A photograph of a paved path leading through a wooded area with autumn foliage. The path is paved with asphalt and has some fallen leaves scattered on it. On the left side of the path, there is a grassy area with some trees and a small wooden fence. On the right side, there is a white wooden fence. In the background, there are more trees and a building. The text is overlaid on the image.

The Path Less Pedaled: An Examination of the Cheshire Rail Trail North in Southwestern New Hampshire

Dylyn Clark • Lena Fontana • Varick Parizo • Kat Wood

Department of Geography: Keene State College

Abstract

This study examines a former railroad bed that was converted to a bicycle and pedestrian trail between Keene and Walpole, New Hampshire. The trail offers a recreation opportunity for local residents and seasonal visitors and accommodates a variety of activities including mountain biking, walking, and running as well as snowmobiling and cross-country skiing in the winter months. This study provides an overview of trail conditions and explores potential relationships between the rail-trail and tourism in the Monadnock Region of Southwestern New Hampshire.

Two types of trail data were gathered: that specific to users and business and that specific to trail conditions and traffic. Data from trail users and local businesses were obtained through survey administration on the trail and through an online survey platform. Trail users were asked to report on distance from their residence to trail; trail use frequency; motivation for use; and preferred trail activity. Businesses were asked about their location relative to trail; their percentage of business resulting from tourism; and promotional use of the trail. Data were analyzed using statistical procedures in Excel and SPSS.

Data on trail conditions and traffic were obtained from traffic counters laid down by the Southwest Region Planning Commission, GPS trackers, and visual observations. Trail data were mapped through ArcGIS serving as a visual platform for the display of trail conditions and amenities.

Acknowledgements

The authors of A Path Less Pedaled: An Examination of the Cheshire Rail Trail North in Southwestern New Hampshire, Dylun Clark, Lena Fontana, Varick Parizo and Kat Wood, would like to express our sincerest gratitude to all of the people who helped make this final report possible. We would first like to thank Dr. Christopher Brehme for being our advisor and our mentor throughout this undertaking. He was there to help guide our research and provide constructive feedback, allowing us to produce a project we are proud of. We would also like to thank J.B. Mack of the South West Region Planning Commission for meeting with us and sharing his vision over the duration of this project. We would also like to thank the following people for meeting with us and sharing their insights with regard to the rail trails:

- Alan Rumrill - Director of the Historical Society of Cheshire County
- Greg Pregent – Chairman of Keene’s Bicycle Pedestrian Path Advisory Committee (BPPAC)
- Chuck Redfern - Board member of Pathways for Keene
- Frank Richter - Board member of Pathways for Keene
- Andy Bohannon - Director of Parks, Recreation, and Cemeteries for the City of Keene

Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
List of Figures.....	v
List of Tables.....	vi
Chapter 1: Introduction.....	1
Chapter 2: Literature Review.....	8
Big Picture & Tourism.....	9
What Existing Studies Have to Convey.....	11
Chapter 3: Methodology & Results.....	16
User Surveys.....	17
Business Surveys.....	20
Trail Assessment.....	23
Mapping.....	25
Bike Counters.....	32
Interviews.....	36
Chapter 4: Discussion & Conclusion.....	43
Limitations and Changes.....	45
Recommendations.....	46
Literature Cited.....	48
Appendices.....	50
Surveys.....	50
Tables.....	52
Maps.....	54

List of Figures

Figure 1: North Bridge	1
Figure 2: Bridge Over the Ashuelot River in Keene	8
Figure 3: End of the North Bridge	16
Figure 4: Where Trail Users are from	18
Figure 5: Distance from trail.....	18
Figure 6: Motivations for Trail Use.....	18
Figure 7: Age Range of Trail Users.....	20
Figure 8: Frequency of Use.....	20
Figure 9: Does Tourism Impact your Business?.....	21
Figure 10: Does Your Business Promote the Trail in Any Way?.....	22
Figure 11: Would your business be willing to give an annual donation to help maintain the trail?.....	22
Figure 12: Would your business be willing to do so if you received promotion for doing so?.....	22
Figure 13: Group Members Collecting Data.....	24
Figure 14: Group Members Varick, Dylun, and Kat	25
Figure 15: Linear Referencing.....	26
Figure 16: Rating Results.....	29
Figure 17: Permitted Trail Use Sign	39
Figure 18: Road Crossing.....	43
Figure 19: Gate on the Trail.....	47

List of Tables

Table 1: Demographics of Keene, Walpole and Westmoreland.....	6
Table 2: Linear Measurements.....	27
Table 3: Weighted Overlay.....	28
Table 4: Condition Score.....	38
Table 5: Counter Locations.....	33
Table 6: Virtual Day.....	34

Chapter 1: Introduction



Figure 1: North Bridge

During the past several decades a growing number of decommissioned railway lines across the globe have undergone a process of change as they are converted to recreational trails. The conversion of railways into important recreational and tourism assets, commonly referred to as rail-trails, has continued to gain popularity. A wide variety of studies has focused on understanding the components of tourism including tourists, businesses providing tourist goods and services, and tourism-based communities. The impact of rail-trails on communities and visitors is not only economic, but also environmental and can effect social and cultural community attitudes (e.g. Tsundoda and Mendlinger 2009; Fletcher 2006; Beeton 2010; Bowker, Bergstrom, and Gill 2007). Our research is intended to provide planners and managers of Southwest Region Planning Commission and the Monadnock Region Transportation Management Association and other interested parties with an assessment of the physical conditions of the trails as well as an assessment of the potential of these trails to generate new tourism opportunities.

The trains that ultimately made the 'rails-to-trails' project possible first rolled into Keene, New Hampshire on May 16, 1848. This coincided with the Industrial Revolution, when industries needed to develop arteries of transport from Boston into the interior of the country to move goods, resources, and people. The businessmen of Keene were advocates for bringing the railways to the region and saw the trains as an opportunity to stimulate the local economy. Keene was ultimately picked to have the trains run through town because of its favorable topography. The town is located in a broad, level valley surrounded by hills, providing ample room to create the physical infrastructure to support rail commerce, including rail yards, depots, roadhouses, sidings and a busy train station. The trains originally ran from Boston

through Keene and on to points north, and brought new settlers and economic stimulus to the area. In the early 1900's, the railroads were used less and less, and in the early 1960's the Cheshire rail line was shut down for passenger use. Just twenty years later in 1982, the last freight train left Keene. The railways were losing money and were closed due in part to the improving conditions of New England's road and highway systems. The rail beds remained but their rails and ties were removed. Today, people can be found hiking, biking, horseback riding, running, walking, snowmobiling, cross country skiing, mushing, and snowshoeing along these trails at various times throughout the year (Reynolds 2013). The continued development of the trails is managed by a number of volunteer and non-profit organizations as well as the City of Keene. Today, the trails have been greatly improved since conversion began in the early 1990's, but there is still work and maintenance to be done. (Alan Rumrill, Director of Historical Society of Cheshire County, 8/26/2014, conversation).

Rail-trails emanate from Keene in three directions: southwest to Hinsdale and Brattleboro, VT, southeast through Troy to Winchendon, MA and northwest through Westmoreland to Walpole. This study focuses on the latter of these three, the portion traveling north to Walpole, better known as the Cheshire Rail Trail North. This trail is fairly well established and frequently traveled as far as Stonewall Farm, four miles west of downtown Keene. Some walkers and cyclists continue along the trail another few miles as far as the Keene transfer station. It is assumed that few people regularly use other sections. In addition to examining current recreational use and trail conditions, this study explores the potential of the trail as a tourism attraction for the towns it traverses and for the entire Monadnock Region.

Our guiding research question is: *What is the significance of the existing relationship between the Cheshire Rail Trail North and tourism within Cheshire County and how can it be expanded upon?* Through data collection via surveys and observation, data analysis via SPSS and ArcGIS, and an extensive review of literature related to rail trails and tourism, an evaluation of this relationship will be presented.

Our research focuses on Keene and several other communities in southwestern New Hampshire. Keene is a centrally located city that functions as a regional service center for smaller surrounding rural towns. From late August to early May, Keene State College is in session and the City of Keene takes on the qualities of a typical college town. In summer months when school is not in session, tourists are drawn to the area for vacations in the surrounding mountains and on nearby lakes.

The central portion of downtown Keene is the hub of several well-developed sections of rail-trails. Here they are paved and wide enough to accommodate two lanes of bicycle and pedestrian traffic in most places. Within one mile of downtown is the recently built North Bridge that overpasses Route 9, a historically dangerous crossing that can now be traversed safely, and effectively links west Keene with downtown. Our data collection begins at the trail's intersection with Island Street, just a quarter mile from Main Street, and just east of the North Bridge. It continues approximately twenty miles to the trail terminus in Walpole. We began our data collection in Keene and worked our way west and north. Collected data will be provided to the Southwest Region Planning Commission to aid in determining how to improve the rail-trail network in order to promote commuting, errand cycling, tourism and a healthier Monadnock

region. The successful expansion of this network requires coordination between a number of organizations.

There are several governing bodies that oversee, maintain, and manage the Cheshire Rail Trail North. For segments of the trail in Keene, the City of Keene is responsible for management and upkeep. Outside of Keene, management of the trails varies from town to town. It is at the discretion of the towns, volunteers and other involved organizations to decide how to appropriately manage trail resources in these areas. Other organizations involved in management include the Monadnock Region Transportation Management Association (MRTMA), a key player in promoting the expansion of transportation options; the New Hampshire Department of Resources and Economic Development (DRED) which aids in monitoring and maintaining trail conditions; the New Hampshire Department of Transportation (NHDOT); and the Southwest Region Planning Commission (SWRPC) which works to understand and implement community needs regarding rail-trails and alternate transportation methods.

The demographics of the three towns traversed by the Cheshire Rail Trail North are important to consider so that trails are managed and marketed accordingly. Demographic characteristics vary among the three towns along the Cheshire Rail Trail North (Table 1). The population of Keene is significantly larger than the other two towns that host the trail. Given this large population, which is concentrated in a relatively small area, it is not surprising that Keene also has a greater percentage of people who commute by walking and biking. Logically, this infers that the Keene portion of the trail is most heavily travelled. Keene's median age is also significantly lower than Walpole and Westmoreland, reflecting the influence of college students. The smaller percentage of people over the age of 18 (38.5%) also represents the

college and young family demographic of Keene as compared to over 40% in Walpole and an even larger 86% in Westmoreland (U.S Census Bureau).

