

Neighboring Landowner Attitudes Regarding A Proposed Greenway Trail: Assessing Differences Between Adjacent and Nearby Residents

Mark I. Ivy
Roger L. Moore

EXECUTIVE SUMMARY: In this exploratory study the beliefs of property owners in Cary, NC, were assessed regarding issues associated with a proposed greenway trail development within a quarter mile of their primary residence. The relationships of those beliefs to the individual's attitude regarding proposed development near their primary residence were then evaluated. Belief dimensions investigated in this study were identified through a review of the trail and greenway literature and incorporated affective, behavioral, and cognitive measures consistent with tripartite attitude theory. This investigation of the beliefs underlying attitudes was undertaken to better understand the factors which negatively influence neighboring landowners' perceptions of greenway trail development. Further analysis was conducted which compared adjacent (shared property boundary) to nearby (located within one quarter mile) property owner beliefs and attitudes. Consistent with previous research, all six belief dimensions (i.e., future property value, property damage, landowner liability, privacy, trespassing and crime) were significantly related to neighboring landowners' overall attitudes toward proposed greenway trail development. Additionally, adjacent landowners were less supportive in their attitudes towards the proposed greenway trail than were nearby landowners. The future property value dimension was found to explain most of the variance in global attitude toward greenway trail development. These results suggest that agencies developing greenway trails should take steps to raise awareness of neighboring landowners regarding proposed projects and potential issues associated with living near greenway trails. Findings also indicate that the greenway trail planning process should include neighboring landowners so that their concerns may be voiced and properly addressed.

Greenway planners may want to treat adjacent and nearby property owners as separate constituencies since attitudes varied greatly between the two groups. An educational strategy should be developed for adjacent landowners in order to raise awareness of planned development, to provide accurate information, and to address concerns. Other implications for planners and researchers are discussed.

KEYWORDS: Attitudes, Beliefs, Greenways, Landowners, Trails

AUTHORS: Ivy is an Assistant Professor with the Department of Recreation, Park and Tourism Management, The Pennsylvania State University, 701 Ford Building, University Park, PA 16802, Phone: (814)863-7538, Email: markivy@psu.edu. Moore is an Associate Professor with the Department of Parks, Recreation and Tourism Management, North Carolina State University.

Introduction

In the current climate of increasing concern regarding the sedentary lifestyles of Americans and the impacts of obesity on the health care system (Hu, Li, Colditz, Willett, & Manson, 2003; Manson, Skerrett, Greenland, & VanItallie, 2004; Finkelstein, Fiebelkorn, & Wang, 2004), urban and suburban trails are becoming an increasingly important component of the recreation and transportation infrastructure of communities. Greenway trails provide active recreation opportunities and alternative transportation corridors which allow people to exercise while performing routine tasks such as commuting to work or visiting the library. A multitude of other benefits can also accrue due to the development of greenway trails, ranging from the opportunity to interact with nature and with neighbors as well as using the trail to the economic revitalization of neighborhoods. One indicator of the institutionalization of trails into the infrastructure of the nation is the increased funding for the Recreational Trails Program administered by the Federal Highway Administration from \$37.5 million for fiscal years 1993-1997 (FHWA, 2006a) to \$370 million for fiscal years 2005-2009 (FHWA, 2006b). The results of this program can be seen, for example, in the growing number and miles of rail-trail conversions in the United States. From 1997 to 2005, the number of rail-trails grew from 878 (representing 8,930 miles) to 1,401 (representing 13,328 miles) for an average annual increase of 58 rail-trails and 489 miles of rail-trail (J. Tump, personal communication, May 3, 2006).

Despite the potential benefits associated with greenway trail development, not everyone is enthusiastic when new greenway trails are proposed. Landowners are often concerned when the use patterns of property located nearby change. Such concern is understandable since land is an extremely valuable asset and its value can be either diminished or enhanced depending on neighboring land uses. This concern can be manifested in the form of opposition toward proposed development of recreation areas and greenway trails by neighboring landowners. Although

previous research has found some support for the notion that early landowner concerns abate following trail construction (Mazur, 1988; Kaylen, Bhullar, Vaught & Braschler, 1993), initial fears can complicate the development process. Therefore, planners and managers need to understand neighboring landowner attitudes and address concerns about proposed greenway trail attributes that are perceived negatively, so as not to alienate neighboring landowners from the planning process.

In this exploratory study, homeowners in Cary, North Carolina, were surveyed regarding their attitudes towards the proposed development of a greenway trail on property located within a quarter mile of their residence. The right of way for the proposed trails was given to the town as a condition of development approval, but trail construction was the responsibility of the town. Landowner attitudes were assessed using belief dimensions regarding potential concerns identified through previous research (reduced property value, property damage, trespassing, landowner liability, privacy, and crime). While both positive (e.g., aesthetics, exercise, community pride, recreation and enhanced property value) and negative aspects of trail development were assessed, the primary focus of this study was to better understand the factors which negatively influence neighboring landowners' attitudes of greenway trail development. The belief dimensions were created using affective, behavioral, and cognitive components consistent with the tripartite model of attitudes, in order to assess the importance of including all three components in trail attitude research.

The primary objectives of this study were to better understand the factors which negatively influence neighboring landowners' perceptions of greenway trail development, to assess the impact of including affective, behavioral, and cognitive measures in trail attitude research, and to investigate differences between adjacent and nearby landowners. This study is distinctive in that it assessed neighboring landowner attitudes prior to trail development rather than relying upon recall of attitudes subsequent to development as is typical in similar studies (Vogelsohn, 1993; Feeney, 1997).

