Tweetsie Trail: Economic Impact Study

BY OLYA BATSULA, NIC CHERNIKOW, SCOTT FRENCH, CHRIS HOBBS, BEVIN KILBOURN, AND KRISTIN LEE

5/5/2011

Table of Contents

EXECUTIVE SUMMARY 0

INTRODUCTION 1
Rails to Trails 1

LITERATURE REVIEW 2

METHOD – BUSINESS DEVELOPMENT 6
Participants 6
Qualifying Trails 7
Trail Selection 8
Bicycle Shop Selection 8
Materials 10
Procedure 12

RESULTS 13
Post-Trail Bicycle Shops 14
Sales Structure 14
Customer Analysis 15
Existing Trail Impact on Decision to Open Bicycle Shop 15
Pre-Trail Bicycle Shops 15
Employment, Sales, Foot Traffic, and Property Tax Increases 16
Sales Structure 17
Customer Analysis 17

METHOD- PROPERTY TAX 18
Procedure 18

PROPERTY TAX RESULTS 24

DISCUSSION 25
New Businesses 26
New Jobs 28
Sales 28
Property Taxes 30
Comments by Trail Users 31
Survey Limitations and Assumptions 32
Limited Sample Size for Survey 32
Respondent Bias 32
Geographic Differences 33
Cannibalization Effects 33
Impacts of Other Shops 33
Other Factors 33

Quality....34
Health....34
Impact of Other Trails....34
Failed Businesses....34
Property Tax Limitations and Assumptions....35
Census Data....35
Zoning Allocations....35
Sample Size....35
Commercial Density Values....36
Appreciation Range....36

REFERENCES....I

APPENDICES:....III
Appendix 1: Original Bicycle Shop Survey....iii
Appendix 2: Properties Used for Tax Study....iv
Appendix 3: Raw Bicycle Shop Data....v
Appendix 4: Raw Property Tax Data....vi
Washington County/Johnson City....vi
Carter County/ Elizabethton....vii
Carter County/ Johnson City....viii

Table of Figures

Figure 1: Beneficiaries of Bicycling Facilities (Krizek) 2
Figure 2: Original Bicycle Shop Survey 11
Figure 3: Original Survey Letter 12
Figure 4: Survey Reminder Letter 13
Figure 5: Tweetsie Trail Segments 19
Figure 6: Elizabethton Zoning 20
Figure 7: Johnson City Zoning 20
Figure 8: Average Property Values 21
Figure 9: Property Tax Revenue Per Unit 22
Figure 10: Property Tax Revenue Per Sq Mi 23
Figure 11: Property Tax Revenue 24
Figure 12: Pre- vs. Post-Trail Bicycle Shops 26
Figure 13: Degree of Influence 27
Figure 14: Local vs. Tourist Revenue 29

Table of Tables

Table 1: Armstrong Trail Economic Impact Analysis 4
Table 2: Summary of Qualifying Trail Characteristics 7
Table 3: Summary of Trails Surveyed Including Number of Bicycle Shops 9
Table 4: Summary Demographics for Bicycle Shops 10
Table 5: Summary Demographics for Bicycle Shops Built After a Trail 14
Table 6: Sales Structure of Post-Trail Creation Bicycle Shops 14
Table 7: Customer Analysis of Post-Trail Creation Bicycle Shops 15
Table 8: Existing Trail Impact on Post-Trail Creation Bicycle Shops 15
Table 9: Summary Demographics for Bicycle Shops Built Before a Trail 16
Table 10: Increase in Employment, Sales, Foot Traffic, and Property Tax for Pre-Trail Bicycle Shops 16
Table 11: Distance from Trail and Property Tax Increase 17
Table 12: Sales Structure of Pre-Trail Creation Bicycle Shops 17
Table 13: Customer Analysis of Pre-Trail Creation Bicycle Shops 18
Table 14: Property Tax Rates 22
Table 15: Weighted Average Density 23
Table 16: Incremental Tax Revenue 25

EXECUTIVE SUMMARY

A proposal has been put forward to convert the ten mile stretch of land where the ET & WNC railroad operated between Johnson City and Elizabethton to a multi-purpose recreational trail, known as the Tweetsie Trail. The purpose of this study is to evaluate the economic benefits the Tweetsie Trail may have on the local community. Analysis of research conducted at other recreational trails revealed positive benefits for local communities including the creation of jobs, tourism, and increased property tax revenues. A survey was conducted of owners and general managers of bicycle shops in the Southeastern United States to determine the economic impact of recreational trails similar to the Tweetsie Trail. Analysis was also completed to determine the potential increase of property tax revenue generated by land one half-mile around the Tweetsie trail in Johnson City, Washington County, Elizabethton, and Carter County. According to the results of this study, 66.67% of shops surveyed were opened after a trail was built with an average of 3.7 new jobs per bicycle shop. A 5.4% average sales increase was experienced by shops offering trail related services and 60% of shops derived 95% of their revenue from local residents. An average increase of 5.5% in property taxes for properties within one half-mile of the trail was reported. An analysis of incremental property tax increases was also performed. The results from this analysis indicate that a $390,000 increase in property tax revenue was possible. The results of the survey indicate that the proposed Tweetsie Trail could have a positive economic benefit on the local community.

INTRODUCTION

Rails to Trails

A rail trail program is the process of converting a former railroad that has either been abandoned or rail banked into a multi-purpose recreational trail. Since these trails are utilizing former railways, it is possible to link separate rail trails to each other and create a network of trails for users to explore and enjoy.

The proposed Tweetsie Trail would be a multi-purpose recreational trail on the land where the ET & WNC railroad operated between Johnson City and Elizabethton. This ten mile stretch of land would begin near downtown Johnson City at the corner of Alabama and Legion Street and proceed east to Elizabethton ending on State Line Road. This trail would go through the countryside between Johnson City and Elizabethton as well as through the downtown areas of both cities (Tweetsie historic trail association, n.d.).

The majority of this line has not been used since 2002. Genessee & Wyoming originally intended to abandon the railroad line, which would return the railroad land back to adjacent property owners. Gaining support from each property owner after the track is abandoned would be extremely difficult, if not impossible. Therefore, Johnson City won a $600,000 bid to purchase the land from Genessee & Wyoming. This bid was accepted and the city is currently going through the process of rail banking the land (Tweetsie historic trail association, n.d.). Rail banking is a way of preserving a railroad's land, right of ways, and easements so if future rail service is feasible, the abandoning railroad company can re-establish service to the area. On an interim basis, the railroad can be converted into a recreational trail, but if future rail service is possible the owner must sell the land back to the abandoning railroad company at fair market value. A successful rail banking application would ensure that ownership of the land would not return to adjacent property owners (Rails to Trails Conservancy, 2007).

Given the above background, the purpose of this study is to evaluate the economic benefits of the Tweetsie Trail as they relate to business development and property taxes. Information obtained from bicycle shops near current trails of similar size in the Southeastern United States will be presented. In addition, this paper analyzes the incremental increases in tax revenue within one half mile of the proposed trail. The following section includes a literature review of previous trail studies.

LITERATURE REVIEW

Many of the economic impact studies that have been conducted for regional and national rails to trails programs have been carried out after the trails were constructed. Researchers are able to gather information relating to user profiles, direct expenditures, and realized indirect economic impact largely through randomized surveying at varying points along the trail. Surveying trail users allows researchers to create a demographic profile to more accurately assess the economic impact of travel, food, lodging, and other trail related expenses from future users. The Tweetsie Trail economic impact study will be different than the previously mentioned studies because the aim of this research will be to project localized revenue for a trail that has yet to be built. The following section will detail many trails nationwide, some similar in size to the Tweetsie and some larger, and the economic impact the surrounding cities encountered.

The benefits of open space recreational facilities have been extensively studied. These facilities include bicycling, walking, jogging, bird watching, etc. under their list of recreational activities. An article by Kevin J. Krizek, director of Active Community Transportation (ACT) Research Group, summarizes the benefits of bicycling and bicycling facilities in a table provided below.

FIGURE 1: BENEFICIARIES OF BICYCLING FACILITIES (KRIZEK)

Beneficiary					
To the User (direct)			*To the Community (indirect)*		
Mobility	Health	Safety	External	Livability	Fiscal
enhanced conditions	increased physical	decreased crashes	decreased congestion	proximity to	increased
shorter travel	activity	increased comfort	reduced polution	recreational facility	economic activity
	decreased health			increased open space	decreased taxes
	care costs				

The most striking benefit is the overall health of the users. It is also one of the most researched and well documented advantages of the walking and biking facilities. However, the main purpose of this study is to provide support for the potential economic impact of the proposed Tweetsie Trail in the community. In order to do that, a literature review was performed to show the support of economic benefits of trails and other open space facilities in the United States. Trails that are similar in length and

demographics are appropriate for this literature review, but general data from all of the United States is included as it is often difficult to find a study done for a similarly sized trail. There are two main economic benefits of primary interest to this study: spending on soft and hard goods by trail users and the impact of the trail on property values.

Several studies evaluate user expenditures as well as the overall annual investment in the local economy. Normally, a survey is conducted to capture the exact amount of money spent by users. According to one of these surveys completed by Rail-to-Trails on the Schuylkill River Trail in Pennsylvania, "the average trail user spends $9.07 per trip on soft goods (beverages, snacks, restaurant meals, etc.), amounting to $3,628,000 contributed annually in local economies" (Rails-to-Trails Conservancy, 2010). A study done in Washington on the Old Dominion Trail states that in 2004 an estimated 1.7 million people used the trail on an annual basis. This injected nearly $7 million directly into the Northern Virginia economy (WMTH Corporation, 2009).

The Armstrong Trail (2010) *User Survey and Economic Impact Analysis* completed by the Rails to Trails Conservancy also evaluated trail users' expenditures per visit. The Armstrong Trail is a 34.8 mile trail located in Pennsylvania that runs from Ford City in Armstrong County to East Brady in Clarion County with the primary activities on the trail being bicycling and walking. The Conservancy conducted the analysis by distributing self-selecting survey forms and placing infrared counters along the trail. The surveys were made available to trail users in six different locations along the trail from May until October of 2010. Three factors were examined in the analysis including the purchase of hard goods, the purchase of soft goods, and lodging. 79.9% of the respondents said they did purchase hard goods while on the trail. The majority of these (40.4%) bought bicycles and bicycle supplies,22.4% reported purchasing footwear, and 15.2% clothing. According to the study, the average amount spent on hard goods on the Armstrong Trail per year is $194.69. More than 65% of the respondents reported spending money on soft goods, primarily on beverages (29.4%). 28% purchased meals, snacks, or sandwiches. This resulted in an average of $8.35 spent on soft goods per person per trip. Around 11% of the respondents indicated they stayed overnight while visiting the trail. The majority of these stayed with a friend or relative. Only 3% of respondents reported that they spent money on lodging during their trail visit. The average number of nights stayed was 2.4 at$52.00 per night. The total economic impact in 2010 was determined to be $897,442 ($740,250 directly into the economy) (Rails-to-Trails Conservancy, 2010).

The table below summarizes the study's findings of the annual purchases of hard goods, soft goods, and lodging (Rails-to-Trails Conservancy, 2010).