	Population	Median Age	Percent over 18 years old	Percent commuting by bike	Percent commuting by walking	Average family size	Percent of households with one or more persons under 18	Median Household Income
Keene	23,409	32.9	38.5	1	11.6	2.85	22.9	\$50,530
Walpole	3,734	44	40.7	.4	3.5	2.86	21.9	\$53,282
Westmoreland	1,874	45	86.1	0	1.1	2.81	35.7	\$78,047

Table 1: Demographics of Keene, Walpole and Westmoreland

The average family size is very similar across the three towns, with each having slightly fewer than three people per household. There is one or more persons under the age of 18 in at least 21% of all households across the three towns, which indicates a youthful demographic that could potentially be more apt to utilize the rail trail. Westmoreland's percentage is noticeably higher at 35.7% and similarly, the median income is significantly higher. Income paired with median age and the much smaller percentage of persons under 18 in a household indicates that there may be more retired couples, or professionals at a later stage in their earnings potential in Westmoreland.

Another important factor to take into consideration is the seasonality of tourism in New Hampshire and what attracts people to the area. In the summers of 2010 and 2011, the most mentioned purpose of a trip to New Hampshire was "visiting friends and relatives" (37.9%) followed by "outdoor recreation" (18.6%). Between 2004 and 2005, it was found that 18.8% of

tourism to New Hampshire was intended for the purposes of hiking and biking (Institute for New Hampshire Studies). Of those who travelled to New Hampshire with tour groups, the greatest reason for travel was due to “outdoor recreation” (Institute for New Hampshire Studies). Given these statistics, it is crucial to maintain and market the rail trails so that the tourists, and even New Hampshire residents, can utilize and benefit from them.

There is most certainly an untapped potential to utilize rail-trails in the Monadnock region, particularly the Cheshire Rail Trail North, as an additional draw for tourism. Through the assessment of rail-trail conditions and data gathered about current trail users and surrounding businesses, we will begin to paint a picture that reveals existing relations between rail-trail and tourism. This research will serve as a basic overview of trail conditions for the Monadnock region and provide insight for further sustainable development and management.

Chapter 2: Literature Review

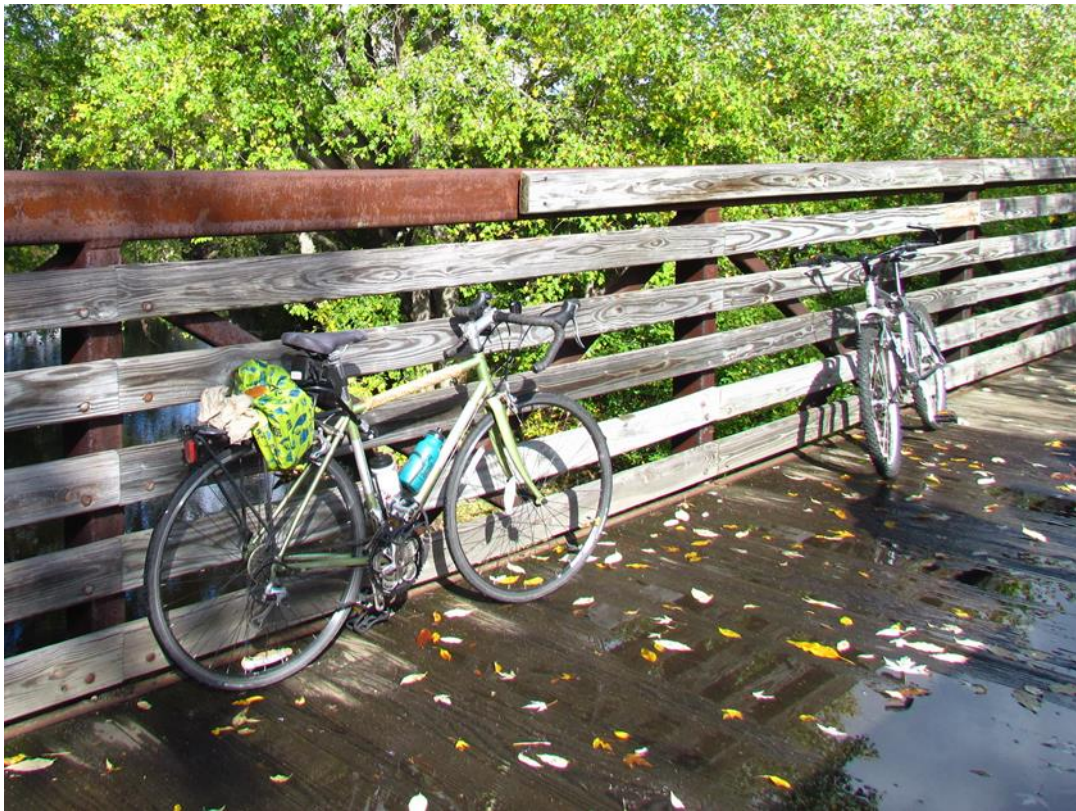


Figure 2: Bridge over the Ashuelot River in Keene

The Big Picture and Tourism

The focus of this research was to aid Southwest Region Planning Commission (SWRPC) in assessing the conditions of the Cheshire Rail Trail North. We also examined the tourism potential of the region's extensive bike path and rail-trail network. An initial question that our research sought to explore was: "What are the characteristics (i.e. physical features, scenery, environmental aspects, dimensions, gateways and heritage) of rail-trails that contribute to their value as a potential tourism asset?" Our research sought to answer this question while providing other contextually important information about the overall rail-trail conditions and tourism potential.

The Cheshire Rail Trail North is a good example of the type of community resources that are promoted by the Rails to Trails Conservancy (RTC). The RTC is a non-profit organization that seeks to create a nationwide network of trails from former rail lines. The RTC is a relatively new organization with an interesting history. It was founded in February, 1986 in Washington D.C with David Burwell serving as president. The initial goal of the Conservancy was to convert abandoned railroads into trails that, in the words of Burwell, would be "the recycling of a whole transportation system" (Fletcher 2006, 1). It was hoped that this effort would also preserve America's national railroad heritage. In December of 1991, President George H.W. Bush signed the Intermodal Surface Transportation Efficiency Act (ISTEA) which set aside funding for these rail-to-trail projects (Fletcher 2006). The current president of RTC states that the "goal for 2020 is that 90 percent of Americans will live within three miles of a trail system" (Fletcher 2006, 4).

Funding for rails-to-trails projects is particularly important for tourism ventures. Tourism is one of the United States' largest industries and biggest employers. While the bicycle

is not as popular as other modes of transportation, it is certainly one of the more favored modes of recreation (Blue 2011). The popularity of biking is evident in long-established traditions such as RAGBRAI, The Des Moines Register's Annual Great Bicycle Ride Across Iowa, as well as in smaller towns, like Keene, that see vacationing families pedal through to check out local businesses and scenery. Whether cycling tourists visit for an organized event or happen in for an ice cream cone at a local mom and pop store, they are spending money in small communities and directly contributing to local businesses. The promotion of bicycle tourism and implementation of bicycle friendly infrastructure is great for tourists passing through but also for creating healthier, more economically sound communities (Blue 2011).

While there are many perks to cycling tourism, for the cyclist and communities they visit, it is important to examine local residents' perspectives on tourism within a community. Tsundoda and Mendlinger (2009) interviewed residents of the town of Peterborough, NH about their perspectives on tourism in their town. Peterborough lies within the popular Monadnock region and receives approximately 500,000 visitors annually. One overarching viewpoint identified by the authors was "that a main priority [for the residents] was maintaining a town for the comfort of the local population and not for tourists" (Tsundoda and Mendlinger 2009, 63). These findings suggest that while a small town can encourage tourism, some residents may not be interested in their town becoming a place that is driven solely by tourist accommodation. Maintaining the town's distinct character is very important to the local residents and tourism is seen as a threat to this. When asked about high tourism rates, one long-time Peterborough resident stated "I don't think we are going to lose the character of the town. I don't think we are going to sell out because people care about the town" (ibid, 63).

Others felt that the lack of overnight accommodations impedes the level of tourism. As one resident stated, “I don’t think tourism will increase greatly because [there is] no place to stay” (ibid, 64). Some residents commented that tourists are rude and inconsiderate people, and tourism should be discouraged. Overall, the authors found that as long as tourism does not drastically alter the lives of residents, then it should be encouraged as a means of economic growth.

What Existing Studies Have to Convey

When assessing trails it is important to understand: how a community seeks to use trails; what motivates them to do so; if there are any barriers that may prohibit or deter their use; and what impacts communities and trails have on each other. The following studies examine one or more of these points.

Tomes et al. (2005) implemented a user survey and economic impact analysis that provided a number of valuable benefits to trail organizations, local municipalities, and state agencies. A complete picture of trail-user characteristics was developed: who uses the trail, where they reside, what activities they partake in on the trail, how long they are on the trail, and which sections of the trail are most popular. The survey documented how users perceived the condition of the trail and helped to identify maintenance issues. The authors suggest that these tools can help to determine whether additional amenities would improve the trail-user experience. Collecting current data on users, usage patterns, and economic impact can serve as a powerful tool to support the development of additional trails. Current facts and figures can help other trail projects gain support from local municipalities, businesses and adjacent

property owners. Data from a user study and economic impact analysis can also prove a powerful aid to researchers and organizations when submitting funding requests or applying for grants to support the development of new trails or the maintenance and upgrading of existing trails (ibid).

Lee and Scott (2002) sought to understand how demographic characteristics, intensity of involvement, and activity type affected trail users' motivations and attitudes toward trail conditions. They studied a four-mile stretch of paved suburban trail just outside of Cleveland, Ohio during the summer months. Surveys were conducted at various points along the trail on both weekends and weekdays between the peak use hours of 8 a.m. and 8 p.m. Questionnaires were administered to pedestrians and cyclists asking about their motives for trail use (e.g. exercise, enjoyment, relaxation, family togetherness, appreciation of nature). Participants were also asked to rank their opinions of physical and social trail characteristics (eg. ease of access, disruptive behaviors, overall trail design, conflicts with other users, feelings of safety) on a scale of 1 to 4. The authors ran multiple regression analyses to determine the most important variables, and found that demographic characteristics were poor predictors for trail users' motivations while intensity of involvement and activity type were good predictors. Two of the most sought after benefits were relaxation and appreciation of nature, both of which are useful in advertising rail trails to tourists. The results of this study also suggest that trail managers should seek to offer a variety of choices for users to accommodate differing levels of experience and interest. The authors conclude that at the very least, community members should be made aware of what the trails have to offer. Public awareness could be raised through promotion by parks and local businesses that may benefit financially from potential tourism.

