ABSTRACT

ZECK, ADRIAN MICHAEL. Examining Users' Preferences, Perceptions, and Attitudes on a Multi-Jurisdictional Rail-Trail. (Under the direction of Dr. Roger L. Moore.)

Instances of trails managed by multiple governmental agencies (i.e., multi-jurisdictional trails) are becoming increasingly common. However, researchers have focused little attention on the users and use of these important recreation resources. The purpose of this study was to examine the use of a multi-jurisdictional trail near a growing metropolitan area by profiling the users and trail use, examining their choices, attitudes, and perceived benefits along the trail. The particular focus was determining the importance of various factors in users' choices of which trail section(s) they use and determining users' awareness of and attitudes toward the multi-jurisdictional nature of the study trail. A purposive sample of visitors to the multi-jurisdictional American Tobacco Trail near Durham, NC participated in an on-site and then a follow-up questionnaire to provide the study data. Study results revealed that multi-jurisdictional awareness and preferences differ somewhat by activity type. Specifically, runners have more concern than bicyclists and walkers for trail-wide consistency in terms of bathroom facilities and availability of drinking water. However, runners have less concern than bicyclists for consistency in terms of parking facilities and on-site information about the trail. These results should help inform the planning and management of such trail settings and, thereby, help increase the benefits they can provide.

Examining Users' Preferences, Perceptions, and Attitudes on a Multi-Jurisdictional Rail-Trail.

by
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DEDICATION

I would like to dedicate this thesis to my loving and supporting parents, Pam and Gerry Zeck. In addition, I would like to thank Dr. Roger Moore for his help and assistance as my advisor for the past two years.

BIOGRAPHY

Adrian Zeck was born in Minneapolis, Minnesota. He received a bachelor of arts in history at the University of Florida then stayed in Gainesville, Florida and worked for the George A Smathers' Libraries at the University of Florida. It was here that he became interested in working in the field of parks and recreation.

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INTRODUCTION

An established body of literature exists on the benefits associated with recreation and recreation resources (Driver, Brown, & Peterson, 1991; Moore & Driver, 2005). These include economic, physical and mental health, environmental, and cultural and social benefits. Trails and trail corridors of all varieties afford users with opportunities for achieving these benefits and others associated with recreation (California State Parks, 2002; Moore & Driver).

Many of the recreation benefits associated with trails relate to the individual's trail use. For instance, physical activity on trails provides users with a variety of health benefits (Crumm & Santoro, 2007; Oh & Hammitt, 2010). These health benefits are not limited to physical benefits associated with exercise although those benefits do result, and include less reported visits to hospitals and lower costs associated with physical care (Fewster; 2004). Trail users also report improvements in their mental health after using trails (Norling et al., 2010; Voruganti et al., 2006). Part of these restorative benefits might result from trails' locations in natural environments. Users perceive forests and other natural areas, like those found around many trails, as more desirable than urban scenes and users believe natural areas possess restorative properties not found in the urban environment (Shin, Yeoun, Yon, & Shin, 2010). Recent studies indicate that urban greenway trail corridors maintain ecological diversity among area flora and fauna, compared to areas outside the corridors, and can provide users with a greater understanding of their environment (Angold et al., 2006; Sandstrom, Angelstam, & Mikusinski, 2006). Some studies have also focused on the social benefits accrued by trail users (Fewster, 2004; Southwick, Bergstrom, & Wall, 2009; Crumm

& Santoro, 2007). Fewster discovered that joining trail clubs could contribute to the benefits users receive from trails. Bereavement organizations, for example, recognize these benefits and recommend their clients join trail-walking clubs to aide in forming a social support system (Fewster). Trail studies have also found that users typically report their trail experiences are more valuable than the economic costs they incurred while visiting the trail (Southwick, Bergstrom & Wall). However, trails benefit more than just trail users.

Trails provide benefits for non-users and communities located near multi-use trails or urban greenway trail corridors. Crompton and Nicholls (2006), for example, found that greenways increased property values of nearby homes compared to those homes located further away from the trail. Trails can be economically sound investments because of the possibility to reduce health care costs for both the individual and the community (Fewster; Wang et al, 2005). Reducing an individual's medical costs paid by the individuals, insurance companies, or government programs, can reduce the need for insurance companies to raise their rates or for governments to spend more taxpayer money on rising health care costs. Trails also generate revenue in terms of spending along trails and jobs (Fewster; Southwick, Bergstrom, & Wall). For example, many trail-dependent jobs cater to tourists visiting the trail by either supplying them with provisions or places to stay. Trails can provide non-local visitors with tax-free benefits of using a public trail. As Crompton and Nicholls pointed out, homeowners not living near the trail who visit the trail do not have the higher tax rates associated with homes near trails. Using trails with family or community members builds stronger and healthier bonds by providing a venue for interaction in an open atmosphere (California State Parks, 1995; Moore & Shafer, 2001). However, trail-based interactions are not the sole means through which trails foster community bonding. In Kelly's (2006) study on trails, the author found that trails can also connect communities to their past by providing access to historic places, artifacts, and buildings.

Although trails provide particular benefits for users and non-users, multiple benefits can combine to generate greater gains than any singular benefit. For example, individuals who use trails for alternative transportation generate health benefits for themselves, reduce traffic congestion for their community, prevent extra air pollution from entering the atmosphere by reducing care use, and might feel more responsible in their choices. In addition, individuals who use trails for group recreation can benefit from better health, community bonding, and environmental awareness. Individuals also contribute to the local economy by purchasing trail related equipment and supplies.

In an effort to maximize benefits for users and non-users, governing authorities, and trail advocates have looked to trails as an efficient method for providing their citizens with benefits (Moore & Driver, 2005). Urban greenway trail expansion, in particular, has received increased governmental attention over the last two decades because of the aggregate benefits afforded through trails. For instance, community benefits lie behind the city of Tampa Bay's plans for a new greenway trail through downtown because the expressway authority believes the trail will, "add [to the] art and educational elements" of the area (Wilkens, 2011). U.S. Representative Earl Blumenauer (D-OR) and Secretary of Transportation Robert LaHood have worked to promote multi-use trails at the national level through proposed tax breaks and promised stimulus funding (H.R. 3271, 2009; LaHood, 2010). Non-governmental organizations help maintain trails and lobby for expanding trail systems. The Rails-to-Trails Conservancy, for example, is a 100,000 member strong nonprofit organization focused on promoting a nationwide network of rail-trails using abandoned rail lines. Currently, 15,000 miles of rail-trail exist in the United States (Mundet & Coenders, 2010). With a vast amount of unused line miles, growth in miles of rail-trails could continue for many years (President's Commission on Americans Outdoors, 1987). However, many challenges exist in developing trails. A proposed bill promising tax breaks to businesses supporting urban trails remains locked in committee (H.R. 3271). With recent state budget constraints, some legislatures continue to consider park closures as cost saving measures (Patterson, 2011; Associated Press, 2011). In order to maximize the potential benefits of trails, trail proponents and researchers need to focus particular attention on trails in and near population centers.

The world has seen a global shift of populations to cities over the past few decades. The United Nations (2009) estimates that a little more than 60% of the world's population will live in urban areas by 2035. By the same year, the United States will see almost 88% of its population reside in urban areas (United Nations). The growing urbanization of the United States has led trail advocates along with local, state, and federal governments to focus on providing more recreation opportunities in and around urban environments. Past research indicates that neighborhood residents are more likely to participate in physical activity on neighborhood streets if the residential neighborhoods have street connectivity, access to outdoor facilities, attractiveness, and access to areas of interest (Sugiyama, Leslie, Giles-Corti & Owen, 2008). Given the large percentage of citizens potentially able to benefit from trails in urban and suburban areas, and the complexities of land ownership in urban and suburban areas, managing authorities will have to work cooperatively to provide trail opportunities in such settings.

Currently, many cooperative management efforts support and promote trails in urban and suburban settings and more managers have been moving toward adopting multi-jurisdictional management approaches since the late 1990s (Adcock, 1999; Crumm & Santoro, 2007; California State Parks, 2002; Chambers, 2009). For example, the City of Santa Barbara cooperates with the County of Santa Barbara and the Los Padres National Forest to provide oversight for Santa Barbara's Front Country Trails Multi-jurisdictional Task Force (City of Santa Barbara, 2011). California State Parks (2002) has also suggested multi-jurisdictional trail corridors are ideal for maintaining wildlife habitat, defining communities, and fostering multi-agency cooperation. As instances of governmental support for multi-jurisdictional trails continue to grow, researchers should start focusing more attention on investigating the use of these increasingly common trails.

One important gap in the literature relating to multi-jurisdictional trails involves understanding how people perceive and use these trails. The various sections of a single multi-jurisdictional trail often have different characteristics and management approaches including different surfaces, rules, signage, type and number of access points, amenities (e.g., restrooms, benches), and etc. Any of these and other factors under the control of the different managers might affect visitors' decisions about whether, where, and how they use the trail. In fact, empirical evidence indicates that some trail users favor specific site layouts and trail conditions when choosing locations for recreation (Siderelis, Naber, & Leung, 2010). However, trail studies have yet to fully address how users choose where and how they access a multi-jurisdictional trail (Moore & Scott, 2003). Trail planners, managers, and advocates would all benefit from a better understanding of trail use and trail users on multi-jurisdictional trails given the importance of such recreational settings and their likely growth in the future.

Therefore, the purpose of this study was to examine the use and users of a multi-jurisdictional trail near a growing metropolitan area. This study has four specific objectives:

1. Profile the characteristics of the users of a multi-jurisdictional trail.
2. Profile the use of a multi-jurisdictional trail, including users' activities, motivations, length of stay, party size, how they travel to the trail, how far they travel for trail access, perceived benefits, and which section(s) of the trail they use.
3. Determine users' awareness of and preferences regarding the multi-jurisdictional nature of the trail.
4. Explore the influence of activity differences on preferences regarding the multi-jurisdictional nature of the trail.

Specifically, this research will attempt to answer the following research question: Do users of a multi-jurisdictional trail prefer uniformity or diversity across the entire trail in terms of the elements under managers' control, such as trail surface, types of facilities, signage, on-trail information, tail maintenance, and availability of drinking water?

Answering this question and addressing the above objectives are intended to provide helpful information for trail managers and advocates.

LITERATURE REVIEW

This chapter provides a review of the literature related to choice behavior, perceptions, motivations, and past studies related to the use and users of trails. The first part of the chapter begins with the theoretical framework upon which this study is built. The chapter then presents previous research related to trails and concludes with a discussion of research related to trail use and trail visitors.

Theoretical Framework

Choice behavior research examines the preferences, motives, attitudes, emotions, beliefs, and perceptions that generate cognitive decisions and produce choices (Ben-Akiva et al., 1999). Although economists, psychologists, and others address choice behavior in their research, these fields have different views on the decision-making process. Economists believe information inputs (e.g., perceptions & tastes) are keys to choice, while psychologists consider a broader array of factors that help inform and affect behavior (e.g., perceptions, motives, attitudes, emotions) (Ben-Akiva et al.). Because economic models approximate choices and rarely include behavioral inputs, Ben-Akiva et al. built upon the physiologists' approach and developed a theoretical framework that suggests how various factors can influence and affect choice (Figure 1). According to their framework, experience and information are two of the key external factors influencing choices along with the individual's internal motivation, perceptions, tastes, memory, and preferences.

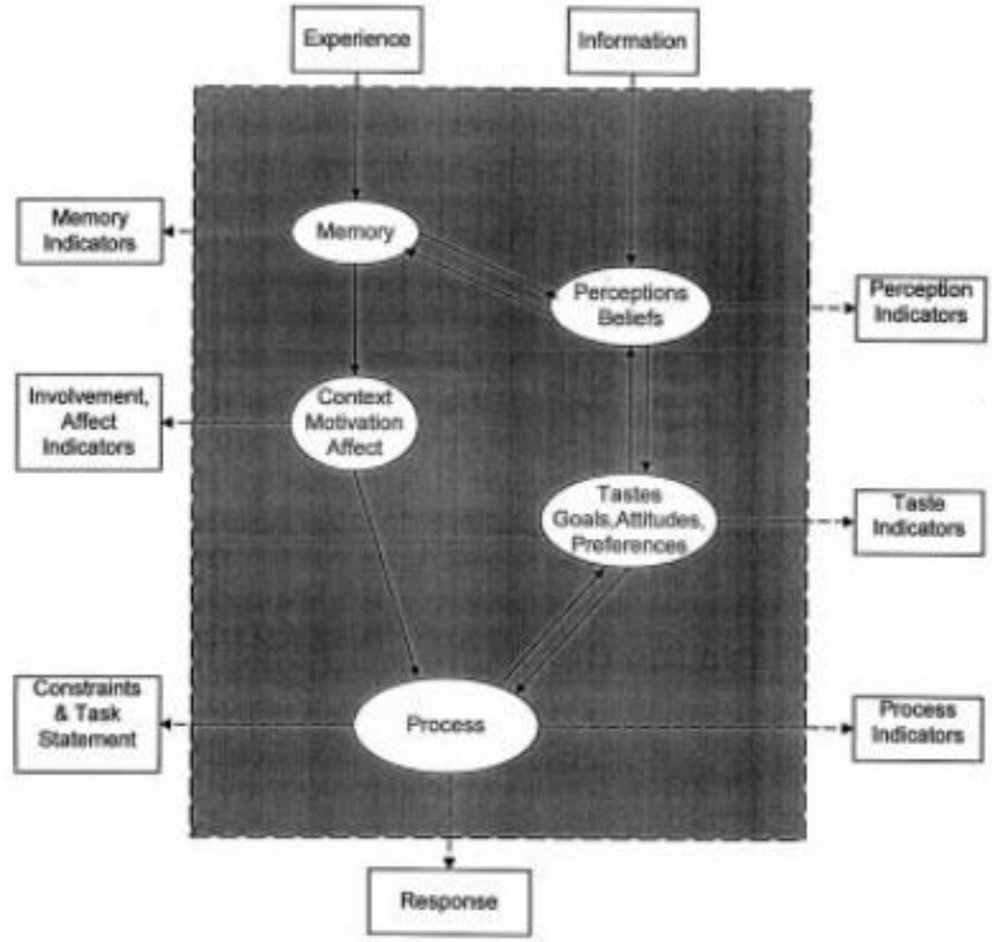

Figure 1: Theoretical Framework for Modeling Choice Behavior (Ben-Akiva et al., 1999)

As Figure 1 illustrates, experience and information are considered primary contributors that can affect a user's choice behavior. Although information from visual cues and desires might affect a user's choice behavior, the theoretical framework proposed by Ben-Akiva et al. attributes comparable importance to users' experiences. Previous research by McFarlane, Boxall, and Watson (1998) supports Ben-Akiva et al.'s theory that the user's previous experiences and awareness can dictate their future choice behavior. They also found empirical support for the contention that a lack of information can also affect a user's preferences in that a lack of information concerning trails explained some of the incongruity between users' preferred experience and their less preferred, but typically used route (McFarlane, Boxall, & Watson, 1998). Ben-Akiva et al.'s (1999) framework illustrates the importance of preferences to choice behavior as well as the importance of the relationship between preferences and perception.

Perception theory, in general, draws from Gibson's (1950) theory of visual perception. Originally designed for psychological applications that study investigated how visual cues (e.g., distance, slant and texture) affect an individual's perception of their environment. Gibson (1979) expanded his study to examine animals' perceptions of environmental stimuli and found that perceptions can afford certain benefits. Using an ecological approach to perception theory examines external stimuli as the factors that individuals interpret. The opportunities provided by the environment (e.g., "affordances," niches, or series of affordances) form part of the theory of ecological perception that dictates how animals negotiate and select their surroundings (Gibson, 1979). Gibson's work helped familiarize environmental-based researchers with the elements of choice theory, previously found primarily in the fields of psychology and economics (Heft, 2010). Later research, described below, investigated the effects of behavior and preference on the experiences of trail users and the attitudes that resulted from their experiences.

The environmental perception work of Rachel and Stephen Kaplan employed photography to understand users' environmental preferences. Kaplan and Kaplan's (1989) research demonstrated that preferences and perceptions have a significant impact on an individual's choices because the individual often selects environments that they believe best fulfill their needs. Other researchers agree that environmental areas and features can draw users because of the distinctive experiences and possibilities for action or constraints on users' actions (Heft, 2010). The Kaplans' research has not been free of detractors. Researchers have criticized their reliance on fixed-point photographs, suggesting that they might detach the visitor from the environment and alter their perceptions (Heft). However, the Kaplans believed that so much of human life already revolves around two-dimensional imagery (e.g., the television) that photographs should not detach the visitor. The Kaplans' detractors do acknowledge that little research has examined how individuals perceive environments during the course of their actions as opposed to viewing snapshots of static environmental scenes (Heft). Although, criticisms of their research technique exist, the Kaplans were able to document that individuals are aware of their environmental perceptions and that preferences for those elements do exist.

Expanding on the relationship between preference and perception, Kaplan and Kaplan (1989, p. 11) state, "Perception is a key element in preference, and the measurement of preference permits an examination of the perceptual process." The relationship between preferences and perceptions can help explain how individuals select one site from an assortment of possible sites. Therefore, perception theory can aid in understanding the complicated process that users follow to develop their preferences. Elements of Ben-Akiva et al.'s (1999) framework (perception in particular) indicate that users can overcome some constraints to access and use. For example, previous studies of choice behavior support suggestions that an individual's preferred blend of physical, social, managerial features

(Driver & Brown, 1978) and their personal set of income constraints (Siderelis, Moore, & Lee, 2000) can impact site choices.

Constraints, though, do not always prevent users from accessing recreation areas. Many factors involving perception (e.g., aesthetic value, type of experience sought, safety, site conditions, cleanliness, naturalness, aesthetics, access, and area development) affect a user's willingness to visit trails or greenways (Cahill, Marion, & Lawson, 2007; Gobster & Westphal, 2004). In addition to these factors, the perceived ease with which users can access a trail can affect trail visitation (Heft, 2010). Empirical research supports the importance of design in users' perceptions of the ease of accessibility (Abildso et al., 2007). Although proximity was not found to be the most important factor for trail use in past studies (Moore & Scott, 2003), recent studies indicate that despite differences in physical distance to trails, users who perceive trails to be close to their residence are more likely to visit those trails (Abildso et al.). Perceptions, memory, and experience can combine to affect motivations (Ben-Akiva et al.) and influence behavioral choices. Users can also develop place attachments related to their motivations (Wolch et al., 2010), activity type, and frequency of trail use which can affect their trail use (Moore, 1994; Moore & Scott).

