so I feel very uncomfortable traveling through that area and would never stop there to view the river, although it looks very inviting at first glance.
15. I ran into several homeless people along the way
16. for the most part, safe, but it goes through some unsavory parts of town; I make sure to use it only during daylight
17. homeless people were sleeping
18. isolated
19. Overall, I think it is safe. Especially for someone like me who tends to be with someone or with a large dog. However, there are several safety issues that concern me in general. There are homeless people in the north oconee river park and lately, there has been a single homeless man camping out at Dudley park. Though I have never been/felt threatened, it does create an element that could be perceived as uninviting. Sometimes I encounter human feces along the greenway, which is obviously a hazard to me and my dog. Ditto for broken glass and other trash. I do not consider the area along Trail Creek to be safe. The warning signs were taken down when there was still evidence of residual chemical/perfume/dye in the water.
20. In my few visits (your survey did not allow for that answer earlier) I saw only homeless people sleeping on benches or panhandling.
21. Incidents in the paper of people being mugged while on the trail. The only time I used it I came across a homeless person and his dog sleeping in the middle of the afternoon.
22. I felt uncomfortable with the few people I did see there. Seemed more like a space for drug or sexual transactions.
23. some parts are safe, others are sketch city

Have you ever felt unsafe while on the North Oconee River Greenway? If YES, please describe the area(s) of the greenway where you felt unsafe:

1. Anytime I'm alone on the Greenway.
2. It is supposedly illegal, but I have spent much time along the greenway at night. Certain areas I would not recommend to women. On the dark stretch north of North Ave. and the beginning of Sandy Creek.
3. The Willow street section between North Avenue and College Avenue
4. Corner of North Avenue and MLK boulevard.

5. I was on the stretch of the greenway between College Ave. and Sandy Creek nature center after dusk and I was one of very few people on it, and I felt unsafe and isolated, even though I use it frequently.
6. between north ave & college, between mlk & the nature center, but it was too close to dusk. Very dark! & unpopulated.
7. Off of Dudley Park.
8. Fact of life, it IS UNSAFE AT ALL HOURS
9. Not for my safety but for others at the intersection of North Ave. and the greenway.
10. Intersection of Willow and North Ave where there is a homeless encampment under the bridge.
11. When I have been alone I have felt somewhat vulnerable.
12. isolated and confused about the direction and my surroundings
13. On the North side under the Loop there is a bridge that is questionable with activity
14. Along Willow St between College to North Ave.
15. The area across from Weaver Ds. The area is pretty deserted and if you try to take the pathways down into the park they end abruptly. Also homeless people camp out along the entire run of the river on this side. It also gets a little creepy when you enter the greenway at MLK and College Ave. However, it only feels unsafe if no one is on the trail but you or a couple other people and its just because nothing is really back there. It feels very safe 3-7 because it is used a good bit during those times of the day.
16. The North Oconee River Park
17. The parts in the woods- with high vegetation on either side. I would never go to this trail by myself.
18. Sorry, I am just generally apprehensive about safety when alone or alone with my smallish child. When I was on the trail, I was the only one around and there are unsafe areas of town that it goes through and there is lots of tall grass and I just have a hard time feeling safe in that type of environment. If it were more frequently used, probably wouldn't be as much of a concern.
19. Dudley Park area - near mama's boy
20. The section that goes from MLK-SCNC could use a call box midway. I know there are already a billion, but that's the only section that's secluded and doesn't offer any easy 'escape routes' but it is also the nicest to travel BECAUSE it's secluded and not a glorified sidewalk!
21. (couldn't describe, need a map)
22. The site across from the main greenway - across from Mama's Boy
23. no specific area
24. North Ave bridge right before MLK
25. I was very near downtown