Related Research

Early research regarding neighboring landowner attitudes towards trails was conducted by public agencies in the United States interested in expanding trail opportunities (Adams & Holmes, 1978; Genereux & Genereux, 1979; Trails & Waterways Unit, 1980). In their investigation of 410 neighboring landowners along the Lafayette/Moraga and the Alameda Creek trails for the East Bay Regional Park District, Adams and Holmes (1978) found that perceived negative impact on property values (7% of sampled owners), trespassing (11%), vandalism (7%) and loss of privacy (6%) were identified as concerns by respondents. Dust and noise from illegal motorcycle use of the trail corridor was the most often reported concern (30% of sampled owners). In 1979, analysis of data related to landowner attitudes toward three existing and two proposed trails in Minnesota revealed that the anticipated problems reported by landowners along the proposed corridors differed from issues identified by landowners living adjacent to existing trails (Genereux & Genereux, 1979; Trails & Waterways Unit, 1980). In general landowners near the proposed

trails were more pessimistic than experiences along the existing trails suggested they would actually encounter.

A decade-long gap in the literature regarding neighboring landowner attitudes toward trails was bridged with research by the City of Seattle (1987) and Mazour (1988). After concerns were raised over the development of a new trail in Seattle, the city conducted a survey of 110 neighboring landowners along the existing Burke-Gilman trail (City of Seattle, 1987). A limited number of property owners indicated that they had experienced vandalism (3.5%) or a burglary (5%) that they attributed to a trail user. Respondents who purchased their property subsequent to trail development were more likely to view the trail as an amenity that adds value to their home. Respondents who purchased their property prior to trail development were mixed in their perceptions of the trail's impact on their property values. In another study, adjacent property owners along the Root River Trail and the Luce Line trails in Minnesota listed loss of privacy, trespass, litter, and reduced access to their property as issues (Mazour, 1988).

Three studies of property owners along rail-trails were conducted in the 1990's. Bhullar et al. (1991) examined 170 neighboring landowner concerns approximately one year after the opening of two pilot segments of the KATY trail in Missouri. Property owners were asked to recall their attitudes regarding eleven potential issues prior to trail development. Of the issues listed, decreased privacy (67% of the respondents), liability suits (59%), and increased trespass (58%), were most often cited as initial concerns by landowners. These three issues remained the top concerns of property owners one year after the trail opened. Moore, Graefe & Gitelson (1994) conducted a study of 663 property owners along three rail-trails, the Lafayette/Moraga Trail in California, the Heritage Trail in Iowa, and the St. Marks Trail in Florida. Property owners identified loss of privacy (7.4% of those responding), noise from trail users (6.2%), fear of crime (3.1%) and more traffic on local roads (3%) as issues. Vogelsong (1993) conducted a census of property owners along the MKT trail in Columbia, Missouri, and received 38 usable responses (76% response rate). Nine adjoining property owners who were in residence prior to trail development indicated an increase in trespassing, noise, and loss of privacy as a result of trail development. Feeney (1997) assessed attitudes of 215 adjacent landowners along the Mohawk-Hudson trail in New York and reported that litter, illegal motor vehicle use, noise, loitering and unleashed pets were identified as "major problems" by 10-14% of the respondents.

Two previous greenway studies in Cary, NC, the location for this research, assessed attitudes of nearby landowners. Tedder (1995) conducted a survey of 109 adjacent and nearby landowners along three greenway trail corridors in Cary (75% response rate). Ninety percent of respondents indicated that they were satisfied with the greenway near their home, and while most of the respondents (74%) purchased their property after greenway trail development, 21% of those who owned their property prior to trail construction indicated a decline in satisfaction from their initial opinion. Nearly all (97%) felt that greenways had either a positive or neutral impact on property values. In response to a question regarding the occurrence of problems associated with greenway trails, trespassing (27%), trail noise (24%),

roaming pets (23%), and loss of privacy (21%) were the most commonly reported concerns (95 surveys had useable responses for this item).

An earlier study (Tucker, 1993) also attempted to assess Cary residents' use, preferences, and support for greenways in their community, including their opinions about whether owning land adjacent to greenways increased or decreased property values. That study was based on written questionnaires hand delivered to 600 randomly selected Cary households, with 93% retrieved completed and usable. Results indicated considerable support. For example, 82% of respondents reported that they were willing to pay increased property taxes to fund additional greenway construction in the community.

Previous research has been complicated by the fact that some study participants owned their property prior to trail development while others purchased their property subsequent to trail development (Adams & Holmes, 1978; Genereux & Genereux, 1979; Moore, Graefe & Gitelson, 1994, Vogelsong, 1993). These two sub-populations of landowners may be very different in that some in the group who purchased their property subsequent to trail development could take the trail or greenway into consideration when making the determination as to whether or not to acquire the property. This study had the advantage of focusing entirely on landowners who owned their property prior to trail development within a publicly owned greenway corridor.

Although the majority of neighboring landowners included in past studies reported no problems with the trails in question, several issues were mentioned consistently by a minority of landowners. The key issues identified included loss of privacy, property damage, trespassing, liability, reduced property values, and fear of increased crime. It is important to note that the problems mentioned by landowners in these studies were not verified through police reports or other objective means. This study evaluated neighboring landowner perceptions regarding these issues. Building on the related studies noted above, we attempted to enhance the existing literature by examining the impact of beliefs on attitudes towards development of the proposed greenway trail, comparing the attitudes of adjacent and nearby landowners, and assessing the affective, behavioral, and cognitive components of attitudes in order to determine the relative importance of each in the creation of global attitudes toward greenway trail development.