Research on Trails and Trail Use

The following section begins with a discussion of the definitions of trails since various definitions currently exist for trail types and these must be established before discussing previous trail research. The historical background of the rail-trail movement in the United States follows to provide a context for the type of trail examined in this study.

Following the background on trails, an overview of related trail research illustrates areas that previous studies have focused on and where gaps in the literature currently exist.

Background

Different types of trails exist and managers and scholars use a variety of definitions to discuss the differences among them. For the purposes of this research, the trail types traditional backcountry trails, recreational greenway trails, multi-use trails, water trails, and rail-trails were used (Moore & Driver, 2005; Moore & Ross, 1998).

Characterized by a natural surface, backcountry trails are located in more remote sections of parks and recreation areas compared to other trails. Recreational greenways represent natural strips of open space with a trail located in that the space. Within the realm of recreational greenway trails, these typically paved multi-use trails in open spaces are commonly referred to as greenway trails (Moore & Ross). Occasionally found in recreational greenways, multiple-use trails have wide and hard surfaces that allow for higher density use by multiple activities. Water trails are navigable bodies of water (e.g., rivers, lakes, streams, etc.) that afford users with opportunities to travel on a designated water route. Rail-trails are recreational trails located in abandoned railroad corridors and reclaimed for recreation or transportation purposes.

Rail-trails afford users with recreation opportunities in a variety of landscapes. The advent of the rail-trail movement traces back to 1983 when the amended National Trails System Act (1983) allowed the government to preserve railroad rights-of-way for future rail use should the rail line become abandoned, and to encourage recreation and energy-efficient transportation use along the corridor. However, the lack of available funding to covert abandoned rail lines into multi-use trails slowed the creation of rail-trails. The Rails-to-Trails Conservancy (RTC) successfully lobbied for funding for trail conversion on rail-banked lines in 1991 through the Intermodal Surface Transportation Efficiency Act (ISTEA). Between 1997 and 2005, rail-trails increased by an average of 58 trails per year in response to a tenfold increase in funding, from $37.5 million to $370 million, for the Federal Highway Administration's Recreational Trails Program (Ivy & Moore, 2007). By 2007, 1,359 rail-trails had been constructed totaling 13,150 miles with 1,172 additional trails (Abildso et al., 2007). Because railroad corridors sometimes travel between and through population centers, they afford users with the opportunity to experience urban, suburban and rural landscapes. Administering these rail-trails has created an increasing need for managers and other stakeholders to understand the use and users of these trails.

Trail Research. Trail research has examined user behavior, user perceptions, user preferences, motivations, recreational conflict, and benefits along with identifying trail users' characteristics. A large proportion of trail research has focused on user behavior in backcountry areas (Dorwart, Moore, & Leung, 2010; Goldenberg, Hill, & Freidt, 2008; Jackson, Haider, & Elliot, 2003; Lawson & Manning, 2002; Mann & Absher, 2008; Vale & Heldt, 2003; Vaske, Dyar, & Timmons, 2004; Vaske, Needham, & Cline, 2007; Watson, Niccolucci, & Williams, 1994). However, recent research related to urban greenway trails indicates that social factors (e.g., user speed, use levels, group size, and conflict), managerial factors (e.g., maintenance, trail surface), and physical factors (e.g., trail design, trail setting) can significantly affect users' trail preferences and choices (Reichhart & Arnberger, 2010).

Social factors that can contribute to a user's preferences and choices include group size, experience level, and speed differential. Empirical evidence indicates that encounters with large groups of individuals cause less disruption to trail users than encounters with individual users (Arnberger & Eder, 2008). Individuals might be more inclined to vary their travel patterns than larger groups and therefore create more disruption for other users. Speed differences among users can contribute to a user's trail preference and perceived trail conflict between users and among user groups (Reichhart & Arnberger; Moore & Scott; 2003). Users that travel slower than others, such as walkers compared to bicyclists, often experience speed related conflict when they encounter a faster user. Social factors include conflict created by users who disrupt another user's desired experience.

Some backcountry trail literature built upon Jacob and Schreyer's (1980) conflict theory and examined how differences in activity, resource attachment, environmental perception, and level of user tolerance contribute to conflict (Banister et al., 1992; Hoger & Chavez 1998; Lee, Shafer, & Kang, 2005; Vaske et al., 2004; Vaske et al., 2007; Watson et al.). Findings suggest that differences in acceptable behavior (Watson, Williams, & Daigle, 1991) and tolerance among different skill levels are related to conflicts experienced by backcountry users (Vaske et al., 2007). Vaske et al., attribute these conflicts to users who have higher skill levels or more specific expectations for the number of other users and their behavior based on previous experience. Efforts to alleviate conflict through segregating trails often generate a perceived resource imbalance that contributes to further conflict between users (Jackson et al., 2003; Mann & Absher, 2008; Vaske et al., 2004).

Researchers have also found that some conflicts do exist on rail-trails and have examined the relationship between trail user conflict and crowding (Gobster, 1995; Moore, Scott, & Graefe, 1998). However, the results might indicate problems with specific trails rather than widespread problems on most trails (Moore, 1994). Design elements have been identified (i.e., trail width, access points) as contributing factors related to conflicts among user groups (Arnberger & Eder, 2008; Banister, Groome, & Pawson 1992; Moore, Scott, & Graefe). Therefore, current issues related to conflicts on trails might be a result of high percentages of new and established users traveling in the same area that also might have different levels of skill. As one of the many factors that trail managers can control to minimize conflict and maximize benefits, trail design and width can help improve the trail users' experience.

Researchers have found that social factors do not have the same impact on respondents' preferences as satisfying those preferences through management and psychical actions (Reichhart & Arnberger, 2010). Empirical research indicates that physical factors (e.g., trail design) can provide some positive affordances for the user and potentially enhance benefits. Users tend to select a trail, in part, based on their activity preferences (Moore, Graefe, Gitelson, & Porter, 1992) and can develop place attachments to particular trails or trail segments (Moore & Scott, 2003). For example, a trail runner might choose a segment of trail with natural soil or compacted limestone surface because those surfaces afford a more comfortable running environment. The route that visitors take once on the trail can also be influenced by scenic views or other local trail attributes. Studies have suggested that many trail users prefer a nature-based experience (Gobster, 1995). However, recent urban rail-trail studies suggest that urban trail users might prefer a diversity of viewsheds (i.e., natural and urban environments) compared to users who were only experiencing a "natural" viewshed (Lindsey, Wilson, Yang, & Alexa, 2008; Reynolds et al., 2007). Although these results might seem to contradict past research, the recent studies do show that users might be more aware of their surroundings than previously assumed and have viewing preferences for diversity in urban and rural settings.

Although managers can control some attributes of trails or greenways, recent research has found that naturalness, distinctiveness, pleasantness, and arousal contributed more to influencing a user's trail preference than maintenance (Chon & Shafer, 2009). While the naturalness of a trail can contribute to the "likeability" of the trail environment (Chon & Shafer), the naturalness of a trail might be at odds another user's perception of a safe environment. One study indicates that perceived trail safety significantly affected the level and extent of trail use (Wolch et al, 2010). Some of these results might be indicative of general familiarity with the trail environment or initial expectations. Although empirical evidence does suggest a general user preference for open viewscapes, Jorgensen, Hitchmough, and Calvert (2002) found that the spatial arrangement of vegetation was more significant in terms of safety perceptions than type of vegetation. Further, an edge treatment of flowers was preferred in all spatial arrangements (Jorgensen, Hitchmough, & Calvert). These results might indicate that a middle ground exists between providing for users' safety preferences and providing natural surroundings.

Many different settings, including trails and greenways, can provide benefits associated with leisure (e.g., economic, environmental, social/cultural, psychological, and psychophysiological) (Moore & Driver, 2001). Some rail-trail studies have investigated the types of benefits sought by visitors to rail-trails (Bichis-Lupas & Moisey, 2001; Bowker, Bergstrom, & Gill, 2007; Moore, Graefe, Gitelson, & Porter, 1992). Some benefit-based trail literature mirrors the groupings described by Moore and Driver. Trail literature includes studies on the economic (Bichis-Lupas & Moisey, 2001; Bowker, Bergstrom, & Gill, 2007; Notaro & De Salvo, 2009; Oh & Hammitt, 2010; Ott et al., 2006), health (Mitchell & Popham, 2008; Pretty, Peacock, Sellens, & Griffin, 2005; Shin, Yeoun, Yoo, & Shin, 2010; Wang et al., 2004), environmental/ecological (Angold et al., 2006; Sandstrom, Angelstam, & Mikusinski, 2006), and social benefits (Kelly, 2006) that using trails, visiting trails, or residing near trails can provide.

Some studies suggest trail design could be a more effective impact on users' preferences for the trail than social factors (Reichhart & Arnberger, 2010). Previous research on the Appalachian Trail has indicated that users perceive particular elements of the trail environment and that these elements can affect user experience (Dorwart, Moore & Leung, 2010). User perceptions of adverse trail quality should encourage managers to improve conditions in attempts to increase visitation or user satisfaction. For example, addressing safety concerns (e.g., more streetlights, fewer tunnels, and reduced trailside vegetation) can increase the likelihood that visitors will use an urban rail-trail (Gordon, Zizzi, & Pauline, 2004; Reynolds et al.).

User Studies. Understanding the types of users who visit trails can assist managers in understanding the needs and desires of their users, help trail planners in designing future trails, and allow businesses to cater better to specific groups of potential customers.

Some user studies have identified trail user groups for the purpose of expanding marketing knowledge for local businesses (Bichis-Lupas & Moisey). Local businesses that already benefit from the rail-trails can employ user demographic information to create marketing programs. For example, studies have found that users with different demographic characteristics (e.g., nationality, education, and income level) might possess different expectations and preferences for crowding in parks, with local users more willing to encounter groups (Sayan & Karaguzel, 2010).

Demographic studies of rail-trail users have been able to identify typical rail-trail users, although wide variations do exist. Overall, rail-trail study respondents are more likely to report higher income, greater education levels, and better general health compared to nonusers (Abildso et al., 2007; Troped et al., 2001). As previously noted, many rail-trail respondents might choose to exercise on the trail and therefore their general health might be improved. Research into trail users has produced varying results regarding race and ethnicity of respondents. Most studies have found that a significant majority of rail-trail users were white (Abildso et al.; Troped et al.). However, other trail studies have found that no clear majority of races use trails (Wolch et al., 2010). The location of the trail quite likely affects the racial mix of the population of users on a particular trail.

Trail researchers have investigated the impact of trail users' residences on the make-up of users. Studies have found that trail users have similar demographic characteristics to the neighborhoods surrounding the trails (Abildso et al.; Moore, Graefe, Gitelson, & Porter, 1992). Although Wolch et al. found no relationship between users' race/ethnicity and their use of multi-use urban trails, the specific trails used in that study passed through neighborhoods of diverse ethnic and racial populations. Despite the possible variations in trail clientele between types of trails, identifying rail-trail recreationists aids trail advocates, planners, and managers in understanding the types of recreationists that use the trail and how to maximize the quality of their trail experiences.

Trail location may be just as important as design for influencing trail use. Researchers have found that proximity affects trail use, with those respondents living closest to the trail often using the trail more often than respondents living farther away do (Abildso et al., 2007; Gordon, Zizzi, & Pauline, 2004). These studies could suggest differing preferences that affect an individual's choices of trails, or segments within a trail.

Trail Activity Differences. A complex relationship exists between and among different activity types. Previous studies have found that users engaged in different activity types can vary in their choices (Won & Hwang, 2009), motivations (Mowen, Graefe, & Williams, 1998; Lee, Scott, & Moore, 2002; Schooley, 2007), behavior (Walker & Shafer, 2011), and attitudes (Mowen, Graefe, & Williams). Further, differences in activity type can influence the perception of conflict (Albritton, Stein, & Thapa, 2009; Moore, Scott, & Graefe, 1998; Vaske, Dyar, & Timmons, 2004).

Users' activity types have been associated with different levels of tolerance for other users' activities. Vaske, Dyar, & Timmons found that behavior outside of the user's activity type was less tolerated than in-type behavior. In a study of motorized activity types, four wheel drive users' level of tolerance was associated with perceived conflict (i.e., the least tolerant type perceived the most conflict) and four-wheel drive users felt they were different from the other activity types (Albritton, Stein, & Thapa). Differences in the level of technology among activity types can also contribute to speed differences. Researchers have found that faster, more technologically advanced activity types are typically more tolerant of slower and less technically advanced activity types (Andereck, Vogt, Larkin, & Freye, 2001). The presence of relatively new activity types and of differences in levels of speed among types can also contribute to conflict and generate behavioral concerns (Moore, Scott, & Graefe, 1998).

Researchers have examined users' activity types (i.e., bicycling, horseback riding, hiking, etc.), trail type (i.e., rail-trail and backcountry trail), or a combination of both variables to determine what most affects trail user diversity (Mowen, Graefe, & Williams, 1998). These variables were divided into categories that included social-demographic characteristics (e.g., education), visit patterns (e.g., miles traveled, time spent in activity), and management attitudes (e.g., place attachment, activity involvement, and expertise). The study found that variations in the measured variables were more significantly affected by users' activities than trail type (Mowen, Graefe, & Williams). Later, studies conducted on urban-proximate trail populations found that activity type was a significant predictor of specific motivations (i.e., family togetherness, friendship ties, exercise, excitement, and skill development) and attitudes about trail design (Lee, Scott, & Moore, 2002). Schooley (2007) found significant differences among activity types (i.e., walking, running, bicycling) in terms of motivations (i.e., family togetherness, friendship ties, appreciation of nature, exercise, excitement, novelty, and skill development).

Conclusion

This chapter presented some of the past and current literature related to choice behavior, preferences, and motivations, as well as a summary of the research related to trail use and users. Although there is a considerable literature related to trails, currently a gap exists in terms of users' perceptions and use on multi-jurisdictional trails. Therefore, this study will examine how users' activity differences influence their preferences and attitudes regarding multi-jurisdictional trails. A better understanding of the various preferences and attitudes users have toward such trails can contribute to the knowledge of how, where, and why users visit particular multi-jurisdictional trails (i.e., trails managed by multiple governmental agencies) or particular segments of those trails. This information could help improve the planning and management of these increasingly common recreation settings and thereby help increase the benefits these trails provide.

The methods used in this study will be described in the next chapter.

METHODS

Chapters one and two offered an introduction to and background for this study. This chapter describes the study site, data collection methods, and analysis.

Study Site

This study examined the use and users of the American Tobacco Trail (ATT), a rail-trail in central North Carolina. The ATT is a multi-jurisdictional trail that has three distinct sections with different characteristics and different management approaches. These differences include dissimilar surfaces, widths, amenities, and access. As an example of a multi-jurisdictional trail proximate to a major population center, the ATT is well suited to the purpose, objectives, and scope of this study.

The ATT is a rail-trail constructed on portions of the Durham and South Carolina Railroad branch. Built in 1905, the Durham and South Carolina Railroad transported tobacco from Bonsal, North Carolina to the American Tobacco Company's warehouse in downtown Durham. The railroad expanded in 1917 to connect Bonsal and Duncan, North Carolina and part of the line was moved in 1977 to accommodate the construction of Jordan Lake. However, a 1974 merger with Norfolk Southern made the Durham-to-Duncan line obsolete, and in 1987, the Norfolk Southern removed the rail line's rails and ties (Belkin, 1986). Following the removal of the rails and ties, the City of Durham, the Town of Cary, the East Carolina Chapter of the National Railway Historical Society, and adjacent property owners purchased sections of the railroad corridor.

Local trail advocates, recognizing the recreational possibilities for the unused corridor, formed the Triangle Rails to Trails Conservancy (TRTC) in 1989. The TRTC's mission is to preserve abandoned railroad corridors in the area for recreation, transportation, or other trail uses. Naming the proposed trail after the Durham tobacco company, the TRTC began lobbying and fundraising efforts to generate interest in building the ATT. The City of Durham asked the North Carolina Department of Transportation to improve the rail corridor for non-motorized use following the adoption of the ATT's Master Plan in 1992 ("Awards: American Tobacco Trail", 2003). However, trail construction did not begin until 1998 because the North Carolina Department of Transportation (NCDOT) had to purchase the sections of the corridor from Norfolk Southern and adjacent landowners ("Yes! A Trail Corridor!", 1995). Because the trail traverses three different counties, each county became responsible for leasing the land from the NCDOT and funding any trail-building expenses in their jurisdiction ("Triangle project is network backbone", 1996; "Wake opens ATT segment Aug. 23", 2003).

Durham County and Wake County had enough resources to construct the trail in their sections ("Wake opens ATT segment Aug. 23", 2003). However, the section of the trail in Chatham County required the installation of two new pedestrian bridges, which delayed construction until the county could secure additional funding. To facilitate completion of the ATT, the Town of Cary agreed to fund and manage construction for the section of trail in Chatham County while Chatham County agreed to provide funds for a future trailhead ("2009 completion in Chatham", 2007). The NCDOT later reimbursed the Town of Cary for their expenses related to trail construction (Godfrey, 2008). Because the construction timetable differed across the governmental authorities involved, the phased development of the ATT left gaps in the trail during its development (Lange, 2008). The current 13.5-mile southern segment was completed in June 2010 and a separate northern 6.7-mile segment was completed in 2000.

At the time of this study, 20.2 miles of the ATT had been completed and opened as a multi-use trail through Durham, Chatham, and Wake Counties (Figure 2). However, a 1.39-mile gap between the northern and southern segments leaves the ATT incomplete. Until the City of Durham completes the gap in the trail, including a proposed bridge over Interstate 40 (I-40), the ATT will remain divided (Lecky, 2011). At present, thirteen and a half miles of contiguous trail exists south of I-40 in Chatham, Durham, and Wake Counties (Figure 3), while the unconnected 6.7-mile section is located exclusively in Durham County north of I-40. For the purposes of this study, only the 13.5-mile southern section was examined. The study segment of the ATT has its northern terminus at Massey Chapel Road. The ATT continues south from there through Durham County, the northeastern corner of Chatham County, and into Wake County. New Olive Chapel Road is the trail's southern terminus. Wake County, Chatham County, and the City of Durham independently manage their three connected sections of the ATT south of I-40. The three jurisdictions involved do communicate regularly and cooperate as needed. The long-term goals of the ATT include connecting the trail to over 70 miles of other local greenway trail corridors throughout the piedmont region of North Carolina.