TABLE 1: ARMSTRONG TRAIL ECONOMIC IMPACT ANALYSIS

Annual Users
80,638

Category	**%Usage**	**Average $**	**Avg. Life**	**Avg. # of Trips**	**Avg. # of Nights**	**Annual Amount $**
Hard Goods	79.9%	$194.69	6 Years	13.3		$157,192
Soft Goods	65.1%	$3.5				$438,341
Overnight Accommodations	3.0%	$52.00			2.4	$301,909

The University of Georgia's *The Virginia Creeper Trail: An Assessment of Creeper User Demographics, Preferences, and Economics* examined the trail users' expenditures in 2003. The Virginia Creeper Trail runs 34 miles from Abingdon, Virginia to Whitetop, Virginia. The primary activities of the trail are bicycling and walking. In 2003, it is estimated that the trail had nearly 61,305 local visitors and 68,769 non-local visitors. The University of Georgia distributed 1,430 questionnaires to trail users, of which 1,036 were completed. The survey asked questions about group expenditures within 25 miles of the trail as well as group expenditures for the entire trip. The primary expenditures evaluated included lodging, food purchased in a restaurant, food purchased outside of a restaurant, primary transportation, bicycle rentals, shuttle services, and entry fees. The study showed that locals using the trail spent about $120,000-$160,000 for the year averaging more than $2 per visit. Non-locals spent nearly $2.2 million on goods and lodging related to their trail visit for the year. Total expenditures for the year totaled nearly $2.5 million (University of Georgia, 2003).

The Virginia Creeper Trail is arguably the most successful rails to trails establishment in the nation. The researchers for this economic impact study developed a survey to capture very specific demographic information, spending habits, and trail usage to determine the direct impact for the surrounding community. This data also was entered into a program called Impact Analysis for Planning (IMPLAN) to determine the indirect impact for the state, such as job creation and additional tax revenue. This software was created and used by the USDA Forest Services to measure the impact of natural resources based

projects. The economic impact study of this trail estimated the total number of visitors to be around 130,000 from November 1, 2002 to October 31, 2003. These visitors accounted for a total economic impact of $1.59 million for the state during this period. The Virginia Creeper Trail is a practical study from which to gather data for an analysis of the Tweetsie Trail because the close proximity to Johnson City will result in a shared user base. Additionally, this study will have a shared cultural aspect that will be hard to compare to trails located in the Northeast region (University of Georgia, 2003).

In Outer Banks, NC bicycling is estimated to have an annual economic impact of $60 million and support 1,407 jobs. There are 40,800 visitors annually that consider bicycling an important reason for choosing to vacation in the area. The annual return on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment. This trail is nearly 100 miles in length and is much larger than the Tweetsie Trail, but if Johnson City connects more trails near the Tweetsie it could become a much larger trail and create similar economic impacts.

The majority of studies confirm that trails and other open space recreation facilities add value to the surrounding properties. The closer the properties are to these facilities the bigger the overall impact. Probably the most famous example is New York City's Central Park and the surrounding homes. "Within 15 years of its completion, property values doubled and the city raised millions of dollars through property taxes" (Asabere & Huffman, 2009). Other places report similar results with the additions of trails and parks within their cities. A study done in San Antonio, Texas used a database of 10,000 homes to prove that trails or greenbelts add up to 5% to the value of the house (Asabere & Huffman, 2009). In Boulder, Colorado, neighborhoods built around the greenbelt contributed $500,000 annually to the overall neighborhood property tax revenue (Active Living Research, 2010). In Austin, Texas, the correlation between a property's value and its proximity to a trail was determined to be statistically significant. The properties appreciated $44,332, representing 12.2% of the average value of all homes adjacent to this amenity. The same study showed a $23,009 increase in the value of homes in the Lost Creek area (Nicholls & Crompton, 2005). A study done in Charlotte, North Carolina reported that a single family home increased in value by $3,200 because it was within 5,000 ft of the greenway. While the premium on a multifamily property is small (about $230), the premium on commercial land per commercial parcel is worth about $4,500. The annual flow of new property tax revenue associated with greenway creation is also significant (nearly $600,000 per year) (Campbell Jr. & Munroe, 2007). These results appear to be consistent with other reports such as those found in Saco, Maine where a home's proximity to greenways added $1,000-$1,500 to its sale price, and in Apex, NC where greenways

commanded a premium of $5,000. In addition, a homeowner received an additional $3,552 due to an open space amenity in Portland, Oregon (Campbell Jr. & Munroe, 2007).

Economic impact information from trails across the U.S. is listed below:

- Morgantown, WV: The 45 mile Mon River trail system is credited by the Convention and Visitors Bureau for revitalizing an entire district of the city, with a reported $200 million in private investment as a direct result of the trail.

- Tallahassee, FL: The Florida Department of Environmental Protection Office of Greenways & Trails estimates an economic benefit of $2.2 million annually from the 16 mile St. Marks Trail.

- San Antonio, TX: Riverwalk Park, created for $425,000, has surpassed the Alamo as the most popular attraction for the city's $3.5 billion tourism industry.

- Pittsburgh, PA: Mayor Tom Murphy credits trail construction for contributing significantly to a dramatic downtown revitalization.

- Allegheny Passage, PA: The direct economic impact of the trail exceeded $14 million a year, encouraging the development of several new businesses and a rise in property values in the first trailhead town.

- Leadville, CO: In the months following the opening of the Mineral Belt Trail, the city reported a 19 percent increase in sales tax revenue.

METHOD – BUSINESS DEVELOPMENT

Owners and general managers of bicycle shops in the Southeastern United States were surveyed to determine the effect of trails on local business development.

Participants

The participants for this study were owners and general managers of bicycle shops near a trail in the Southeastern United States. The eligibility requirement for participation in this study was that the bicycle shop must be located near a qualifying trail.

Qualifying Trails

All qualifying trails must have several characteristics designed to ensure they are similar to the proposed Tweetsie trail. First, the trail must be located in the Southeastern United States. For the purpose of this study, the Southeastern United States is defined by the following states: Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, and Arkansas. Another characteristic was the type of trail surface. To match the several possibilities of surfaces tentatively planned for the Tweetsie trail, qualifying trails must have consisted of one of the following trail surfaces: asphalt, gravel, crushed stone, or concrete. A third characteristic is trail length. Qualifying trails must have been between five and ten miles in length. Qualifying trails were also sorted based on the types of activities that take place on the trail. All qualifying trails must have bicycling and walking as two of their listed activities. Finally, qualifying trails must have been built on or after the year 2000. This final characteristic was chosen because the researchers believed that new business development would likely occur between five and ten years. Therefore, the ten to eleven year range was used and the researchers believe that doing so would provide a more accurate analysis of new business development. Below is a summary of the characteristics of a qualifying trail.

TABLE 2: SUMMARY OF QUALIFYING TRAIL CHARACTERISTICS

Number	Characteristic	Rationale
1	Located in the Southeastern United States	To ensure the trail user demographic is similar
2	Similar trail surface (asphalt, gravel, crushed stone, or concrete)	To control for the effects of trail surfaces not being considered for the Tweetsie Trail
3	Trail length (five to ten miles)	To ensure the trails were of similar length
4	Trail user activities (walking and bicycling)	To control for trails that do not include the primary activities proposed by the Tweetsie Trail
5	Age of trail (built on or after year 2000)	To provide a more accurate analysis of new business development

Trail Selection

All qualifying trails were selected via Trail Link (Trail Link, 2011). Qualifying characteristics (except age of trail) were entered into the Trail Link database and the qualifying trails were downloaded into an excel spreadsheet. The initial list of qualifying trails, without being sorted for the age of the trail, consisted of 59 trails (55 were Rails to Trails projects). This list was then sorted via online research to include only qualifying trails meeting all characteristics. A decision was also made to drop some trails that are in areas not demographically similar to Northeastern Tennessee (i.e. Miami, Florida). The final list consisted of 20 trails (18 were Rails to Trails projects).

Bicycle Shop Selection

After the final trail list was populated, the researchers began the process of selecting bicycle shops near the trails. This process was completed using the Trail Link trail mapping service along with Google Maps (Trail Link, 2011). After a bicycle shop near a trail was identified, the shop's name, phone number, address, and email address were collected and entered into a spreadsheet. Bicycle shops were organized under the qualifying trails near them. The following is a list of each trail that was surveyed and the number of bicycle shops surveyed near them.

TABLE 3: SUMMARY OF TRAILS SURVEYED INCLUDING NUMBER OF BICYCLE SHOPS

Number	Trail Name	Trail Location	Bicycle Shops Surveyed
1	Arkansas River Trail	Pulaski County, AR	3
2	Fort Fraser Trail	Polk County, FL	5
3	South Lake Trail	Lake County, FL	3
4	Trolley Line Trail	Fulton County, GA	4
5	Riverwalk Trail	Danville County, VA	2
6	Cape Henry Trail	Virginia Beach, VA	5
7	Dam Neck Road Trail	Virginia Beach, VA	1
8	Four Mile Run Trail	Arlington County, VA	5
9	Railroad Grade Road Trail	Ashe County, NC	4
10	American Tobacco Trail	Durham County, NC	2
11	Little Tennessee River Greenway	Macon County, NC	2
12	Jacksonville Camp Lejeune Trail	Onslow County, NC	3
13	Dunn Erwin Rail Trail	Harnett County, NC	1
14	Maryville Alcoa Greenway	Blount County, TN	3
15	Kingsport Greenbelt	Sullivan County, TN	2
16	Cumberland River Greenway	Davidson County, TN	2
17	Cumberland River Bicentennial Trail	Davidson County, TN	1
18	Johnson City/Elizabethton Area Bicycle Routes	Washington County, TN	2
19	Harpeth River Greenway	Davidson County, TN	1
20	Shelby Bottoms Greenway	Davidson County, TN	1
		Total	**52**

Bicycle Shop Demographics

As you can see from above, 52 bicycle shops were surveyed. Fifteen total bicycle shops chose to fill out the survey (in the materials section below). Ten bicycle shops (66.667%; 2/3) indicated that they were created after the identified qualifying trail. Five bicycle shops (33.334%; 1/3) indicated they were created before the identified qualifying trail. The following was the demographic information for the age of the bicycle shops: mean – 1998, median – 2002, standard deviation – 11.72 years. The following was the demographic information for the number of employees at the bicycle shops: mean – 4,

median – 3, standard deviation – 2.828 people. Yearly revenue information for the bicycle shops was: mean – $505,666.67, median – $450,000.00, standard deviation – $348,414.50. Seven bicycle shops (60%) were located within 0.0 and 0.5 miles of the qualifying trail. Two bicycle shops (13.33%) were located within 0.5 and 2.0 miles. One bicycle shop (6.67%) was within 2.0 and 3.0 miles; there was also one bicycle shop between 3.0 and 4.0 miles of a qualifying trail. Four bicycle shops (26.67%) were located 4.1 miles or greater. The number of bicycle shops that responded by trail is not given to protect the privacy concerns of those businesses. Below is the summary statistics for these demographics.

TABLE 4: SUMMARY DEMOGRAPHICS FOR BICYCLE SHOPS

n = 15	Mean	Median	SD	Range	IQR
Age of bicycle shop	1998	2002	11.72 years	37 years	14.5 years
Number of bicycle shop employees	4	3	2.828	11	3
Yearly revenue of bicycle shop	$505,66.67	$450,000.00	$348,414.50	$966,000.00	$400,000.00
Distance of bicycle shop to trail	**0.0-0.05**	**0.05-2.0**	**2.0-3.0**	**3.0-4.0**	**4.0+**
Number of responses	7 (60%)	2 (13.33%)	1 (6.67%)	1 (6.67%)	4 (26.67%)

Materials

An original survey was created to analyze the economic impact of the qualifying trail on the bicycle shop. Most questions in the survey were open ended and measured interval/ratio scale data. Two questions measured ordinal scale data and used a likert scale response structure. Care was taken to ensure that all possible answer choices were available for those two questions. All questions were designed with the intention of being straightforward and easy to answer. No questions were designed with the intention of extrapolating an answer into a greater meaning. Therefore, due to its high level of content validity, the researchers believe this survey is a valid tool to measure the effect of a trail on a bicycle shop (especially if the bicycle shop was built before the trail). Many of the questions were

created with the intention to measure the change within the bicycle shop before and after a trail creation. Some questions were also applicable to the bicycle shops which were built after the trail. Below the entire survey is attached and is also attached in appendix 1.