Influence of beliefs on attitudes

Early attitude theorists believed that understanding attitudes would provide the key for predicting behavior (Allport, 1935). The attitude concept has proved to be multidimensional, with strength, complexity, accessibility, structure and certainty being identified as a few of the facets important to the underlying concept. Several models have been developed to explain relationships between attitudes and behavior including the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the Process Model (Fazio, Powell, & Herr, 1983), the Theory of Planned Behavior (TPB) (Ajzen, 1987), and the Theory of Self Regulation (TSR) (Bagozzi, 1992). The primary goal of these models is to explain the causes of behavior and to predict future behavior. A common thread linking them is the underlying assumption that

attitudes are based on beliefs. In order to better understand the impact of attitudes on behavior, the derivation of attitudes from beliefs must be fully explored (Fishbein & Azjen, 1975; Azjen, 1991).

The Theory of Reasoned Action is the most commonly used framework for describing the relationship between beliefs and attitudes (Eagly & Chaiken, 1993). This information-processing model postulates that an individual's attitude toward any given attitude object depends upon the strength of their beliefs regarding attributes that they ascribe to the attitude object, weighted by the positive or negative evaluation of those attributes. The strength of an individual's belief regarding each of the attributes considered in the model is quantified through a subjective probability that the attitude object will have the attribute in question. An important tenet of the model is that only those beliefs which are salient when the individual is asked to generate an attitude are summed to provide an overall measure of attitude toward the attitude object. Since only the salient beliefs are used in the process of attitude formation, attitudes may change over time as beliefs are modified.

In this study the influence of beliefs regarding trail attributes was assessed as an indication of attitude toward the development of a greenway trail that is proposed within $\frac{1}{4}$ mile of the landowners included in the sample. Multiple beliefs may influence an attitude with each belief representing a facet of the attitude. The tripartite theory of attitude describes behavioral, affective and cognitive components of attitude (Eagly & Chaiken, 1993), and research indicates that each component should be measured when assessing attitudes (Breckler, 1984). Questionnaire items were developed to capture beliefs representing each of the three attitude components for every trail attribute included in the study. While attitudes have been a common theme in trails research, the underlying beliefs which lead to attitude formation have not typically been examined. Enhancing understanding of the impact of beliefs on attitudes should lead to a better understanding of behavioral intentions and, ultimately, behaviors. This research was designed with both basic and applied objectives. Researchers will be most interested in the exploration of the attitude formation process, while practitioners will be interested in why neighboring landowners are often hesitant to support greenway trail development.

Method

Study Area

The two proposed greenway trails selected for inclusion in the study were the Bachelor's Branch/Panther Creek greenway and the White Oak greenway in Cary, NC, both of which were identified for development within the five year capital improvement plan for the town. The community is committed to expanding the existing greenway network to serve the rapidly growing population and has created a greenway master plan which calls for the development of over 50 miles of greenway trails, thus development of these trails is very likely. The land being protected as greenway corridors is predominately flat and ranged from pasture and crop land to old fence rows and riparian corridors that lies within an area that is quickly being converted from agricultural uses to medium and low density housing with some

commercial districts. The typical greenway right-of-way in Cary is 30' – 100' wide and is situated between single family housing lots, similar to an alley right-of-way. As a condition of development approval, easements must be provided for greenway trails identified on the greenway master plan for the community. In addition, developers often create linkages from non-adjacent parcels to tie into the greenway network. Public access to greenway trails is typically provided at street intersections, although some access points between adjacent lots also exist. The Bachelor's Branch/Panther Creek greenway corridor is approximately seven miles long and passes predominately through agricultural land and several recently constructed single family housing subdivisions (this corridor will be referred to hereafter as the Bachelor's Branch corridor). The White Oak greenway corridor is approximately five miles long which will link a large community park to a regional trail.

Sampling and Data Collection

The names and addresses of all owners of record for parcels within one-quarter mile of the Bachelor's Branch and the undeveloped portions of the White Oak greenway corridors were identified through tax parcel records. The parcels were then divided into two categories - "adjacent" (property that physically touches the trail/greenway right-of-way), and "nearby" (parcels within one quarter mile of the trail/greenway right-of-way, but not immediately adjacent to it). A census of the owners of the parcels in each category (adjacent and nearby) was conducted to ensure that all residents that might be impacted were notified of the proposed trail development and to provide them with an opportunity to voice their opinions. Of the 361 surveys distributed along the White Oak corridor, 76 were sent to adjacent property owners and 285 were sent to nearby property owners. In the Bachelor's Branch corridor 580 surveys were distributed with 75 sent to adjacent property owners and the remaining 505 to nearby property owners. Since no previous direct contact with the neighboring landowners was initiated by the Town of Cary regarding potential trail development within the study greenway corridors, it is possible that the initial contact for this survey provided the first indication for many owners that greenway trail development near their homes was under consideration.

Questionnaires were mailed to all neighboring landowners in June, 2000. A cover letter explaining the importance of the survey and a postage paid reply envelope was included. A modified Dillman (2000) technique was followed using four mailings (i.e., a follow-up postcard and two replacement questionnaires were distributed to non-respondents). Of the 941 parcels included in the original sample, 151 (16%) were immediately adjacent to the proposed greenway corridors. Of the 590 completed questionnaires, 15% were completed by adjacent landowners. The response rate for the Bachelor's Branch corridor was 64% for nearby landowners and 60% for adjacent landowners, yielding an overall response rate for the corridor of 63%. The response rate for the White Oak corridor was 63% for nearby landowners and 59% for adjacent landowners, yielding an overall response rate for the corridor of 62%. The combined response rate for the study was 63% (nearby landowners), 59% (adjacent landowners), and 62.6% overall.