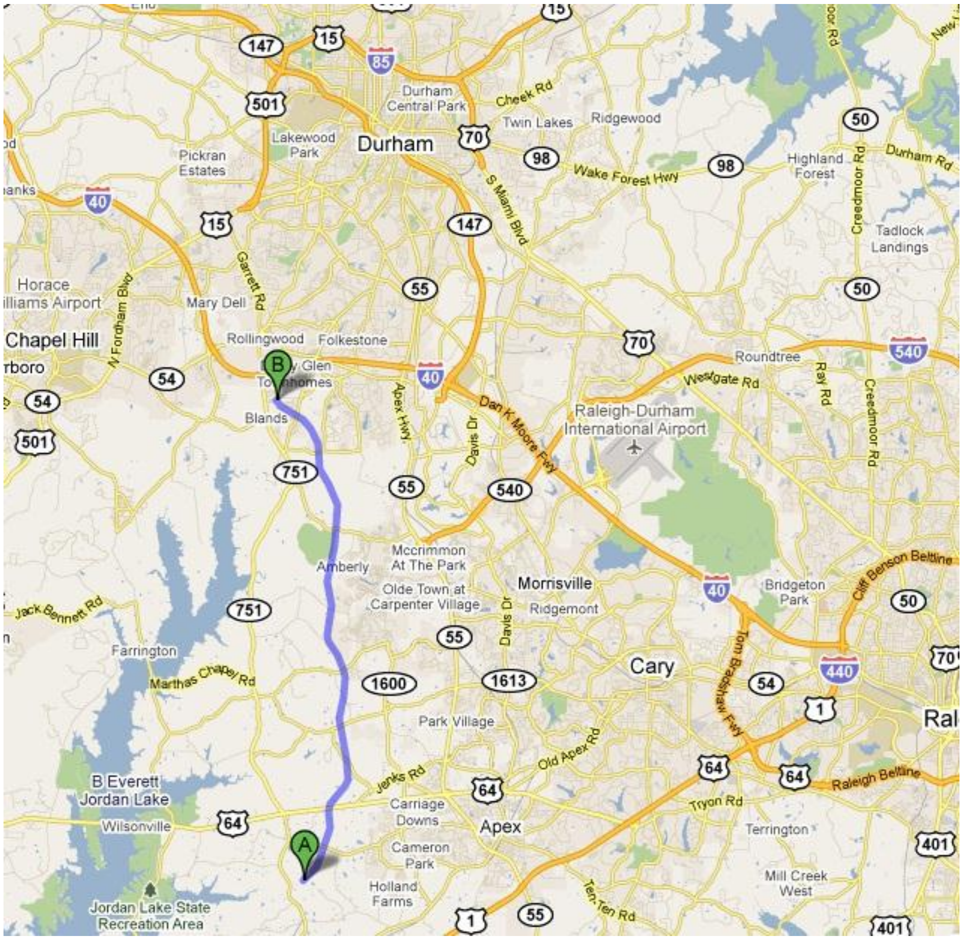

Figure 2: American Tobacco Trail (ATT) in Context

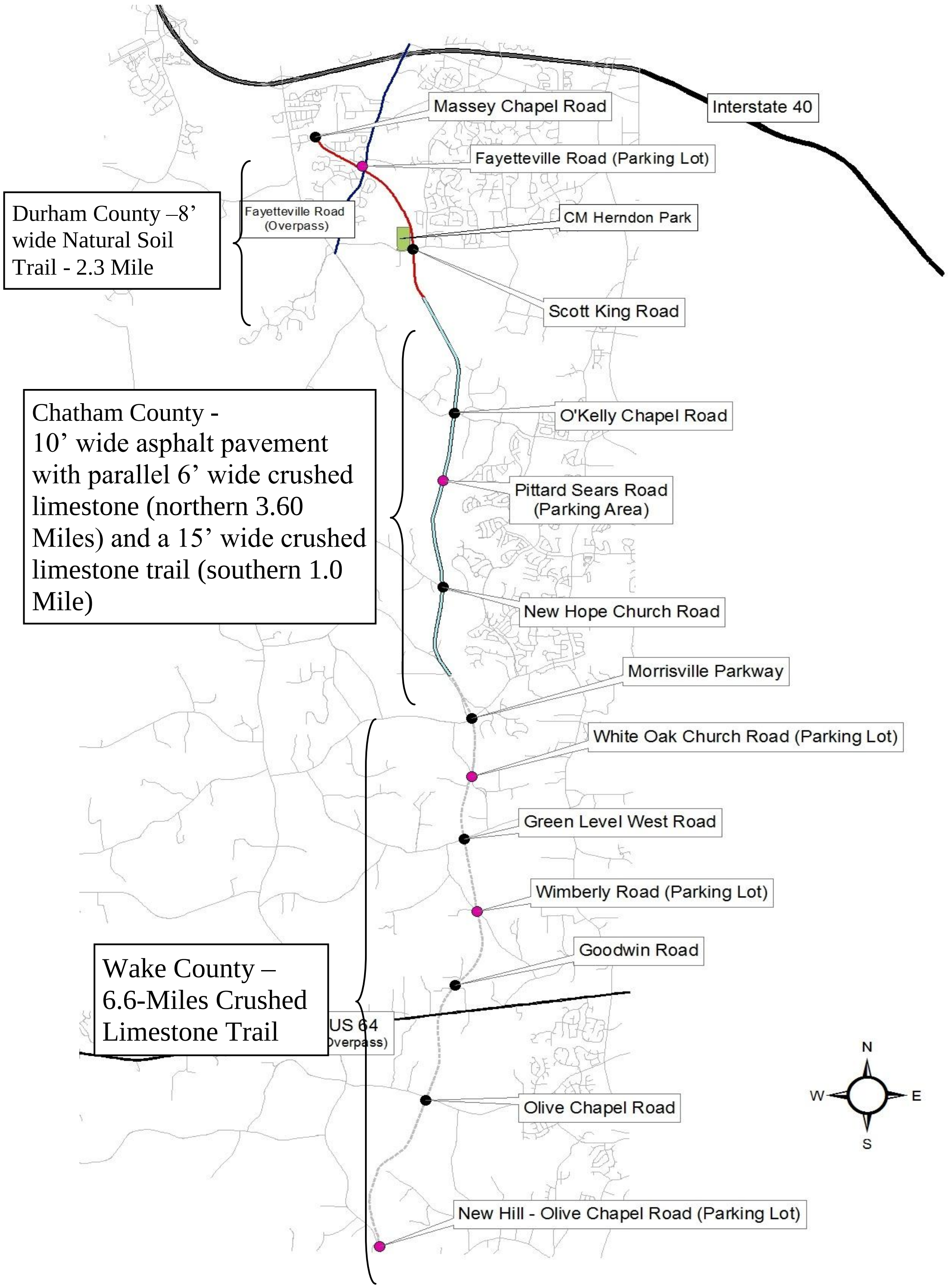

Figure 3: Map of Southern Section of ATT

Trail Characteristics

Variations in trail characteristics across sections are typical for multi-jurisdictional trails, including the ATT. Table 1 presents a summary of the key distinctions among the three sections of the ATT examined in this research. Beginning at the study's northern terminus in Durham County, the study segment of the ATT passes between suburban housing developments, behind single-family homes, and through areas of the Jordan Lake State Game Lands before reaching the southern terminus in Wake County. In Durham County, the ATT is a 10-foot-wide dirt trail (Figure 4 & 5). When the trail crosses the boundary between Durham and Chatham Counties, the surface changes to a 15-foot-wide trail comprised of 10 feet of asphalt pavement paralleled by 6 feet of crushed limestone (Figure 6). The trail surface changes again at New Hope Church Road, to a 15-foot-wide crushed limestone trail (Figure 7). This crushed limestone trail continues until it reaches the southern terminus at New Hill Olive Chapel Road in Wake County.

Table 1. Sections of the ATT

Managing Agency	**Surface Type**
City of Durham	10' wide dirt trail
Chatham County / Town of Cary	10' wide asphalt pavement with parallel 6' wide crushed limestone (3.6 Miles) Then 15' wide crushed limestone (1.0 Mile)
Wake County Parks and Recreation	15' wide crushed limestone

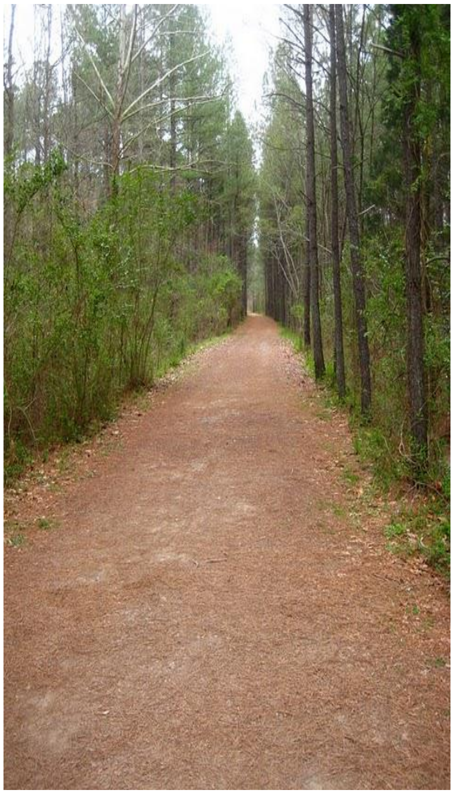

Figure 4: ATT in Durham County

Figure 5: ATT in Durham County

Figure 6: ATT in Chatham County

Figure 7: ATT in Wake County

Procedures

The data for this study were gathered from a sample of ATT users in September and October 2011. An attempt was made to contact all adult users, 18 years of age and older, who entered the trail, left the trail, or passed that access point on the trail during selected sampling periods.

Most users enter the ATT from one of 12 access points. For this study these access points were classified into either “primary” or “secondary” access points based on rough estimates of the relative amount of use each one receives (Table 2). ATT managers operate parking lots at the four primary access points. Although three access points in Wake County have traffic counters that record the number of cars entering and exiting the parking lots, none of the other nine access points have traffic counters. In these cases, input from ATT managers was used to help validate the classifications. Sampling focused on the primary access points because those locations were expected to experience the highest numbers of visitors and are well dispersed over the length of the ATT. The primary access points are also the locations where ATT managers have constructed or provided parking areas specifically for ATT users. The secondary access points are simply road crossings, none of which have official parking areas. Despite the fact that it is illegal to park along the road at all of these points, trail users can walk or use a bicycle to enter the trail there.

The researcher used systematically selected sampling periods that represented different days of the week. Wake County does not open two of their parking areas until 8:00 AM. To be consistent for all areas, on-site sampling began at 8:00 AM. Therefore, six sample dates that lasted from 8:00 AM until 8:00 PM were used. Based on the traffic counter data, sampling periods were selected to be roughly proportional to estimated use levels in terms of day of week. Weekend days comprised half of the sampling dates, while weekdays comprised the other half. Previous trail research has successfully used similar stratified sampling strategies (Bichis-Lupas & Moisey, 2001; Moore, Scott, & Graefe; 2001; Moore & Scott, 2003).

Table 2: Public Access Points for ATT

Intersecting Road	Access Type	Category
Massey Chapel Road	No official parking provided (Northern Terminus)	Secondary
Fayetteville Road	Official parking provided (managed by TRTC)	Primary
Scott King Road	No official parking provided (parking at CM Herndon Park)	Primary
O'Kelly Chapel Road	No official parking provided	Secondary
Pittard Sears Road	Official parking provided	Primary
New Hope Church Road	No official parking provided (Beginning of Mixed Surface)	Secondary
Morrisville Parkway	No official parking provided	Secondary
White Oak Church Road	Official parking provided	Primary
Green Level Road West	No official parking provided	Secondary
Wimberly Road	Official parking provided	Primary
Goodwin Road	No official parking provided	Secondary
Olive Chapel Road	No official parking provided	Secondary
New Hill-Olive Chapel Road	Official parking provided (Southern Terminus)	Primary

Survey Instruments

An on-site questionnaire and a follow-up questionnaire were used for data collection. The researcher made contact with adult trail users at the sample sites and asked if they would be willing to participate. For those individuals willing to participate in the study, the researcher gave them the on-site questionnaire that they completed at that point. Once the subjects completed the survey, the next adult to pass the researcher was asked to participate in the survey. The on-site questionnaire took approximately 2 minutes to complete. For those trail users that were unwilling to participate in the on-site questionnaire, the researcher recorded observable information including gender, location of access, date, time, and weather conditions. This information enabled an examination of possible non-response bias. Additional data regarding users' awareness and choices was gathered through the longer follow-up questionnaire, which participants could either complete when contacted on-site, or receive as an online follow up depending on their preference.

The on-site survey instrument was in a two-page form with close-ended questions relating to respondents' current ATT visit, including the users' mode of travel and primary recreation activity. This questionnaire also asked users to indicate on a map the parts of the ATT used that day as well as the portions of the trail they had ever used. Asking respondents to comment immediately about their site visit can aid in creating a more accurate profile of trail use by reducing possible recall bias. The investigator also recorded some observable information for each participant (e.g., gender, location of access, date, time, and weather conditions).

The on-site respondents who preferred not to complete the follow-up questionnaire at that point were asked to provide an email address so they could be emailed a link to the web-based version of the instrument. Surveymonkey.com provided the online platform for the email follow-up questionnaire because the service allows for open-ended, close-ended, image associated, and matrix questions. This online service also prevents tracking and storing of IP addresses, to preserve the anonymity of the respondents.

The follow-up questionnaire investigated users' choice behavior and their attitudes about the ATT. Close-ended and open-ended questions were included in the follow-up questionnaire to help determine the factors affecting users' choices, their perceptions, and their attitudes toward the trail. The follow-up questionnaire also asked participants about their trail behavior (e.g., frequency of use, preferred access area, most used access area, distance typically traveled on the ATT, etc.).

Data Analysis

Descriptive statistics were employed to summarize the characteristics of users, their trail use, and favorite sections of the trail, as well as the Likert-type scales that measured the importance of various factors such as users' preferences for various trail characteristics. Responses to open-ended questions were content analyzed to provide a deeper understanding of users' attitudes toward the importance of consistency on the ATT.

To further address the research question, multinomial logistical regression (mlogit) was used to explore how the respondents' primary activity might relate to the importance of trail-wide consistency in terms of various trail features (i.e., type of surface, type and formatting of signs, bathroom facilities, parking facilities, availability of drinking water, on-site information about the trail, and trail maintenance). Previous studies have shown that mlogit models are useful for understanding the choices that users make given specific parameters. The following equation illustrates how the mlogit test was employed in this research

$$g_h(X_a, X_b, \ldots, X_k) = e^{a_h + b_{h1}x_1 + b_{h2}x_2 + \cdots + b_{hk}x_k}$$

$$h=1, 2, \ldots, M-1$$

where "X" represents consistency in terms of trail features and "h" refers to specific values of the dependent variable "Y" (i.e., the activity types).

Instead of focusing on categorical coefficients, the odds ratio was used to describe the estimated effect of different trail activities on users' importance rating. Therefore, an odds ratio below one indicates that those engaged in the activity in question ascribe a lower importance to trail-wide consistency in that trail characteristic relative to the reference group.

RESULTS

This chapter presents the research results. It begins with a summary of the characteristics of the trail users contacted during the study as well as the characteristics of their trips on the day of contact. The next section contains results concerning the users' trail experiences, which is followed by a section examining users' perceptions and attitudes about the American Tobacco Trail (ATT). The final section reports the results addressing the research question.

User Characteristics

The average age was 45 with over half of respondents (53%) between the ages of 36 and 55 (Table 3). Analysis of the data revealed that just over half the respondents (53%) were male (Table 4). Generally, respondents had high incomes, with over half of respondents (55%) reporting annual household incomes of $100,000 or more (Table 5). Respondents also had high educational levels with more than eighty-five percent of respondents completing a Bachelor's degree or higher (Table 6). White was the most common race reported (93%) with Asian or Pacific Islander second most common (Table 7).

Table 3. Respondents' Age

Years	N	(%)
18-25	27	5.7
26-35	101	21.4
36-45	123	26.0
46-55	128	27.1
56-65	73	15.4
Over 65	21	4.4
Total	473	100.0%

Mean = 44.5, Standard Deviation = 12.4

Table 4. Respondents' Gender

Gender	N	(%)
Male	252	52.6
Female	227	47.4
Total	479	100.0%

Table 5. Respondents' Annual Household Income Level

Income (in $)	n	(%)
Under 20,000	10	2.4
20,000-39,999	23	5.4
40,000-59,999	42	9.9
60,000-79,999	56	13.2
80,000-99,999	63	14.8
100,000-119,000	60	14.1
120,000-139,999	42	9.9
140,000-159,999	27	6.4
160,000-179,999	22	5.2
180,000-199,999	12	2.8
200,000 or more	68	16.0
Total	425	100.0%

Table 6. Respondents' Highest Level of Education

Education Level	n	(%)
Some high school	1	0.2
High school diploma or GED	6	1.3
Business or trade school	5	1.0
Some college, no degree	31	6.5
Associate's degree	18	3.8
Bachelor's degree	150	31.4
Some graduate school	44	9.2
Master's degree	133	27.8
Doctoral or professional	90	18.8
Total	478	100.0%

Table 7. Respondents' Race

Race	n	(%)
White, not of Hispanic origin	440	93.4
Asian, or Pacific Islander	10	2.1
Other Race	7	1.5
Hispanic or Latino	6	1.3
Black, not of Hispanic origin	5	1.1
American Indian or Alaska Native	3	0.6
Total	471	100.0%

Trip Characteristics

This section summarizes the characteristics of the trip that respondents took on the ATT the day they were contacted at the trail. Results revealed that the majority (92%) of respondents arrived on the ATT after traveling from their primary residence. The remaining respondents reported arriving from work (3%), another residence (3%), or other locations (2%) to access the ATT that day (Table 8). These "other locations" included a local movie theater, a museum, and eating establishments. A majority of ATT users (83%) reported using a car or other motor vehicle to travel from their original location to where they accessed the ATT (Table 9). Most respondents (54%) traveled from five miles or more to access the ATT, with an average travel distance of 7.4 miles (Table 10). Half of the users (50%) reported that it took between 10 minutes and 29 minutes to get to the ATT, with an average travel time of 14 minutes (Table 11).