FIGURE 2: ORIGINAL BICYCLE SHOP SURVEY

1. Year Business Opened?
2. How far is your business from the trail?
    a) 0.0 – 0.5 miles
    b) 0.5 – 2.0 miles
    c) 2.0 – 3.0 miles
    d) 3.0 – 4.0 miles
    e) 4.0 miles or greater
3. Number of employees (including owner)?
    i. If your business existed before the trail, did you have an increase in the number of employees since the trail opened? If so, how many?
        a) How many of the new employees were full-time?
4. Yearly Revenue (optional)?
5. If your business existed before the trail, please estimate the percentage increase(or decrease) in sales since the trail was opened.
6. If your business existed before the trail, please estimate the percentage increase (or decrease) in overall foot traffic since the trail was opened.
7. If your business existed before the trail, could you please estimate the percentage your property taxes raised (or decreased) after the trail was completed?
8. What portion of your business would you describe as relating to equipment sales, rentals, service, or other?
    i. Pre-Trail (If applicable)
        a) Equipment sales _____%
        b) Equipment rentals _____%
        c) Equipment service _____%
        d) Other_____%
            - 100%
    ii. Post-Trail Creation
        a) Equipment sales _____%
        b) Equipment rentals _____%
        c) Equipment service _____%
        d) Other_____%
            - 100%
9. If possible, could you estimate what % of your sales and/or rentals are to local customers?
10. If your business was created after the trail, to what degree was the trail instrumental in your decision to open your business?
    a) Not considered
    b) 10-25%
    c) 25-50%
    d) 50-75%
    e) 75-100%

Procedure

After the qualifying trail list was completed and bicycle shops were identified, one researcher emailed the survey to all bicycle shops for which an email address could be found. The researchers determined that using one researcher's name and email address would increase response rate and improve organization. In order to improve response rate, researchers did not include a link or attachment inside the email. A letter and the entire survey were entered into the email with the instructions for the bicycle shop to reply via email with their responses. Below is the entire letter that was originally sent out to all bicycle shops.

FIGURE 3: ORIGINAL SURVEY LETTER

Dear (owner's name if available/ name of business):

My name is (name of researcher) and I am a M.B.A. student at East Tennessee State University. Our capstone project is to investigate the economic impact of a new biking/walking trail in the Tri-Cities region of Northeast Tennessee. To this end, my team and I are assessing the impact bicycle shops have on local economies. We are sending out short surveys (below this text) to bicycle shops around trails in the Southeastern United States. We selected your shop because of its proximity to the (name of trail). This information will add to the knowledge base on the value of open space recreation and could act as a potential catalyst for local governments to spend money creating new trails. We also believe this information could benefit you as you may want to know the potential impact that your shop has in your community. Our results will be made available to you after our project is completed on or around May 6, 2011. If you choose to participate in this survey, the information you provide will be kept confidential and the name of your business will be kept separate from the information you provide. On behalf of my team, I would like to thank you for considering participation in our survey as this step in our project is very important to its success. If you have any questions or concerns, please do not hesitate to contact me via email at (email address) or phone (phone number). You may also contact our faculty advisor, (name of faculty advisor), via email at (email address) or phone (phone number).

Our survey is directly below this text. If you choose to participate, please just reply and enter your choices directly in this email. If the format of the survey is distorted when emailed, I can send you an attachment of the word file.

Thank you,
(name of researcher)

Instructions: Please answer the following questions to the best of your ability. There is a comments section at the bottom of this survey for questions where you feel the need to provide additional explanation or for general comments.

The entire survey was attached here.

This first contact occurred on the evening of Sunday March 27, 2011. Between March 27 and March 31, three responses were gathered. On March 31, 2011 a reminder email was sent to all bicycle shops that had not responded. Below is a copy of this letter.

FIGURE 4: SURVEY REMINDER LETTER

Dear owner/general manager:

My name is (name of researcher). I emailed you Sunday evening requesting information about your shop for a trail study my team is working on. Your responses to the survey are very important as this project cannot be completed without them, and I believe this study could benefit you as well. If you would take a few minutes of your time to fill out our short 10 question survey, our team would be very grateful. If you need me to resend the survey to you, I would be happy to do so. Again, your responses to this survey are greatly appreciated.

Thank you very much for your time and consideration,
(name of researcher)

After sending this letter, eight new responses were gathered. Another researcher contacted all bicycle shops for which gave no email address (15 in total) and gathered their contact information. This researcher then sent out the original survey letter and survey to those 15 bicycle shops. Four responses were gathered from that initiative. All responses were gathered or forwarded (for the 15 no email bicycle shops) to one email address for storage. Information from the emails were compiled into an excel spreadsheet for analysis.

RESULTS

Due to the low number of responses, researchers did not have sufficient statistical power to perform any statistical test with confidence. The story of the data collected will be told via means, medians, and standard deviations, but higher order statistical tests were not performed.

Demographic information was given above in the bicycle shop demographics section. Due to the nature of the questions asked on the survey, it is proper to split the results into two sections. The first section will detail the results for the bicycle shops which were created after the trail. The second section will include the results for the bicycle shops which were created before the trail. These bicycle shops should have pre- and post-trail information that will give some indication as to the effect of the trail on the business.

Post-Trail Bicycle Shops

One of the most compelling stories the researchers found was the amount of new start-up bicycle shops that were created after a trail was built. Ten bicycle shops out of fifteen respondents indicated that their bicycle shop was built after the trail was created. Below are the summary demographic statistics for bicycle shops built after a qualifying trail.

TABLE 5: SUMMARY DEMOGRAPHICS FOR BICYCLE SHOPS BUILT AFTER A TRAIL

n = 10	Mean	Median	SD	Range	IQR
Age of bicycle shop	2004	2007	6.297 years	17 years	9 years
Number of bicycle shop employees	3.7	2.5	3.401	11	1.75
Yearly revenue of bicycle shop	$583,500.00	$650,000.00	$420,026.59	$966,000.00	$466,500.00
Distance of bicycle shop to trail	**0.0-0.05**	**0.05-2.0**	**2.0-3.0**	**3.0-4.0**	**4.0+**
Number of responses	5 (50%)	2 (20%)	0 (0%)	1 (10%)	2 (20%)

Sales Structure

Eight of the ten post-trail bicycle shops responded to the question about sales structure. This was question eight from the survey that asked about the percent of business relating to four categories: sales, rentals, service, and other. The majority of the businesses indicated that their primary business activity was sales. Service was ordered second, other third, and rentals fourth on the list of business activities. Below is a summary table of this data.

TABLE 6: SALES STRUCTURE OF POST-TRAIL CREATION BICYCLE SHOPS

n = 8	Mean	Median	SD	Range	IQR
Sales	62%	75%	27%	72%	38%
Rentals	9%	0%	18%	50%	7%
Service	19%	15%	21%	60%	11%
Other	13%	0%	19%	40%	25%

Customer Analysis

Question nine on the survey asked the bicycle shops to estimate the percentage of their customers who were local versus tourists. All ten post-trail creation bicycle shops answered this question. The majority of the bicycle shops served primarily local customers. The average percent of customers who were local was over 70%. Summary data for this question as it relates to post-trail creation bicycle shops is below.

TABLE 7: CUSTOMER ANALYSIS OF POST-TRAIL CREATION BICYCLE SHOPS

n = 10	Mean	Median	SD	Range	IQR
Local	71%	90%	33%	95%	38%
Tourist	29%	10%	33%	96%	38%

Existing Trail Impact on Decision to Open Bicycle Shop

The final question in the survey asked post-trail creation bicycle shops to estimate the degree to which the existence of the trail was instrumental in their decision to open their bicycle shop. The majority of respondents indicated that the trail was not considered when deciding to open their bicycle shop. The summary information for this survey question is provided in the table below.

TABLE 8: EXISTING TRAIL IMPACT ON POST-TRAIL CREATION BICYCLE SHOPS

n=10	Not Considered	10-25%	25-50%	50-75%	75-100%
Number of Respondents	4 (40%)	1 (10%)	1 (10%)	1 (10%)	3 (30%)

Pre-Trail Bicycle Shops

Five bicycle shops out of fifteen indicated their business was built before the qualifying trail was created. Pre-trail bicycle shops were a key demographic for this study as many questions in the survey were directed towards the group. Also, it was with this demographic that the researchers hoped to learn the impact of trails similar to the Tweetsie trail on existing businesses. Below is the summary demographic data on the pre-trail bicycle shops.

TABLE 9: SUMMARY DEMOGRAPHICS FOR BICYCLE SHOPS BUILT BEFORE A TRAIL

n = 5	Mean	Median	SD	Range	IQR
Age of bicycle shop	1987	1986	12.82 years	33 years	14 years
Number of bicycle shop employees	4.6	5.0	1.14	5.0	1.0
Yearly revenue of bicycle shop	$350,000.00	$350,000.00	$70,710.68	$100,000.00	$50,000.00
Distance of bicycle shop to trail	**0.0-0.05**	**0.05-2.0**	**2.0-3.0**	**3.0-4.0**	**4.0+**
Number of responses	2 (40%)	0 (0%)	1 (20%)	0 (0%)	2 (40%)

Employment, Sales, Foot Traffic, and Property Tax Increases

Four questions in the survey asked the bicycle shop owners/general managers specific questions about the impact of the trail on their business. These questions asked for the increase (or decrease) for several key parts of their business: employment, sales, foot traffic, and property tax. Only one business indicated an increase in employment and this resulted in one new full-time hire. Sales, on average, increased 7.40%. Foot traffic, on average, increased 9.40%. Property tax averaged an increase of 3.25%. Summary statistics for these four questions are listed below.

TABLE 10: INCREASE IN EMPLOYMENT, SALES, FOOT TRAFFIC, AND PROPERTY TAX FOR PRE-TRAIL BICYCLE SHOPS

n=5	Mean	Median	SD	Range	IQR
Employment	20.00%	0.00%	0.00%	1.00%	0.00%
Sales	7.40%	5.00%	7.99%	20.00%	8.00%
Foot Traffic	9.40%	5.00%	12.12%	30.00%	8.00%
Property Tax	3.25%	1.50%	4.57%	10.00%	3.25%

This data also indicated that bicycle shops that were located closer to the trail had a higher increase in property tax than those further away. There were four pre-trail bicycle shops that answered the survey question about increasing (or decreasing) property tax. Two shops indicated they were located between 0 and 0.5 miles from the trail. These shops had an average property tax increase of 6%. One shop was located between 2.0 and 3.0 miles from the trail and their reported increase in property tax was 2%. Finally, one shop was located beyond four miles and reported their property tax did not increase. Summary statistics relating these two questions are listed below.

TABLE 11: DISTANCE FROM TRAIL AND PROPERTY TAX INCREASE

n=4			
Distance from Trail	**0.0-0.5**	**2.0-3.0**	**4.0+**
Average Property Tax Increase	5.5%	2%	0%

Sales Structure

Three of the five pre-trail bicycle shops answered question eight completely. This question was designed to determine the effect of a new trail on the sales structure of the business (i.e. was there an increase in bicycle rentals after the trail was completed?). The question also identifies the business's current sales structure. As with the post-trail bicycle shops, the pre-trail bicycle shops indicated that the majority of their business was related to sales. The second highest activity was service. Rentals were the third highest and no pre-trail bicycle shop reported any activities in the other category. No shop reported a change in sales structure after the trail was created. Summary statistics for sales structure are listed below.