To assess the possibility of non-response bias, a wave extrapolation was conducted comparing the mean responses for the 24 item belief dimension scale used to assess landowner attitude. Only three items were found to have significantly different means between the first and third waves of mailings: “I would exercise more often” decreased from 4.67 to 4.17; “the trail would increase my property value” decreased from 4.19 to 3.52; and “I feel that the trail would provide recreational opportunities” mean dropped from 5.28 to 4.66. Since only 3 of 24 items were significantly different between waves, non-response bias was deemed not to be an issue. Unfortunately, limited resources made it impossible to conduct follow ups directly with non-respondents.

The Town of Cary had a population of approximately 91,000 residents at the time the study was conducted (Town of Cary, 2000) and is located in the Research Triangle area of central North Carolina. The sample was approximately evenly split in terms of gender (51% male) and the respondents ranged in age from 24 to 92 years old. Over half (56%) reported having at least one child living in their household with them, with the children ranging in age from newborn to 50 years old. The sample was well educated and financially secure overall, with the vast majority of landowners being college graduates (84%). The modal income category was \$100,000 to \$119,000 per year, with 26% earning more than \$140,000 and 22% earning less than \$80,000 annually. These demographic findings are consistent with the overall population of Cary.

Research Instrument

Each of the six belief dimensions identified as being important to neighboring landowners through previous research - loss of privacy, property damage, trespassing, landowner liability, property values, and crime - were assessed regarding belief strength. Three items were developed or adapted from previous studies to examine belief strength for each belief dimension. Consistent with Ajzen, Nichols, & Driver (1995), belief strength was assessed by asking respondents to rate eighteen statements using a seven-point scale ranging from “extremely unlikely” to “extremely likely.” The questionnaire items for each belief were selected *a priori* to represent all three components of attitude as described in the tripartite theory of attitudes, affective, behavioral, and cognitive. For example, belief strength regarding the issue of landowner liability was operationalized using the following items “I feel that liability would not be an issue” (affective), “I would post signs to reduce my liability” (behavioral) and “Trail users will stay on the public right-of-way” (cognitive). Consistent with the definition of a belief, each of these items provided a link between an “object” (the proposed greenway trail) and an “attribute” (e.g., landowner liability), or between a “behavior” by either the landowner (posting signs) or a greenway user (staying on the public right-of-way) and an “outcome” (e.g., landowner liability). This strategy provided the opportunity to explore beliefs corresponding to each of the components of an attitude. While all of the belief dimensions can be considered negatively, efforts were made to include positive assessments of the dimensions (including the affective measure of liability mentioned earlier in this paragraph).

Additional items were included on the questionnaire to assess beliefs regarding potential benefits associated with greenway trail development. Among these were enhancing community pride, neighborhood aesthetics and recreational opportunities through the development of greenway trails. The same seven-point scale ranging from “extremely unlikely” to “extremely likely” was used for these items as well. The responses for the positive and negative items provided the subjective probabilities that the proposed greenway trails would have the attributes in question.

The process for questionnaire development was extensive, consisting of two pretests, a focus group, and a pilot test. A confirmatory factor analysis was conducted on each of the two pretest results samples to reduce the number of items in the questionnaire and to ensure that the remaining items were loading on the anticipated dimensions. The three items which loaded the highest for each belief dimension were incorporated into the questionnaire used in the pilot test. Prior to conducting a pilot test, a focus group consisting of three neighboring landowners along existing greenways in Cary was organized to identify the salient issues regarding the potential development of a greenway trail for neighboring landowners in the community. After discussion of the potential pros and cons identified through the focus group, an effort was made to reach consensus on the most important negative issues. The top three negative issues were noise, loss of privacy, and trespassing.

The information gathered through the focus group suggested that the neighboring landowner belief dimensions identified through previous research were applicable to Cary residents. The only issue identified by the focus group that was not included in the pre-tests was the potential impact of noise on neighboring landowners. Given the importance of this issue to the focus group participants, the item “I feel that noise generated by trail users would be a problem” was added to the questionnaire. Finally, a pilot test of the survey instrument was conducted using 43 adjacent landowners along a different proposed greenway in Cary, NC.

Global attitude toward the proposed greenway trails was operationalized using three items. “Please indicate your level of support for the development of a trail in the greenway corridor near your home,” was quantified using a seven point scale ranging from “very opposed to new trail” (1) to “very supportive of new trail” (7). Respondents were also asked to indicate their level of agreement with the statements “Greenway trails improve the quality of life for Cary residents” and “The potential benefits associated with a greenway trail near my home are greater than the potential problems.” Each of these items were quantified using a seven point scale ranging from “strongly disagree” (1) to “strongly agree” (7). These three items were combined to form a global attitude index for use in subsequent analyses.

Global attitude toward the proposed greenway trail development served as the dependent variable for much of the data analysis. As recommended by Crites, Fabrigar, and Petty (1994) the level of specificity of the overall attitude measure was consistent with the issue under study. The items specifically assessed attitudes towards the proposed greenway trails rather than documenting attitudes towards existing Cary greenway trails in general under the assumption that those attitudes would be applicable to any proposed greenway trails. The reliability of the items selected for the attitude index was assessed using Chronbach’s alpha.

Indexes were also created for each of the belief dimensions identified through previous research (future property value, property damage, trespassing, privacy, liability, and crime). Again, reliability was assessed using Chronbach's alpha. Correlation analysis was used to assess the impact of each of the indices on neighboring landowner attitudes and t-tests were employed to explore differences in beliefs and attitudes between nearby and adjacent landowners. Regression analysis was used to determine the ability of the belief dimensions to explain the variance in global attitude, as well as to explore how well the affective, behavioral and cognitive items independently explained the same variance.