26. don't remember exactly - bit north of weaver d's
27. not sure, off oconee rd. maybe?
28. can't specify, probably a personal thing
29. TENT CITY
30. where you are in the thick woods
31. where the trail is just a sidewalk at the point where it turns off of willow ave, onto elizabeth (I think), then to north ave, then down by the river along MLK
32. Overall, I think it is safe. Especially for someone like me who tends to be with someone or with a large dog. However, there are several safety issues that concern me in general. There are homeless people in the north oconee river park and lately, there has been a single homeless man camping out at Dudley park. Though I have never been/felt threatened, it does create an element that could be perceived as uninviting. Sometimes I encounter human feces along the greenway, which is obviously a hazard to me and my dog. Ditto for broken glass and other trash. I do not consider the area along Trail Creek to be safe. The warning signs were taken down when there was still evidence of residual chemical/perfume/dye in the water.
33. The area from Mama Boys to the trestle and just past there.
34. walking along river near MLK, walking toward train trestle (sp?).
35. Nearing dark. Not many people.
36. It's isolated and very sparsely populated. As a female, I would never walk there by myself without my huge dog.
37. i did see a homeless man pee - and there are at least 2 homeless camps
38. along Willow Street at the bridge

What about that area(s) and/or the situation at that time made you feel unsafe?

1. I feel more vulnerable when I m alone on the 2. It's getting dark and nobody is around on the Greenway.
2. It’s getting dark and nobody is around
3. Near the bridge by North Avenue there is always a group of people that stay out of site and their intentions are not well known.
4. Strange tweakers malingering and meanderinga bout and a general lack of lighting.
5. This section is unlit at night, and prostitutes regularly use this area to work.
6. Drug addicts and prostitutes come to you to ask for money.
7. It was dark, no access point off the trail (except for very steep slope up to 441), felt very isolated.

8. It was so isolated. I was with family and did not feel extremely unsafe at that time, but decided I would never go there alone.
9. Gang activity, just ask the local Athens Police.
10. Homeless gentlemen glaring at women.
11. There are a lot of homeless men that hang out at that intersection and it feels almost like it's their private space.
12. A large group of homeless men who are usually camped out under the bridge at the North Oconee River Park often make me feel uncomfortable.
13. invasive plantings give the impression of abandoned areas and lack of design...overall eery feeling in parts on the greenway. signage is poor and it is confusing as a greenway, possibly the worst one I have seen.
14. vandalization, remains of homeless
15. At night riding my bike along Willow St from College to North Ave. There are no street lights and it was a new moon. I'd say that nighttime seems pretty dangerous on the trail.
16. It was getting late and dark and on my trip I only saw two other people.
17. vagrants
18. Too isolated. Not enough users.
19. See previous note.
20. homeless kitchen nearby, lots of local/transient foot traffic
21. It would be difficult for police to access me and I was stuck between the 10 loop and the river, you can't really go anywhere in that situation to find people.
22. homeless people accosting us
23. That area - I didn't know to use the other side b/c it wasn't clearly marked
24. a creepy man walking near me
25. regular crowd of homeless people under the bridge/hanging out on the corner
26. homeless people were sleeping
27. not anyone around except people who appeared a bit unsavory - clothes etc. in vegetation
28. it seemed overgrown and I felt like I might have been the only person there
29. just a weird feeling of being alone
30. TENT CITY
31. no people around

32. i just wasn't comfortable with the surrounding housing and empty buildings along the trail at those points... i felt a little out of place in that part of town i guess

33. Overall, I think it is safe. Especially for someone like me who tends to be with someone or with a large dog. However, there are several safety issues that concern me in general. There are homeless people in the north oconee river park and lately, there has been a single homeless man camping out at Dudley park. Though I have never been/felt threatened, it does create an element that could be perceived as uninviting. Sometimes I encounter human feces along the greenway, which is obviously a hazard to me and my dog. Ditto for broken glass and other trash. I do not consider the area along Trail Creek to be safe. The warning signs were taken down when there was still evidence of residual chemical/perfume/dye in the water.

34. I'm trying to fill this out accurately, yet so far every question has been skewed to only certain answers. One time I was walking with my 87 year old mother. We were approached by drunks twice. There was no one else on that stretch around 3 PM. She didn't want to go on and without a clear map I could only decide to return rather than find a shorter exit.