TABLE 12: SALES STRUCTURE OF PRE-TRAIL CREATION BICYCLE SHOPS

n = 3	Mean	Median	SD	Range	IQR	% Change
Sales	73%	70%	15%	30%	15%	0%
Rentals	4%	1%	6%	10%	5%	0%
Service	23%	30%	12%	21%	11%	0%
Other	0%	0%	0%	0%	0%	0%

Customer Analysis

The final question for pre-trail bicycle shops asked the owner/general manager of the business to estimate the percentage of their customers that are local versus tourists. The pre-trail bicycle shops were again similar to the post-trail bicycle shops in that the majority of their customers were local. Local customers accounted for an average of 82% of the pre-trail bicycle shops' business. Summary statistics for the customer analysis are listed below.

TABLE 13: CUSTOMER ANALYSIS OF PRE-TRAIL CREATION BICYCLE SHOPS

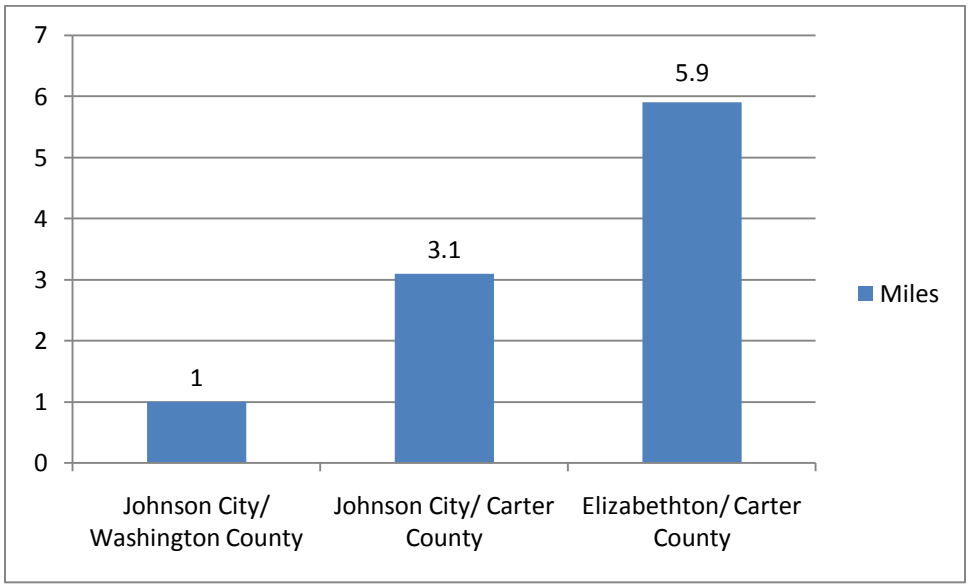
n = 10	Mean	Median	SD	Range	IQR
Local	82%	95%	21%	100%	25%
Tourist	18%	5%	33%	50%	25%

METHOD- PROPERTY TAX

Procedure

The Tweetsie Trail was divided into sections to determine the portions that were located in Johnson City and Elizabethton as well as Washington County and Carter County. The reason the trail was divided this way was to properly allocate the city and county tax rates when the overall property tax value was calculated along the Tweetsie corridor. GIS software that was developed for the Tennessee Valley Authority was used to identify the Tweetsie Railroad corridor, Washington County and Carter County lines, and the city limits for both Johnson City and Elizabethton (TVA, 2011). The three divisions of the trail were as follows: Johnson City and Washington County, Johnson City and Carter County, Elizabethton and Carter County. The GIS software was capable of measuring the length of each segment. The length of the three trail segments are found in the chart below.

FIGURE 5: TWEETSIE TRAIL SEGMENTS



The allocation of residential and commercial zoning was estimated for a one-half mile corridor around the railroad for each of the three trail segments listed above. The one-half mile distance was used because census data is readily available for housing units and number of firms per square mile. This data can straddle the proposed trail to capture housing and commercial estimates one-half mile in either direction. The allocations for Johnson City/Washington County and Johnson City/Carter County were estimated by speaking with Steve Neilson, AICP. Steve Neilson is the Long-Range Planning Coordinator of Johnson City. He has access to local GIS software that shows the zoning breakdown of the city. Steve indicated that the GIS software was not capable of measuring the exact zoning breakdown one-half mile from the trail. He informed the researcher that the portion of the trail in Johnson City is almost completely residential with exception to the Bosch plant area (Neilson, 2011). From this description, a 95% residential and 5% commercial allocation was assumed for the portion of trail running through Johnson City. A zoning map for Elizabethton was available on the City of Elizabethton website (City of Elizabethton: Planning and Development, 2010). The map breaks down Elizabethton into residential, business, industrial, historic, and urban planning zones. Using the legend and scale, the estimated residential and commercial zones within one-half mile of the Tweetsie trail was 70% and 30% respectively.

FIGURE 6: ELIZABETHTON ZONING

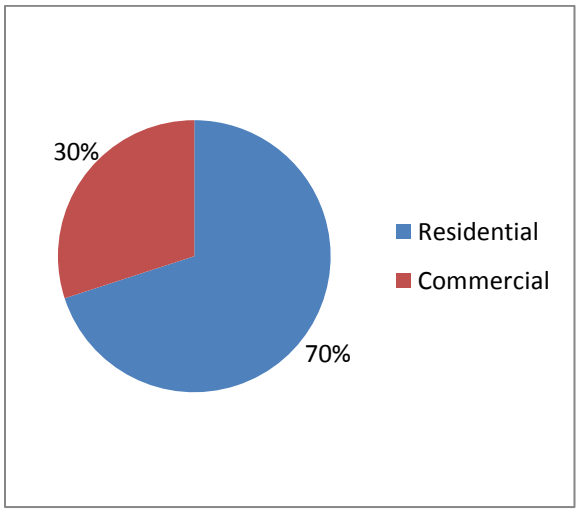
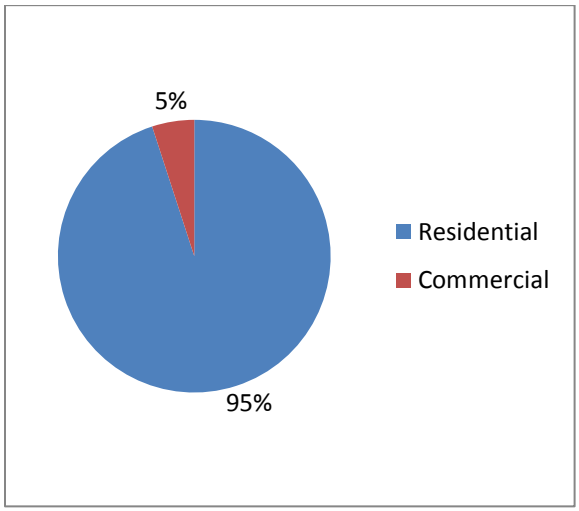


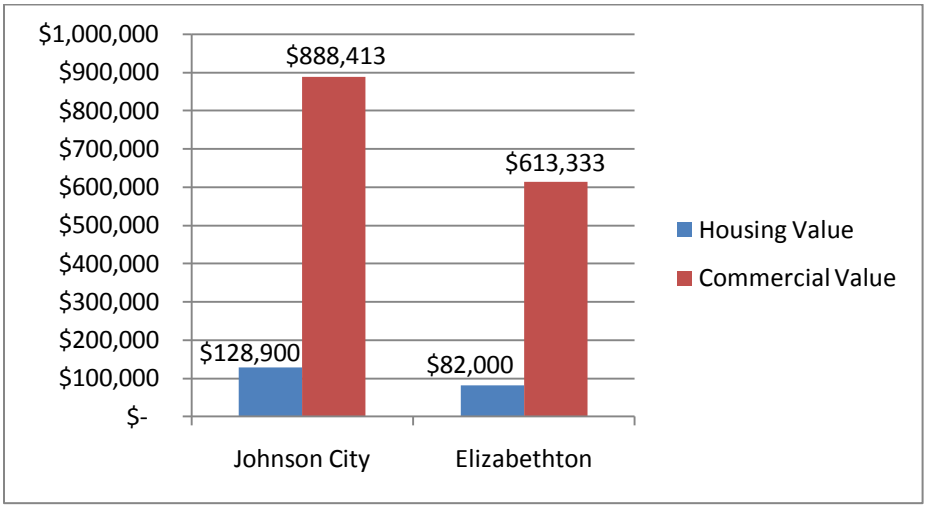
FIGURE 7: JOHNSON CITY ZONING



The average appraisal value for housing units in Johnson City and Elizabethton came from sources that updated their data monthly. This source calculates the housing values for a specific geographic region based on the median home prices at that time (Zillow, 2011). The appraisal values for the three trail segments are reflective of the cities in which they reside as opposed to county housing values. For both Johnson City segments of the trail, a housing value of $128,900 was used. The value from the Elizabethton segment of the trail was found to be $82,200. Both of these housing values were updated on April 1, 2011.

The average appraisal values for commercial buildings were based off commercial land and businesses that were listed for sale in Johnson City and Elizabethton. The number of properties listed for sale in Johnson City was 16 and produced an average value of $888,412.50 (Land and Farm, Inc., 2011). The number of properties listed for sale in Elizabethton was 3 and produced an average value of $613,333.33 (Land and Farm, Inc., 2011). These properties were found on March 14, 2011. The complete listing of properties can be found in appendix 2.

FIGURE 8: AVERAGE PROPERTY VALUES

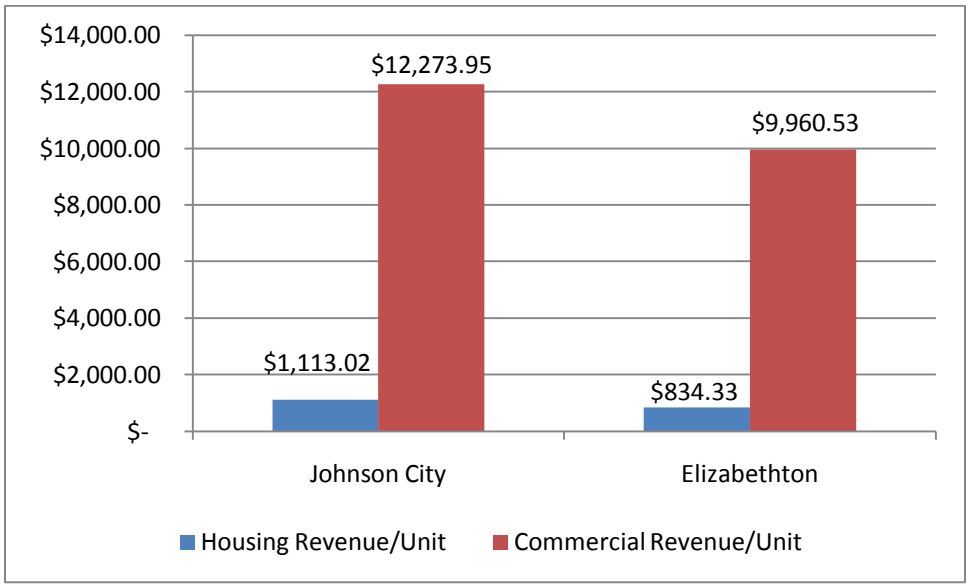


In order to calculate the property tax revenue for housing units and commercial buildings, the average property values were multiplied by the appropriate assessment percent to calculate the taxable base. The assessment rate for residential buildings is 25%, and the commercial assessment rate is 40%. The taxable base for segments of the trail located in Johnson City was found to be $32,225 for residential buildings and $355,365 for commercial buildings. The taxable base for the segment of the trail located in Elizabethton was computed as $20,550 and $245,333 for residential and commercial buildings respectively. All three of the segments of the trail paid a city and county tax rate. The Johnson City and Washington County property tax rates of 1.54% and 1.9139% respectively were attained from the Department of Finance office. The Elizabethton and Carter County property tax rates were found on the county website as 1.78% for city and 2.28% for county (Carter County TN, 2011). The taxable base for residential and commercial property was multiplied by the appropriate tax rate to yield the average tax revenue per building unit. Below is a summary of the tax rates associated with each segment of the trail as well as the revenue per unit for each segment of the trail.