Table 8. Origin Location that Respondents Traveled from to access the ATT

Location	n	(%)
Primary Residence	686	92.2
Work	23	3.1
Another Residence	19	2.6
Other	16	2.2
Total	744	100.0%

Table 9. How Respondents Travelled to the ATT

Method	n	(%)
Car or other motor vehicle	618	83.1
Bicycle	78	10.5
Walk, Run, or Jog	48	6.5
Total	744	100.0%

Table 10. Miles from Respondents' Origin to Trail

Miles	n	(%)
Less than 1	106	14.2
1 to 1.9	111	14.9
2 to 4.9	125	16.8
5 to 9.9	168	22.6
10 to 19.9	167	22.4
20 or more	67	9.0
Total	744	100.0%

Mean = 7.4, Standard Deviation = 7.6

Table 11. Minutes from Respondents' Origin to Trail

Minutes	n	(%)
Less than 10	289	38.8
10-29	369	49.6
30-59	73	9.8
60-119	12	1.6
More than 120	1	0.1
Total	744	100.0%

Mean = 14.2, Standard Deviation = 12.7

The most common activity among those sampled was bicycling (42%) followed by running (38%), walking (16%), dog walking (2%), and a combination of running and walking at two percent (Table 12). One individual each reported horseback riding, in-line skating, and paddle skateboarding as their primary activity. When contacted, users generally reported that they spent, or expected to spend, an average of 90 minutes on the ATT (Table 13). The follow-up questionnaire revealed slightly higher lengths of stay, with respondents indicating that their trip to the ATT actually lasted an average of 99 minutes (Table 14).

Table 12. On-site Respondents' Primary Trail Activity (from On-site Questionnaire)

Activity	n	(%)
Biking	311	41.8
Running	279	37.5
Walking	118	15.9
Dog Walking	17	2.3
Run / Walk	16	2.2
In-line Skating	1	0.1
Horseback Riding	1	0.1
Paddle Skateboarding[1]	1	0.1
Total	744	100.0%

[1] – Paddle Skateboarding involves the participant standing on a longboard skateboard and propelling themselves using a modified paddle. The paddle has two wheels on the end instead of a blade.

Table 13. Length of Time Expected to Spend on Trail

Minutes	n	(%)
Less than 15	7	0.9
15-59	162	21.8
60-119	339	45.6
120-179	173	23.3
180-239	45	6.0
240 or more	18	2.4
Total	744	100.0%

Mean = 90.3, Standard Deviation = 50.6

Table 14. Length of Time Spent on Trail

Minutes	n	(%)
Less than 15	6	1.2
15-59	80	15.7
60-119	227	44.4
120-179	142	27.8
180-239	44	8.6
240 or more	12	2.4
Total	744	100.0%

Mean = 99.2, Standard Deviation = 53.2

The follow-up questionnaire contained questions eliciting more detail in terms of users and their experiences. The most common activity among respondents' in the follow-up was bicycling (42%) followed by running (40%), walking (16%), fitness training (1%), with nature observation, in-line skating, duck scouting, photography, and pushing a wheelchair each reported by one respondent (Table 15). Another series of questions explored users' previous experience with the American Tobacco Trail. Part of the follow-up questionnaire asked users if the day they were contracted was their first visit to the ATT. Results indicated that the vast majority of respondents (91%) had visited the ATT before the day the researcher contacted them (Table 16). A majority of respondents (65%) reported that their first visit to the ATT occurred between 2008 and 2011 (Table 17). Of those who had visited the trail before, 19% indicated that they visited the ATT for the first time in 2011, followed by 2009 (18%), 2010 (16%), and 2008 (10%). Most respondents had visited the ATT in each of the three counties where the trail is located (Table 18). When asked in the follow-up questionnaire which section of the ATT they had visited most often, Wake County (36%) was the most common response (Table 19).

Table 15. On-site Respondents' Primary Trail Activity (from On-site Questionnaire)

Activity	n	(%)
Biking	213	41.9
Running	204	40.2
Walking	81	16.0
Fitness Training	5	1.0
Nature Observation	1	0.2
In-line Skating	1	0.2
Duck Scouting	1	0.2
Photography	1	0.2
Pushing Wheelchair	1	0.2
Total	508	100.0%

Table 16. Was it the Respondent's First Visit to the ATT?

First Visit	n	(%)
No	459	90.5
Yes	48	9.5
Total	507	100.0%

Table 17. Year of First Visit to Trail for Repeat Visitors

Year	n	(%)
2003 or earlier	43	10.0
2004	17	3.9
2005	37	8.4
2006	31	7.1
2007	28	6.4
2008	45	10.3
2009	83	18.1
2010	70	16.0
2011	85	19.4
Total	439	100.0%

Table 18. County where Respondents had ever visited ATT

County	n	(%)
Chatham	639	85.9
Wake	598	80.4
Durham	589	76.5

n = 744

Table 19. Section of the ATT Visited Most Often

Section	n	(%)
Wake County	173	35.6
Durham County	135	27.8
Chatham County	100	20.6
Chatham & Wake	35	7.2
Durham & Chatham	25	5.1
All Counties	16	3.3
Durham & Wake	2	0.4
Total	486	100.0%

Data analysis showed that the respondents' frequency of ATT use varied widely. A small percentage of respondents (7%) indicated that they had visited the ATT just once in the past twelve months, while a similar number (9%) had visited the ATT 100 times or more during the same period. The average number of ATT visits that respondents made over the past twelve months was 41 with a median of 20 (Table 20). On average, respondents expected their number of visits to the ATT to increase in the next twelve months for an average of 51 (Table 21).

Table 20. Number of Times Respondents visited ATT in past Twelve Months

Visits	n	(%)
1	35	7.3
2-10	138	28.7
11-25	109	22.7
26-100	155	32.2
More than 100	44	9.1
Total	481	100.0%

Mean = 40.9, Standard Deviation = 59.5, Median = 20

Table 21. Number of Times Respondents Expect to visit the ATT in next Twelve Months

Visits	n	(%)
1	7	1.5
2-10	90	18.7
11-25	125	25.9
26-100	207	43.0
More than 100	53	11.0
Total	482	100.0%

Mean = 51.3, Standard Deviation = 62.3, Median = 30

Analysis revealed that an almost equal number of respondents indicated their ATT travel party size as either one (41%) or two (41%) people on the day of contact. The average group size was two (Table 22). The most common response for group type was alone (42%), followed by traveling with family (30%), friends (23%), a combination of friends and family (3%), two percent reported visiting with an organized group (Table 23).

Table 22. Size of Group Visiting the ATT

Group Size	n	(%)
1	304	40.9
2	306	41.1
3	78	10.5
4	20	2.7
5 or more	36	4.8
Total	744	100.0%

Mean = 2.0, Standard Deviation = 1.3

Table 23. Travel Group Visiting the ATT

Group Type	n	(%)
Alone	213	42.1
Family	152	30.0
Friends	114	22.5
Friends and Family	16	3.2
Organized Groups	11	2.2
Total	506	100.0%

A series of map-based questions were asked to better understand the trip that users took on American Tobacco Trail during the day of contact. The most commonly used section was from Pittard Sears Road to New Hope Church Road (62%) followed by 56% of respondents using the section from the Chatham County Line to O'Kelly Chapel Road (Table 24). The most commonly used access point was the White Oak Church Road Parking Lot (24%) followed by 20% of respondents using the access point at Scott King Road (Table 25). Data analysis also revealed that respondents typically entered and exited the ATT at the same point during their visit (Table 25 & 26).

Table 24. ATT Section Used by Respondents during that Visit

Section	n	(%)
Massey Chapel Rd – Fayetteville Rd Lot	148	19.9
Fayetteville Road Lot – Scott King Road	231	31.0
Scott King Rd – Chatham County Line	368	49.5
Chatham County Line – O'Kelly Chapel Rd	417	56.1
O'Kelly Chapel Rd – Pittard Sears Rd	404	54.3
Pittard Sears Rd – New Hope Church Road	462	62.1
New Hope Church Rd – Wake County Line	370	49.7
Wake County Line – Morrisville Parkway	373	50.1
Morrisville Parkway–White Oak Church Rd	346	46.5
White Oak Church Rd–Green Level West Rd	255	34.2
Green Level West Road – Wimberly Road	226	30.4
Wimberly Road – Goodwin Road	193	25.9
Goodwin Road – Olive Chapel Road	186	25.0
Olive Chapel Rd– New Hill Olive Chapel Rd	186	25.0

n = 744

Table 25. Access Point used by Respondents to Access ATT during that Visit

Access Point	n	(%)
Massey Chapel Rd.	58	7.8
Massey Chapel Rd – Fayetteville Rd Lot	25	3.4
Fayetteville Road Lot	71	9.5
Fayetteville Road Lot – Scott King Road	7	0.9
Scott King Rd	149	20.0
Scott King Rd – O'Kelly Chapel Rd	0	0.0
O'Kelly Chapel Rd	10	1.3
O'Kelly Chapel Rd – Pittard Sears Rd	0	0.0
Pittard Sears Rd.	88	11.8
Pittard Sears Rd – New Hope Church Road	1	0.1
New Hope Church Rd	13	1.8
New Hope Church Rd – Morrisville Parkway	0	0.0
Morrisville Parkway	10	1.3
Morrisville Parkway–White Oak Church Rd	1	0.1
White Oak Church Road Lot	177	23.8
White Oak Church Rd–Green Level West Rd	0	0.0
Green Level West Road	9	1.2
Green Level West Road – Wimberly Road	0	0.0
Wimberly Road	29	3.9
Wimberly Road – Goodwin Road	0	0.0
Goodwin Road	1	0.1
Goodwin Road – Olive Chapel Road	0	0.0
Olive Chapel Road	3	0.4
Olive Chapel Rd– New Hill Olive Chapel Rd	1	0.1
New Hill Olive Chapel Rd	95	12.8
Total	744	100.0%

Table 26. Access Point used by Respondents to Exit the ATT during that Visit

Exit Point	N	(%)
Massey Chapel Rd.	54	7.3
Massey Chapel Rd – Fayetteville Rd Lot	24	3.2
Fayetteville Road Lot	72	9.7
Fayetteville Road Lot – Scott King Road	7	0.9
Scott King Rd	149	20.0
Scott King Rd – O'Kelly Chapel Rd	0	0.0
O'Kelly Chapel Rd	10	1.3
O'Kelly Chapel Rd – Pittard Sears Rd	0	0.0
Pittard Sears Rd.	88	11.8
Pittard Sears Rd – New Hope Church Road	1	0.1
New Hope Church Rd	13	1.8
New Hope Church Rd – Morrisville Parkway	0	0.0
Morrisville Parkway	9	1.2
Morrisville Parkway–White Oak Church Rd	0	0.0
White Oak Church Road Lot	178	23.9
White Oak Church Rd–Green Level West Rd	1	0.1
Green Level West Road	9	1.2
Green Level West Road – Wimberly Road	0	0.0
Wimberly Road	29	3.9
Wimberly Road – Goodwin Road	0	0.0
Goodwin Road	1	0.1
Goodwin Road – Olive Chapel Road	0	0.0
Olive Chapel Road	3	0.4
Olive Chapel Rd– New Hill Olive Chapel Rd	1	0.1
New Hill Olive Chapel Rd	95	12.8
Total	744	100.0%

Users' Trail Experiences

Overall, respondents indicated high levels of satisfaction with their visit to the American Tobacco Trail. On a scale from 1 to 10, with 10 being "the best possible trip," respondents rated their trip an average of 8.9. Possibly more telling was that ratings below eight accounted for less than 9% of responses (Table 27).

Table 27. Respondents' Satisfaction Ratings for their ATT Visit

1(%)	2(%)	3(%)	4(%)	5(%)	6(%)	7(%)	8(%)	9(%)	10(%)	Mean	S.D	n
0.2	0.0	0.0	0.0	0.8	1.0	6.9	25.2	27.2	38.8	8.9	1.1	508

The follow-up questionnaire explored users' motivations for visiting the American Tobacco Trail. When asked to identify the most important reason for their visit that day from among three alternatives (i.e., their activities, the place, or their companions), almost five-sixths (83%) indicated that they visited the ATT because it was a good place to do the outdoor activity they enjoyed (Table 28). Enjoying the place itself followed (15%). Spending time with companions represented the least common reason (2%).

Table 28. Respondents' Most Important Reason to Visit the Trail

Reason	n	(%)
It's a good place to do the outdoor activities I enjoy	422	83.4
I enjoy the place itself	75	14.8
I wanted to spend time with my companions	9	1.8
Total	506	100.0%

Respondents also indicated what usually motivated them to visit the ATT by rating 24 potential reasons using a five-point scale where one represented "not important at all" and five represented "extremely important" as a reason to visit. "To keep physically fit" rated as the most important on average (4.6) followed by "to be close to nature" (3.8), "to help release or reduce some built-up tensions" (3.8), "to get away from the usual demands of life" (3.7), and “to view the scenery” (3.7) (Table 29). The motivations that rated lowest involved other people. Those motivating reasons included, “to know others are nearby” (2.3), “to observe other people in the area” (2.0), “to meet other people in the area” (2.0), and “to tell others about the trip” (1.8). On average, “to take risks” (1.7) was the least important motive.

Table 29. Respondents’ Motivations for their Visit to the ATT

	Not at all Important				Extremely Important			
Reason	1(%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	S.D.	n
To keep physically fit	0.4	0.8	3.3	25.4	70.2	4.6	0.6	493
To be close to nature	2.6	9.7	20.0	39.7	28.0	3.8	1.0	496
To help release or reduce some built-up tensions	4.3	7.3	18.9	40.7	28.9	3.8	1.1	492
To get away from the usual demands of life	4.7	9.5	18.4	43.7	23.7	3.7	1.1	494
To view the scenery	3.0	10.4	22.7	42.1	21.8	3.7	1.0	499
To experience tranquility	6.9	11.1	22.0	38.2	21.8	3.6	1.1	495
To develop your skills and abilities	7.7	13.6	24.1	34.7	19.9	3.5	1.2	493
To have a change from your everyday routine	7.1	13.1	25.7	35.1	19.0	3.5	1.5	490
To relax physically	10.8	14.5	22.3	33.1	19.2	3.4	1.2	489
To do something with your family	12.8	14.4	21.1	30.8	20.9	3.3	1.3	493

Table 29. Respondents' Motivations for their Visit to the ATT (continued)

Reason	1(%) Not at all Important	2 (%)	3 (%)	4 (%)	5 (%) Extremely Important	Mean	S.D.	n
To test your abilities	15.3	18.2	23.5	29.4	13.7	3.1	1.3	490
To be with friends	13.9	21.0	28.7	28.3	8.2	3.0	1.2	491
To be on your own	15.3	19.8	28.6	26.0	10.3	3.0	1.2	496
To be with others who enjoy the same things you do	15.9	23.2	25.8	26.0	9.2	2.9	1.2	492
To think about your personal values	22.2	21.4	29.6	19.6	7.1	2.7	1.2	490
To experience new and different things	21.9	23.7	27.6	21.3	5.5	2.6	1.2	493
To experience excitement	28.4	30.6	26.8	11.0	3.3	2.3	1.1	493
To learn more about nature	26.7	33.8	26.1	10.8	2.7	2.3	1.1	491
To learn more about things here	28.4	31.0	27.2	11.0	2.4	2.3	1.1	493
To know others are nearby	35.6	25.4	20.3	13.6	5.1	2.3	1.2	492
To observe other people in the area	39.1	33.6	17.1	7.9	2.2	2.0	1.0	491
To meet other people in the area	37.7	35.1	19.7	6.3	1.2	2.0	1.0	493
To tell others about the trip	49.3	27.9	15.5	5.7	1.6	1.8	1.0	491
To take risks	56.9	23.6	13.8	4.5	1.2	1.7	1.0	492

To help understand any problems users might have had with the ATT, respondents rated fourteen possible problems that they might have encountered while on the trail. Respondents rated each problem on a five-point scale where one represented "not a problem" and five represented "major problem." On average, not one of the potential issues appeared to be at all serious, with none of the average ratings reaching the midpoint of three. Availability of parking (2.7) was the highest rated problem on average. However, horse manure (2.4), availability of restrooms (2.4), and "other" (2.1) all rated above a two on average (Table 30). Other problems included issues such as "sharing the trail," "access from other trails," "unleashed dogs," "available water," and "safety."

Table 30. Extent of Potential Trail Problems as Perceived by Respondents

Potential Problem	1(%) Not a Problem	2 (%)	3 (%)	4 (%)	5 (%) Major Problem	Mean	S.D.	n
Availability of parking	26.0	21.7	24.9	15.7	11.8	2.7	1.3	466
Horse manure	26.6	32.1	21.1	12.3	7.9	2.4	1.2	470
Availability of restrooms	28.7	25.3	27.0	12.2	6.9	2.4	1.2	467
Other problems	62.4	4.3	4.3	15.1	14.0	2.1	1.5	93
Pet waste	38.4	35.8	15.2	7.3	3.2	2.0	1.0	466
Crowding	44.1	29.3	18.1	7.3	1.3	1.9	1.0	465
Availability of park staff	44.9	34.6	15.1	3.7	1.7	1.8	0.9	463
Litter	54.1	32.1	9.5	2.4	2.0	1.7	0.9	464
Reckless user behavior	59.1	28.0	7.3	3.5	2.2	1.6	0.9	464
Posted rules and regulations	61.1	25.1	9.0	3.2	1.5	1.6	0.9	467
Conflict between visitors	69.6	19.0	9.1	2.0	0.4	1.4	0.8	463
Traffic noise	67.1	26.5	3.9	1.5	1.1	1.4	0.7	464
Noisy / Rowdy people	66.8	26.5	3.9	2.0	0.9	1.4	0.7	465

Users' Perceptions and Attitudes about the American Tobacco Trail

A series of follow-up questions were asked to understand users' preferences, perceived benefits, and attitudes regarding the American Tobacco Trail. Respondents rated their preferences for 17 trail characteristics using a five-point scale where one represented "not important at all" and five represented "extremely important." The following seven preferences all had means of four or more, indicating that they were the most preferred characteristics overall: "personal safety" (4.3), "cleanliness" (4.2), "natural surroundings" (4.2), "peaceful & quiet setting" (4.2), "good maintenance" (4.1), "proximity to home" (4.0), and "type of trail surface" (4.0) (Table 31). The next question explored the type of surface ATT users most preferred. Respondents chose their one most preferred surface type from a list of the surfaces currently found on the various section of the ATT (i.e., pavement, crushed limestone, pavement with crushed limestone beside it, and natural soil) (Table 32). Almost half of respondents (45%) preferred pavement with crushed limestone beside it, followed by crushed limestone (28%). When asked which county section of the ATT respondents' most preferred, a slight plurality preferred Chatham County (38%) followed by Wake County (36%) (Table 33).