Abildso et al. (2007) examined the relationships between the built environment of a neighborhood, social factors, and perceptions of rail trail access. The research was based in ecological theory stating, “individuals’ physical activity choices are influenced by the physical and sociocultural environments in which they live and interact” (ibid, 374). Proximity to a trail increases the likelihood of its use, but usage is also linked to the built environment and how this influences individuals’ *perceptions* of proximity. In this study, participants were surveyed via telephone regarding their use of rail trails in Morgantown, West Virginia, which, like Keene, is a college town with a population of around 30,000. Participants were asked to evaluate psychosocial barriers, such as having too little energy to exercise, and perceived walkability to the trails on a scale of 0 to 10. GIS was utilized to code respondents’ street addresses and quantify linear distance to the rail trail. Using a Chi-square analysis, the authors determined there was a significant relationship between perceived distance and trail use. Psychosocial factors were evaluated with a statistical procedure to test differences across several variables. Ultimately, the authors found that the presence or absence of some neighborhood factors were related to the perceived distance to the rail trail. These factors include: the presence of sidewalks, streetlights, other trail users, scenery, and amount of traffic. Psychosocial barriers were also found to significantly impact participants’ trail use rates.

Bichis-Lupas and Moisey (2001) examined the benefits sought by users visiting the Katy Trail in Missouri. At 200 miles, this is one of the longest rails-to-trails conversion projects in the United States. The researchers broke down benefits into five categories: escapism, exploration, nature appreciation, company, and fitness and health. Similar to Keene’s rail trail system, the Katy Trail passes through scenic landscapes and past historical markers that may also be of

interest to trail users. The researchers looked to utilize the benefit segmentation approach to gain more knowledge about potential marketing strategies. Benefit segmentation is defined as “the group or package of social psychological outcomes of a recreational purchase” (ibid, 80).

The main goal of the benefit segmentation process was to define which groups may be better targeted by trail managers and tourism promoters. Participants were asked to complete a questionnaire at the end of their recreation trip. Questions ranged from trail related expenditures to trail use patterns, and included social and demographic information (Bichis-Lupas and Moisey 2001). After completing the questionnaire, participants were categorized according to their scores. This resulted in four groups: fitness seekers, typical trail users, group naturalists, and enthusiasts. ANOVA and chi-square tests were run to statistically examine differences between groups. The results showed that it would be most beneficial to target specific groups based on profitability, accessibility, and reachability (ibid). The results indicated that many people were unaware of the offerings of not just the trail, but also the surrounding areas to which the trail provides access. The study also served to highlight important relationships between communities, tourists, and natural resource management.

In assessing the tourism potential of the Cheshire Rail Trail North, a model of tourism products is vital to provide a conceptual basis for trail management, planning, and research. Reis (2012) examined the Otago Central Rail Trail in New Zealand, and found a potential for rail trails to be assets to their adjacent communities through promotion as sustainable tourism products. The paper highlights an extensive list of characteristics (e.g. physical features, scenery, environmental aspects, dimensions, gateways and heritage) associated with exemplary

rail trail development as a tourism product and provides an array of additional sources which support and aid in highlighting these trail characteristics (Baker 2001).

The net economic value and impacts of recreational trails are derived from an individual's demand for trail visits. Bawker (2007) estimated the net economic value of the Virginia Creeper Rail Trail to trail users and local businesses in southwestern Virginia. Based on the recreational trail demand curve, the results suggest that the trail is a highly valuable asset to the people who enjoy using it and to local businesses who benefit from trail-related tourist expenditures. Integrated valuation is used to quantify the benefits of recreational trails' economic benefits that are vital for determining tourism potential (Bawker 2007).

As examined by Downward (2009), the issues linked to management are crucial to understanding the impacts of recreational tourism. Their paper explores the economic impacts and underlying behavioral responses of cyclists and their spending. The authors develop a model of expenditure on the basis of 383 travel diaries. The findings confirm that incomes, group sizes, and durations of activity are integrally linked to expenditures. The expenditures and durations of cycle trips correlate to preferences for longer journeys. This has implications for trail managers to attract all types of cyclists from the most casual leisure trip to racing cyclists (Downward 2009).

Tourism is central to the development of many regions, however understanding the complex nature of tourism and its relationship with recreational development is often difficult to determine. Beeton (2010) examines the role of rail trails for bicycle tourism and recreation in Australia. The author finds evidence that these trails bring strong economic benefit to

communities and concludes that, in order for the economic and associated social benefits to be realized, community-based planning and support is necessary (Beeton 2010).

Chapter 3: Methodology & Results



Figure 3: Western End of the North Bridge, Keene

A variety of methods were employed in this research. The statistical base of this research, which is in the form of data collection, was performed on several levels with the first being by survey. We administered two separate surveys during our research, a trail user survey and a business survey.

User Survey Methods

A survey for rail-trail users was developed to collect an array of information regarding trail use (Appendix A-1). Surveys were administered on-site to trail users during fall months of September, October and November of 2014. Surveys were administered on weekdays during daylight hours between 11 AM and 5 PM. Respondents were asked about general demographic information such as gender, age (presented as seven different ranges) and location of residence (a local resident versus someone visiting the area). Users were also asked which activities (walking/running, biking, horseback riding, snowmobiling, or other) they most utilized the trail for and what best defined their motivations for trail use (exercise, recreation, enjoyment of nature, time with family and friends). Respondents were asked how often they use the trail (daily, weekly, monthly or seasonally) and how much time they typically spend on the trail during a given period of use, with options ranging from less than 30 minutes to more than 2 hours. Users were also asked how they typically access the trail (whether directly from home, work, other accommodations, or via their car) and how far their point of origin was from the trail. In its entirety, the survey was nine questions long, taking users no longer than five minutes to complete. Questions were geared toward gathering general trail-user information as well as determining if users were mostly local residents or visiting from elsewhere, thus

touching on the tourism factor. Thirty surveys were obtained for statistical analysis. We attributed the low return rate of surveys to several causes. We had a late start when it came to administering them, many people did not want to bother to take them, and much of our time was spent on parts of the trail with very little to almost no traffic.

User Survey Results

We had intended that our survey results would allow us to explore specific hypothesis about the tourism potential the trails possess. We were initially interested in determining if there were differences between groups, such as residents and visitors, on various measures, such as frequency of trail use and motivations for using the trail. We quickly realized that our low number of returned surveys was too small to obtain any meaningful statistical results.

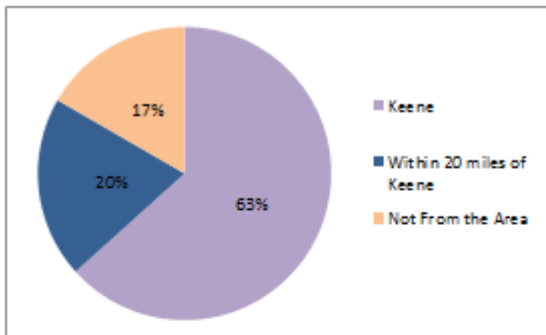


Figure 4: Where Trail Users are from

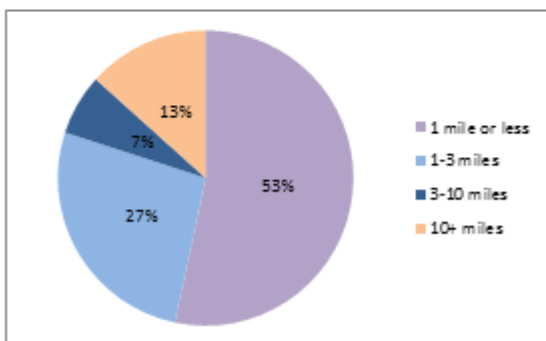


Figure 5: Distance from trail

Instead, we used descriptive statistics to discern several patterns in the data gathered from the people who we surveyed on the trails. Tourism does not appear to have a strong or active influence in drawing people to the trails. A majority of the people that were using the trails were from Keene or nearby. We had five surveys taken outside of downtown but none of them were taken in Walpole or Westmoreland. This was influenced by our location in the city, where

most of the survey takers were encountered. Once away from the city and west of the North Bridge, we encountered people less frequently. After we rode past the golf course at the Keene Country Club, people on the trails became few and far between. There were obvious signs that the trails received daily use by bikers and hikers but the further away from Keene we traveled the less used the trails appeared to be. These observations are consistent with the bike count data that was also collected. (Appendix B-2)

When completing the survey, the takers were able to check multiple categories for motivations of use. Everyone who took the survey cited either exercise or recreation as motivation for using the trail.

About 85% of survey takers said they use the trail for walking and or running and about 75% said they use the trail for biking.

Almost 80% of the people use the trail at least monthly. About two thirds of the people on the trails were either under 25 or older

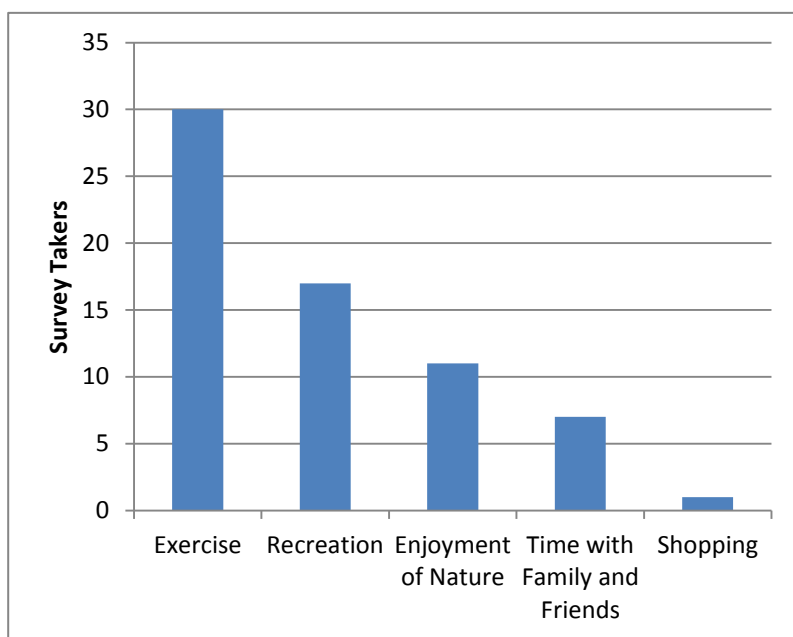


Figure 6: Motivations for Trail Use

than 55. With that, about two thirds of the people said they spend typically half an hour to an hour on the trails. There is possible bias here because of the times that we surveyed people.

Most of the working class, the people in the age cohorts between 25 and 55, were probably at work when we were on the trails. This would explain absence of that part of the sample population.

The majority of the people who are using the trails are probably locals and utilize the trail because of their proximity to it. More than 75% of the people on the trail live within three miles of it. Most tend to stick to the paved section of the trail in the City of Keene and use the rail-trail as a way to get out and be active. Within the city the trail is used much more frequently by people who are walking it although there are a considerable number of bikers as well. Outside the city, the most common activity is biking but there are also people walking and running on the trails. We conducted the surveys during the fall semester. As the temperatures started to drop, so did the number of trail users.