TABLE 14: PROPERTY TAX RATES

	City	County	Total
Johnson City/ Washington County	1.54%	1.9139%	3.4539%
Johnson City/ Carter County	1.54%	2.28%	3.82%
Elizabethton/ Carter County	1.78%	2.28%	4.06%

FIGURE 9: PROPERTY TAX REVENUE PER UNIT



The next step to determine the property tax revenue generated around the Tweetsie trail was to find the number of houses and commercial buildings within one-half mile of the railroad. Residential and commercial densities per square mile were found using 2000 census data (US Census Bureau, 2011). Residential densities were calculated using the number of housing units from Johnson City and Elizabethton divided by their respective land area per square mile. Johnson City had 25,730 housing units over a total land area of 39 square miles netting a housing density of 659.74 per square mile. Elizabethton has 5,964 housing units spread out over 9.163 square miles yielding an average housing density of 650.9 per square mile. The commercial density for these areas was likewise calculated using 2000 Census data for the total number of firms divided by the land area per square mile. Johnson City had 5,179 firms producing a business density of 132.7949 firms per square mile. The number of firms for Elizabethton was not available using the Census data, therefore, the population ratio between

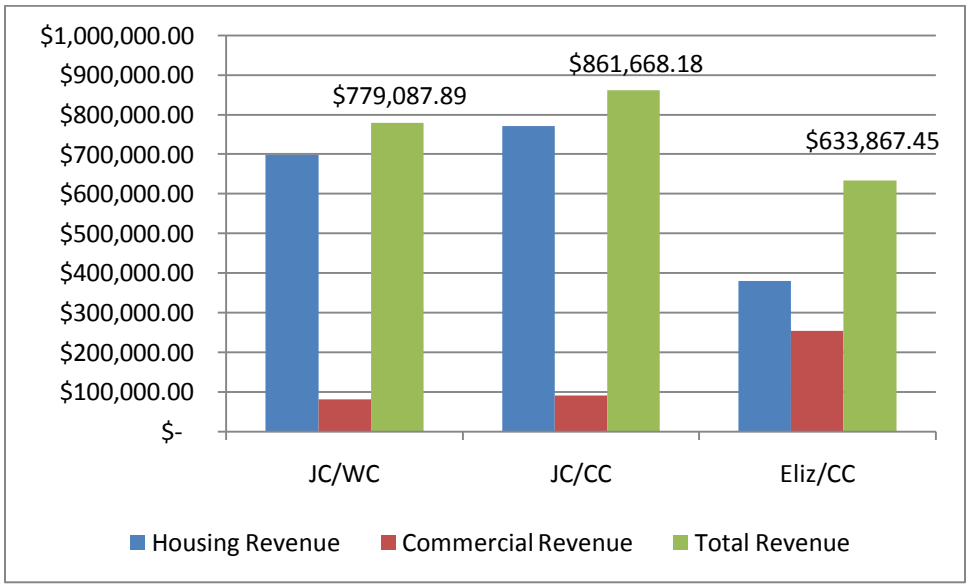
Elizabethton and Carter County was used to estimate the total number of firms. The population of Elizabethton was 13,372 and the population for Carter County was 56,742 netting a ratio of .2357. The total number of firms throughout Carter County was found to be 3,340. With a population ratio of .2357 the total number of firms in Elizabethton was estimated to be 787.115, leading to a density value of 85.9015 per square mile. The residential and commercial densities for each segment were adjusted based on the zoning allocations identified in the previous steps.

TABLE 15: WEIGHTED AVERAGE DENSITY

	Number of Units/ Sq mi	
Segments (Zone Allocations)	**Residential**	**Commercial**
Johnson City (95/5)	626.76	6.64
Elizabethton (70/30)	455.63	25.47

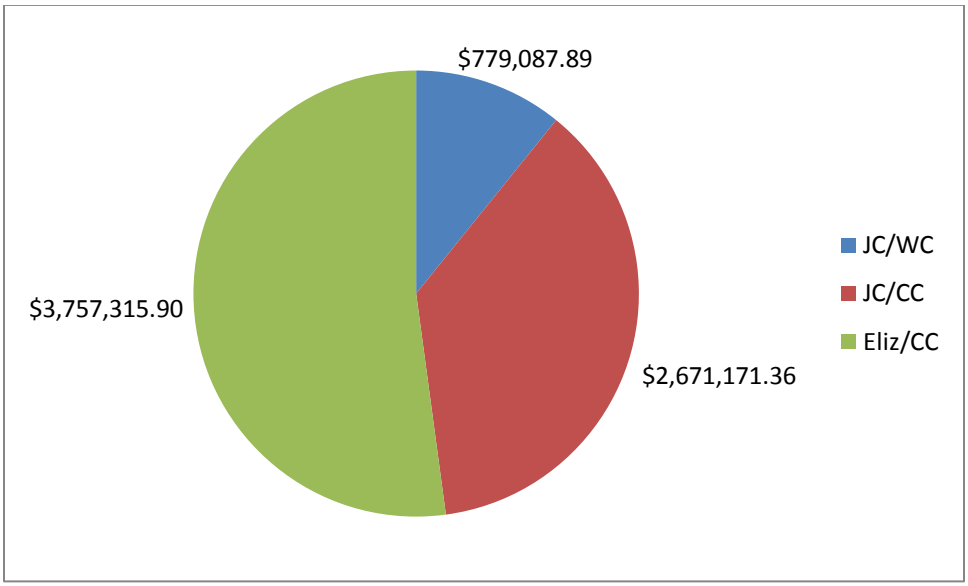
The next step to determine total property tax revenue for the trail was to calculate the total revenue for the three segments of the trail. The density values found above were multiplied by the revenue per unit for each segment. The housing and commercial revenue for each segment was then combined to show the total revenue per square mile for each of the three segments. The chart below summarizes total revenue per square mile for the three segments.

FIGURE 10: PROPERTY TAX REVENUE PER SQ MI



The final step to determine the current property tax revenue for the Tweetsie trail was to multiply the total revenue per square mile for each segment times the length in miles of each segment as identified in the first step. The chart below summarizes the current property tax revenue generated by the land one-half square miles around the trail.

FIGURE 11: PROPERTY TAX REVENUE



PROPERTY TAX RESULTS

The current property tax revenue for the Tweetsie trail as calculated by this procedure totaled $7,207,575.14. The reason for determining the current property tax revenue was to estimate the incremental increase in property tax revenue as a result of the appreciation of land adjacent to the trail. This research assumed that properties within one-half mile of the trail will appreciate; however the average rate of appreciation for the corridor around the trail remains unknown. The following chart expresses the average property value appreciation rates and their incremental increase in tax revenue.

TABLE 16: INCREMENTAL TAX REVENUE

Avg. Appreciation	Property Tax Revenue	Incremental Increase
1%	$ 7,279,650.89	$ 72,075.75
2%	$ 7,351,726.64	$ 144,151.50
3%	$ 7,423,802.39	$ 216,227.25
4%	$ 7,495,878.14	$ 288,303.01
5%	$ 7,567,953.89	$ 360,378.76
6%	$ 7,640,029.65	$ 432,454.51
7%	$ 7,712,105.40	$ 504,530.26
8%	$ 7,784,181.15	$ 576,606.01
9%	$ 7,856,256.90	$ 648,681.76
10%	$ 7,928,332.65	$ 720,757.51

DISCUSSION

The results of the current study partially support the implication that a proposed rail trail will provide extensive economic benefits for the local community. Overall, it appears that the completion of a trail of this type has historically aided in the decision for individuals to open new bicycle shops in the local area. Also, the results of this study indicate that there are a number of other positive economic benefits incurred by communities adopting trails, including additional sales and tax revenue for the area.

The findings of this study, however, do not coincide with many of the previous studies in this field. For example, prior studies suggest that the creation of a trail can directly cause property taxes for shops along the trail to increase over 20%, in turn increasing tax revenue for the local community. It should be noted, however, that the majority of these studies were not conducted in similar geographic areas to that of Johnson City and Elizabethton. Moreover, the majority of studies indicating these effects were conducted by analyzing trails significantly longer than the Tweetsie Trail. Due to the fact that trails built in different regions and demographic areas are likely to have economic impacts that vary from what can be expected locally, a new study was required to gauge the economic impact the proposed Tweetsie Trail will have on surrounding areas.

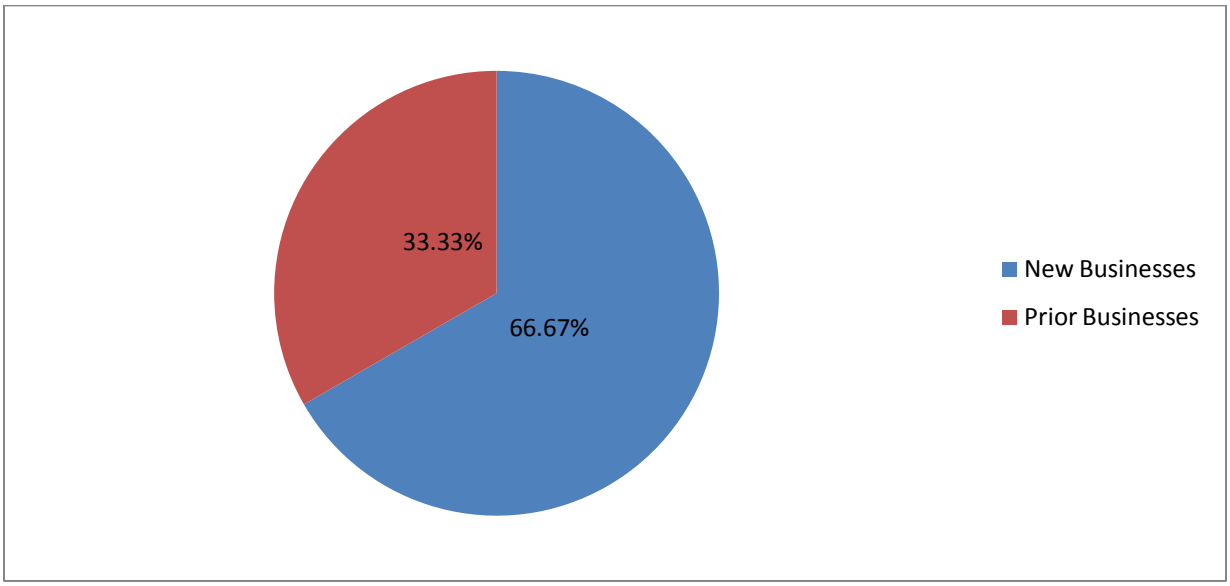
Therefore, in order to accurately project the impact the proposed trail will have on the local community, it was critical to only evaluate areas which include trails of similar sizes (5 to 10 miles) and built in similar geographic and demographic areas (only trails in the Southeastern United States considered). As a result, the findings of this study support the suggestion that the construction of a trail will provide a number of economic benefits for the surrounding community. The areas the trails tend to

impact economically, and which will be discussed in further detail below, are the following: New Businesses, Sales, Property Tax Increases, and New Jobs.

New Businesses

Prior research indicates that the inception of a trail in a community will help lead to a number of new businesses near the trail, specifically businesses related to trail use. The findings of this study support this suggestion. The chart below illustrates the breakdown of bicycle shops that opened after the trail's construction versus those already in existence, according to the survey.