35. Isolated, few other people there. The few others I did see made me uncomfortable; seemed like a likely spot for drug or sexual transactions. I was new in town and did not know then that it had a reputation as an unsafe place, but quickly found out it did.

36. Vulnerability.

37. Isolation; lack of other people. Closer to intown, some of the areas are potentially dangerous.

38. people milling about and yelling at me, also following me around the path...the time was morning

Appendix F – All other open-ended responses

USERS: "About how often do you use the greenway?"

"Other, please specify:"

1. Whenever I am in Athens. I moved away last Summer.
2. Once every 3 months **
3. Very occasionally
4. I've been a few times (5 to 10). And I have not been back in probably a year or more.
5. a few times a semester **
6. three to four times a year **
7. A few times a year **
8. Probably used the greenway two or three times in the last year and a half. **
9. once or twice per year **
10. once a year
11. Irregularly. Maybe 2-3 times per year. **
12. I used to use it weekly when I lived close enough to walk/run/cycle over, but now I do not live nearby and haven't used it in probably 8 months. *
13. couple times per year **
14. I used to use it 2x/day 5 days a week, but now I use it about monthly... so whatever frequency that is! *
15. every other month **
16. sporadically, it is not a part of my regular routine.
17. maybe 3 or 4 times
18. a couple of times
19. 2 times per year **
20. several times yearly **
21. every 2 months **
22. only 3 times
23. 2-3 times / year **
24. two or three times in five years
25. On occasion for events or personal use - no set time
26. Periodically use it to ride my bike.
27. a few times a few years ago
28. 3-4 times per year **
29. only a few times (5)
30. maybe a few times a year **

31. I moved back into the surrounding area almost two years ago and live further away. Since then, I haven't made use of it.
32. Sporadically. Just to get away from the office.

* included as "Weekly" ** included as "A few times per year"

USERS: What day(s) of the week and time(s) of the day do you/did you use the greenway?

“Other, please specify:”

1. I use the greenway often, without discretion of time of day
2. random
3. I also use the greenway at non-regular times for 'commuting' on foot (ie, walking through Dudley park to get from Point A to Point B, and walking to catch a bus at the multi-modal trans. center)
4. various times
5. other than Tueday mornings, my use is very random

USERS: "For what activities do (or did you) use the greenway?"

Other, please specify:"

1. Flying a Kite
2. Exploring
3. volunteer for invasive plant removal work days
4. class project for the river district, and volunteered one time
5. To show visitors the historical info markers by Chicopee
6. "alternative route of transportation" - not sure what that means. I use the NORG for transportation purposes occasionally, but the word "route" confuses me - maybe you mean "mode." Still, "alternative transportation" is a dated phrase that marginalizes bicycling and walking as legitimate modes of transport.
7. I'm using this to specify the question above. While I would like to see more people using the Greenway the more pedestrians, the harder it is to navigate on bike. I never got a good passing system down and startled a number of folks...
8. Volunteer clean-up activity
9. Because it's awesome and we need more!
10. picking up trash; also restoration projects as a volunteer
11. Only to see how much cement was used to encroach upon nature.
12. looking for blackberries
13. class assignment/observations

ALL: "Do you participate in outdoor recreation (other than on the North Oconee River Greenway)?, If YES, what type(s)?"

"Other(s), please list:"

1. Golfing
2. Site seeing historical sites.
3. Avid gardener
4. sports
5. Frisbee, Soccer
6. biking for commuting and pleasure
7. I do a lot of dog oriented activities... so I spend a lot of time at dog parks and other places that are dog friendly.
8. team sports
9. Frisbee, soccer, does farming count?
10. gardening
11. Birding
12. Camping, soccer
13. Camping
14. Backpacking
15. Team sports, disc golf, etc.
16. Camping
17. playground w/kids, kids soccer
18. jazzercise!!
19. golf
20. dog walking
21. camping, climbing
22. dog walking
23. Geocaching
24. We walk our dog. We photograph all aspect of nature. We camp in State Parks.
25. gardening
26. photography
27. picking blackberries

ALL: "How IMPORTANT are the following factors when you are considering a place for outdoor recreation?"