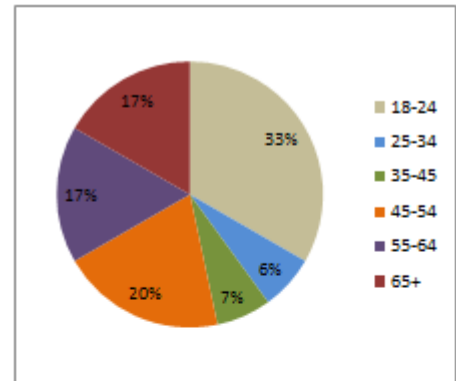


Figure 7: Age Range of Trail Users

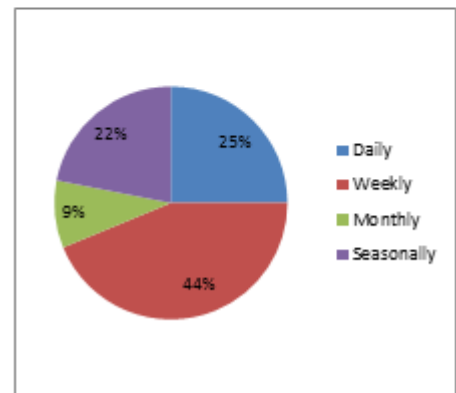


Figure 8: Frequency of Use

Business Survey Methods

In addition to surveying trail users, we developed a survey to gather data with regards to how, if at all, local businesses are utilizing and promoting the rail-trail to potential customers. Business survey questions were oriented towards tourism. Businesses were asked general information such as name and size of business and their proximity to the trail. Respondents were also asked if they utilize the trail for their business and what season is busiest for them. Businesses were asked how strongly tourism impacts their business, what percent of annual income could be attributed to tourism, and where tourists who frequented their establishment

were traveling from. To determine businesses' interest in trail maintenance and promotion, they were asked if they might be willing to give an annual donation for trail upkeep and whether they might be more willing to donate if their business received promotion for doing so.

Group members distributed paper copies of business surveys on-site during business hours on weekdays. Surveys were also administered to businesses by email. Surveys sent via email were developed through a web platform called Qualtrics. Qualtrics allows for the creation of a user friendly, interactive survey that leads participants through the survey questions step by step. With the Qualtrics format we were able to reach several business around the area that we were not able to visit in person. With the paper surveys, we were able to present a friendly and personable impression upon local businesses.

Business Survey Results

Thirty surveys were obtained for analysis. Within these results, we were able to recognize several trends about the businesses in the area and their relation to the Cheshire Rail Trail North. Of the businesses that we questioned, 80% were located within one mile of the trail and almost 90% of the businesses said

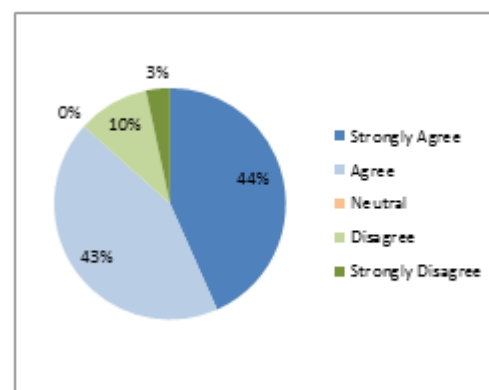


Figure 9: Does Tourism Impact your Business?

tourism did impact their business. Their percent of income from tourism ranged greatly with no discernable pattern. This is good for the Keene and Cheshire County economy, but not necessarily for the bike trails. There are several sections that run through downtown Keene

that people frequently use, but tourists are not coming to the area specifically to use the trails. 80% of these businesses do not promote the trails. About 95% of the businesses do not utilize the trail in any way.

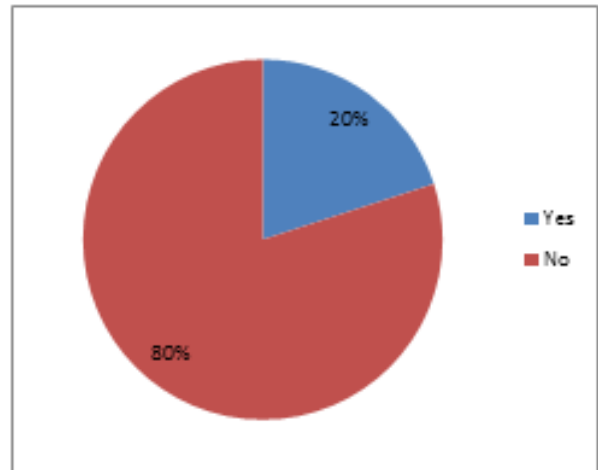


Figure 10: Does Your Business Promote the Trail in Any Way?

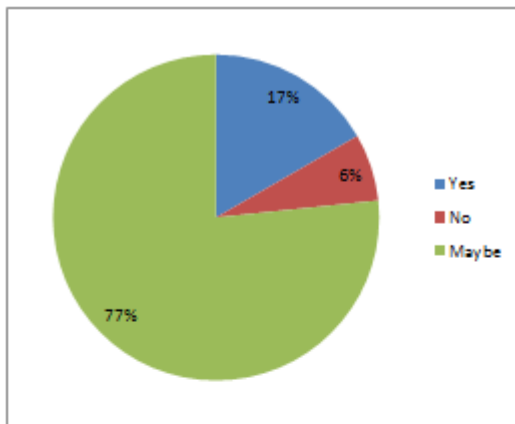


Figure 11: Would your business be willing to give an annual donation to help maintain the trail?

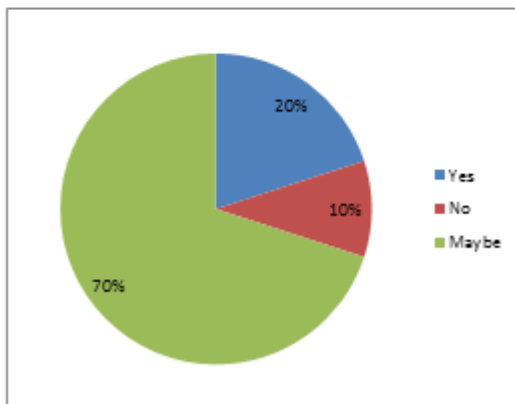


Figure 12: Would your business be willing to do so if you received promotion for doing so?

We asked two questions about whether businesses would be willing to support the maintenance of the trail. We asked, “Would your business be willing to give an annual donation to help maintain the trail?” and “Would your business be willing to do so if you received promotion for doing so?” Around 70% of the businesses stated ‘maybe’ to both questions, while about 20% said ‘yes’. The majority of the places that said ‘yes’ to both questions were locally owned stores and businesses. The places that said ‘no’ were typically the corporately owned businesses. This shows that local businesses might be willing to work with towns along the trails, specifically

in Keene, to increase cycling tourism. The bike paths are a beautiful asset to the towns which

they run through but they are underutilized and under promoted by the businesses of the area. The minimal populations in the towns of Westmoreland and Walpole also affect the lack of use and promotion of the Cheshire Rail Trail North, but the City of Keene has the potential to attract tourists.

Trail Assessment Methods

An examination of the physical conditions of the Cheshire Rail Trail North was a vital component to this research. Research members collected data pertaining to physical rail-trail conditions for the entire length of the approximately 22-mile trail segment stretching from downtown Keene to the outskirts of Walpole, New Hampshire. Data collection forms were developed to efficiently gather a predetermined set of trail attributes, as well as to ensure consistency across data collection periods (Appendix B-1). Attributes regarding the trail itself, as well as the surrounding area, are both important elements for the examination of tourism related to the Cheshire Rail Trail North. Trail point attributes such as trail surface conditions, road crossings, gates, natural obstructions, bridges, evidence of ATV and horse activity, and points of interest were marked with a GPS waypoint number, an identification photo and any other notable observations. Off-trail point attributes such as lodging, retail sites, worksites and entertainment were noted in a similar manner. Other important data points that were noted during collection include the length of the segment being observed, last known time of rainfall, and the direction of travel from downtown Keene (inbound or outbound). The use of a handheld GPS unit allowed for each waypoint feature to be easily and accurately recorded and later used in the process of mapping and analyzing the physical trail conditions.



Figure 13: Group Members Collecting Data

The primary data gathered for each GPS waypoint represents the physical condition of three main attributes: the trail surface, the trail moisture, and the surface texture. The trail surface is defined as being paved, concrete, dirt, gravel, stone dust, sand, grass, or other. The trail condition was measured as being either wet or dry (>50% wet/dry) and includes records for potential hazards such as standing water puddles and muddy conditions. The surface texture identifies whether the trail is smooth, lightly rutted, very rutted, or other at a waypoint location. The collection of these features aids in determining whether or not the physical conditions at various points along the Cheshire Rail Trail North are conducive to trail use by walking or cycling. A full list of trail attributes gathered can be seen in the Appendix.

Physical assessments of the Cheshire Rail Trail North took place in six different data collection periods, with a total of 110 individual GPS waypoints gathered over approximately twenty miles. The previously mentioned attributes were systematically assigned to each

waypoint according to their relevance and stored within a handheld GPS unit. The entirety of waypoint assessments was then gathered and organized using Microsoft Excel, to prepare the raw data for visual representation. The analysis of this data was performed using GIS techniques such as linear referencing and weighted overlay.



Figure 14: Group members Varick, Dyllyn, and Kat.

Mapping Methods

With the waypoint data formatted, we proceeded to use ESRI ArcGIS 10.2 Software to visually represent trail attributes in maps. The creation of maps allows individual portions of the trail to be represented according to physical condition. The three primary attributes tied to the condition of each trail waypoint feature were combined to determine the overall “rideability” of that portion of trail. This allows us to determine whether or not various portions of the Cheshire Rail Trail North are favorable for walking or cycling and at what level of difficulty. This method required the use of weighted overlay, a helpful tool also referred to as integrated valuation methodology, used to create an aggregated score of attributes along a linear feature. The trail was segmented using each waypoint that corresponds to the physical trail. These physical attributes were later scored and combined to visually highlight the ‘rideability’ rating.

In addition, any natural obstructions such as a fallen trees or washouts were highlighted and accounted for when analyzing the physical condition of the trail.

Prior to the use of weighted overlay, the waypoint attributes representing physical attributes of the trail conditions (moisture, surface, and texture) were converted from X,Y, locations to linear references. Linear referencing is a method of storing geographic locations by using relative positions along a measured line feature rather than X,Y, coordinates. Distance measures from a common starting point are used to locate events along a road, river or other network feature.