Respondents answered two open-ended questions, one asking what they liked best about the American Tobacco Trail and the other what they liked least about it. Four hundred eighty-two respondents provided information about what they liked best about the ATT and their responses yielded 834 reasons they liked the ATT (Table 34). The most frequent response category (31%) was made up of positive comments about the natural or peaceful environment of the ATT such as "[they liked] the scenery" and "It's well kept and makes me feel like I'm out in the woods walking in nature." The second most common response (15%), referenced safety on the ATT, and included comments such as, "Trail is safe from passing cars" and "It feels safe." Respondents made the third most comments (13.2%) about liking the surface or trail design. One user liked, "Easy grades/ no steep hills." Users also referenced liking the convenience of access, trail length, shade, [a] good place to do activity, beauty, maintained, entire trail experience, signs, variety, and other people.

Four hundred fifty-seven respondents provided comments for things that they liked least about the trail, however, 47 of the respondents said, "[they liked] nothing [least]" (Table 35). Their responses yielded 515 things they liked least about the ATT. The most frequent response category (28%) related to the current state of the facilities on the ATT. One user liked least, "NO PARKING!!! Cars towed at O'Kelly Chapel entrance, only 4 cars fit at Pittard Sears. Why have such a beautiful trail and then make it so hard for FAMILIES to get there!...." This response category was followed by one involving that related to conflicts (15%), with statements like, "When biking, weaving around walkers, large/slow family groups, etc….?" or "Road bikers who ride way too fast for the trail…" typifying the category. Some users (10.7%) disliked the ATT's lack of connectivity the most, using statements like "Greenway in Cary does not connect; does not go all the way south to Jordan lake" or "Does not cross interstate 40" to express their opinions. Respondents also indicated that they least liked the surface, horse manure, safety, travel distance to access, overuse, boring trail design, the section in Durham County, and inadequate signs.

Table 31. Respondents' Trail Preferences

Trail Characteristics	1(%) Not at all Important	2 (%)	3 (%)	4 (%)	5 (%) Extremely Important	Mean	S.D.	n
Personal safety	2.0	3.2	10.8	27.8	56.2	4.3	0.9	500
Cleanliness	0.0	1.2	11.8	49.0	38.0	4.2	0.7	500
Natural surroundings	0.0	2.6	14.2	45.0	38.2	4.2	0.8	500
Peaceful & quiet setting	0.8	2.0	16.4	41.3	39.5	4.2	0.8	501
Good maintenance	0.8	1.6	20.2	46.6	30.9	4.1	0.8	496
Proximity to home	1.8	4.4	18.1	40.2	35.5	4.0	0.9	502
Type of trail surface	1.0	5.2	19.4	42.8	31.6	4.0	0.9	500
Convenient parking	5.2	5.8	23.3	41.8	23.7	3.7	1.1	498
Mileage markers along trail	5.3	15.2	24.2	31.1	24.2	3.5	1.2	495
Availability of restrooms	9.4	19.1	30.9	24.9	15.7	3.2	1.2	498
Availability of trashcans	10.6	22.7	33.5	23.5	9.8	3.0	1.2	499
Availability of drinking water	17.3	24.8	26.6	17.3	13.9	2.9	1.3	496
Presence of wildlife	12.9	26.7	38.4	16.5	5.6	2.8	1.1	498
Information on-site about the trail	15.0	29.7	31.7	18.8	4.8	2.7	1.1	499
Accessibility for people with disabilities	30.4	23.5	24.8	13.1	8.3	2.5	1.3	497
Benches for resting	24.8	31.2	26.0	11.5	6.6	2.4	1.2	497
Information on-site about nature	26.3	34.1	28.1	9.4	2.2	2.3	1.0	499

Table 32. Respondents' Preferred Surface on the ATT

Surface Type	n	(%)
Paved with Crushed Limestone beside it	225	44.6
Crushed Limestone	140	27.8
Natural Soil	84	16.7
Pavement	55	10.9
Total	504	100.0%

Table 33. Section of the ATT Respondents Most Prefer

Section	n	(%)
Chatham County	182	38.1
Wake County	171	35.8
Durham County	73	15.3
Chatham & Wake	31	6.5
Durham & Chatham	12	2.5
All Counties	8	1.7
Durham & Wake	1	0.2
Total	478	100.0%

Table 34. What Respondents' Liked Most about the ATT

Categories	n	(%)
Natural setting / peaceful	264	31.7
Safe environment	125	15.0
Surface / train design	110	13.2
Convenience to access	82	9.8
Trail length	53	6.4
Shade	45	5.4
Good place to do activity	38	4.6
Beauty	35	4.2
Maintained	23	2.8
Entire trail experience	21	2.5
Signs	16	1.9
Variety	12	1.4
Other people	10	1.2
n = 482	834	100.00

Table 35. What Respondents Liked Least about the ATT

Categories	n	(%)
Amenities (e.g., parking, water, restrooms)	139	27.0%
Conflict (e.g., trail etiquette, bicyclists)	77	15.0%
Connectivity / Accessibility	55	10.7%
Nothing	47	9.1%
Surface	41	8.0%
Horse manure	39	7.6%
Safety / trail crossings	37	7.2%
Travel distance to access	26	5.0%
Overuse	19	3.7%
Boring	16	3.1%
Durham County	11	2.1%
Signs	8	1.6%
n = 457	515	

The follow-up questionnaire also explored potential benefits associated with the ATT by asking respondents "Here is a list of broader public benefits the American Tobacco Trail might have for its users and surrounding community. Please choose only one number that best indicates how important you feel the American Tobacco Trail is in providing each benefit listed," for ten potential benefits. The potential benefits were rated on a five-point scale where one represented "not important at all" and five represented "extremely important." "Physical activity and health" (4.7) rated as the most important benefit on average followed by "preserving undeveloped open space" (4.4), "aesthetic beauty" (4.3), and "public recreation opportunities" (4.1) (Table 36). Although still rated as moderately important on average, respondents felt that the ATT was least important in providing "traffic reduction and transportation alternatives" (3.2), "public education about nature and the environment" (3.2), and "tourism and business development" (2.9). Other benefits listed by respondents included: "safe for riding horses," "safety," and "shaded areas…"

The final series of questions investigated users' awareness of the multijurisdictional nature of the ATT and their attitudes regarding consistency of characteristics across the entire length of the ATT. The majority of the respondents (84%) reported that they were aware the ATT existed in and was managed by three different counties (Table 37).

Table 36. Importance of the ATT in Providing Various Benefits

	Not at all Important				Extremely Important			
Benefit	1(%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	S.D.	n
Physical activity and health	0.2	0.4	2.6	22.2	74.6	4.7	0.6	469
Preserving undeveloped open space	0.9	2.1	10.0	29.8	57.2	4.4	0.8	470
Aesthetic beauty	0.0	1.7	13.2	35.2	49.9	4.3	0.8	469
Public recreation opportunities	2.7	4.5	15.0	36.4	41.3	4.1	1.0	467
Community pride	2.4	5.6	22.5	38.2	31.3	3.9	1.0	463
Access for disabled persons	5.2	13.5	34.6	27.0	19.8	3.4	1.1	460
Public education about nature and the environment	7.4	17.3	35.5	24.0	15.8	3.2	1.1	462
Traffic reduction and transportation alternative	9.3	21.5	28.2	23.7	17.4	3.2	1.2	465
Tourism & business development	14.2	23.4	30.5	20.2	11.6	2.9	1.2	465
Other Benefits	36.2	12.1	10.3	17.2	24.1	2.8	1.6	58

Respondents were then asked, "How important is it to you that each of the following features be consistent across the entire length of trails like the ATT?" They rated seven features using a five-point scale, where one represented "consistency not important at all" and five represented "consistency extremely important." All seven characteristics examined were rated at or above the scale midpoint, on average, in terms of the importance of trail-wide consistency. Respondents rated consistency in "trail maintenance" as the most important on average (4.2) and this was the only feature to rate above a four overall. Trail maintenance was followed by consistency in "type and formatting of signs" (3.3), "parking facilities" (3.2), "bathroom facilities" (3.2), "type of trail surface" (3.2), and "availability of drinking water" (3.1) (Table 38). The lowest rated feature, consistency in "on-site information about the trail" had a mean rating of only three.

Immediately after rating the importance of consistency for the seven trail features, respondents were asked "In the space below, please briefly explain why consistency across the entire length of a trail is or isn't important to you." Three hundred fifty-five respondents answered this question and their responses yielded 368 reasons why consistency was or was not important to them. These reasons were grouped into categories as presented in Table 39. A slight plurality of respondents (46.3%) answered with statements that indicated consistency across an entire trail was not important. Comments describing why consistency was important represented 45.8% of responses and 7.5% of the comments were ambiguous in terms of the importance of consistency.

Table 37. Respondents' Awareness that ATT has Multiple Managers

Aware	n	(%)
Yes	402	84.8
No	72	15.2
Total	474	100.0%

Table 38. Importance of Consistency across Entire ATT Length for Various Features

	Consistency Not at all Important			Consistency Extremely Important			
Trail Feature	1(%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	S.D.	n
Trail maintenance	3.4	3.2	12.6	33.9	46.9	4.2	1.0	469
Type and formatting of signs	15.5	14.7	21.0	26.5	22.3	3.3	1.4	471
Parking facilities	12.8	14.5	27.2	27.5	18.1	3.2	1.3	470
Bathroom facilities	13.9	14.5	30.1	23.7	17.9	3.2	1.3	469
Type of trail surface	19.7	11.4	23.7	24.5	20.7	3.2	1.4	473
Availability of drinking water	16.2	17.2	28.5	19.6	18.5	3.1	1.3	470
On-site information about the trail	14.5	20.3	34.8	19.8	10.7	3.0	1.2	469

The most frequent response category for why consistency is not important was "Variety is nice / interesting." Statements such as, "Variety is more natural and offers a more diverse experience," "People can choose the environment that best suits their activities," and "One surface might appear like all the other greenways" typified this group of reasons. Others thought that variety was acceptable if certain conditions were met. For example, the next most common response category was “Variety fine if well maintained / usable / safe” and was typified by comments like, “Some difference in character from one section to the next provides interest, as long as the surface is good and well maintained throughout” and “I like the LENGTH of the trail best. I just want it all to stay open and maintained. Additional length would be good and consistency requirements might decrease the chance of expanding it.” The third most common response category was categorized into a group labeled, “Variety increased enjoyment.” One respondent, for example, offered “I prefer it not to be consistent as it's a nice change from trail to trail otherwise it would get monotonous...more adventurous this way.” Other responses in this category referenced the surface such as, “Running on different surfaces is good training.” Other comments were categorized into groups that focused on “Consistency not important,” “Variety is fine if you know what to expect,” “Variety increased the choices available to users,” “Variety provides section with different character / personality” and “Differences in amenities is good.” Some comments were classified as “Other” since they did not fit into any of the above categories. These included statements such as, “No need to force consistency,” “Counties are motivated to do what the residents want,” and “Not all are as well funded as Wake.”

The categories of reasons for why consistency is important to respondents included, “Consistent maintenance important,” “Consistent surface better for running / biking / walking,” “Consistent signage / information better communicates a unified trail,” “Reduces uncertainty in what is available on trail,” “Consistency makes planning easier,” “Consistent facilities (e.g., parking, bathrooms, water) is important,” “Other,” and “Reduces chance of injury for runners.” The most common group of statements was “Consistent maintenance important". Statements like, "As long as each agency maintains the safety and quality of the trail that is enough for me," typified this consistent maintenance category. The second most frequently commented category, "Consistent surface better for running / biking / walking," included responses such as, "I often run up to twenty miles on the trail, so consistency is extremely important to me to ensure I have a consistent experience with my training." "Consistent signage / information better communicates a unified trail" was the third most common response category and included responses such as, "Trail marking and signage is important for new and frequent visitors," "Consistency with that information and general facilities will encourage people to utilize the trail and feel comfortable in all the sections, not just the sections they are most familiar with." Another response in the "Consistent signage / information better communicates a unified trail" category referred to mile markers, "The way the trail distances are marked is important …are important due to the number of runners on the trail." Other responses were concerned with what they might encounter on the trail. Comments in the "Reduces uncertainty in what is available on trail" category were the fourth most common category and were reflected by statements like, "If you are doing a long run, you should not have to guess what facilities are available to you or where there is shelter," and "Lets me know I'm on the same trail. Sounds dumb, but if you space out and listen to music while running, sometimes you lose track of time and place."

Table 39. Why Consistency Across a Trail is Important or is not Important

	n	(%)
Reasons Consistency is not Important	170	
Variety is nice / interesting	36	21.1
Variety fine if well-maintained /useable / safe	33	19.3
Variety increases enjoyment	29	17.0
Consistency not important	20	11.7
Variety fine if you know what to expect	15	8.8
Variety increases the choices available to users	15	8.8
Variety provides section with different character / personality	11	6.4
Other	9	5.3
Differences in amenities is Good(e.g., parking,	2	1.2
Reasons Consistency is Important	169	
Consistent maintenance important	41	24.3
Consistent surface better for running / biking	37	21.9
Consistent signage / information better communicates a unified trail	26	15.4
Reduces uncertainty in what is available on trail	20	11.8
Consistency makes planning easier	14	8.3
Consistent facilities (e.g., parking, bathrooms, water) is important	13	8.3
Other	12	7.1
Reduces chance of injury for runners	6	3.6
Ambiguous Consistency Comments	28	
n = 355 Respondents	368	

Study Research Question

This section presents the results of the statistical tests used to address the research question, which was:

> Do users of a multi-jurisdictional trail prefer uniformity or diversity across the entire trail in terms of the elements under managers' control, such as trail surface, types of facilities, signage, on-trail information, tail maintenance, and availability of drinking water?

Prior to analysis, possible non-response bias was checked by comparing the responses regarding primary activity type from the on-site questionnaire with those from the follow-up questionnaire because that question was included on both the on-site and follow-up questionnaires. The respondents' primary activity type was collapsed into three categories (i.e., biking, running, and walking). For example, dog walking was collapsed into the walking category and run/walk was collapsed into the running category. The other activity types (i.e., in-line skating, scouting for ducks, paddle boarding, fitness training, etc.) were dropped from analysis because of their low frequencies. There was no evidence of non-response bias in terms of the primary activity. After collapsing the activity types, the percentages between the activity types were all quite close (i.e., on-site bicycling – 42%, follow-up bicycling – 43%; on-site running – 40%, follow-up running – 41%; on-site walking – 18%, follow-up walking – 16%).

STATA's® multinomial logistic regression procedure was employed to examine the relationships among the seven consistency attributes for the three primary activity groups on the ATT – biking (n=213), running (n=204), and walking (n=81). The first step in this procedure was to pool the three activity groups into one. Chi-square values revealed the importance of consistency for bathroom facilities, parking facilities, availability of drinking water, and on-site information about the trail were statistically significant at the .05 level (Table 40). This means that we reject the null hypothesis and those attributes were unique amongst the activity groups. The remaining attributes were not statistically significant.

Table 40. Likelihood-ratio test with chi-square values for consistency variables

Consistency attributes	$\chi 2$	df	P> $\chi 2$
Type and formatting of signs	0.48	2	0.788
Trail maintenance	1.37	2	0.503
Type of trail surface	3.32	2	0.190
Bathroom facilities	8.42	2	0.015
Parking facilities	9.89	2	0.007
Availability of drinking water	11.94	2	0.003
On-site information about the trail	12.34	2	0.002

The likelihood ratio tests for combining alternatives were significant for two of the alternatives (i.e., walkers verses runners and runners verses bicyclists) and thus rejected the Independence of Irrelevant Alternatives (IIA) assumption (Table 41). Failure to reject the IIA for walkers versus bicyclists indicated that walkers and bicyclists have similar preferences for the consistency attributes. We therefore could have combined walkers and runners combined into one group for analysis. Although bicyclists and walkers could have been combined into one group, we still chose to use the multinomial estimator to compare all three activity groups. This was done for practical reasons. Managers and planners typically address multi-jurisdictional trail issues considering those the three activities.

Table 41. Likelihood ratio tests with chi-squares for combining alternatives

Alternatives	$\chi2$	df	P> $\chi2$
Walking versus Running	20.465	7	0.005
Walking versus Bicycling	8.346	7	0.303
Running versus Bicycling	30.846	7	0.000

Multinomial logistic regression was then used to determine the odds of the importance to respondents for consistency in each of the seven attributes, based on their activity group. Bicycling was used as the reference group. We chose bicycling because this activity involves a mechanical device, while the others do not, and thus bicycling might influence the consistency ratings on the seven attribute variables more than would either walking or running.

The first half of Table 42 presents the odds that runners placed a greater or lesser importance on each of the consistency attributes than did the combined group of walkers and bicyclists. The null hypothesis of no difference was rejected for four attributes, (i.e., bathroom facilities, availability of drinking water, on-site information about the trail, and parking facilities). The odds were 1.4 times greater that those individuals observed running placed a greater importance on consistency in the "availability of drinking water" than those individuals observed bicycling or walking. For users observed running, the odds were 1.4 times more likely that they placed a greater importance on the consistency in "bathroom facilities" than those individuals observed bicycling or walking. The odds were 0.7 times lower that those individuals observed running placed a greater importance on consistency in "on-site information about the trail" than those individuals observed bicycling or walking.

For users observed running, the odds were 0.7 times lower that they placed a greater importance on consistency in "parking facilities" than individuals observed bicycling or walking.