Results

Description of Neighboring Landowners and Their Property

Landowners within one quarter mile of the proposed greenway trails predominantly had a short tenure in the area. The majority (75%) reported purchasing their property within the previous five years, while 14% indicated that they owned the property for a decade or longer. Length of residence and overall attitude toward trail were negatively and significantly ($p < .001$) related. The longer a respondent owned their property, the less likely they were to have a supportive attitude toward the greenway trail.

Few (11%) of the property owners had knowledge of the greenway corridors prior to purchasing their parcels. Of those who were aware of the greenway corridors, 61% indicated that the greenway was a positive influence on their purchasing decision, while 5% indicated that it was a negative influence. Only about one third (32%) of the landowners had knowledge of the greenway corridors prior to receiving the questionnaire. Most commonly, respondents first learned of the greenway corridors from their neighbors (30%). Those landowners who reported learning about the greenway corridors from their neighbors had a significantly lower (at the .05 level) mean attitude towards greenway trails (14.35, on a scale from 3 being the most negative to 21 being the most positive) as compared to landowners who learned of the greenway corridor from all other sources (other = 16.92, master plan = 17.16, news article = 17.30, real estate agent = 17.69).

Reliability of Indices for Belief Dimensions

Each of the six belief dimensions identified through previous research was operationalized using three indicator variables (Table 1). The responses for the indicators for each belief dimension were combined to create an index for that latent variable. The reliability of each of the six indices was assessed using Chronbach's alpha. Nunnally and Bernstein (1994) indicate that indices with Chronbach's alpha values of .60 or higher are considered to have acceptable levels of internal consistency. The indices for the belief dimensions of future property value, crime, landowner liability, and privacy all had rates of internal consistency (alphas) which exceeded the .60 cut-off, while the trespassing and property damage indices yielded lower values. The lower Chronbach's alpha scores do not indicate that the items used to estimate the belief dimension are unrelated, rather it is an indicator that

the construct validity of the items should be reassessed and that there is room to improve the indices (Nunnally & Bernstein, 1994).

Table 1. Indicator Items for the Belief Dimensions¹.

	n	Mean ²	SD	Chronbach's alpha
<i>Privacy</i>				.61
I feel that trail users would respect my privacy.	575	3.95	1.88	
I would spend less time in my yard.	572	2.64	1.96	
The trail would enable me to interact more with my neighbors.	576	3.44	1.89	
<i>Crime</i>				.76
I would take steps to enhance security for my property.	575	4.28	1.99	
I am concerned that trail users would harm my property.	571	3.35	1.97	
I would feel comfortable having my children use the trail.	534	4.11	1.85	
<i>Trespass</i>				.56
I would post signs on my yard to keep out trespassers.	571	2.93	2.14	
Trail users would stop in my yard to rest.	568	2.74	1.81	
Having more people around during the day would make me feel more secure.	573	2.76	1.62	
<i>Landowner Liability</i>				.64
Trail users would stay on the public right-of-way.	570	4.03	1.75	
I would post signs to reduce my liability.	567	2.98	2.03	
I feel that liability would not be an issue.	564	3.83	1.95	
<i>Future Property Value</i>				.83
The trail would increase my property value.	570	3.95	1.83	
If I move, I would feature the trail in ads to sell my home.	572	3.95	2.02	
I feel that living near a trail would reduce my property value.	570	3.30	1.95	
<i>Property Damage</i>				.43
I would be more careful about what I leave outside.	576	5.14	1.79	
I feel that trail users would pick my flowers/ fruits/vegetables.	570	2.54	1.81	
Trail users would deter criminals when I am not home.	574	2.87	1.70	

¹ Seven point scale ranged from *Extremely Unlikely* (1) to *Extremely Likely* (7)

² All negatively worded items were re-coded prior to index creation so that a high score would be a positive belief.

In addition to the six belief dimensions, the overall attitude of neighboring landowners towards the development of the proposed greenway trail was also operationalized using three indicator variables (Table 2). The indicator variables were used to create an index and the reliability was determined using Chronbach's alpha. The index was found to have a high level of internal consistency.

Table 2. Indicator Items for the Overall Attitude Regarding Proposed Greenway Trail Index.

	N	Mean	SD	Chronbach's Alpha
<i>Attitude</i>				.95
The potential benefits associated with a greenway trail near my home are greater than the potential problems. ¹	571	4.68	2.06	
Greenway trails improve the quality of life for Cary residents. ¹	565	5.18	1.93	
Please indicate your current level of support for the development of a trail in the greenway corridor near your home. ²	564	4.97	2.22	

¹ Seven point scale ranged from *Strongly Disagree* (1) to *Strongly Agree* (7)

² Seven point scale ranged from *Very Opposed to New Trail* (1) to *Very Supportive of New Trail* (7)

Each of the six belief dimensions was found to be related to neighboring landowner attitudes toward greenway trail development. Future property value, property damage, trespassing, landowner liability, privacy, and crime were all significantly correlated with neighboring landowner attitudes at the .001 level (Table 3). A regression analysis (all independent variables were entered in a single step) indicated that the six belief dimensions explained approximately 79% of the variance in overall attitude (Table 4), with the future property value dimension having the greatest influence on overall attitude toward the trail (beta = .535). The privacy and crime dimensions also exerted strong influences on overall attitude with .230 and .197 beta weights, respectively. The property damage dimension was the only belief dimension found not to have a significant influence on overall attitude toward the greenway trails.