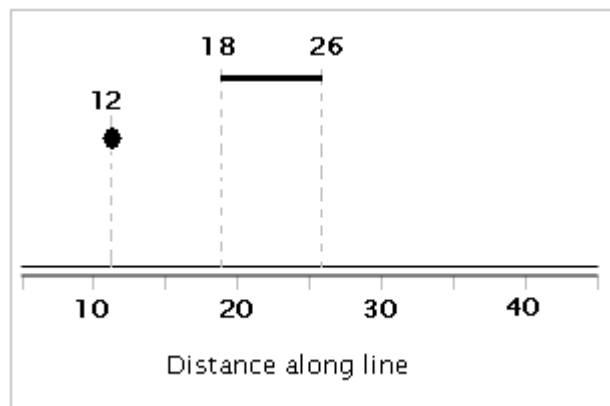


Figure 15: Linear Referencing

Both point events and line events can be located along the line (Figure 15). The use of linear referencing is convenient for referencing multiple overlapping attributes on the same line such as the three trail attributes, surface, moisture, and surface texture. This method avoids having to split line features into many

segments, and also supports line segmentation using more than one variable at a time (ESRI 2014).

The various steps required for linear referencing are as follows: First, all waypoint features collected were organized into a master file in Microsoft Excel, and were given a unique identification number. Next, our assessment sheets were updated with the new identification number. Waypoints representing point attributes such as culverts or signs were then removed. Next, GPS track features that were collected with each GPS waypoint were edited in order to

correspond to the visible trail in air photos. The GPS track was then converted to a route feature using the 'Create Routes' tool in the linear referencing toolbox. Routes are distinctive from lines, as they allow features to be represented as measures, rather than X,Y, locations. The 'Locate Features Along Routes' tool was then used to assign each waypoint a linear reference based on its distance from the starting point in Keene. A trail condition marked at waypoint 1 was assumed to continue to waypoint 2. Each point was used to determine 'to' and 'from' points corresponding to the physical attributes tied to each recorded segment along the

Cheshire Rail Trail North (Table 2).

Ident.	Measure
1	.194
5	.250
8	1
15	1.5
27	2.10

LineID	RouteID	From_M	To_M	Condition
001	1	.194	.250	Paved
002	1	.250	1	Stonedust
003	1	1	1.5	Gravel
004	1	1.5	2.10	Paved

Table 2: Linear Measurements

After these tables were created, the primary attribute table was then updated to include the new measurement attributes vital for scores derived from both linear referencing and weighted overlay. The layer was then imported into ArcGIS to serve as an event table, which was displayed using the 'Display Route Events' option from the Rail-Trail route layer. A visual representation of the result of this process, shown in the appendix, displays the three main waypoint attributes, trail moisture, trail texture, and trail surface represented using three

separate line features and symbolized using color as an interpretive method of analysis (Table 3).

	1		3		5			
Moisture	Pool		Wet		Dry			
	1		3		5			
Texture	Very Rutted		Lightly Rutted		Smooth			
	0	1	1	2	2	3	4	5
Surface	Impassable	Other	Sand	Grass	Dirt	Gravel	Stone dust	Paved
Score	0	1		5		10		15

Table 3: Weighted Overlay

The purpose of implementing weighted overlay is to allow the representation of multiple types of condition features along the same line. Each trail attribute can be converted to a separate line representing a particular category of trail condition. All three layers (surface, moisture, and texture) could then be scored, or weighted individually. Each of the values for line segments within these layers was then given a rating between 0 (impassible) and 5 (best). For some layers, features could be classed within the same category, while for others there were fewer than five categories (Table 4).

Trail Surface	Impassable	Other	Sand	Grass	Dirt	Gravel	Stone dust	Paved
Rating	0	1	1	2	2	3	4	5

Trail Texture	Very Rutted	Lightly Rutted	Smooth
Rating	1	3	5

Trail Moisture	Pool	Wet	Dry
Rating	1	3	5

Table 4: Condition Score

With each segment within each trail condition now scored from worst to best, the next step was to combine these layers into a combined score. An intersect was performed in ArcGIS to combine all three line features into one shapefile. The file was then combined with an additional line file that contained segments with a rating of zero to indicate an impassible trail surface, and one to indicate passable.

The impassible score of zero was then multiplied by all line segment scores, so that ‘impassible’ would override any other condition. The original score remained the same for all passable segments.

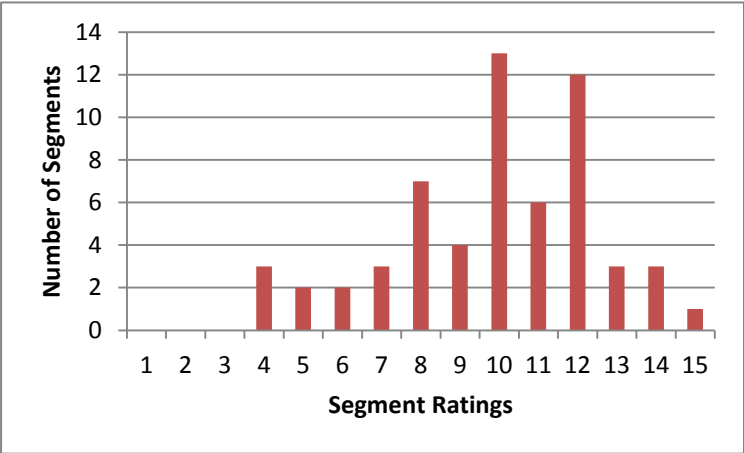


Figure 16: Rating Results

Trail Assessment Results

After gathering, organizing, and analyzing data pertaining to the physical conditions of the Cheshire Rail Trail North, several conclusions can be made. The results from this process indicate that a large majority of trail segments are rated as being in good condition. The overall condition of the Cheshire Rail Trail North is however in need of improvement, indicated by a range of ratings below what is defined as being a good rating (Figure 16). Several key segments along the northern stretch of the trail need considerable work and maintenance in order for this to be a safe and potentially profitable tourist attraction. The ‘rideability’ rating derived from the use of weighted overlay provides clear evidence that the physical conditions of

portions of the Cheshire Rail Trail North are safe for use by potential tourists and local residents alike (Appendix C-5).

As indicated in the map, it is clear that the portions of trail within Keene, and especially those near downtown received the highest ratings (Appendix C-5). The portions of trail which experience the highest valued rating (14-15) stretch from the trailhead at Island Street located near downtown Keene and end near Whitcomb's Mill Road, an approximately 2.2 miles long segment. The physical features responsible for this rating include pavement or stonedust trail, dry trail conditions and a smooth surface. These conditions and proximity to a large population of potential trail users appear to support the heaviest user rates in bike counter data (see next section). The segments of trail within and near Keene are best maintained and are highlighted as the most "rideable" when compared to the trail as a whole.

It would appear that the overall physical condition of the trail is conducive to use as a potential tourist product. However, additional work is needed to upgrade several segments of the trail, especially those located furthest north. This includes a segment of trail in Walpole approximately .7 miles in length that is completely impassable as highlighted in red on the final map indicating a 'rideability' rating of 0. Through a discussion with an unnamed land owner at the site, it was pointed out that this section of impassable trail has been unused for a number of years due to a collapsed bridge. This bridge was originally built for the use by locomotives but clearly suffered from the lack of maintenance over the years. The remainder of the Cheshire Rail Trail North was then accessed by a detour of approximately .6 miles, traveling north on Bookseller Road, then continuing left onto Halls Crossing for an additional .2 miles to the nearest trail access point.

The most remote northerly segments of trail are located in Walpole and these reflect the worst overall conditions of the entire trail. The features which contribute to the final rating of poor “rideability” (between 3 and 6) for these segments include a varied trail surface of gravel, dirt or other. This region also includes a segment of trail that crosses a large field that is cultivated by a local farmer. This trail segment begins just west of River Road and stretches for approximately .3 miles northward, parallel with NH Route 12. Other segments of this trail have a very rutted texture and wet conditions that include a number of water pools and mud. These conditions contribute to the low overall score for this section of trail. The northernmost portions of trail also experience the lowest user rates when examining the virtual day count from bike counters (see next section). Another contributing factor to the poor rating of these locations is due to the use of ATVs along a number of segments, which lead to very rutted surface textures.

The segments of trail furthest North are in relatively poor condition due to an inadequate network of hydrologic features such as culverts, ditches and drains; the illegal use of ATVs that create a poor and very rutted surface; and lack of proper maintenance to various features such as bridges. A number of washouts along the middle to upper portions of the trail were noted as being caused by improper drainage either due to unmaintained culverts or the complete lack of culvert drainage. These segments of trail experience the lowest number of trail users in a virtual day, and highlight areas in which the greatest amount of maintenance must be performed in order to use the Cheshire Rail Trail North in its entirety as a potential tourist product. A positive, despite the overall trail conditions of the northern segments of trail, lies in its setting in the picturesque Town of Walpole. A number of viewsheds, highlighted on the map

to indicate their location, are key tourist attractions and hold potential for the development of the rail-trail as a tourist product.

The middle portions of the Cheshire Rail Trail North stretching from northwestern Keene to the Walpole/Westmoreland town line are in relatively good condition as illustrated in the final map. The ratings in this section vary between 9 and 13, as highlighted in colors of yellow and green on the map. These scores are a product of physical trail conditions such as a varied surface of stone dust, gravel and some dirt and grass, an overall dry trail moisture condition, and a lightly rutted surface. The middle segments of the trail are in relatively good condition, highlighting the potential for upgrades and additional maintenance in the future.

Bike Counter Methods

To fully understand the amount of use on the Cheshire Rail Trail North, we needed an accurate measurement of user rates. To obtain these measurements of user rates SWRPC deployed five bike counters at strategic points along the trail. These pneumatic counters were designed specifically for the measurement of bike users using a rubberized triggering method. The counters were not intended for counting pedestrians on foot.

The bike counter itself is a rather simple machine consisting of a pneumatic sensor, battery pack, three small LED bulbs used for indicating various modes of activation, and two adaptors for the connection of rubber tubing. These tools are concealed from the elements in a specially designed plastic container that fits inside a metal two-part container. The rubber tube is placed perpendicular to the flow of traffic and is held in place by two large nails located along the right and left hand shoulders of the trail. The tube is knotted at the end furthest from the

counter, while the nearer end fits snugly onto the in/out adaptors to allowing the pneumatic sensor to be triggered each time the rubber tube is compressed. The compression of the tube triggers the sensor that is responsible for counting and provides an accurate measurement of the number of bikes that pass that point of the trail.

Each bike counter deployment requires the use of a laptop computer in the field. To begin, the counter must be turned on and connected to the laptop, which contains software specific for collection and analysis of traffic-related data. The counter was designated a specific location with allied description using the laptop computer. A set of instructions prompted each counter to begin counting after a full hour's time. After being deployed for a full week, each counter was then gathered and the data was promptly uploaded and organized in the field using the laptop computer.

During the months of September and October, six counters were deployed for a full week (Table 5) at a total of eight locations along the Cheshire Rail Trail North. Data were gathered and then organized in Metrocount Traffic Executive v4.05 prior to analysis.