"Other(s), please list & designate HOW IMPORTANT the factor is to you:"

1. the amount of privacy/aloneness is important in terms that I want a happy medium. I don't want it to be crowded, but I don't want to be isolated either (for safety reasons).
2. Cost is quite important I would pay more for a safe clean area though.
3. Beautiful vegetation to provide interest year-round
4. Child friendliness
5. I don't mind foot traffic and the presence of other people, but other kinds of traffic bother me. In large part I do not go to NORG because I dislike having to walk along the street. Also... I'm not a super huge fan of bicycle traffic. I don't mind being around bikes, but when there aren't specific bike paths, it gets a bit annoying having to always get out of the way of passing cyclists.
6. Safety is by far the most important factor for me when deciding whether or not to use an outdoor recreation area.
7. I defined "Natural Features" as vegetation and water. The natural features don't need to be spectacular but I don't want to recreate in a concrete parking lot.
8. Dog park: "very important"
9. operating hours: "moderately important"
10. bike access: "extremely important"
11. Well, the big difference is between an urban park and a wilderness area, so my answers are again not for urban parks. Now that I am done, I have to say I oppose any additional trails to the greenway. You never ask questions about conservation or preservation only utilization and recreation. Is that what design principles are all about these days? New Urbanism is just manifest destiny for the elite.
12. Educational signs, about the natural purposes of the greenway area, would be very useful.
13. Bicycle patrols, activities that draw people on a regular basis (i.e. dog park, programming) very important.

Appendix G – Brochure of Events for the 16th Annual Neponset River Greenway Festival

Boston Natural Areas Network

NEPONSET RIVER Greenway Festival

16th ANNUAL

June 27–August 24, 2010

All Programs are FREE of Charge
For more information or to register for a program contact: Boston Natural Areas Network at 617-542-7696 or info@bostonnatural.org. For more events visit www.bostonnatural.org

MA Department of Conservation and Recreation

Martini Shell Inaugural Event

Martini Shell, Truman Parkway, Hyde Park

The 50-year-old band shell has been completely renovated. New park features including a river overlook will be unveiled. Stay tuned for date and details!

Greenway Triple Play – Discover the Neponset Greenway by Bike, Canoe or on Foot!

Join Neponset Greenway Council members, BNAN and MA DCR on these special guided programs to learn about the history of the Greenway effort, the newly created path and the vision to complete the trail. Join us for one or all three programs!

- **BIKE the New Greenway:**
  Martini Shell to Mattapan Square *Opening this Summer!*
  Wednesday, July 14 – 6:00 p.m.
  Meet at Martini Shell, Truman Parkway, Hyde Park
  We'll have two groups to ride this new section, including a family-friendly group. Bikes & helmets available to borrow! **Registration required.**
- **CANOE the Future Greenway:**
  Mattapan Square to Central Avenue *Currently in planning!*
  Saturday, July 24, 10:00 a.m.
  Meeting location will be determined pending river levels in July. Get a view from the river of the mile long trail gap in the trail between Mattapan Square and Milton. **Paddling experience and registration required.**
- **WALK the Dorchester/Milton Path:**
  Central Ave. to Pope John Paul II Park
  Wednesday, August 11 – 5:30 p.m.
  Meet at Central Ave. and River St., Lower Mills, Dorchester.
  On this easy walk, learn the story behind the beautiful murals and amazing transformation of this parkland from a railway corridor, landfill, drive-in theater and more. **Registration required.**

River Flicks – Family Movie Series

Sponsored by the MA Department of Conservation and Recreation

Watch a movie under the stars every Tuesday and Thursday night at two parks on the Neponset. Bring a blanket, chair and popcorn for a family movie that begins at sunset. Visit www.bostonnatural.org to find out what's playing.