FIGURE 12: PRE- VS. POST-TRAIL BICYCLE SHOPS

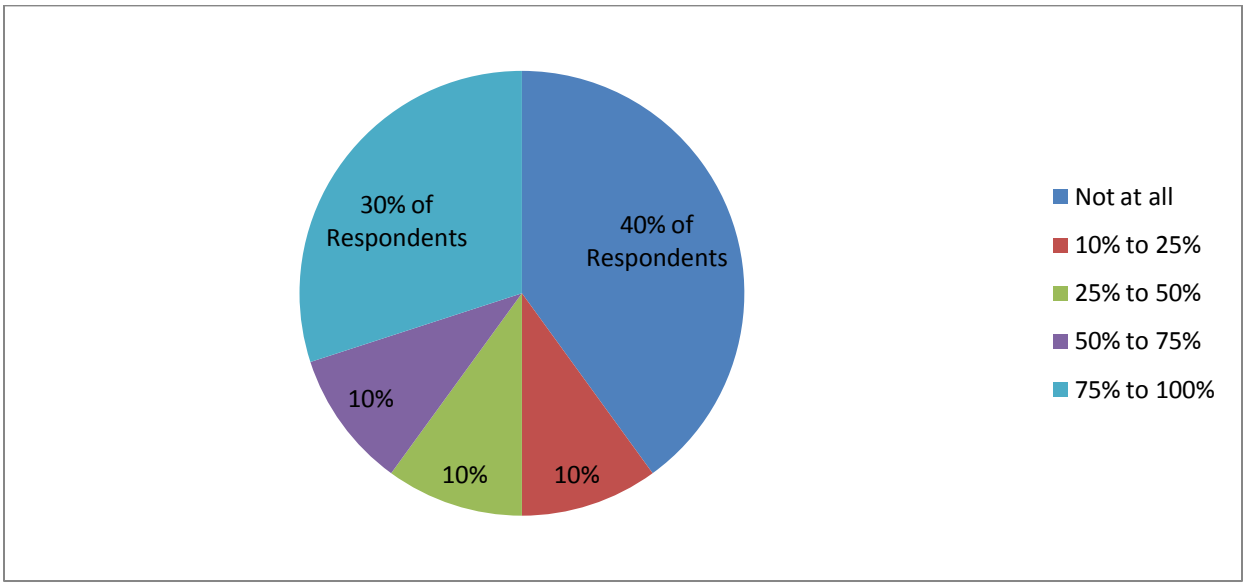


As illustrated above, 66.67% of those surveyed responded that their shop was opened after a trail was built. This indicates that trails similar in size to the proposed Tweetsie Trail, and in similar areas, have actually had a significant impact regarding the influence of new businesses. Therefore, since well over half of those surveyed opened after a trail's inception, the construction of a local trail is expected to have a similar impact regarding the attraction of new small businesses to the area. Specifically, new businesses related to trail use are expected to open near the location of the trail. It should be noted that, of the new shops opening after construction of the trail, 50% were within a half mile of the trail, with 70% within two miles.

Additionally, of those that opened after the trail, 40% cited that the trail was a major factor in their decision to open a new business by stating that it contributed 50% or more in their decision to open.

The breakdown of these new businesses and the degree to which the trail influenced their decision is as follows:

FIGURE 13: DEGREE OF INFLUENCE



Overall, 60% of those responding stated that the trail had some influence in their decision to open. 40% stated that the trail contributed 50% or more in their decision to start a new business. Of these, 30% stated the trail was instrumental in their decision to open, citing between 75% and 100% degrees of influence. The remaining 40% stated that the trail had no influence on their decision to open. This data provides insight as to the extent with which trails of similar sizes impact the decision for entrepreneurs to open new businesses targeting trail users.

Therefore, based on the study, the likelihood of new businesses opening in the area is expected to increase with the construction of a trail. However, since 40% also stated that the trail had no influence on their opening, it is difficult to identify precisely what degree the trail will influence new businesses. It does seem reasonable to expect the trail to have a moderate to significant influence on attracting new businesses to the area since 2/3 of the businesses surveyed opened after the trail, and most cited that the trail had some influence on their decision to open. It should be considered that 33.33% of those surveyed were not opened after the trail, and it is not clear if the trail would have influenced new businesses had these shops not existed. Due to the fact that most of those surveyed indicated that the trail was considered, and 40% listed the trail as a major influence, it appears likely that the construction of a new trail in the community will serve as motivation for new businesses and services to open near the trail.

New Jobs

Another critical economic benefit resulting from trails, cited by previous studies, is that of an increase in employment for businesses targeting trail users. While this has been noted as a very positive benefit resulting from trails in earlier evaluations, this study finds that trails of this size located in similar regions do not create significant economic benefits in terms of employment. For example, of the shops which existed before the trail, 80% experienced no growth in employment after the trail's inception. While 20% did experience an increase in employment, this resulted in an average of only one new job per shop which existed before the trail. This indicates that the construction of a trail in the area will not have a significant impact regarding employment for businesses built before the trail which offer services revolving around trail related activities.

However, this does not include the number of jobs created as the result of new startups opening after a trail's construction. The average number of new jobs created by new businesses after the construction of a trail of this type, according to the study, was 3.7. This indicates that, while the findings project that existing businesses will experience relatively no job creation as a result of the trail, there is the likelihood of new businesses forming which, typically, creates an average of almost 4 jobs for each new business. Overall, this does not appear to be a significant economic benefit for the community, but does indicate that there is the potential for a relatively small number of new jobs to be formed with the creation of a local trail.

Sales

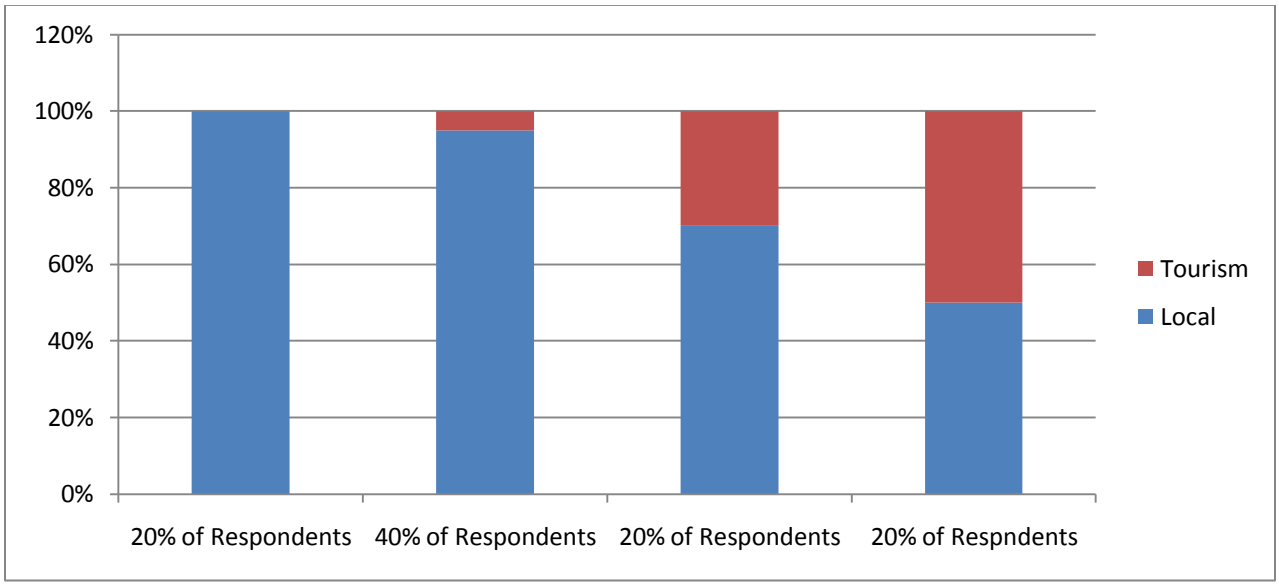
Another variable to consider when evaluating the potential economic impact the Tweetsie Trail could have on the local community is that of additional sales from trail users. Currently, the study indicates that trails of this type in the Southeastern United States experience an average increase of 7.8% in sales after a trail was built. Also, it should be noted that no shop reported a loss after a trail's construction while the majority reported an increase in sales, indicating that much of the additional revenue is actually the result of new sales for the area. The range for additional sales, according to the survey, was between 0% and 20%.

However, when reviewing the results of the study, the shop which reported the maximum increase in sales also commented that other factors strongly contributed to this increase, which was not at all related to the trail. Therefore, if this shop was excluded from the analysis, the average increase in sales for the remaining shops after construction of the trail was 5.4%. This provides more accurate information regarding the economic impact which can be expected due to the construction of a trail. As a result of this

insight, the expected increase in sales for those shops offering trail related services can most reasonably be projected around 5.4%. While this figure is not the average of all shops surveyed, it is necessary to adjust the analysis to only include figures which accurately represent new sales resulting from the trail to gauge an expected impact. Since the maximum of the previous range specified that sales increased largely due to factors unrelated to the trail, that 20% maximum seems unrealistic. When excluding this shop from the evaluation, the new maximum in the range is 10%. Therefore, the expected increase in sales, due to the construction of a similar trail in this area, would be roughly 5.4%, with low and high ranges of 0% and 10% respectively.

Another aspect of the study which should be considered is the fact that 80% of the shops which previously existed reported that local sales represented 70% or more of their revenue, with tourism comprising the remaining percentage. Also, 60% reported that locals represented 95% of their sales or more. Finally, 30% reported a split between local and tourist sales. This indicates that trails of this type typically do not heavily impact tourism for the local areas, especially considering 60% of the shops derive 95% of their revenue from local residents. Therefore, it can be expected that any revenue increases reported in this study can be projected to be derived from local residents, should the Tweetsie Trail be constructed. To graphically illustrate this breakdown, the chart below shows the percentage of sales between tourists and locals for each percentage of businesses surveyed:

FIGURE 14: LOCAL VS. TOURIST REVENUE



In summary, while the 5.4% average increase in shop revenue may not appear to suggest a strong economic impact, it does represent an impact for the community which should not be overlooked.

For example, one shop reported a sales increase of 10% after the trail's construction, resulting in roughly $30,000 in additional sales. Meanwhile, another shop indicated that sales increased by 5%, which resulted in an additional $20,000 in revenue. Overall, the results of this study support the position that the construction of a trail will result in additional revenue for shops offering trail related services, with an expected increase in revenue around 5.4%.

Property Taxes

Another major economic impact which has been cited by a number of previous studies is that of the impact which trails have on local property taxes. Many earlier studies indicate that property taxes tend to increase over 20%. However, as with prior variables, these studies are likely not relevant for this area as they did not consider similar types of trails or geographic areas, which will each have a major influence regarding the amount of property tax increases.

The results of this study, again, partially support prior evaluations with respect to the amount of property tax increases that can be expected with the construction of a trail. For those shops that existed prior to the trail, an average increase of 3.25% was realized in their property taxes after a new trail's inception. The range of responses was from a high of 10% to a low of 0% for those shops surveyed. Therefore, it appears that the expected increase in property taxes will be on the lower end of the reported range, due to the average being 3.25%.

Also, based on the results of this study, the amount of property tax revenue which may be realized from properties residing within one-half mile from the trail can be projected. According to this survey, the average increase in property taxes for these shops was 5.5%. When applying this figure to the incremental tax revenue chart listed in table 16, an estimated increase of $396,416 in additional tax revenue can be projected.