Additional regression analyses were conducted to explore how well the belief dimensions for each of the three components of attitude predicted overall attitude toward greenway trail development. Affective belief items were found to explain approximately 74% of the variance in overall attitude, while behavioral beliefs explained approximately 69% and cognitive beliefs explained approximately 75% (Table 5). Future property value was found to be the belief dimension which had the greatest influence on overall attitude regardless of how the dimension was measured. Landowner beliefs regarding liability had a stronger influence on overall attitude when measured using either behavioral or cognitive items, while property damage belief had a significant influence on overall attitude only when measured using affective items.

Table 3. Correlations Between the Overall Attitude and each Neighboring Landowner Belief Dimension

Belief Dimensions	Correlation Coefficients ¹
Future Property Value	.84
Privacy	.77
Property Damage	.74
Crime	.73
Landowner Liability	.60
Trespassing	.59

¹All correlations were significant at the .001 level.

Table 4. Regression Results for the Relationship Between the Overall Attitude and Belief Dimensions of Neighboring Landowners (adjusted R² = .793)

Belief Dimensions	Beta Weights
Future Property Value	.535***
Privacy	.230***
Crime	.197***
Landowner Liability	.122*
Trespassing	.118*
Property Damage	.018

*Significant at .05 level

***Significant at .001 level

**Table 5
Regression Results for the Relationship Between the Attitudes and Beliefs of Neighboring Landowners**

Belief Dimensions	All Attitude Components (adj R ² = .793)	Affective Attitude Component (adj R ² = .737)	Behavioral Attitude Component (adj R ² = .688)	Cognitive Attitude Component (adj R ² = .748)
	Future Property Value	.535***	.299***	.507***
Privacy	.230***	.261***	.112***	.122***
Crime	.197***	.215***	.132***	.231***
Landowner Liability	.122*	.056*	.163***	.213***
Trespassing	.118*	.109***	.105**	.079*
Property Damage	.018	.153***	.058	.006

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

Adjacent and Nearby Landowner Comparisons

In an effort to understand the differences between adjacent and nearby landowners, comparisons were made between the two categories of property owners on a variety of variables.

Responses for belief dimensions and attitude variables were also analyzed regarding differences between adjacent and nearby landowners. On all six belief dimensions (see Table 1 for items in each belief dimension) significantly different responses were provided by the two groups of landowners (Table 6). Adjacent landowners were more likely to have negative attitudes regarding the potential for crime, property damage, landowner liability, trespassing, reduced privacy, and reduced property value associated with trail development. Adjacent and nearby landowners also provided significantly different responses for items related to community planning and trails. Adjacent landowners indicated that establishing a network of greenway trails should be a lower priority as compared to nearby landowners ($M = 3.35$ and 4.74 , respectively, on a seven point scale with $1 =$ a very low priority and $7 =$ a very high priority). Additionally, adjacent landowners were less likely to agree that greenway trails should be considered a basic feature of development than were nearby landowners ($M = 3.50$ and 4.93 , respectively, on a seven point scale with $1 =$ strongly disagree and $7 =$ strongly agree). Since noise was identified during the focus group to be a salient issue for some Cary residents, this issue was also included in the instrument. Adjacent landowners were significantly more likely (at the .001 level) to indicate that noise generated by trail users would be a problem ($M = 4.78$ as compared to $M = 3.09$ for nearby landowners) on a seven point scale ($1 =$ extremely unlikely, $7 =$ extremely likely).

Due to the emerging pattern of significant differences between adjacent and nearby owners' responses on the belief items, a second regression was run using a dummy variable for proximity of property. The adjusted R^2 remained virtually the same as in the first regression (.795 vs. .793), but the trespassing dimension no longer provided a significant influence on overall attitude toward the trail (Table 7). The land ownership category was significantly related (at .01 level) to overall attitude with a slightly negative impact for adjacent landowners.

Table 6. Mean Values of Adjacent and Nearby Landowner Beliefs¹

Belief Dimensions	Overall Sample Mean (n)	Nearby Landowners (n)	Adjacent Landowners (n)	Differences Between Groups ²
Crime	12.50 (526)	13.18 (437)	8.93 (75)	$t = -7.328$
Property Damage	11.20 (565)	11.59 (470)	9.25 (80)	$t = -5.337$
Future Property Value	12.65 (558)	13.29 (464)	9.56 (80)	$t = -6.255$
Trespassing	13.10 (560)	13.76 (466)	9.72 (79)	$t = -8.732$
Landowner Liability	12.94 (554)	13.52 (460)	10.03 (80)	$t = -6.779$
Privacy	12.75 (567)	13.31 (470)	10.18 (82)	$t = -6.301$

¹ Scores could range from 3 to 21 for each dimension, with lower scores being more negative.

²All are significant at the .001 level

Table 7. Regression Results for the Relationship Between the Overall Attitude and Belief Dimensions of Neighboring Landowner with the addition of Land Ownership Variable (adjusted $R^2 = .795$)

Belief Dimensions	Beta Weights
Future Property Value	.476***
Privacy	.179***
Crime	.140***
Landowner Liability	.086*
Trespassing	.015
Property Damage	.032
Adjacent Land Ownership (dummy variable, 0 = Adjacent)	-.071**

*Significant at .05 level

**Significant at .01 level

***Significant at .001 level

Discussion

Landowner Characteristics and Belief Dimensions

Neighboring landowners fit the demographic profile of Cary residents, but Cary is an atypical community. The household income (modal category = \$100,000 - \$119,000) and education levels (84% college graduates) of respondents were much higher than national averages, thus the results from this study may not be generalizable to communities with more typical demographics. Alternatively, greenway trail development commonly occurs in suburban areas with higher socio-economic characteristics, thus the study community may be representative.