<u>Counter ID</u>	<u>Town</u>	<u>Date (2014)</u>	<u>Counter Description</u>
Bike 22	Keene	Oct 21-Oct28	Cheshire Rail Trail West of Pearl Street
Bike 23	Keene	July 29- Aug 4	Cheshire Rail Trail West of North Bridge
Bike 28	Keene	July 29 - Aug 4	Cheshire Rail Trail West of Transportation Center
Bike 38	Westmoreland	Sept 30- Oct 7	Cheshire Rail Trail North, West of NH 12 near Westmoreland/Surry TL
Bike 39	Westmoreland	Sept 23-Sept 30	Cheshire Rail Trail North, North of Aldrich Road
Bike 40	Walpole	Sep 30-Oct 7	Cheshire Rail Trail North, South of Blackjack Crossing
Bike 41	Walpole	Sep 30-Oct 7	Cheshire Rail Trail North, North of River Road
Bike 42	Walpole	Sep 30-Oct 7	Cheshire Rail Trail North, North of NH 123

Table 5: Counter Locations

The data collected from the pneumatic counters was organized in several ways. It is standard procedure to give each counter a full week of exposure to a given point along the trail in order to gather an accurate sample of data. The number of triggers representing individual bike users at each counter's location was measured and grouped into 15 minute segments. Each 15 minute segment was then compiled into hour and day segments to form a full week of deployment. This method of organization allows for the detailed analysis of raw data pertaining to each 15 minute period of that week.

A second method of organizing bike counter data is through the creation of virtual days, a term that describes the daily average number of bike users at a given point along the trail. This average is used to simplify what is otherwise a large data set, into a more easily interpreted form. The virtual day allows one to see both the daily average number of biker users and the AM and PM peak number of bike users at a given location (Table 6).

* Virtual Day=196, 15 minute drops																							
0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
1	0	0	0	0	0	2	2	5	6	8	10	16	17	15	16	20	22	19	11	13	5	4	3
0	0	0	0	0	0	0	1	1	1	1	2	5	3	3	4	6	10	4	3	6	2	2	1
0	0	0	0	0	0	1	0	1	1	3	4	4	5	5	4	4	3	4	3	2	2	0	1
0	0	0	0	0	0	1	0	1	2	2	2	4	5	5	4	5	5	9	2	2	1	1	1
0	0	0	0	0	0	1	1	1	2	2	3	4	4	3	3	5	4	3	3	3	1	1	0
AM Peak 1145 - 1245 (15), AM PHF=0.83 PM Peak 1615 - 1715 (23), PM PHF=0.61																							
Numbers have been rounded to the nearest integer.																							

Table 6: Virtual Day

The top row of the table indicates the hour of each day and the second row indicates the total number of bikes counted in that hour. The numbers below these rows highlight the number of bike users within each fifteen-minute segment of that hour. The bottom row of information highlights the AM and PM peak in bike user rate, in this example the AM peak is between 11:45 and 12:45 with a total number of fifteen users.

Data can be inaccurate due to several elements such as the triggering of the counter by something other than a bike, for example an ATV or similar type of vehicle. Data can be inaccurate due to not having a full week of exposure as well, yet the software Metrocount Traffic Executive v4.05 allows the analysis of segmented portions of a given week.

Bike Counter Results

After deploying all five counters for a full week at each of the previously mentioned locations along the Cheshire Rail Trail North, they were gathered and the process of extracting the data began. The use of Metrocount Traffic Executive v4.05, software designed specifically for analyzing traffic data, was used during this process. The data for each bike counter was gathered immediately upon attaining the counter by connecting it through fire wire to a laptop running the software.

Once the data download was completed, the creation of reports was produced for each location. The first report contained the raw data for each 15 minute segment for the duration of the entire week. The second report contained the virtual day, or the average daily number of bikers, for the duration of that full week (Appendix B-2). This data was imported into Esri ArcMap, a software designed for spatial representation and analysis, to create a graduated symbol map that displays the average number of bikers per day at each bike counter location along the Cheshire Rail Trail North (Appendix C-6). This map can be used to easily determine what locations along the trail experience the largest number of bike users.

Clearly, segments of the Cheshire Rail Trail North closest to downtown Keene experience the highest number of trail users where an average virtual day indicated 196 individual bike users. As the trail extends to the northwest the average number of trail users decreases. The highest average number of trail users was 200 bike users measured in a virtual day at the North Bridge, which spans Routes 9, 10 and 12. The large number of trail users counted near downtown Keene is explained by the ideal trail conditions and the close proximity to a dense population.

The bike counters deployed along middle portions of trail reveal low numbers of trail users. This also coincides with moderate trail conditions and a less dense population when compared to downtown Keene. A number of homes are located near these trail segments, which potentially contribute to the majority of bike counter data collected.

Bike counters deployed at trail segments furthest to the north in Walpole revealed the lowest number of trail users, highlighting the potential for further development and marketing

of these segments. Due to the evidence of ATVs throughout these segments, it is important to note that any counter data acquired here may not represent bikes alone.

Interview Methods

To provide additional context for understanding current and potential use of the rail-trails, a series of interviews was conducted. These interviews provided background knowledge, answered specific trail-related questions, and established how interested parties would like to see the future of the rail trails develop. A semi-structured format was used, in which questions from interview to interview were kept similar to allow for comparison. Seven questions were asked per interview, as we anticipated that information provided by the interviewees would lead to additional questions. Note taking was the primary method of data collection during the interview process. Additional pertinent questions were asked depending on the subject. Subjects include those who have been involved with bicycle and pedestrian coalitions, city council members, and other town administrators.

Four separate interviews of five individuals were conducted. We met with the Director of the Historical Society of Cheshire County, Alan Rumrill; with the chairman of Keene's Bicycle Pedestrian Path Committee (BPPAC), Greg Pregent; with board members of Pathways for Keene, Chuck Redfern and Frank Richter; and Andy Bohannon, the director of Parks and Recreation for the City of Keene. The interview times ranged from fifteen to forty-five minutes.

The first interview was conducted with Alan Rumrill on August 26, 2014. Rumrill shared his insight about the history of Keene and its railroads. He pointed out that the trains traveling through Keene at the beginning of the industrial revolution were what brought people and

economic stimulus to the area. This included Keene, but also places like Brattleboro and surrounding towns and villages. By 1850, the trains traveling through this area reached from Boston to Montreal to New York City. Their popularity and use started to dwindle at the turn of the twentieth century, when automobiles became popular. Of course, without the trains, the rail beds would not exist to be converted into bike paths beginning in the 1980s.

The second interview with Chuck Redfern and Frank Richter occurred on October 13, 2014. Chuck Redfern and Frank Richter talked about the origins of Pathways for Keene and shared their views on the potential for rail-trails to generate tourism. Pathways for Keene is a non-profit organization dedicated to promoting and preserving alternative sources of transportation in Keene and receives its funding through private- public partnerships. It was established in 1994 by Redfern with the help of John Summers, who gave him the idea to start a non-profit. Since then, it has created fifteen board positions and has raised over \$335,000. It receives most of its funding from the Transportation Alternatives Program (TAP), part of the Federal Department of Transportation. Additional funding also comes from Pathways for Keene's annual 'Four on the Fourth' road race.

Redfern stated the challenges that the organization faces, ranging from fundraising to preservation of historic features, such as the stone arch bridge near Route 101 in Keene, to working with private landowners along the trail in Westmoreland and Walpole to mitigate the use of ATVs on the trail. Redfern expressed his wish for the state to provide greater authority, serving as a steward of the rail bed for private owners.

When asked about the trails' potential for tourism, Redfern cited the Walpole Winery, a fairly large tourist attraction in Cheshire County. He believes that if they were to advertise and

market the trail to the tourists, it could generate more traffic to the Cheshire Rail Trail North. He also mentioned that Pathways for Keene has distributed about 50,000 maps of the rail trails to over ninety locations throughout New Hampshire, Massachusetts, and Vermont. Most of the locations were either liquor stores or trail-related businesses that could potentially see economic returns from more visitors to the area.

The third interview with Greg Pregent took place on Monday November 3, 2014 at the Monadnock Radio Group in Keene. Pregent, Chair of the Bicycle Pedestrian Path Advisory Committee (BPPAC) and radio announcer at Monadnock Radio Group, shed light on the rail-trails in Cheshire County and potential improvements that could be made in the future. He stated that while the Cheshire Rail Trail North is in a prime location for potential tourism, the Ashuelot Rail Trail, which is in close proximity, is “in poor condition” and has a longer way to go in terms of becoming a tourist attraction. Pregent stated that if a bridge over Route 101 in Keene were to be built, it would increase tourism along the Ashuelot Rail Trail. However, he mentioned that Route 101 is a state highway, and it is up to the state to erect the



Figure 17: Permitted Trail Use Sign

bridge. In his opinion, even if the state is given the money, it is not guaranteed that they will implement the change.

Pregent cited some challenges that BPPAC faced in terms of development and management of the trails. He first mentioned that the Colony Mill, a shopping center in Keene that the trail traverses, has been difficult to work with in terms of putting up signs to notify people of the trail. The trail gets lost through parking lots and buildings of the office and retail complex known as the Center at Keene. Pregent mentioned that in general, more signage would be very helpful for boosting traffic on the trails. Another problem he mentioned was the use of illegal ATVs and motor bike riding on the trails outside of Keene, which destroys the condition of these non-paved areas. He hopes to see greater penalties in the future for these offenders and increased signage along the trails so that these incidents can be prevented.

Pregent stated that tourism along all of the rail trails could be increased if local businesses implemented simple ways to attract tourists. For example, there are many businesses along the Cheshire Rail Trail North in downtown Keene that could promote it, such as hotels, the Monadnock Food Co-op, Andy's Bike Shop, and numerous restaurants. One example he gave of promotion is through the use of social media, which he feels is currently lacking. He also mentioned that the businesses could show his YouTube videos of the trails so that customers and tourists become aware of their existence and recognize that they are an asset within the community. In his opinion, social media about the trails can only benefit the community as a whole, with the promotion of the trails bringing more business into the city.

He also mentioned that there is not a lot of promotion in towns outside of Keene for trail use because tourism is not a large segment of the economy in these towns.

In the future, Pregent hopes that town governments will take a greater initiative in the management and promotion of the trails. He mentioned that the towns of Hinsdale and Brattleboro must invest in building a bridge over the Connecticut River for rail trails. Swanzey is the only town outside of Keene that has made any efforts to improve and maintain the trails. They accomplished this by making contacts with the Department of Transportation (DOT) and the New Hampshire Department of Resources and Economic Development (DRED). He concluded that come December, his four year term as BPPAC chairman will expire. He has plans for developing a “Friends of Cheshire Rail Trail Group” with Chuck Redfern in the spring of 2015. The goal of this organization will be to work closely with the state to make sure that plans for improvement of the trails are implemented.