- **Tuesday Nights at Sunset**
  July 6 – August 24
  Martini Shell, Truman Pkwy
  Hyde Park
- **Thursday Nights at Sunset**
  July 8 – August 26
  Pope John Paul II Park,
  Gallivan Blvd, Dorchester

Ranger River Fun!
Kids! Join a DCR ranger one hour before movies every other week to enjoy nature exploration, crafts and other activities.

- July 6, 20 & August 3, 17
  Martini Shell, Truman Pkwy
  Hyde Park
- July 8, 22 & August 5, 19
  Pope John Paul II Park
  Gallivan Blvd, Dorchester

Canoe the River

Co-sponsored by MA Department of Conservation and Recreation

- **Basics for Beginners**
  Mother Brook Mill Pond – Knight Street, Hyde Park
  Sunday, June 27 – 10:00 a.m., 11:00 a.m. & 12:00 p.m.
  Curious about canoeing? The Mother Brook Mill Pond is a perfect spot to learn basic paddling skills. Beginners only please! **Registration required.**
- **Morning Estuary Paddle**
  Neponset Landing, Hilltop Street, Dorchester
  Saturday, July 10 – 10:00 a.m.
  Enjoy a canoe trip upstream into the estuary, highlighting local history along the way. **Paddling experience required. Registration required.**

- **Paul's Bridge Paddle**
  Brush Hill Road and Neponset Valley Parkway, Milton/Hyde Park
  Sunday, August 1 – 1:00 p.m.
  We'll launch from this historic bridge and enjoy the lush vegetation on this section of the river. **Paddling experience required. Registration required.**
- **More Basics for Beginners**
  Mother Brook Mill Pond – Knight Street, Hyde Park
  Sunday, August 15 – 1:00 p.m. & 2:00 p.m.
  If you missed the beginners program at the start of the summer, here's another chance to learn. We'll practice basic paddling skills around the Mill Pond. Beginners only please! **Registration required.**

River Arts & Nature Workshops

- **Neponset Watercolor**
  Martini Shell, Truman Parkway, Hyde Park
  Wednesday, July 28 – 5:30 p.m.
  Cathy Garnett of MA Dept. of Conservation and Recreation will instruct the group in basic watercolor technique, using the surrounding trees and river as our subjects. Supplies provided, bring your own folding chair. **Registration required.**

- **Fowl Meadow Photography**
  Meet at Paul's Bridge parking area, Neponset Valley Pkwy & Brush Hill Rd, Hyde Park/Milton
  Sunday, August 8 – 4:00 p.m.
  Join Readville nature photographer Martha McDonough to learn photo composition while exploring the flora, fauna and vistas of Fowl Meadow. Bring your own camera. **Registration required.**

Especially for Children

Ryan Playground, River Street, Mattapan
Co-sponsored by the Mattapan Community Development Corporation

Thursday, July 8 – 10:30 a.m. - 11:30 a.m.
Come meet the exotic critters of **Rainforest Reptile Shows.** Enjoy this fun opportunity to learn and get up close and personal with alligators and more!

Thursday, July 15 – 10:30 a.m. - 11:30 a.m.
Cornell "Sugarfoot" Coley will entertain, teaching hand-drum rhythms and bursts of high energy African, Latin/Caribbean and Brazilian dance.

Thursday, July 22 – 10:30 a.m. - 11:30 a.m.
Bonaparte the Magician will dazzle and delight audiences of all ages with his unique blend of amazing magic, hysterical comedy and much more!

Thursday, July 29 – 10:30 a.m. - 11:30 a.m
Storyteller **Valerie Stephens** offers up interactive tales, songs and games from West Africa, the Americas and Caribbean with lessons and fun for all to enjoy.

Sponsors: Boston Natural Areas Network, Neponset River Greenway Council, MA Department of Conservation & Recreation, Mattapan Community Development Corporation, MA Cultural Council, Alice Willard Dorr Foundation, Merck Family Fund

Visit us at www.bostonnatural.org

BOSTON NATURAL AREAS NETWORK dcr NEPONSET RIVER GREENWAY MCC