Respondents' overall attitudes toward greenway trails in this study were positive and supportive (see Table 2). This is consistent with previous research in general and with previous studies conducted in Cary itself, where Tedder (1995) found 9 out of 10 respondents satisfied with the greenway near their home, and Tucker (1993) found residents willing to pay increased property taxes to finance greenway development. As noted above, these findings may be due, in part, to unique characteristics of Cary rather than indicative of similar widespread support in other communities.

Neighboring landowner beliefs regarding potential issues associated with the development of a greenway trail near their homes were found to be accurate predictors of overall attitude toward the proposed greenway trail. While potential benefits of trails were also included in the questionnaire, the focus of this analysis was on beliefs towards potentially negative attributes which might influence landowners to oppose trail development. The issues of future property value, trespassing, property damage, liability, privacy, and crime were identified by neighboring landowners as potential sources of concern through numerous previous research efforts (Adams & Holmes, 1978; City of Seattle, 1987; Mazour, 1988; Bhullar et al., 1991; Moore, Graefe & Gitelson, 1994). All six of the belief dimensions evaluated in this study

significantly correlated with landowners' overall attitudes toward development of a greenway trail. A positive attitude toward trail development was associated with the beliefs that impacts on future property values would be positive, that property damage was unlikely, that privacy would not be negatively impacted, and that landowner liability, trespassing, and crime would not be problems. These findings are consistent with previous research that identified these issues as being important to landowners living near greenway trails.

The six belief dimensions explained 79% of the variance in the overall attitude of neighboring landowners toward development of a proposed greenway trail. Five of the six belief dimensions had a significant influence on overall attitude. The future property value dimension had the greatest influence on overall attitude, with a beta weight of .535. Since a home is often a family's primary asset, it is not surprising that concern over negative impacts on property values had the biggest influence on attitude toward greenway trails.

Landowner attitudes were explored using the tripartite structure of attitudes (Eagly & Chaiken, 1993), thus survey items assessed beliefs associated with all three attitude components: affective, behavioral, and cognitive. Beliefs associated with each attitude component independently provided strong explanations of the variance in overall attitude toward greenway trail development with adjusted R^2 ranging from .688 for behavioral beliefs to .748 for cognitive beliefs (Table 5). The beta weights for the specific belief items varied somewhat among the attitude components. For example, the property damage beliefs had no significant influence on overall attitude for the behavioral or cognitive attitude components, but significantly influenced the affective attitude component. When all of the belief items were combined into belief dimensions, the influence of the affective property damage belief on overall attitude disappeared. Since the property damage belief dimension had the lowest Chronbach's alpha (.43) of all the belief dimensions, it is possible that the affective item was the only one of the three items making up the dimension that accurately measured the construct.

Adjacent vs. Nearby Landowner Perceptions

Adjacent landowners had significantly lower means than nearby landowners on all six belief dimensions, thus indicating greater concern regarding trail development. This is not surprising since adjacent landowners' homes and property abut the proposed trail corridor and they therefore could be most impacted by problems. The issue of most concern to adjacent landowners was crime ($M = 8.93$) as compared to property damage for nearby landowners ($M = 11.59$).

Adjacent landowners were also more pessimistic than nearby landowners regarding potential benefits that might result from greenway trail development. Adjacent landowners were neutral in regards to whether a greenway trail would provide more outdoor recreation opportunities as compared to nearby landowners who indicated that it was likely that such opportunities would be enhanced. Adjacent landowners also felt that it was somewhat unlikely that neighborhood aesthetics would improve or that community pride would be enhanced while nearby landowners indicated that it was somewhat likely that these benefits would accrue. It is

possible that some of the adjacent landowners who were most adamantly opposed to the greenway trail provided strategic responses in an effort to influence agency opinion regarding following through with the project.

The response rate from adjacent landowners (59%) was lower than the response rate for nearby landowners (63%). It was anticipated that adjacent landowners would be more likely to respond to the survey because the potential for trail users to impact their property and lifestyle would be higher due to their proximity to the greenway corridor. Those adjacent landowners who did not respond might be unconcerned regarding the proposed greenway trail development, or they might be confused as to the location of the greenway corridor. Over one fourth (26%) of the adjacent landowners who did respond indicated that they were unsure of the location of the proposed corridors and an additional 17% incorrectly reported that their property was not adjacent to the proposed corridors.

Implications for Managers

The results of this study have numerous implications for managers. The most important implication for managers is that agencies developing greenway trails need to effectively communicate with affected residents regarding proposed greenway trail developments. In this study over two thirds of the neighboring landowners reported that they had no knowledge of the proposed greenway corridors prior to receiving the questionnaire for this study. Given the lack of knowledge of the planned greenway trails, it is not surprising that nearby residents tended to have neutral attitudes toward greenway trail development and adjacent landowners, who would likely endure a proportionally greater impact, tended to have negative attitudes. Communication between landowners and community planners is critical so that landowners understand all of the potential benefits associated with greenway trails and how the community plans to address any negative consequences that might arise from trail development. Past research describing the positive impacts trails can have on property values should be shared with neighboring landowners (The Green Bay-Brown County Planning Commission, 1997; Lindsey, Man, Payton, & Dickson, 2004; Hobden, Laughton, & Morgan, 2004). It is also incumbent upon real estate professionals and developers to inform potential buyers of planned greenway trail development. A more open approach would allow prospective buyers to consider the level of proximity to greenway trails with which they would feel most comfortable.