Table 42. Multinomial logistic regression with odds ratios (bicycling is the reference comparison)

One activity group with bicycling and walking combined as the reference group

Activity Group	Odds Ratio	Standard Error	Z	p |z|
Running				
Type of trail surface	1.114	0.092	1.31	0.191
Type and formatting of signs	0.943	0.088	-0.62	0.532
Bathroom facilities	1.383	0.194	2.32	0.021
Parking facilities	0.727	0.087	-2.67	0.008
Availability of drinking water	1.357	0.146	2.84	0.005
On-site information about the trail	0.695	0.075	-3.35	0.001
Trail maintenance	1.043	0.119	0.37	0.715

Two activity groups and bicycling as the reference group

Activity Group	Odds Ratio	Standard Error	Z	p |z|
Walking				
Type of trail surface	0.866	0.0981	-1.27	0.205
Type and formatting of signs	0.969	0.127	-0.24	0.810
Bathroom facilities	0.716	0.1414	-1.69	0.091
Parking facilities	1.270	0.2003	1.51	0.130
Availability of drinking water	1.349	0.211	1.92	0.055
On-site information about the trail	0.900	0.136	-0.70	0.484
Trail maintenance	1.196	0.196	1.09	0.276
Running				
Type of trail surface	1.070	0.095	0.76	0.449
Type and formatting of signs	0.933	0.094	-0.69	0.490
Bathroom facilities	1.267	0.190	1.58	0.115
Parking facilities	0.775	0.098	-2.01	0.045
Availability of drinking water	1.472	0.173	3.30	0.001
On-site information about the trail	0.673	0.079	-3.37	0.001
Trail maintenance	1.098	0.134	0.77	0.442

The second section of Table 42 presents the odds of walkers and runners placing more or less importance on the consistency of each attribute compared to bicyclists. Three attributes (i.e., bathroom facilities, availability of drinking water, and on-site information about the trail) were found to be significant at the .05 level for runners. The odds were 1.5 times greater that individuals observed running placed a greater importance on consistency in the “availability of drinking water” than those individuals observed bicycling. For users observed running, the odds were 0.8 times lower that they placed a greater importance on consistency in “parking facilities” than did those individuals observed bicycling. The odds were 0.7 times lower that those individuals observed running placed a greater importance on consistency in “on-site information about the trail” than did those individuals observed bicycling.

Statistically significant odds ratios are plotted in Table 43 to make the significant findings easier to visualize. For example, the first row shows that runners ascribed significantly less importance to consistency in on-site information about the trail than did bicyclists.

Although the odds between bicycling and walking were not quite significant at the .05 level for the availability of drinking water (p=.055 as show in Table 42) this result merits consideration. The odds were 1.3 times greater that individuals observed walking placed a greater importance on consistency in the “availability of drinking water” than did those individuals observed bicycling. Likewise, although only significant at the p=.091 level, it is worth noting that for users observed walking, the odds were 0.7 times lower that they placed a greater importance on consistency in “bathroom facilities” than did those individuals observed bicycling.

The study results are discussed in the next chapter and implications for management and further research are presented there.

Table 43. Odds Ratios for two activity groups (bicycling is the reference comparison)

Consistency	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
On-site information about the trail		R***		W	B					
Availability of drinking water					B				W	R***
Parking facilities			R*		B			W		

R=running, W=walking, and B=bicycling

* Statistically significant at the 0.05 level
*** Statistically significant at the 0.001 level

DISCUSSION

This chapter discusses the study results, management implications, and possible areas for further research. The purpose of this study was to examine the use and users of a multi-jurisdictional trail near a growing metropolitan area. To best interpret these findings the study's original purpose will be revisited.

The study's research question asked:

> Do users of a multi-jurisdictional trail prefer uniformity or diversity across the entire trail in terms of the elements under managers' control, such as trail surface, types of facilities, signage, on-trail information, tail maintenance, and availability of drinking water?

The study's four objectives were to:

1. Profile the characteristics of the users of a multi-jurisdictional trail.
2. Profile the use of a multi-jurisdictional trail, including users' activities, motivations, length of stay, party size, how they travel to the trail, how far they travel for trail access, perceived benefits, and which section(s) of the trail they use.
3. Determine users' awareness of and preferences regarding the multi-jurisdictional nature of the trail.
4. Explore the influence of activity differences on preferences regarding multi-jurisdictional nature of the trail.

The first part of this chapter will address the study's objectives and possible explanations for the study's findings. After this, the results related to the study research question will be discussed directly. Then the utility of the study will be addressed in terms of the strengths and limitations of the methodology. This chapter concludes with implications for management and for future research.

Profile of Users' Characteristics

Some of the characteristics found for users of the American Tobacco Trail were consistent with results from previous trail studies. Specifically, the respondents' mean age (45) was similar to that found in a trail study in a metropolitan area (45) (Moore & Scott, 2003), in a state park trail study (44.42) (Oh & Hammitt, 2010), and with those documented in another rail-trail study (42) (Mowen, Graefe, & Williams, 1998). The slight majority of male users found on the ATT (53%) also mirrors results found in another rail trail study (Bichis-Lupas & Moisey, 2001).

However, some ATT user characteristics were not consistent with those characteristics documented in other research. Specifically, the educational level and annual household income of ATT respondents were higher than those found through previous trail studies. Eighty-five percent of ATT respondents had earned a bachelor's degree or higher. However, previous trail studies reported a lower proportion of respondents had earned at least a bachelor's degree. In a 2010 state trails study, 63% of respondents reported earning a bachelor's degree or higher (Oh & Hammitt), while an earlier metropolitan area trail study found that 57% of respondents were college graduates (Moore & Scott). One previous rail-trail study found that 62% of respondents had attained a bachelor's degree or higher (Moore, Graefe, Gitelson, & Porter, 1992). A variety of factors might help explain the relatively high education levels of respondents found among ATT users. A number of colleges and universities (e.g., Duke University, University of North Carolina, North Carolina State University, North Carolina University, Shaw University, Meredith College, etc.) are proximate to the ATT and their students or employees likely comprise some of the study participants. Further, many of the jobs at high technology companies located in the nearby Research Triangle Park (e.g., IBM, GlaxoSmithKline, Cisco, etc.) and the aforementioned educational institutions require advanced degrees and many of those employees likely also use the ATT.

More than four-fifths of ATT respondents (83%) reported an annual household income over $59,999, with over half of respondents (55%) reporting annual household incomes of $100,000 or more (Table 5). This percentage of users that reported a household income of more than $59,999 was higher than previously found in other rail-trail studies. In an earlier study that investigated three rail-trails, for example, only the Lafayette/Moraga trail in California had more than half (58%) of respondents reporting a household income over $59,999 (Moore, Graefe, Gitelson, & Porter, 1992). A later rail-trail study reported that the average respondent's household income was between $40,000 and $60,000 (Bichis-Lupas & Moisey, 2001). The high educational levels of ATT respondents would likely help explain why they had household incomes higher than those found for other rail-trail users.

Profile of Use on the ATT

Activities. The most common primary trail activity on the ATT was biking (42%), followed by running (40%) and walking (18%). However, previous rail-trail studies have found that respondents' primarily activity was typically either walking or bicycling (Bowker, Bergstrom & Gill, 2007; Moore, Graefe, Gitelson, & Porter, 1992). The proportion of runners on the ATT was also higher than that found in an earlier North Carolina statewide trail and greenway study where only 4.5% of users reported running on a trail or greenway at least once during the past twelve months (Moore, Siderelis, Lee, Ivy, & Bailey, 1998). Perhaps the high number of runners in this study, relative to previous trail studies, was a result of the ATT being a particularly attractive place to bike or run. The trail's length, lack of motorized traffic, and shady environment are ideal for these activity types. Although those attributes make the ATT ideal for walkers as well, some of the surrounding cities also have extensive greenway systems (e.g., Capital Area Greenway Trail System, Cary Greenways). Many walkers may be choosing more conveniently located greenway segments for their outings.

Distance Traveled to Access. Most users (83%) reported traveling to the trail using a car or other motor vehicle. This percentage was consistent with other rail-trail studies (Moore, Graefe, Gitelson, and Porter, 1992). The distance traveled to get to the trail has less variance than those found in previous rail-trail studies. Moore, Graefe, Gitelson, and Porter reported a standard deviation of 65.7 miles for distance traveled compared to only 7.6 miles on the ATT.

These results indicate that ATT respondents generally live or work closer to where they accessed the trail than do previously studied rail-trail users. The urban-proximate nature of the ATT places it within close proximity to many nearby cities (e.g., Cary, Chapel Hill, Apex, and Durham) which are all within 10 miles of a primary ATT access point. Unlike many other rail-trails (e.g., Virginia Creeper Trail) which have become popular tourist destinations, at this point it appears that the ATT serves primarily as a local recreation setting.

Informal conversations during the on-site contacts corroborated how close many ATT users live to the trail. In fact, some respondents revealed they entered the trail using connectors their communities built primarily to access the ATT. Additionally, the average time spent to access the trail might be low because of the ATT's proximity to Interstate 40. The northern half of the study segment (i.e., between Massey Chapel Road and Scott King Road) has access points within a six minute drive from an interstate exit. The relatively higher speeds possible on the interstate, compared to county roads, allow some users to travel from further away and reach the trail in times similar to those of more local residents.

Sections used. The sections of the trail that respondents reported using the most were concentrated in the center of the trail's length. The greatest use of the ATT was reported between the two busiest access points on the trail, Scott King Road and the White Oak Church Road Parking Lot. Conceivably these sections are the most heavily used because this area contains the respondents' most preferred surface type (i.e., the paved with crushed limestone surface type), a surface found on the ATT only in Chatham County. However, Chatham County has a small parking area that limits access to this surface type, which might displace some users to the parking lots at Scott King Road and White Oak Church Road. Users would then have to travel north or south, thereby increasing the use of those sections, to access the paved with crushed limestone surface. Because financing delayed the completion of the trail in Chatham County until 2010, these sections are the newest trail on the ATT. The newness of the Chatham County sections might appeal to long-term ATT users who want to experience a new section.

Length of stay. The average time respondents spent on ATT was lower than that found in some previous rail-trail studies. Moore, Graefe, Gitelson, and Porter (1992) found that the average respondent spent 68 minutes on the Lafayette/Moraga trail, 141 minutes on the St. Marks trail, and 150 minutes on the Heritage trail. By comparison, the average ATT user reported 99 minutes spent on the trail and although that average falls within the range reported by the Moore, Graefe, Gitelson, and Porter, the duration is less than found in later rail-trail research by Bowker, Bergstrom, and Gill (2007) (2.2 hours). The difference might have been a result of different activity mixes on the trail. The proportion of bicycling on the ATT was lower than that found on trails where users averaged more than 140 minutes on the trail. Runners averaged the longest stays on the ATT (107 minutes) followed by bicyclists (104 minutes) and walkers (72 minutes). Perhaps bicyclists generally have longer lengths of stay on other trails and therefore the more bicyclists that use a rail-trail the higher the average length of stay overall.

Perceived Benefits & Motivations. This study found that the benefits users believed were most important were consistent with their motivations for visiting the trail. On average, respondents rated the importance of “to keep physically fit” (4.6) as the strongest motivation for them visiting the trail. Similarly, respondents rated “physical activity and health” (4.7) as the most important benefit they perceived the ATT providing overall. Respondents may have rated these aspects so high because users are increasingly aware of the importance of physical activity. Multiple studies have found that physical activity on trails provides health benefits (Crumm & Santoro, 2007; Oh & Hammitt, 2010). Respondents' focus on physical activity might help explain why the average respondent spent 99 minutes on the trail, and a small percentage (2.4%) of users even spent four hours or more on the trail.

Respondents also placed a high importance on variables related to the natural trail environment. "Preserving undeveloped open space" was rated as the second most important benefit provided by the ATT. "To be close to nature" was also the second strongest motivation for users to visit the ATT. In addition, items that related to the natural surrounding were the most common category for what respondents liked best about the trail. Previous trail literature reinforces the findings that nature is an important preference for trail users (Gobster, 1995).

Users' Multi-jurisdictional Awareness and Preferences

Most (84.8 %) of respondents indicated that they knew the ATT was located in and managed by three different counties. This coincides with the high number (86% to 77%) of respondents who reported having previously visited each the three counties the ATT passes through.

Although users were aware of the multi-jurisdictional nature of the trail, their attitudes about consistency on the trail were mixed. Respondents were asked, "How important is it to you that each of the following features be consistent across the entire length of trails like the ATT," and then rated seven features (i.e., type and formatting of signs, parking facilities, bathroom facilities, type of trail surface, availability of drinking water, on-site information about the trail, and trail maintenance) on a five point scale where five represented "consistency extremely important." On average, trail maintenance rated as the most important feature (4.2) in terms of consistency across the trail. This result was corroborated by results from the open-ended question on consistency that followed. The open-ended consistency question asked respondents, “In the space below, please briefly explain why consistency across the entire length of a trail is or isn’t important to you.” Among all comments, the most common group of statements centered on maintenance (i.e., constant maintenance important, variety fine if well maintained /useable /safe).

The other six features examined (e.g., type and formatting of signs, parking facilities, bathroom facilities, type of trail surface, availability of drinking water, and on-site information about the trail) rated close to the scale midpoint. The next most important of these features was “type and formatting of signs” (3.3). Consistency in the type and formatting of signs might have been rated as the second most important feature because some users rely on mile markers to orient themselves and monitor their distance traveled on the trail. For example, users might appreciate knowing the bathrooms are located at the southern terminus (i.e., mile 0), near mile 5, and at mile 11.5 to know how far they have to travel for a bathroom. Many respondents who use the trail as an exercise location likely rely on mile markers to note the distance traveled and where they should turn around. The other three features (e.g., “parking facilities,” “bathroom facilities” and “type of trail surface”) are amenities which rated as a 3.2 on the 5-point scale overall. Many respondents might simply prefer having access to these features at all rather than being particularly concerned with their consistency across the entire trail. The least important feature was consistency regarding “on-site information about the trail,” which rated at the scale midpoint. This feature might have been rated the lowest because respondents do not wants signs and informational posters interfering with the naturalness of the trail. Alternatively, most respondents might already be aware of on-site information through the Triangle Rails to Trails Conservancy website or previous experience on the trail and do not need or want additional reminders throughout the trail. Perhaps these results indicate that, as a whole, respondents were either divided about the importance of the features that rated close to the midpoint, or were ambivalent about their importance.

Influence of Activity Differences on Preferences for Trail Use

Bicycling (41.8%) and running (37.5%) were the most common activity types on the ATT, accounting for 79.3% of the respondents to the on-site questionnaire. The type of trail surface available on the ATT might help explain the larger proportion of runners compared to previous studies. The data indicate that the most commonly used sections of trail use were near and in Chatham County, where the main trail is paved with a crushed limestone trail immediately beside it. Users' trail surface type preferences supported these results. A paved trail with crushed limestone beside it was the most common surface preference reported by respondents (44%). The split paved and crushed limestone surface in Chatham County and the crushed limestone surface in Wake County could encourage more runners to use these sections, and those surface types could afford acceptable trail surfaces for bicycling and walking as well.

Other rail-trails that have only a paved surface (e.g., Lafayette-Moraga Regional Trail) might attract fewer runners and encourage more bicyclists. An asphalt surface could negatively affect runners' enjoyment, due to possible health concerns (e.g., leg and foot impact injuries), while providing a surface that encourages higher speeds among bicyclists.

Alternatively, the ATT might displace some walkers because the mixed surface type affords use for the other activity types. Reponses to the open-ended question on what users liked least about the ATT indicated that some respondents had issues with bicyclists, groups of runners, and lack of trail etiquette. Previous studies have found that speed differences can contribute to higher levels of conflict on trails (Reichhart & Arnberger, 2010; Moore & Scott; 2003). Some walkers might be displaced from the ATT because of these issues.

Research Question

This study's research question asked:

> Do users of a multi-jurisdictional trail prefer uniformity or diversity across the entire trail in terms of the elements under managers' control, such as trail surface, types of facilities, signage, on-trail information, tail maintenance, and availability of drinking water?

Multinomial logistic regression was used to explore the relationship between primary trail activity and importance of consistency in terms of these features. The null hypothesis, of no difference among the three groups, was rejected for four of the elements under managers' control (i.e., bathroom facilities, availability of drinking water, on-site information about the trail, and parking facilities). The odds were 1.4 times greater that runners placed a greater importance on consistency in terms of the "availability of drinking water" than bicyclists and walkers combined (Table 42). Bicyclists can carry additional water on their bike in bottles attached to the frame or in a hydration pack on their backs. However, runners might find it more difficult to carry water without reducing their enjoyment on the trail. Alternatively, runners would have to either leave water in their car or carry it in their hands, either of which might not be acceptable to many runners. Therefore, runners could consider consistency more important in terms of availability of water. Conversely, water that bicyclists could carry might mean they would be less concerned about the consistent availability of water than runners would. Bicyclists can also travel further and can get to available water easier than runners can.

The distance that users travel on the trail might also factor into their rating of importance concerning consistency of bathroom facilities along the trail. Three bathroom facilities currently exist along the trail, one at the New Hill-Olive Chapel Road Lot, one at the White Oak Church Road lot, and one at CM Herndon Park near Scott King Road. For users observed running, the odds were 1.3 times greater that they placed a greater importance on consistency in “bathroom facilities” than those individuals in the combined bicycling and walking group. Bicyclists are able to traverse the trail faster and further than runners can and therefore bicyclists can access any of the three bathrooms near the trail more easily than runners can. Perhaps that explains why bicyclists would be less likely to place a greater importance on consistency for bathroom facilities than runners would.

Runners were less likely than the combined group of bicyclists and walkers to rate that consistency was more important in terms of “on-site information about the trail.” The odds were 0.7 times lower that those individuals observed running placed a greater importance on consistency in “on-site information about the trail” than those individuals observed bicycling or walking. Perhaps, the reference group (e.g., bikers and walkers) was more interested in knowing what type of trail surface exists ahead on the trail or how far they have gone along the trail compared to runners.

The importance of consistency in “parking facilities” was the last variable that was significantly different across trail activities when comparing runners with the combined group of bikers and walkers. For users observed running, the odds were 0.7 times lower that they placed a greater importance on consistency in “parking facilities” than individuals observed bicycling or walking. Runners might use the trail in the early morning or late evening hours when parking could be less of an issue compared to busy weekends or right after work. The researcher noted that early morning trail users were typically runners apparently trying to exercise before work or before the temperature was too high.