The fourth interview was with Andy Bohannon and took place on November 25, 2014 via telephone. As the director of the Keene Parks and Recreation Department, Bohannon also believes that tourism to the Monadnock region can be improved as a product of the trails. He mentioned that increased tourism to the city of Keene alone will eventually provide greater traffic to the trails. When asked about ride-ability, he sees the Cheshire Rail Trail North as one that lends itself to all ability levels. He considers it less difficult than the Drummer Hill and Goose Pond bike trails of the region. He also remarked on the condition of the rail trails in Keene, stating that they are in excellent condition and the addition of the North Bridge has increased awareness of the Cheshire Rail Trail North throughout the region.

Bohannon also touched upon ways that the Parks and Recreation Department has made an effort to promote the trails. They have established a dedicated Facebook page, website and some videos of the trails, which he believes has helped to bring more people to them. As Chuck Redfern mentioned, the creation and distribution of brochures of the trails is something that the Parks and Recreation Department has implemented and they have been distributed along the Interstate 91 corridor as far south as Holyoke and Springfield, Massachusetts. The number of brochures distributed has also greatly increased since 2013, when 12,000 brochures were distributed to hotels and liquor stores. In 2014, that number increased to 45,000. Clearly, there has been a significant effort on the city's behalf to promote the trails of the Monadnock region.

Bohannon is also familiar with positive feedback from trail users. He mentioned that multiple community groups have adopted different sections of the trails and are involved with the maintenance and improvement of their section. He stated that this has encouraged more people to become involved with the trails than ever before, and awareness of the trails is definitely increasing.

It is clear that our interview subjects have similar ideas on ways to improve tourism rates to the area and the trail itself. Both Redfern and Pregent mentioned the businesses near the trail that have the potential to promote it through advertising. This would be beneficial for both the businesses and the trail as it could attract more people to the area. Both also mentioned ways they have promoted the trail through map distribution and YouTube videos;

increasing tourism to the trail is something that they would both love to see happen. Some differences lie within the context of social media promotion. While Pregent believes that social media is not as strong as it needs to be, Bohannon stated that the City's website and Facebook page is updated and dedicated. There is also a desire among our interview subjects for state and local governments to become more involved in maintenance and promotion of the trails. There needs to be a greater commitment from businesses to advertise the trail and recognize its potential. The interviewees remarked on the poor physical condition of some portions of the trail and the impact it has on people using it. They expressed their hopes that in the future these unmaintained parts of the trail will be improved.

Chapter 4: Discussion and Conclusions



Figure 18: Road Crossing

In conclusion, we found a number of underlying themes of the trail. It appears that the unpaved parts of the trail, which compromise a large majority of it, are somewhat of a hidden gem. Outside of downtown Keene, the bike paths are under-promoted and under-utilized. This beautiful bike trail network that runs through Keene and several towns to the north is an asset to the region and should be promoted and used as such. This trail network has the potential to be a positive economic generator for the area. We found that tourism is most assuredly present in the Monadnock Region, which means that it has the potential to permeate from Keene to the surrounding areas with the trails as a good medium for this. It is only a matter of raising awareness of the trails and getting people to come to the area to use them.

We found that regular maintenance is vital to keeping the trails in good, useable condition for the public. Since they were first built, there have been many improvements to the trails. Adding the North Bridge and paving the portions in and around downtown Keene has made the trails more user friendly and subsequently increased the number of people who use them. But outside the city, trail conditions are generally poor. To the north in Walpole, there are several segments that need to be repaired before any bikers or pedestrians can use the trail. There are also several potential hazards that could develop if not attended to soon. There are many good portions of the trail, too. There are multiple vistas and points of interest that make the Cheshire Rail Trail North unique. These are the places that could be capitalized on when trying to bolster tourism along the trails.

Ultimately it is up to the towns that the trail runs through and the regional volunteer organizations to maintain and promote them. This could happen through social media or

through more traditional forms of advertising. The trails are an asset and should be promoted more to make more people aware of their hidden allure. While awareness of the trail in Keene is relatively high, there is still room for improvement in the way of signage. If the locals are not talking about the trails and promoting them, then the tourists are not going to know about them and ergo they are not being used as tourist attractions. Also, if the towns of Walpole and Westmoreland were more proactive in the advertisement of the trail, the Cheshire Rail Trail North might be able to really prosper. If trail conditions were to be improved to match those in Keene, more people might use them and in turn, more money would be generated via local businesses.

Limitations and Changes

The major limitation we found ourselves up against over the course of our research was time. This was true not just in terms of accomplishing tasks to meet deadlines, but also when considering the time our study. Our surveys were completed during the fall months. This means that we only gathered data for one season of use on the rail-trail. It would have been useful to develop our surveys earlier in order to distribute them throughout the summer months, thus capturing a larger group of trail users that might represent a different demographic (i.e. summer tourists). Developing our surveys earlier would have also led to potentially more returned surveys. Although 30 surveys is said to be the minimum number necessary to run statistical analyses, many of the tests we were interested in running required grouping respondents into smaller numbers for comparisons. This limited the power of any statistical tests we might run. It would not be unreasonable to try and obtain over 100 surveys

over a longer period of time. With more surveys, a statistical analysis of the answers would yield a more meaningful result. Also, with more surveys, more people on the trails would have been reached resulting in more people being made aware of and thinking about tourism and the connection to the trail.

In terms of the surveys themselves, there are a few changes we would implement if we were to continue our research. On the trail user survey, we would reorder the questions to flow more sensibly. We would also add the option of “shopping/errands” under the “motivation for trail use questions.” The third option, 3-10 miles, under the “How far away from the trail is your workplace, home, or other accommodation?” should be changed to 3.1-10 miles to avoid overlap. For the online portion of the business survey we would allow for the selection of more than one season in the “What season are you busiest?” question. The question regarding tourism impacting business should be changed to a statement instead of a question because respondents are asked to evaluate the statement with a Likert scale. For both surveys we would add a comments section to allow for helpful feedback that may not be covered by the questions. Again, if we had more time we would be able to adjust and redistribute a new survey, and consider our first round of surveys as a ‘pilot study’.

Recommendations

One addition to the trails we thought would be helpful is the implementation of signs. These would aid users in finding their bearings as well as provide information about the surrounding area. It would be beneficial to have trail maps at each road crossing or stop so that users know exactly where they are, how far they have come, and how far they have to go

to the next stop. A simple map of the towns and trail with a 'You Are Here' marker would help people feel more comfortable as they travel further away from Keene. In addition, the maps could denote other information such as points of interest and local businesses that are on or close to the proximity of the trail. This would be an easy way to promote local businesses that could in turn potentially boost tourism. Business could even sponsor the signs. They could advertise what they have to offer, their hours, and where they are located in relation to the trail. In turn, they could also promote the trail at their place of business.

The addition of historic markers on the trail might also be interesting to tourists. Places of historical significance could be denoted with a marker that talks about what occurred and its significance in relation to the trail. This would provide trail users with background information and offer them a further connection to the trails. Trail markers and signage create the opportunity for connection that in turn might make people more likely to utilize the trails and talk about them with other people.



Figure 19: Gate on the trail ~ 49 ~

Literature Cited

Abildso, C., S. Zizzi, L. Abildso, J. Steele, and P. Gordon. 2007. Built Environment and Psychosocial Factors Associated With Trail Proximity and Use. *American Journal of Health and Behavior* 31(4):374-383.

Baker, T.R. 2001. A Method to Assess the Potential Value of Railway Corridors as Recreation Trails: A Case Study of Three Nova Scotia Rail-Trails. Dissertation (Master's in Urban and Regional Planning). Queen's University.

Beeton, S. 2010. Regional Community Entrepreneurship through Tourism: The Case of Victoria's Rail Trails. *International Journal of Innovation and Regional Development*. 2(1-2): 128-148.

Bichis-Lupas, M., and R. Moisey. 2001. A Benefit Segmentation of Rail-Trail Users: Implications for Marketing by Local Communities. *Journal of Park and Recreation Administration* 19(3): 78-92.

Blue, Elly. 2011. *The grand tour: how bicycle tourism helps local economies*. GRIST.
<http://grist.org/biking/2011-06-06-the-grand-tour-how-bike-tourism-helps-local-economies/>
(last accessed 15 November 2014).

Bowker, J.M., J.C. Bergstrom, and J. Gill. 2007. Estimating the Economic Value and Impacts of Recreational Trails: A Case Study of the Virginia Creeper Rail Trail. *Tourism Economics*. 13(2): 241-260.

Downward, P.L., L. Lumsdon, and R. Weston. 2009. Visitor Expenditure: The Case of Cycle Recreation and Tourism. *Journal of Sport & Tourism* 14(1): 25-42.

Field, A. 2009. *Discovering Statistics: Using SPSS*. Third Edition. London: SAGE Publications.

Fletcher, Kristen. 2006. *A Trip Down Memory Trail: 20 Years of RTC*. Rails to Trails Conservancy.
http://www.railstotrails.org/resources/documents/magazine/06Spr_20YearsofRTC.pdf (last accessed 26 August 2014).

Institute for New Hampshire Studies. 2005. *New Hampshire Visitor Surveys 2004/2005*. Plymouth State University. <http://www.plymouth.edu/institute-for-new-hampshire-studies/nh-tourism-data/seasonal-visitors-surveys/> (last accessed 24 November 2014).

Lee, J., D. Scott, and R. Moore. 2002. Predicting Motivations and Attitudes of Users of a Multi-use Suburban Trail. *Journal of Park and Recreation Administration* 20(3): 18-37.

Reis, A.C., and C. Jellum. 2012. Rail trails development: A conceptual model for sustainable tourism. *Tourism Planning and Development*. 9(2): 133-148.

Reynolds, Andrew. 2013. *From Railroad to Rail Trail: A History of the Cheshire Recreational Rail*. Keene: New Hampshire Parks and Recreation. <http://blog.nhstateparks.org/from-railroad-to-rail-trail-a-history-of-the-cheshire-recreational-rail-trail/> (last accessed 26 August 2014)

Tomes, P. C. Knoch, K. Stewart, and J. Barr. 2005. *Trail User Workbook Survey: How to conduct a survey and win support for your trail* *Sample Surveys and Methods*. Rails-to-Trails Conservancy. Trail Facts & Integrated Marketing. (7): 11-14.

Tsundoda, T., and S. Mendlinger. 2009. *Economic and Social Impact of Tourism on a Small Town: Peterborough New Hampshire*. Scientific Research. <http://file.scirp.org/Html/458.html>. (last accessed 14 September 2014).

U.S Census Bureau. 2010. *Profile of General Population and Housing Characteristics: 2010 Keene city, New Hampshire*. U.S Census Bureau. <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF> (last accessed 25 August 2014).