The issues identified as being important to neighboring landowners should be discussed during public workshops, and a plan of action for addressing those issues should be identified and communicated. Previous studies have asked respondents to recall attitudes towards trails prior to development and upon reflection most landowners have indicated that issues were not as bad as initially expected (Mazour, 1988; Kaylen, et. al., 1993). Similarly, the MN Trails and Waterways Unit (1980) found that property owners along a proposed trail right of way expected more problems than were reported by landowners along existing trails. In future neighboring landowner studies, the appropriate public agency should provide an initial contact letter to participants explaining the proposed development prior to questionnaire

distribution. Also, within the text of the cover letter for any study related mailings, the landowner should be identified as having either an adjacent or nearby parcel, ideally using an accurate map.

It may be helpful for both planners and researchers to treat adjacent and nearby property owners as separate constituencies since attitudes varied greatly between the two groups. Adjacent landowners were more likely to indicate that crime, trespassing, future property values, landowner liability, property damage, and privacy issues would be exacerbated by the development of a greenway trail. Adjacent landowners were also less likely than nearby landowners to agree that greenway trail development could yield benefits for the community in the form of enhanced opportunities for recreation, aesthetic beauty or community pride.

Greenway trail planners might benefit from the findings regarding belief dimension items. The use of belief dimensions tied to specific issues rather than to broad generalizations of good and bad in determining attitude should make it possible to better determine the relative importance of the issues to the respondents. All six of the belief dimensions evaluated in this study significantly correlated with landowner attitude toward development of a nearby greenway trail. Knowledge of individual beliefs regarding greenway attributes could assist agency personnel in the planning and management of greenway trail facilities and in educating the public about them. For example, although the crime dimension was the greatest concern for adjacent landowners and the property damage dimension for nearby landowners, the future property value dimension explained most of the variance in global attitude for both groups of landowners. This finding indicates that the potential impact of greenway trail development on property values should be a key component of information provided to educate property owners.

Limitations of the Study and Future Research

This study was exploratory in nature applying the Theory of Reasoned Action to the measurement of landowners' behavioral, affective and cognitive components of attitude toward a greenway project. An important limitation of the research concerned the measurement. While all of the belief dimensions independently correlated with landowner attitude, the constructs may not all be conceptually distinct. The construct validity of the items in the property damage and trespassing dimensions should be reassessed due to the low Chronbach's alpha found for these dimensions. These dimensions may not be conceptually distinct enough from each other or from the others to be considered as separate belief dimensions. The belief items "Trail users would stop in my yard to rest" or "I would be more careful about what I leave outside" could be linked to future property value, property damage, landowner liability or privacy issues. If a landowner is concerned about privacy, he or she might be worried about a trail user coming into their yard, which would be trespassing and trespassing is a crime. Additionally, the belief item "Trail users would deter criminals when I am not home" could be interpreted as a benefit to reduce the possibility of property damage or of all crime in general. These issues illustrate the complexity of attempting to dissect attitudes into component belief dimensions. None of the items used in this study to examine the belief dimensions

had been employed in previous questionnaires, therefore the low internal consistency for the crime and trespassing dimensions could also be due to inadequate measurement. Researchers should also explore why the belief dimensions for privacy and crime exerted more influence over attitude toward trail development than liability and trespassing.

Additionally, in the process of creating the items to assess landowner beliefs the researchers realized that a block of questions assessing potentially negative aspects of trail development might influence respondents. A concerted effort was made to create a neutral survey instrument by adding positively worded items, such as "liability would not be an issue" and including potentially positive impacts associated with trail development. The scale used to assess belief dimensions was made up of 24 items, 13 of which were worded positively. Contemplating the belief dimension items may have enhanced misgivings about greenway trail development by increasing the saliency of some issues that may not have been considered by landowners if they were not identified in the survey instrument.

The lower response rate from adjacent landowners as compared to nearby landowners was unexpected. It was anticipated that adjacent landowners would be more likely to respond to the survey because the potential for trail users to impact their property and lifestyle would be higher due to their proximity to the greenway corridor. Those adjacent landowners who did not respond might be unconcerned regarding the proposed greenway trail development or unsure of the actual location of the proposed greenway trail. Researchers should make a concerted effort to accurately inform landowners of the proximity of their property to the greenway corridor in order to encourage a higher response rate.

Further investigation into the influence of affective, behavioral, and cognitive beliefs on attitudes is warranted. While the model which included all three types of beliefs explained the most variance in attitude toward greenway trail development (adjusted $R^2 = .793$) it may be acceptable to reduce the number of questionnaire items and focus on one attitude component and still obtain a reasonable assessment of the concerns of neighboring landowners regarding a specific trail development proposal. In this case using only affective, behavioral and cognitive beliefs provided adjusted R^2 of .737, .688, and .748 respectively.

Conclusion

With the need to reverse the sedentary lifestyles of U.S. citizens, it is important to provide convenient opportunities for people to be physically active. Greenway trails can play an increasingly important role in this regard. As such, it is important to document neighboring landowner perceptions of greenway trails. This study found that adjacent and nearby landowners can have differing attitudes regarding the impact of greenway trail development on their property and regarding potential benefits of such facilities for the community at large. Adjacent and nearby property owners should be included early in the planning process and educated about the potential benefits of greenway trails, with special attention being given to the concerns of adjacent property owners. Failure to include neighboring landowners in the development process and to educate them regarding the potential benefits

and impacts of greenway trail development may lead to delays or abandonment of proposed projects. Researchers are encouraged to continue this potentially important line of research and to further explore attitudes towards health issues and to assess the impact of completing questionnaires on attitudes toward greenway trails.

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