Because managers and planners often address trail issues by considering these three trail activities separately, the multinomial estimator was then used to compare all three-activity groups separately. The null hypothesis of no difference among the three groups was rejected for three of the elements under managers’ control (i.e., availability of drinking water, on-site information about the trail, and parking facilities). The odds were 1.5 times greater that runners placed more importance on the consistency of the “availability of drinking water” than did bicyclists (Table 42). Although the results of the walkers’ importance of consistency for the feature “availability of drinking water” was not quite significant at the .05 level, the odds were 1.4 times greater that walkers placed a greater importance on the consistency of the “availability of drinking water” than bicyclists. These results indicated that runners rated a slightly greater level of importance for the consistency of the availability of drinking water than walkers did. Walkers’ lower importance rating, relative to runners, might be related to how far walkers travel along the trail. Conceivably, walkers do not travel far enough from the water in their vehicle or at their home compared to runners and therefore do not place a higher level of importance for consistency in the availability of water along the trail itself.

The results indicated that walkers were the least likely to place a high importance on the consistency of bathroom facilities (0.7 times less likely) than bicyclists. Walkers might not be using enough of the trail to be that far from their vehicles, home, or trailside bathroom and thus might not need the bathroom facilities on the trail. Alternatively, walkers could be using the trail for less time than the other activity types. The multinomial logistic regression results indicated that runners placed the highest importance on consistency in terms of "bathroom facilities" followed by bicyclists then walkers.

These results might also explain why walkers placed a higher importance (1.3 times) on consistency regarding "parking facilities" than did bicyclists. Walkers might visit the trail during the middle of the day, on weekends, and during nice weather, and therefore might encounter more issues with the availability of parking along the trail.

Summary. Although the mix of trail activities on the ATT was somewhat different than those found in some previous rail-trail studies, ATT users shared similar characteristics with users of other rail-trails. The results of this study indicate that the activity types of rail-trail users can, in fact, relate to their preferences for trail-wide consistency in terms of some of the trail elements controlled by the managers.

Strengths and Limitations

Using a short on-site questionnaire followed by an online follow-up questionnaire, proved effective in this research, in part, because it reduced the burden of the on-site contact and likely increased trail users' willingness to participate in the study. Many users were using the trail before going home, going to work, or were intercepted in the midst of their visit as they passed by on the trail. It was sometimes challenging for the researcher to get users to agree to the two-minute on-site questionnaire, at times the researcher had to run with the respondent to capture the on-site questionnaire information. Many users would have been unwilling to complete the 10-15 minute follow-up questionnaire when contacted on the trail. Completing the survey at home also allowed the respondents to reflect on the questions instead of feeling pressured to complete the questionnaire on the trail during their visit.

The use of an online questionnaire also created an easy way to send follow-up reminders to the respondents. Survey Monkey® provided a list of email addresses for those who had not completed or started the questionnaire, so follow-up emails could be targeted to only those that had not yet responded. Overall, the online questionnaire format was quite effective for this research. Very few respondents to the on-site questionnaire refused to provide an email address for a follow-up questionnaire.

The main limitation of this study was that surveying occurred only in late September and October and therefore did not capture users who frequent the trail only during other times of the year. It would be necessary to expand the surveying period to represent all months of the year to gain a more complete picture of how all users use and view the ATT. Another limitation is related to using email addresses to deliver the follow-up questionnaire. Some respondents might have provided an email address they use for spam mailings and thus did not see any of the emails concerning the online questionnaire, thereby reducing the response rate. Additionally, using Survey Monkey® to host the instrument limited the design options for the questionnaire. Other online survey hosts (e.g., Qualtrics™) have broader design abilities and would be better for future studies.

Management Implications

Trail maintenance emerged as an important priority for the study's respondents, even though respondents did not indicate there were currently problems with maintenance of the ATT. Problems levels were all low, even litter which in some ways is a maintenance issue. In fact, litter was rated as only a 1.7 on average on a five-point scale, suggesting it was only a very minor problem. Currently, governmental agencies are responsible for the vast majority of the maintenance along the ATT, although, the members from the Triangle Rails to Trails Conservancy do help maintain the section of the trail in Durham County (B. Bussey, personal communication, October 2011). Managers should look at the issue of maintenance and consider working more with local clubs and other volunteer organizations to help maintain a clean and inviting environment on the trail. Perhaps organizing volunteer work crews based on users' activity types could bridge any gap between what the counties can accomplish and what users prefer. Additionally, work crews comprised of multiple activity types might help head off possible user conflicts among difference activity types. Horseback riding clubs could encourage members to bring shovels and help clean any manure off the trail while they use the trail. ATT managers could also develop a volunteer adopt-a-trail program for sections of the ATT.

Consistency in the type and formatting of signs was another priority for many ATT users, particularly runners. This could also provide an opportunity to help encourage users to engage in and promote trail etiquette. More signs that are consistent and ones containing trail etiquette information could be added relatively easily and inexpensively in a phased approach as signs need replacing. Signs could also be moved to locations where users congregate (i.e., in parking areas or near bathrooms) to maximize users' exposure to the trail etiquette information.

One interesting insight from this study involved respondents' trail surface preferences. While the section of the ATT north of I-40 is paved, that type of surface was the least favored among users of the southern half of the trail. Because the planned bridge that will span I-40 and connect the two sections of the ATT has just recently received North Carolina Department of Transportation funding (Gronberg, 2012), managers will soon be deciding what surface will be provided along this new connecting segment. This research provides information on users' surface preferences that can be considered when deciding what surface will be provided there.

Further Research

Future research should expand on the sampling used in the study. Part of that process might include a yearlong sample of ATT users. These additional users might provide different insights into how people use the ATT throughout the year and what characteristics these users have. Research could also be expanded to compare users on the southern section of the ATT to those individuals who use the northern section of the ATT. Because there are plans to connect the two sections of the ATT it would be interesting to understand the users of both trail sections before that connection occurs, then study them afterwards to see what effects the integration might have on use. In-depth interviews could also be employed to expand the depth of knowledge we have for ATT use and users. Participants could then further explain their current attitudes and preferences concerning the multi-jurisdictional nature of the trail.

Rail-trail users could be further evaluated by more directly comparing the American Tobacco Trail to other rail-trails in the southeast, or other long trails that are proximate to population centers. Such studies could explore the differences across trails to examine any differences in regional use or users. This could provide more information on what type of trails would be most desirable and useful to users in each region and help managers tailor future trails to their local situation.

Finally, it would be interesting to explore any effects runners or bicyclists might have on the walkers who use the ATT. It would be worth further exploring why walking appears to be less common on the ATT, than other rail-trails (Bowker, Bergstrom & Gill, 2007; Moore, Graefe, Gitelson, & Porter, 1992), perhaps by asking respondents to identify what they consider to be substitutes for the ATT.

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APPENDICES

Appendix A: On-site questionnaire

American Tobacco Trail On-Site User Survey 2011

Managers of the American Tobacco Trail (ATT) are interested in how people use the trail and how to make it better. This study focuses on the southern 13.5 miles of the ATT from Massey Chapel Rd south to New Hill - Olive Chapel Rd (see map). Thank you for taking a few minutes to answer the following questions.

1. How did you travel to where you got on the ATT today?

   _____ Car or other motor vehicle ______ Bicycle
   _____ Walk, Run, or Jogged ______ Other (please specify ________________)

2. Where did you travel from for your trip to the ATT today?

   ______ Primary Residence _______ Work
   ______ Another Residence _______ Other (please specify_________________)

3. About how many miles did you travel to where you got on the ATT today?

   ______ Miles (One-way)

4. About how long did it take you today to travel to the ATT? _________Hours _________Minutes

5. What time did you get on the ATT today? ______ AM or PM

6. About how long did/will you spend on the trail today? _________Hours _________Minutes

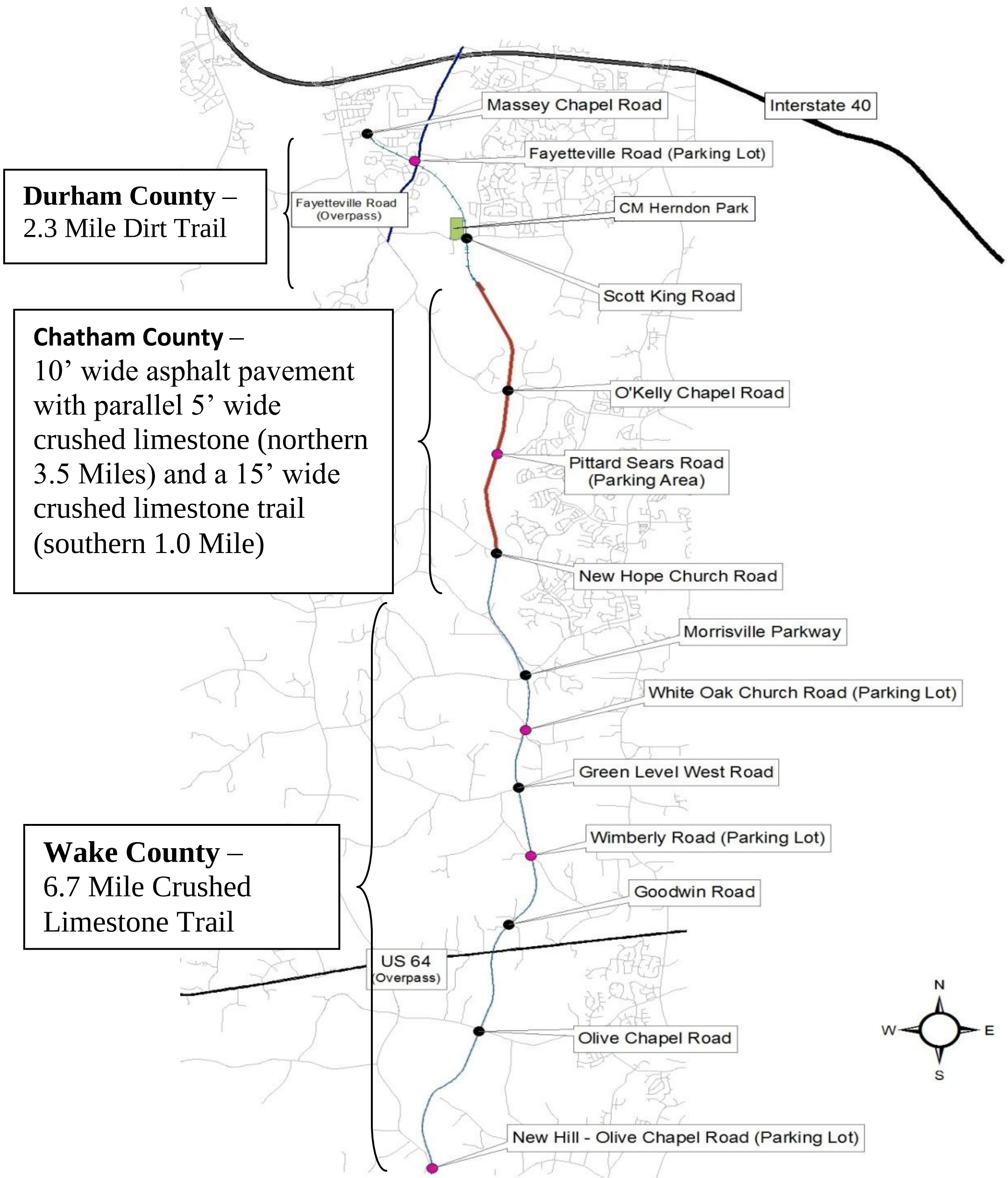
7. What is your *primary* activity during this visit? (please check only one)

   ___ Bicycling ___ Walking
   ___ Running ___ In-line Skating
   ___ Horse-back Riding ___ Hunting
   ___ Other (Please specify___________________________________)

8. How many people (counting you) are in your travel party for this visit? ___ Number of people

9. What is your postal Zip Code? __________ Zip Code

10. Referring to the map on the reverse side, please identify what section(s) of the ATT you have *ever* visited (Check all that apply).
    ___ Durham County ___ Chatham County ___ Wake County
11. On the map below, please show us the part of the ATT you have used (or will use) for your visit today. Please mark your starting point with a **small circle (i.e.** "**O**"), your ending point with an **X**, and **use an arrow** to show your trip on the trail.



ATT managers can best serve you if they understand more about your preferences and use. Therefore, we would be grateful if you would complete a follow-up survey at your convenience. It will take about 15 minutes to complete. If you are willing to complete one, we have copies we can give you if you would like to complete it now. If you would rather complete it later, please provide an email address so we can email you a link to the follow-up survey. Your email address with not be shared with anyone and we will delete it after you complete the survey.

Email address ____

Thank you

If you have any questions or concerns about this study, please contact Adrian Zeck at azeck@ncsu.edu or 919-515-3276

Appendix B: Follow-up Questionnaire

American Tobacco Trail User Survey 2011

Thank you very much for agreeing to participate in this follow-up survey about the American Tobacco Trail (ATT) and the people who use it. The results of this study will help ATT managers to best meet the needs of visitors. Your participation is voluntary, but your cooperation is extremely important because each selected user represents many others not included in the survey. Your responses are completely confidential.

This study focuses on the southern segment of the American Tobacco Trail, the 13.5 miles of trail from Massey Chapel Road in the north to New Hill - Olive Chapel Road in the south. The trail is managed by the City of Durham, Chatham County in cooperation with the Town of Cary, and Wake County. Please take a few minutes to answer the following questions.

Part I: YOUR TRAIL TRIP. This section relates to YOUR TRIP to the ATT on the day you were contacted on the trail for this study.

1. Approximately how long was your visit on the ATT the day you were contacted?
   ________ Hours ______ Minutes
2. Was that your first visit to the ATT? ______No ______Yes (if Yes, go to Question #3)

   If "No," about when was your first visit to the ATT?
   _______ Month _______ Year

3. What activities did you engage in during your ATT visit the day you were contacted? (check all that apply)

   ___ Bicycling ___ Walking ___Dog Walking
   ___ Running ___ In-line skating ___Picnicking
   ___ Nature Observation ___ Hunting ___Fitness / Training
   ___ Horse-back riding ___ Other (Please specify________________________)

4. Which of the above activities was the *primary* activity that you were engaged in the day you were contacted? _______________________

5. Which of the following best describes the group you were traveling with during your visit on the day you were contacted? (Please check one)

   ___ Alone ___ Friends ___ Family
   ___ Organized Group ___ Friends and Family
   ___ Other (please specify_____________________)

6. Which of the following was the *most* important reason for your visit to the ATT on the day you were contacted (Please check one):
   _____ I went there because I enjoy the place itself
   _____ I went there because it's a good place to do the outdoor activities I enjoy
   _____ I went there because I wanted to spend time with my companions

7. On a scale from 1 to 10, with 10 being the best possible trip, how would you rate your visit to the ATT on the day you were contacted _______ Rating from 1 to 10

Part II: YOUR PREFERENCES. This section examines your trail PREFERENCES

1. Listed below are trail characteristics people often consider when deciding which trails to visit. Please consider the following characteristics and **circle the number** that best indicates how important it is to you when considering a visit to the ATT.

Trail Characteristic	NOT AT ALL IMPORTANT				EXTREMELY IMPORTANT
a. Proximity to Home	1	2	3	4	5
b. Personal Safety	1	2	3	4	5
c. Convenient Parking	1	2	3	4	5
d. Information On-Site about the Trail	1	2	3	4	5
e. Information On-Site about Nature	1	2	3	4	5
f. Presence of Wildlife	1	2	3	4	5
g. Type of Trail Surface	1	2	3	4	5
h. Natural Surroundings	1	2	3	4	5
i. Peaceful & Quiet Setting	1	2	3	4	5
j. Cleanliness	1	2	3	4	5
k. Availability of Restrooms	1	2	3	4	5
l. Availability of Trashcans	1	2	3	4	5
m. Good Maintenance	1	2	3	4	5
n. Mileage Markers Along Trail	1	2	3	4	5
o. Benches for resting	1	2	3	4	5
p. Availability of Drinking Water	1	2	3	4	5
q. Accessibility for People with Disabilities	1	2	3	4	5

2. Listed below are some of the surfaces that are common on trails like the ATT. Please indicate which trail surface you prefer (Please check one).

____ Pavement

____ Crushed limestone

____ Pavement with a crushed limestone trail beside it

____ Natural soil

3. In the space below, please briefly explain why you like that surface the best.

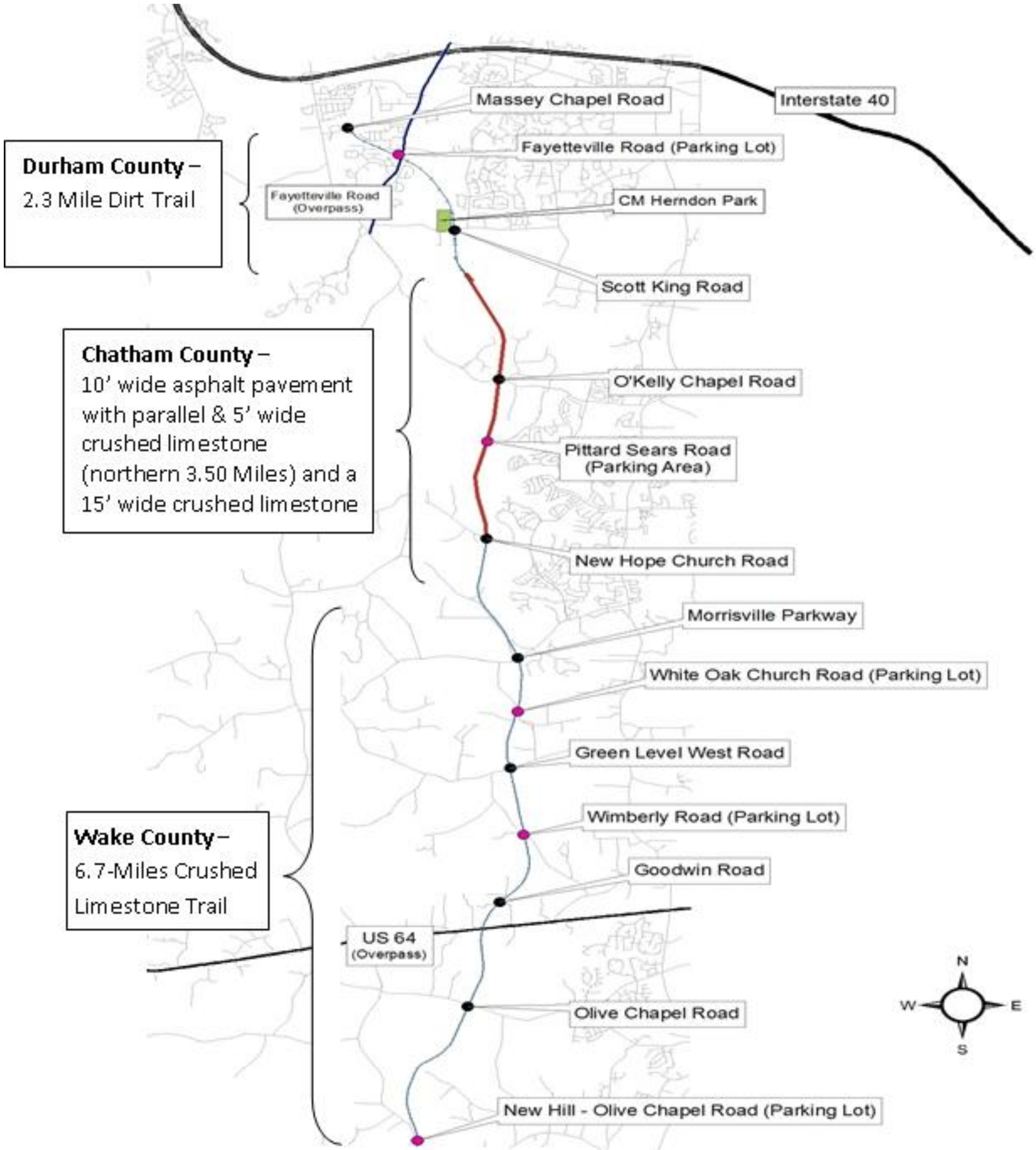
4. Please identify which section of the ATT you have visited *most often*. (Please refer to the map on the next page if needed)
   ____ Durham County
   ____ Chatham County
   ____ Wake County
5. In the space below, briefly explain why you have visited that section of the ATT *most often*.