Overall, these findings partially support previous data which suggests that the construction of a trail will have economic benefits for the area. Based on this study, the construction of a trail is expected to have at least a moderate impact on new startups in the area, as 40% of shops opening after a trail's construction cited the trail as having a significant influence on their decision to open. Also, sales for trail related activities can be expected to increase roughly 5%. However, in terms of employment, there is expected to be a very minimal economic impact should the trail be constructed. For those shops in place before a trail, 80% stated that they experienced no increase in employment, and the average for those who did experience an increase was only one new job. Meanwhile, the most significant economic impact appears to be additional property tax revenue. Based on the study, the average increase in property

taxes is 5.5% after a trail has been constructed for properties within one-half mile of a trail. This would result in a total of nearly $390,000 in additional revenue from properties within this proximity of the trail. While this projected increase is still less than other studies indicate, it does illustrate a very positive economic benefit which could be created as a result of the Tweetsie Trail.

Comments by Trail Users

Each trail included in the study has its own strengths and weaknesses. One key to maximizing the use and quality of a proposed trail in the local area is to evaluate what current users perceive to be the strengths and weaknesses of existing trails and incorporating these aspects into the new trail. The most efficient way to measure this was simply to observe the comments made about each trail identified by the study, which is available on Trail Link (Trail Link, 2011). This will allow potential users of similar trails to be identified, as well as observing what these users find positive and negative about the trails in their community.

The primary users for these trails appear to be families and those who consistently walk or jog for health benefits. Also, it should be noted that several individuals commenting identified themselves as kids or teenagers, further illustrating the likely users of a similar trail in Johnson City. The overwhelming majority of these trails were surfaced with paved asphalt which garnered many positive reviews from the users.

Other positive comments which were stated from users regarding the trails included easy access to parking and access to picnic and rest areas. Also, signage along the trail which indicated both mileage and location was the most common positive comment. This information can be valuable when constructing a local trail as it provides insight as to what potential users will find beneficial, which will make the trail more useful to those in the community. Furthermore, this information can also aide in creating an economic benefit because more people will likely use the trail should these comments be considered in the construction.

Finally, several comments were made in reference to negative aspects of various trails. To further reinforce the importance of some of the comments mentioned earlier, many of the negative comments were due to a lack of items or variables which, when available, were commented as being a positive aspect for other trails. For example, the most common negative comment by far was a lack of signage. Specifically, a lack of signage for location markers and for the trail head was mentioned. Also, no access to waste disposals was listed as a setback to one trail. These comments should be taken into consideration

when constructing a new trail, as they allow the identification of what the likely users will find useful in a trail, which will make the trail more beneficial for everyone in the community.

Survey Limitations and Assumptions

While the previous sections have discussed the results of the study and what these results may indicate regarding the economic impact of the proposed Tweetsie Trail, there are limitations to this study. Moreover, several assumptions have been made to project figures or potential benefits for the area based on the results. These limitations and assumptions are discussed below.

Limited Sample Size for Survey

This study consisted of 15 responses from various bicycle shops throughout the Southeastern portion of the United States. While each of these bicycle shops were located near trails and can all provide valuable insight as to the impact which the corresponding trail has had on their operations, this limited sample size can provide misleading data. Due to this small sample, the possibility of outliers or uncommon results being reported in the survey would strongly influence the data. Also, due to the small sample size, wide ranging responses to certain questions make it difficult to extrapolate the expected impact which the Tweetsie Trail would have on the local area. For example, while 15 shops responded to the survey, some questions were only answered by a few businesses. In these cases, some of the results varied greatly, making it difficult to obtain the expected impact on the local area due to a small number of responses and a wide range. In these cases, an average of the figures would again be greatly impacted by outliers or uncommon responses.

Respondent Bias

As is the case with any survey, the possibility of respondent bias or inaccurate information being given is always available. There is the chance that an owner could report misleading results which would appear favorably for his or her institution. This would affect the analysis greatly as the evaluation of the study is directly related to the responses of store owners and, thus, requires that all responses are accurate and contain no bias.

Geographic Differences

While all of the shops surveyed were in the Southeast, there is still the possibility that some of the shops were in areas not comparable to that of Johnson City or Elizabethton. For example, a number of shops were located in areas of Florida which may not represent the local area as closely as would be preferred. This could lead to results which would not accurately reflect the impact the Tweetsie Trail would have on this community.

Cannibalization Effects

The possibility of cannibalization of sales exists with those shops which were surveyed. Any increase in sales reported since the trail's inception among the shops is assumed to be a direct result of the trail and that of a new economic impact. However, it is possible that a portion of these sales merely cannibalize other stores' sales in the area and are not actually new purchases. For example, a shop near the trail may attract customers who would have purchased items at other shops in the area regardless of the trail's existence. However, this study assumes that this cannibalization of other shops' sales is actually the result of increased sales due to the trail, even if a purchase would have occurred at another shop regardless. While our data did not show a decrease in sales by any shop, no information was available to determine if any shop's sales were increasing at a decreasing rate.

Impacts of Other Shops

This study currently does not discuss the impact a trail may have on other shops in the area, such as sporting goods stores. These businesses could also experience an impact in sales or employment due to the trail's existence which would also provide an economic benefit for the community. However, these impacts were not measured as this study focused primarily on bicycle shops in the surrounding area. It should be noted that the trail's existence could have an economic impact in the purchase of other goods which may not be available at bicycle shops, or simply goods purchased by individuals at stores other than bicycle shops for use at the trail.

Other Factors

Again, any increase or decrease in the respondent's data since the trail's inception is considered to be the result of the trail itself. However, there is the possibility that shops could experience a growth in sales for reasons unrelated to the trail's existence. For example, one shop indicated that they

experienced a drastic increase in sales since the trail opened. However, the same shop commented that this increase was largely due to the population growth of the area and not due to an increase in trail users subsequently causing more sales.

Quality

Another factor which is assumed to be consistent within the areas surveyed is that of the quality of the trail. Obviously, a trail of high quality is more likely to experience a high number of users while a trail of lesser quality would likely experience less users. This variable would have a drastic impact on the sales of bicycle shops located near the trail. However, this variable cannot be measured and is assumed to be consistent for the purposes of this study. Furthermore, the researchers assumed that the quality of the proposed Tweetsie Trail will be of similar quality to the trails in the areas surveyed.

Health

One major impact which was cited by various shops as a result of the trail was improved community health. This is a major advantage which trail users may experience as a result of an available trail in the area. This is a variable which is extremely difficult to measure and was not included in the study. However, it should be considered to be an impact which the local community can expect to derive from a constructed trail in the area.

Impact of Other Trails

Some of the shops listed in the survey have multiple trails around the area in which their shop exists. Therefore, it cannot be certain that a specific impact which may be listed on the survey is the result of one trail for certain shops. It is possible that an economic benefit on the survey is actually the result of multiple trails circulating near one store. However, the results would not identify the impact which just one trail has had on such a shop and actually considers the cumulative effect of all trails as one overall economic impact for the store. This is not the case for the local trail as the study is attempting to only analyze the effects which the proposed Tweetsie Trail will have on the area.

Failed Businesses

The possibility that a number of bicycle shops have opened near the trails which were analyzed and have actually gone out of business exists. Therefore, the results do not consider the possible negative economic effects of a shop opening near a trail and failing shortly afterwards since these businesses are

not available to respond to this survey. It is likely that this study only includes shops which are profitable and not those which do not succeed, since most of the stores surveyed have been open for a number of years and are still conducting business in the area.

Overall, there are several limitations and assumptions to this study, as there are with any type of analysis. However, two severe limitations to prior data include trails which aren't comparable to that of the proposed Tweetsie Trail and geographic regions which vary greatly in terms of demographics to that of the local area. Therefore, it appears that, despite these shortcomings, a new study was critical to determine an expected economic impact of the proposed Tweetsie Trail in the local area.

Property Tax Limitations and Assumptions

Census Data

The property tax revenue calculation has limitations that may impact the final results. The first limitation was that census data from 2000 was used as opposed to the data from the 2010 census. The 2010 data had not been released at the time of this research. The census did provide more recent estimates of demographic data; however, the values from 2000 provided measured figures that were completely accurate.

Zoning Allocations

Another limitation of this research was that zoning allocations for each of the three segments of the trail were estimated using methods that may be inimitable. The zoning allocations for the Johnson City segments of the trail were estimated based on speaking with Steve Neilson, AICP. Due to the limitations of the GIS software, Steve was not able to accurately measure and report the allocation of residential and commercial zones around the trail. Additionally, the Elizabethton zoning allocation was estimated using similar methods. The researcher approximated the allocation within the one square mile section of land surrounding the trail using a detailed zoning map and scale.

Sample Size

Another limitation was the small sample size of commercial property listings used to calculate the average property value for Johnson City and Elizabethton. The number of properties used in the calculation for Johnson City was 16; 3 were used in the calculation for Elizabethton. The relatively small

sample size can be skewed by one single entry. This was another factor identified that may be inimitable in this research.

Commercial Density Values

There was an inconsistency in the methodology of collecting data for Elizabethton that may not accurately reflect business density and property tax revenues. Elizabethton was not large enough to be listed as a stand-alone city in the census data. Therefore, the number of firms was not provided for this area. The methodology used may produce inaccurate property tax revenues for the Elizabethton/ Carter County segment of the trail.

Appreciation Range

An underlying assumption that was made in this calculation was that the property values within one-half mile of the trail would appreciate. Previous studies have expressed that land values would increase at a diminishing rate the further it was located from a trail or greenway. The distance in which the appreciation was zero has not been duplicated from one study to the next. The one-half mile corridor was selected because density values are generally quoted per square mile. This made it more convenient and appropriate to carry out this method given the limited time in which to conduct this research.

REFERENCES

Active Living Research. (2010, May). *The economic benefits of open space, recreation facilities and walkable community design*. Retrieved April 10, 2011, from Active Living Research Web site.

Asabere, P. K., & Huffman, F. E. (2009). *The relative impacts of trails and greenbelts on home price*. Journal of Real Estate Finance and Economics 38(4), 408-419.

Campbell Jr., H. S., & Munroe, D. K. (2007). *Greenways and Greenbacks: the impact of the Catawba Regional Trail on property values in Charlotte, North Carolina*. Southeastern Geographer, 118.

Carter County TN. (2011). Retrieved April 2011, from Area Specs: http://www.cartercountytn.gov/about/specs.html

City of Elizabethton: Planning and development. (2010, March 22). Retrieved March 15, 2011, from http://www.elizabethton.org/government/forms/planning/zones.pdf

East Tennessee Railway. (n.d.). Retrieved December 5, 2010, from: http://www.gwrr.com/operations/railroads/north_america/east_tennessee_railway

Gray, G. B. (2010, June 5). '*Rails-to-trails' project takes big step forward*. Retrieved December 5, 2010, from Johnson City Press. Local News: http://www.johnsoncitypress.com/News/article.php?ID=77394

Hot off the press - Recent news. (2009, November 22). Retrieved December 6, 2010, from Tweetsie Historic Trail Association Web site: http://www.eteamz.com/SouthernAppalachianGreenwaysAlliance/news/index.cfm?id=4794379&cat=621336&subsite=4950491

I don't want no stinkin' Tweetsie Trail! (n.d.). Retrieved December 5, 2010, from Tweetsie Historical Trail Association: News: http://www.eteamz.com/SouthernAppalachianGreenwaysAlliance/news/index.cfm?id=4794473&cat=0&subsite=4950491

Krizek, K. J. (n.d.). *Estimating the economic benefits of bicycling and bicycling facilities: An interpretive review and proposed methods*. Retrieved April 11, 2011, from Alliance for Biking and Walking Web site: http://www.peoplepoweredmovement.org/site/images/uploads/Economic_Benefits_of_Bicycling_and_Bicycle_Facilities.pdf

Land and Farm, Inc. (2011). *Land and Farm*. Retrieved March 14, 2011, from Johnson City Commercial Land for Sale: http://www.landandfarm.com/search/TN/Johnson-City-commercial-land-for-sale/