6. Please identify which section of the ATT *you prefer the most*. (Please refer to the map on the next page if needed)
   ____ Durham County
   ____ Chatham County
   ____ Wake County

7. In the space below, briefly explain why *you prefer* that section of the ATT *the most.*

8. What do you *like best* about the American Tobacco Trail?

9. What do you *like least* about the American Tobacco Trail?


Massey Chapel Road
Interstate 40
Fayetteville Road (Parking Lot)
Durham County –
2.3 Mile Dirt Trail
Fayetteville Road (Overpass)
CM Herndon Park
Scott King Road
Chatham County –
10' wide asphalt pavement with parallel & 5' wide crushed limestone (northern 3.50 Miles) and a 15' wide crushed limestone
O'Kelly Chapel Road
Pittard Sears Road (Parking Area)
New Hope Church Road
Morrisville Parkway
White Oak Church Road (Parking Lot)
Green Level West Road
Wimberly Road (Parking Lot)
Wake County –
6.7-Miles Crushed Limestone Trail
Goodwin Road
US 64 (Overpass)
N
W
E
S
Olive Chapel Road
New Hill - Olive Chapel Road (Parking Lot)

10. There are many potential reasons why someone might visit the American Tobacco Trail. We would like to know what usually motivates you to visit the ATT. Please indicate how important each of the following is to you as a reason to visit. Please circle *only one* number for each reason.

Reason	NOT AT ALL IMPORTANT				EXTREMELY IMPORTANT
a. To view the scenery	1	2	3	4	5
b. To develop your skills and abilities	1	2	3	4	5
c. To be with friends	1	2	3	4	5
d. To get away from the usual demands of life	1	2	3	4	5
e. To think about your personal values	1	2	3	4	5
f. To meet other people in the area	1	2	3	4	5
g. To be close to nature	1	2	3	4	5
h. To help release or reduce some built-up tensions	1	2	3	4	5
i. To do something with your family	1	2	3	4	5
j. To keep physically fit	1	2	3	4	5
k. To learn more about things here	1	2	3	4	5
l. To experience excitement	1	2	3	4	5
m. To test your abilities	1	2	3	4	5
n. To have a change from your everyday routine	1	2	3	4	5
o. To observe other people in the area	1	2	3	4	5
p. To be with others who enjoy the same things you do	1	2	3	4	5
q. To learn more about nature	1	2	3	4	5
r. To tell others about the trip	1	2	3	4	5
s. To relax physically	1	2	3	4	5
t. To take risks	1	2	3	4	5
u. To know others are nearby	1	2	3	4	5
v. To experience tranquility	1	2	3	4	5
w. To experience new and different things	1	2	3	4	5
x. To be on your own	1	2	3	4	5

PART III: RESOURCES and MANAGEMENT. In this section, we are interested in your opinions concerning the American Tobacco Trail.

1. Approximately, how many times did you use the ATT during the *past 12 months*? _________ Times

2. Approximately, how many times do you expect to use the ATT during the *next 12 months*? _______ Times

The next four questions present different hypothetical changes related to the ATT and then ask how your use might change in each situation. Please understand that none of these changes are actually being considered. But your responses will help us better understand trail use.

3. Suppose the American Tobacco Trail became so popular that the amount of use on the trail doubled (in other words, increased by 100%). How many trips would you take during the next 12 months? (Check one)

____ I would take MORE trips (If so, how many MORE? ______ Trips)
____ I would take FEWER trips (If so, how many FEWER? ______ Trips)
____ I would take the SAME NUMBER of trips

4. Suppose trail authorities decided to pave the entire length of the American Tobacco Trail. How many trips would you take during the next 12 months? (Check one)

____ I would take MORE trips (If so, how many MORE? ______ Trips)
____ I would take FEWER trips (If so, how many FEWER? ______ Trips)
____ I would take the SAME NUMBER of trips

5. Suppose the American Tobacco Trail allowed twice as many organized running events to be held on the ATT (in other words, increased by 100%). How many trips would you take during the next 12 months? (Check one)

____ I would take MORE trips (If so, how many MORE? ______ Trips)
____ I would take FEWER trips (If so, how many FEWER? ______ Trips)
____ I would take the SAME NUMBER of trips

6. Suppose drinking water was available at several locations along the American Tobacco Trail. How many trips would you take during the next 12 months? (Check one)

____ I would take MORE trips (If so, how many MORE? ______ Trips)
____ I would take FEWER trips (If so, how many FEWER? ______ Trips)
____ I would take the SAME NUMBER of trips

7. Here is a list of broader public benefits the American Tobacco Trail might have for its users and surrounding community. Please circle *only* one number that best indicates how important you feel the American Tobacco Trail is in providing *each* benefit listed.

Benefit	NOT AT ALL IMPORTANT				EXTREMELY IMPORTANT
a. Preserving undeveloped open space	1	2	3	4	5
b. Aesthetic beauty	1	2	3	4	5
c. Community pride	1	2	3	4	5
d. Tourism and business development	1	2	3	4	5
e. Traffic reduction and transportation alternatives	1	2	3	4	5
f. Physical Activity and Health	1	2	3	4	5
g. Access for disabled persons	1	2	3	4	5
h. Public recreation opportunities	1	2	3	4	5
i. Public education about nature and the environment	1	2	3	4	5
j. Other (please specify_____________)	1	2	3	4	5

8. Before this survey were you aware that the ATT was located in and managed by three different counties?

_________ No   _______ Yes

9. When trails like the ATT have sections that are managed by different agencies, managers must decide whether to try to make those trail sections similar or not. How important is it to you that each of the following features be consistent across the entire length of trails like the ATT?

Benefit	CONSISTENCY NOT AT ALL IMPORTANT				CONSISTENCY EXTREMELY IMPORTANT
a. Type of trail surface	1	2	3	4	5
b. Type and Formatting of Signs	1	2	3	4	5
c. Bathroom Facilities	1	2	3	4	5
d. Parking Facilities	1	2	3	4	5
e. Availability of Drinking Water	1	2	3	4	5
f. On-site information about the Trail	1	2	3	4	5
g. Trail Maintenance	1	2	3	4	5

10. In the space below, please briefly explain why consistency across the entire length of a trail is or isn't important to you.

11. To what extent (if at all) do you feel each of the following are problems at the American Tobacco Trail? (Circle one number for each item)

	NOT A PROBLEM				MAJOR PROBLEM
a. Crowding	1	2	3	4	5
b. Conflict between Visitors	1	2	3	4	5
c. Availability of Restrooms	1	2	3	4	5
d. Availability of Parking	1	2	3	4	5
e. Reckless User Behavior	1	2	3	4	5
f. Horse Manure	1	2	3	4	5
g. Pet Waste	1	2	3	4	5
h. Availability of Park Staff	1	2	3	4	5
i. Noisy/Rowdy People	1	2	3	4	5
j. Traffic Noise	1	2	3	4	5
k. Posted Rules and Regulations	1	2	3	4	5
l. Litter	1	2	3	4	5
m. Other (specify____________)	1	2	3	4	5

PART IV: ABOUT YOU. In this section we are interested in VISITOR INFORMATION that will be used to help managers understand the characteristics of ATT users and make predictions about future trail use. All answers will be kept confidential and only reported as overall statistical summaries.

1. I am ______Female ____ Male

2. In what year were you born? ________________ Year

3. Highest level of education attained (Please check only one)

_____ 8th grade or less _____ Some high school

_____ High School diploma or GED _____ Business or trade school

_____ Some college, no degree _____ Associate's degree

_____ Bachelor's degree _____ Some graduate school

_____ Master's degree _____ Doctoral or professional degree

4. To what Race or Ethnic Group do you belong? (Please check only one)

_____ Asian or Pacific Islander _____ American Indian or Alaska Native

_____ Black, not of Hispanic origin _____ White, not of Hispanic origin

_____ Hispanic or Latino _____ Other (Please specify_____________)

5. Which of the following best describes your total household income, before taxes, for 2010? (Please check only one)

____ under $20,000
____ $20,000 to $39,999
____ $40,000 to $59,999
____ $60,000 to $79,999
____ $80,000 to $99,999
____ $100,000 to $119,999
_____ $120,000 to $139,999
_____ $140,000 to $159,999
_____ $160,000 to $179,999
_____ $180,000 to $199,999
_____ $200,000 or more

6. Please use the space below for any additional comments about the ATT or its management

Thank You!
Please return your completed survey to our field staff member
If you have any questions or concerns about this study, please contact Adrian Zeck at
azeck@ncsu.edu or 919-515-3276

Appendix C: Results Compared by Trail Activity

Table 1. Differences in User Characteristics Among Activity Types

Variable	Bicyclists	Runners	Walkers	n	Difference among groups
Gender (% male)	56.2	53.9	40.0	469	$\chi2 = 5.94$
Age	48.3^a	40.2^b	45.4^a	463	F = 23.79***
Bachelor's or higher education level (%)	82.7	92.7	85.1	468	$\chi2 = 9.20$**
Annual household income (% > 79,999)	73.5	67.7	60.9	415	$\chi2 = 3.80$
Totals					

Note: Means with different lettered superscripts are significantly different at the .05 level
*Significant at .05 level
**Significant at .01 level
***Significant at .001 level

Table 2. Differences in Trip Characteristics Among Activity Types

Variable	Bicyclists	Runners	Walkers	n	Difference among groups
Group size (# in Group)	1.8	1.8	2.0	498	F=1.37
Group type (% alone)	39.4	56.4	27.2	498	$\chi2$=23.72***
Trip satisfaction[1]	9.0	8.9	8.7	497	F=1.98
Miles traveled to trail	8.0^a	7.9^a	4.8^b	497	F=6.59**
Travel method to trail (% car)	76.1	91.2	88.9	498	$\chi2$=19.55***
Number visits in past 12 months	29.4^a	47.3^b	56.8^b	472	F = 7.70***
Number of visits in next 12 months	38.2^a	56.7^b	73.8^b	473	F = 10.36***
Preferred surface (% Paved with Crushed Limestone)	53.1	40.7	31.2	492	$\chi2$=34.45***
Totals					

Note: Means with different lettered superscripts are significantly different at the .05 level
[1]Coded on a 10-point scale with (10) *best trip possible*
*Significant at .05 level
**Significant at .01 level
***Significant at .001 level

Table 3. Differences Among Activity Types Regarding Preferences

Trail Characteristics	Bicyclists	Runners	Walkers	N	Difference among groups
Personal safety[1]	4.3	4.3	4.6	489	F=2.74
Cleanliness	4.2	4.2	4.3	489	F=0.15
Natural surroundings	4.2	4.1	4.3	489	F=2.27
Peaceful & quiet setting	4.2	4.0[a]	4.4[b]	490	F=4.92**
Good maintenance	4.0	4.1	4.0	485	F=0.26
Proximity to home	3.9	4.1	4.1	491	F=1.33
Type of trail surface	3.8[a]	4.3[b]	3.7[a]	489	F=21.52***
Convenient parking	3.7	3.7	3.8	487	F=0.23
Mileage markers along trail	3.4[a]	3.8[b]	3.4[a]	484	F=6.56**
Availability of restrooms	3.2	3.3[a]	2.9[b]	487	F=4.01*
Availability of trashcans	3.0	2.9	3.1	488	F=0.64
Availability of drinking water	2.7[a]	3.1[b]	2.7	485	F=5.40**
Presence of wildlife	2.8	2.6[a]	3.0[b]	487	F=4.81**
Information on-site about the trail	2.8[a]	2.5[b]	2.7	488	F=4.35*
Accessibility for people with disabilities	2.6	2.3	2.6	486	F=3.25*
Benches for resting	2.6[a]	2.2[b]	2.6	486	F=5.50**
Information on-site about nature	2.4[a]	2.1[b]	2.5[a]	488	F=8.01***

Totals

Note: Means with different lettered superscripts are significantly different at the .05 level

[1]All variables in table coded on a 5-point scale from *not at all important* (1) through *extremely important* (5)

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

Table 4. Differences Among Activity Types Regarding Reasons for Visiting the Trail

Reasons	Bicyclists	Runners	Walkers	n	Difference among groups
To keep physically fit[1]	4.6^a	4.8^b	4.4^c	482	F=11.18***
To be close to nature	3.9^a	3.6^b	4.1^a	485	F=8.79***
To help release or reduce some built-up tensions	3.8	3.9	3.9	481	F=1.11
To get away from the usual demands of life	3.8	3.6	3.9	484	F=3.11*
To view the scenery	3.9^a	3.4^b	4.0^a	488	F=14.77***
To experience tranquility	3.6	3.4^a	3.9^b	484	F=4.71**
To develop your skills and abilities	3.3^a	3.9^b	2.8^c	482	F=29.78***
To have a change from your everyday routine	3.6	3.3	3.4	479	F=2.26
To relax physically	3.5^a	3.1^b	3.6^a	478	F=7.33***
To do something with your family	3.5^a	3.0^b	3.8^a	482	F=16.03***
To test your abilities	2.9^a	3.5^b	2.4^c	480	F=24.15***
To be with friends	3.1^a	2.8^b	3.0	480	F=3.04*
To be on your own	3.0	3.0	2.9	485	F=0.34
To be with others who enjoy the same things you do	2.9	3.0	2.9	481	F=0.35
To think about your personal values	2.7	2.6	2.8	479	F=0.79
To experience new and different things	2.8^a	2.5^b	2.7	482	F=4.80**
To experience excitement	2.5^a	2.2^b	2.1	482	F=4.42*
To learn more about nature	2.4^a	2.1^b	2.5^a	480	F=7.38***
To learn more about things here	2.4^a	2.1^b	2.4	482	F=6.41**
To know others are nearby	2.2	2.4	2.2	481	F=1.00
To observe other people in the area	2.0	2.0	2.0	480	F=0.29
To meet other people in the area	1.9	2.1	2.0	482	F=1.54
To tell others about the trip	2.0^a	1.7^b	1.8	480	F=6.47**
To take risks	1.7	1.7	1.6	481	F=0.87

Totals

Note: Means with different lettered superscripts are significantly different at the .05 level

[1]All variables in table coded on a 5-point scale from *not at all important* (1) through *extremely important* (5)

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

Table 5. Differences Among Activity Types Regarding Potential Problems

Problem	Bicyclists	Runners	Walkers	N	Difference among groups
Availability of parking[1]	2.7	2.6	2.4	458	F=1.14
Horse manure	2.5	2.4	2.4	461	F=0.55
Availability of restrooms	2.3[a]	2.7[b]	2.2[a]	458	F=8.19***
Other problems	2.1	2.2	2.3	90	F=0.05
Pet waste	2.0	2.0	2.2	457	F=0.97
Crowding	2.0	1.8	2.1	456	F=3.36*
Availability of park staff	1.8	1.8	1.8	454	F=0.01
Litter	1.6	1.6	1.8	456	F=1.35
Reckless user behavior	1.6	1.6	1.7	455	F=0.33
Posted rules and regulations	1.6	1.5	1.7	458	F=1.78
Conflict between visitors	1.5	1.4	1.5	454	F=0.68
Traffic noise	1.5	1.4	1.5	455	F=0.96
Noisy / rowdy people	1.5	1.3[a]	1.6[b]	456	F=4.85**

Totals

Note: Means with different lettered superscripts are significantly different at the .05 level

[1]All variables in table coded on a 5-point scale from *not a problem* (1) through *major problem* (5)

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

Table 6. Differences Among Activity Types Regarding Various Benefits

Benefit	Bicyclists	Runners	Walkers	N	Difference among groups
Physical activity and health[1]	4.7	4.8^{a}	4.5^{b}	461	F=5.43**
Preserving undeveloped open space	4.5	4.3	4.4	462	F=1.05
Aesthetic beauty	4.4	4.3	4.2	461	F=2.91
Public recreation opportunities	4.2^{a}	4.1^{a}	3.7^{b}	459	F=6.68**
Community pride	4.0	3.8	3.8	455	F=2.77
Access for disabled persons	3.5	3.4	3.4	452	F=0.45
Public education about nature and the environment	3.4^{a}	3.0^{b}	3.2	454	F=5.30**
Traffic reduction and transportation alternatives	3.4^{a}	3.1	2.9^{b}	457	F=4.12*
Tourism & business development	3.2^{a}	2.8^{b}	2.6^{b}	457	F=7.20***
Other benefits	2.8	2.6	3.5	56	F=0.66

Totals

Note: Means with different lettered superscripts are significantly different at the .05 level

[1]All variables in table coded on a 5-point scale from *not at all important* (1) through *extremely important* (5)

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level