Land and Farm, Inc. (2011). *Land and farm*. Retrieved March 14, 2011, from Elizabethton Land for Sale: http://www.landandfarm.com/search/TN/Elizabethton-land-for-sale/

Neilson, S. (2011, March). *Long-Range Planning Coordinator*. (N. Chernikow, Interviewer)

Outreach and Adjacent Landowners. (n.d.). Retrieved December 5, 2010, from Rails-to-Trails Conservancy Web site: http://www.railstotrails.org/ourWork/trailBuilding/toolbox/informationSummaries/opposition_adjacents.html

Rails to Trails Conservancy. (2007). *Railbanking*. Retrieved December 4, 2010, from: http://www.railstotrails.org/ourWork/trailBuilding/toolbox/informationSummaries/railbanking_whatandwhy.html

Rails to Trails Conservancy. (2010). Retrieved December 6, 2010, from The Benefits of Rail-Trails; http://www.railstotrails.org/ourWork/index.html

The economic benefits of open space, recreation facilities and walkable community design. (2010,May). Retrieved December 6, 2010, from American Trails Web site: http://atfiles.org/files/pdf/Economic-Benefits-Active.pdf

Trail Link. (2011). *Find a trail*. Retrieved February 9, 2011, from http://www.traillink.com/trailsearch.aspx

Tweetsie historic trail association. (n.d.). Retrieved December 5, 2010, from: http://www.eteamz.com/SouthernAppalachianGreenwaysAlliance/index.cfm?league=4950475&subsite=4950491

TVA. (2011). *TVA sites*. Retrieved March 1, 2011, from http://www.tvasites.com/default.aspx?rida=TENNESSEE

US Census Bureau. (2011). Retrieved March 2011, from http://www.census.gov/

WMTH Corporation. (2009, April). *2009 Southwest Virginia final report - Volume 2: Greenways*. Retrieved April 15, 2011, from Southwest Virginia's Spearhead Trails Initiative Web site: http://www.trailsrus.com/swvirginia/finalreport/volume2/greenways.pdf

Zillow. (2011, April 1). Retrieved April 2011, from Carter County Home Prices and Home Values: http://www.zillow.com/local-info/TN-Carter-County-home-value/r_923/

APPENDICES:

Appendix 1: Original Bicycle Shop Survey

1. Year Business Opened?
2. How far is your business from the trail?
    a) 0.0 – 0.5 miles
    b) 0.5 – 2.0 miles
    c) 2.0 – 3.0 miles
    d) 3.0 – 4.0 miles
    e) 4.0 miles or greater
3. Number of employees (including owner)?
    i. If your business existed before the trail, did you have an increase in the number of employees since the trail opened? If so, how many?
        a) How many of the new employees were full-time?
4. Yearly Revenue (optional)?
5. If your business existed before the trail, please estimate the percentage increase(or decrease) in sales since the trail was opened.
6. If your business existed before the trail, please estimate the percentage increase (or decrease) in overall foot traffic since the trail was opened.
7. If your business existed before the trail, could you please estimate the percentage your property taxes raised (or decreased) after the trail was completed?
8. What portion of your business would you describe as relating to equipment sales, rentals, service, or other?
    i. Pre-Trail (If applicable)
        a) Equipment sales _____%
        b) Equipment rentals _____%
        c) Equipment service _____%
        d) Other_____%
            - 100%
    ii. Post-Trail Creation
        a) Equipment sales _____%
        b) Equipment rentals _____%
        c) Equipment service _____%
        d) Other_____%
            - 100%
9. If possible, could you estimate what % of your sales and/or rentals are to local customers?
10. If your business was created after the trail, to what degree was the trail instrumental in your decision to open your business?
    a) Not considered
    b) 10-25%
    c) 25-50%
    d) 50-75%
    e) 75-100%

Appendix 2: Properties Used for Tax Study

Commercial Properties in Johnson City		
Description	**Address**	**Price**
Salvage Yard; 35.83 acres; Commercial Land	*1343 Old Gray Station Road, Johnson City, TN*	$ 450,000.00
State of Franklin Rd. at North Roan Office/Retail; 9.4 acres; Commercial Land	*3201 N Roan Street, Johnson City, TN*	$ 2,450,000.00
Creekmore Dr.; 11.84 acres; Commercial Land	*Creekmore Drive & E Oakland Avenue, Johnson City, TN*	$ 265,000.00
Creekmore Dr.; 5.6 acres; Commercial Land	*Creekmore Drive, Johnson City, TN*	$ 115,000.00
3807 N. Roan St.; 1.1 acres; Commercial Land	*3807 N Roan Street, Johnson City, TN*	$ 120,000.00
Overlook Park of Johnson City; 70 acres; Commercial Land	*Chamber Drive, Johnson City, TN*	$ 563,500.00
Rocky Top Multi-Family Land; 7.03 acres; Commercial Land	*Rocky Top Road, Johnson City, TN*	$ 210,000.00
Boones Creek Rd. Property; 1.17 acres; Commercial Land	*Boones Creek Road, Johnson City, TN*	$ 468,000.00
Boones Creek Rd.; 1.34 acres; Commercial Land	*Boones Creek Road, Johnson City, TN*	$ 536,000.00
Boones Creek Rd. Property; 1.56 acres; Commercial Land	*Boones Creek Road, Johnson City, TN*	$ 624,000.00
Boones Creek Rd. Property; 1.51 acres; Commercial Land	*Boones Creek Road, Johnson City, TN*	$ 995,000.00
Knob Creek Outparcel; 1.08 acres; Commercial Land	*Knob Creek Road & Marketplace Drive, Johnson City, TN*	$ 600,000.00
Boones Creek Rd. Property; 34.21 acres; Commercial Land	*312 Old Gray Station Road, Johnson City, TN*	$ 5,131,500.00
1003 Milligan Hwy.; 14.24 acres; Commercial Land	*1003 Milligan Highway, Johnson City, TN*	$ 450,000.00
Boones Creek Rd. Property; 9.68 acres; Commercial Land	*Boones Creek Road, Johnson City, TN*	$ 1,161,600.00
Arrowhead Dr.; 3.24 acres; Commercial Land	*Arrowhead Drive, Johnson City, TN*	$ 75,000.00

Commercial Properties in Elizabethton		
Description	**Address**	**Price**
Lynn Mountain; 140 acres; Residential Land	*Us Highway 321 &Amp 19E, Elizabethton, TN*	$ 1,120,000.00
Elizabethton Estates; 95.3 acres; Residential Land	*Lexington Avenue & Bob Little Road, Elizabethton, TN*	$ 295,000.00
West Elk Ave.; 0.87 acres; Retail Land	*West Elk Avenue, Elizabethton, TN*	$ 425,000.00

Appendix 3: Raw Bicycle Shop Data

#	1	2	3	3 i	3 i a	4	5	6	7	8 Pre a	8 Pre b	8 Pre c	8 Pre d	8 Post a	8 Post b	8 Post c	8 Post d	9 local	9 tourist	10
30	2009	e	2	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75%	20%	-	-	95%	5%	a
49	2008	d	4	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	85%	0%	15%	0%	90%	10%	a
31	1993	e	1	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40%	0%	60%	0%	90%	10%	a
42	1999	b	12	N/A	N/A	800,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%	-	20%	-	75%	25%	a
40	1995	a	2	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	0%	-	-	95%	5%	b
9	2006	a	7	N/A	N/A	1,000,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	91.5%	2.5%	6%	0%	96%	4%	c
51	2010	b	3	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-	-	-	90%	10%	d
34	2002	a	2	0	0	-	10%	20%	-	-	-	-	-	-	50%	-	-	30%	70%	e
1	2007	a	1	N/A	N/A	34,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75%	0%	0%	25%	50%	50%	e
5	2010	a	3	N/A	N/A	500,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45%	0%	15%	40%	0%	100%	e
35	1986	e	5	0	0	300,000	10%	10%	-	90%	1%	9%	0%	90%	1%	9%	0%	95%	5%	N/A
28	1979	e	6	0	0	-	2%	2%	0%	60%	10%	30%	0%	60%	10%	30%	0%	50%	50%	N/A
10	1993	a	3	1	1	400,000	5%	5%	10%	70%	0%	30%	0%	70%	0%	30%	0%	70%	30%	N/A
38	1973	a	5	0	0	-	0%	0%	1%	-	-	-	-	-	-	-	-	100%	0%	N/A
50	2006	c	4	0	0	-	20%	30%	2%	-	-	-	-	-	-	-	-	95%	5%	N/A

Appendix 4: Raw Property Tax Data

Washington County/Johnson City

Washington County/ Johnson City

Residential Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue	Total Revenue/ Sq Mi
100%	25.0%	$ 128,900.00	$ 32,225.00	3.4539%	$ 1,113.02	659.74	$ 734,307.34	$ 734,307.34
95%						626.76	$ 697,591.98	$ 779,087.89
90%						593.77	$ 660,876.61	$ 823,868.43
80%						527.79	$ 587,445.87	$ 913,429.51
70%						461.82	$ 514,015.14	$ 1,002,990.60
60%						395.85	$ 440,584.41	$ 1,092,551.68
50%						329.87	$ 367,153.67	$ 1,182,112.77

Commercial Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue
0%	40.0%	$ 888,412.50	$355,365.00	3.4539%	$12,273.95	0.00	$ -
5%						6.64	$ 81,495.91
10%						13.28	$ 162,991.82
20%						26.56	$ 325,983.64
30%						39.84	$ 488,975.46
40%						53.12	$ 651,967.28
50%						66.40	$ 814,959.10

Carter County/ Elizabethton

Carter County/ Elizabethton

Residential Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue	Total Revenue/ Sq Mi
100%	25.0%	$ 82,200.00	$ 20,550.00	4.06%	$ 834.33	650.90	$ 543,065.40	$ 543,065.40
90%						585.81	$ 488,758.86	$ 574,321.33
80%						520.72	$ 434,452.32	$ 605,577.27
70%						455.63	$ 380,145.78	$ 636,833.20
60%						390.54	$ 325,839.24	$ 668,089.14
55%						358.00	$ 298,685.97	$ 683,717.11
50%						325.45	$ 271,532.70	$ 699,345.07

Commercial Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue
0%	40.0%	$ 613,333.33	$245,333.33	4.06%	$ 9,960.53	0.00	$ -
10%						8.59	$ 85,562.47
20%						17.18	$ 171,124.95
30%						25.77	$ 256,687.42
40%						34.36	$ 342,249.90
45%						38.66	$ 385,031.14
50%						42.95	$ 427,812.37

Carter County/ Johnson City

Carter County/ Johnson City

Residential Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue	Total Revenue/ Sq Mi
100%	25.0%	$ 128,900.00	$ 32,225.00	3.82%	$ 1,231.00	659.74	$ 812,141.07	$ 812,141.07
95%						626.76	$ 771,534.02	$ 861,668.18
90%						593.77	$ 730,926.97	$ 911,195.29
80%						527.79	$ 649,712.86	$ 1,010,249.50
70%						461.82	$ 568,498.75	$ 1,109,303.71
60%						395.85	$ 487,284.64	$ 1,208,357.92
50%						329.87	$ 406,070.54	$ 1,307,412.14

Commercial Zoning

Zoning Allocation	Assessment %	Avg. Appraisal Val.	Avg. Assess.	Tax Rates	Rev./building	Housing Density/mi	Housing Revenue
0%	40%	$ 888,412.50	$355,365.00	3.82%	$13,574.94	0.00	$ -
5%						6.64	$ 90,134.16
10%						13.28	$ 180,268.32
20%						26.56	$ 360,536.64
30%						39.84	$ 540,804.96
40%						53.12	$ 721,073.28
50%						66.40	$ 901,341.60