Appendix A-1: Trail-User Survey

Cheshire Rail Trail North:

How do you use the trail?

Are you:

☐ a local resident, I live in _____

☐ visiting the area, from _____

What is your age? (circle one)

Under 18 18-24 25-34 35-44

45-54 55-64 65+

What is your gender?

☐ Male ☐ Female ☐ Prefer not to say

What activities do you perform on the trail? (check all that apply)

☐ Walking/running ☐ Biking ☐ Horseback riding

☐ Snowmobiling ☐ Other _____

How often do you use the trail? (circle one)

Daily Weekly Monthly Seasonally

How far away from the trail is your workplace, home, or other accommodations? (circle one)

1 mile or less 1-3 miles 3-10 miles 10+ miles

What best defines your motivation for trail use?

☐ Exercise ☐ Recreation

☐ Enjoyment of Nature ☐ Time with friends and family

How much time do you typically spend on the trail? (circle one)

Less than 30 minutes 30-60 min 1-2 hours 2+ hours

How do you typically access the trail?

☐ Directly from my house

☐ Directly from my workplace

☐ Directly from my accommodations

☐ By using my vehicle to drive to a trailhead

Why are we so curious, huh? We are a group of Keene State College Geography students conducting research for our senior seminar project. We are curious about trail users and their habits. Data provided (by users like you!) will be statistically analyzed and compiled into a final product (available for you to access at the end of the semester!) that will ultimately be provided to local parties that are interested in better maintaining and developing rail-trails. Thanks for your help!

North Cheshire Rail Trail Business Survey

What is the name of your business? _____

What is your business address? _____

What is your business' primary purpose?

Lodging

Restaurant

Retail Store

Bike Shop

Convenience/Gas Station

Other _____

What is the proximity of your business to the North Cheshire Rail Trail? _____

What season are you the busiest?
Circle all that apply

Spring

Summer

Fall

Winter

How many employees does your business have? _____

Do any employees commute via the trail? If yes, how many?

Yes

No

Does your business utilize the rail trail? If yes, how?

Yes No

Does your business promote the trail in any way? If yes, explain.

Yes No

Does tourism impact your business? If you answered agree or strongly agree, how so?

Strongly-agree

Agree

Neutral

Disagree

Strongly-disagree

Roughly, what percent of your annual income is from tourism? _____

If tourism has a significant impact on your business, where are the tourists from? _____

Would your business be willing to give an annual donation to help maintain the trail?

Yes

No

Maybe

Would your business be willing if in turn you received promotion for doing so?

Yes

No

Maybe

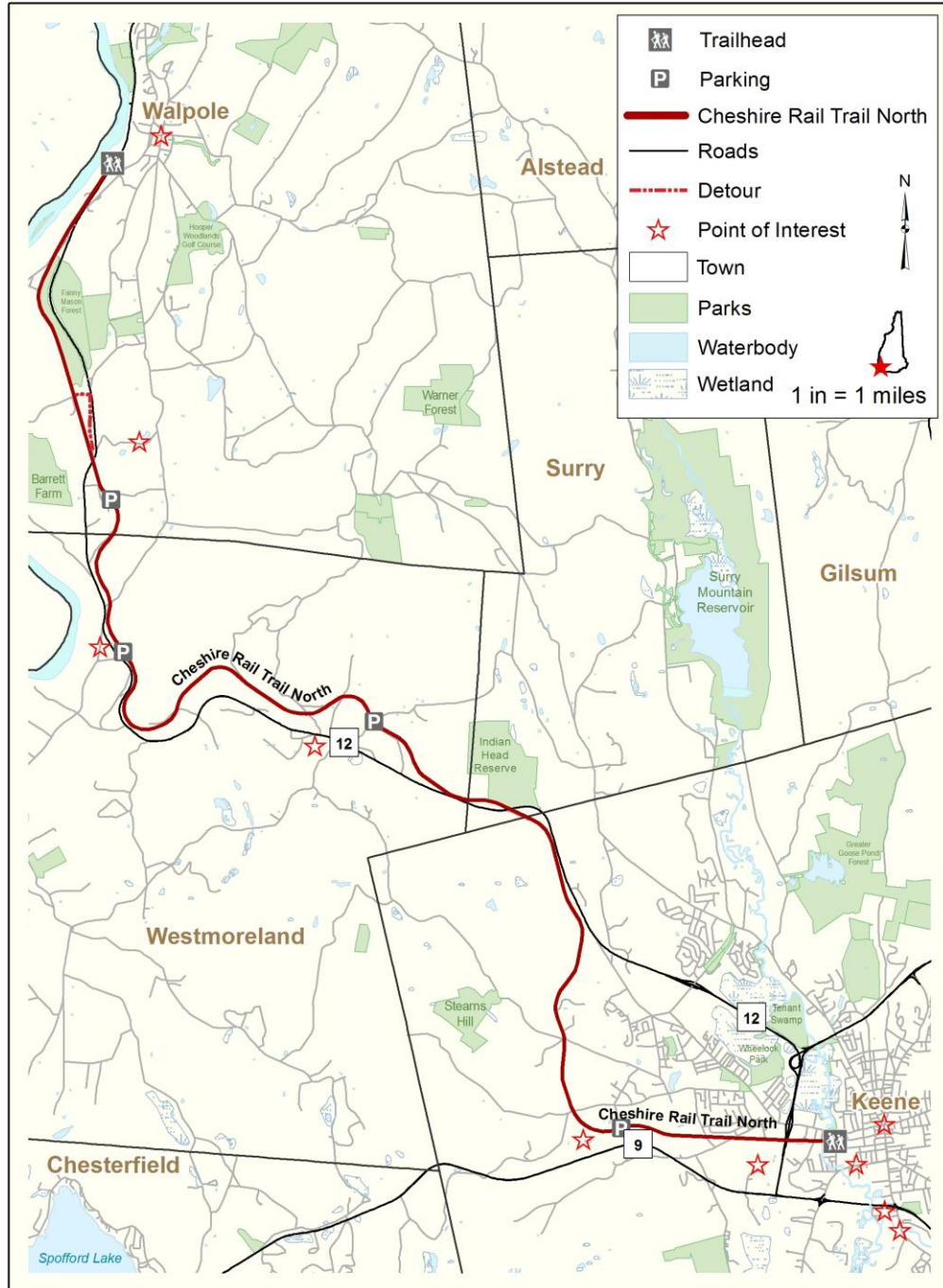
Appendix B-1: Trail Collection Attribute Table

Trail Point Attributes
1. Trailhead
2. Trail surface (paved, concrete, dirt, gravel, stone dust, sand, grass, other)
3. Trail moisture (> 50% dry, > 50% wet, standing water/puddle, other)
4. Surface texture (smooth, lightly rutted, very rutted, other)
5. Parking (name nearest road)
6. Road crossing (road name, approx. width)
7. Visible structure (provide distance and description)
8. Sign (describe)
9. Trail branch (direction & destination if known)
10. Gate (describe condition)
11. Natural obstruction or hazard (tree down, washout, other)
12. Bridge (describe condition)
13. Culvert or drainage (describe condition)
14. Bike (describe evidence)
15. Horse (describe evidence)
16. Snowmobile (describe evidence)
17. ATV (describe evidence)
18. Motor vehicle (describe evidence)
19. Informal trail (describe evidence)
20. Point of interest (viewshed, rail depot, pond, lake, other)
Off Trail Points of Interest
a. Lodging
b. Shopping
c. Food
d. Large worksite
e. Entertainment

Appendix B-2: Virtual Day Bike Counts

Bike/ 22	* Virtual Day=81, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 1 2 3 5 5 7 6 7 7 11 10 9 2 2 1 0 0 0
	0 0 0 0 0 0 0 1 1 0 2 2 2 1 1 3 3 2 1 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 1 2 0 2 1 2 3 2 3 0 1 0 0 0 0
AM Peak 0915 - 1015 (7), AM PHF=0.75 PM Peak 1545 - 1645 (12), PM PHF=0.72	
Numbers have been rounded to the nearest integer.	
Bike/ 23	* Virtual Day=200, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	1 0 0 0 0 0 1 2 4 6 10 12 15 16 17 19 22 18 20 14 13 6 3 1 1
	0 0 0 0 0 0 0 0 0 1 2 2 3 3 6 7 7 4 5 4 2 3 1 0 0
	0 0 0 0 0 0 0 0 1 2 2 4 3 6 3 5 5 5 4 4 4 1 1 0 0
AM Peak 1130 - 1230 (18), AM PHF=0.30 PM Peak 1500 - 1600 (22), PM PHF=0.82	
Numbers have been rounded to the nearest integer.	
Bike/ 28	* Virtual Day=196, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	1 0 0 0 0 0 0 2 2 5 6 8 10 16 17 15 16 20 22 19 11 13 5 4 3
	0 0 0 0 0 0 0 0 1 1 1 1 2 5 3 3 4 6 10 4 3 6 2 2 1
	0 0 0 0 0 0 0 1 0 1 1 3 4 4 3 5 4 4 3 4 3 2 0 1
AM Peak 1145 - 1245 (15), AM PHF=0.83 PM Peak 1615 - 1715 (23), PM PHF=0.61	
Numbers have been rounded to the nearest integer.	
Bike/ 38	* Virtual Day=2, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0
	0 0
	0 0
AM Peak 0915 - 1015 (1), AM PHF=0.28 PM Peak 1800 - 1900 (1), PM PHF=0.36	
Numbers have been rounded to the nearest integer.	
Bike/ 39	* Virtual Day=13, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 0 1 1 1 1 2 2 1 1 1 2 2 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0
	0 0
AM Peak 1130 - 1230 (2), AM PHF=0.60 PM Peak 1215 - 1315 (2), PM PHF=0.96	
Numbers have been rounded to the nearest integer.	
Bike/ 40	* Virtual Day=1, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0
	0 0
AM Peak 1000 - 1100 (1), AM PHF=0.25 PM Peak 0000 - 0100 (0), PM PHF=-1.8J	
Numbers have been rounded to the nearest integer.	
Bike / 41	* Virtual Day=1, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0
	0 0
	0 0
AM Peak 1100 - 1200 (1), AM PHF=0.42 PM Peak 0000 - 0100 (0), PM PHF=-1.8J	
Numbers have been rounded to the nearest integer.	
Bike/ 42	* Virtual Day=81, 15 minute drops
	0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
	0 0 0 0 0 0 1 2 3 5 5 7 6 7 7 11 10 9 2 2 1 0 0 0
	0 0 0 0 0 0 0 1 1 0 2 2 2 1 1 3 3 2 1 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 1 2 0 2 1 2 3 2 1 0 1 0 0 0 0
AM Peak 0915 - 1015 (7), AM PHF=0.75 PM Peak 1545 - 1645 (12), PM PHF=0.72	
Numbers have been rounded to the nearest integer.	

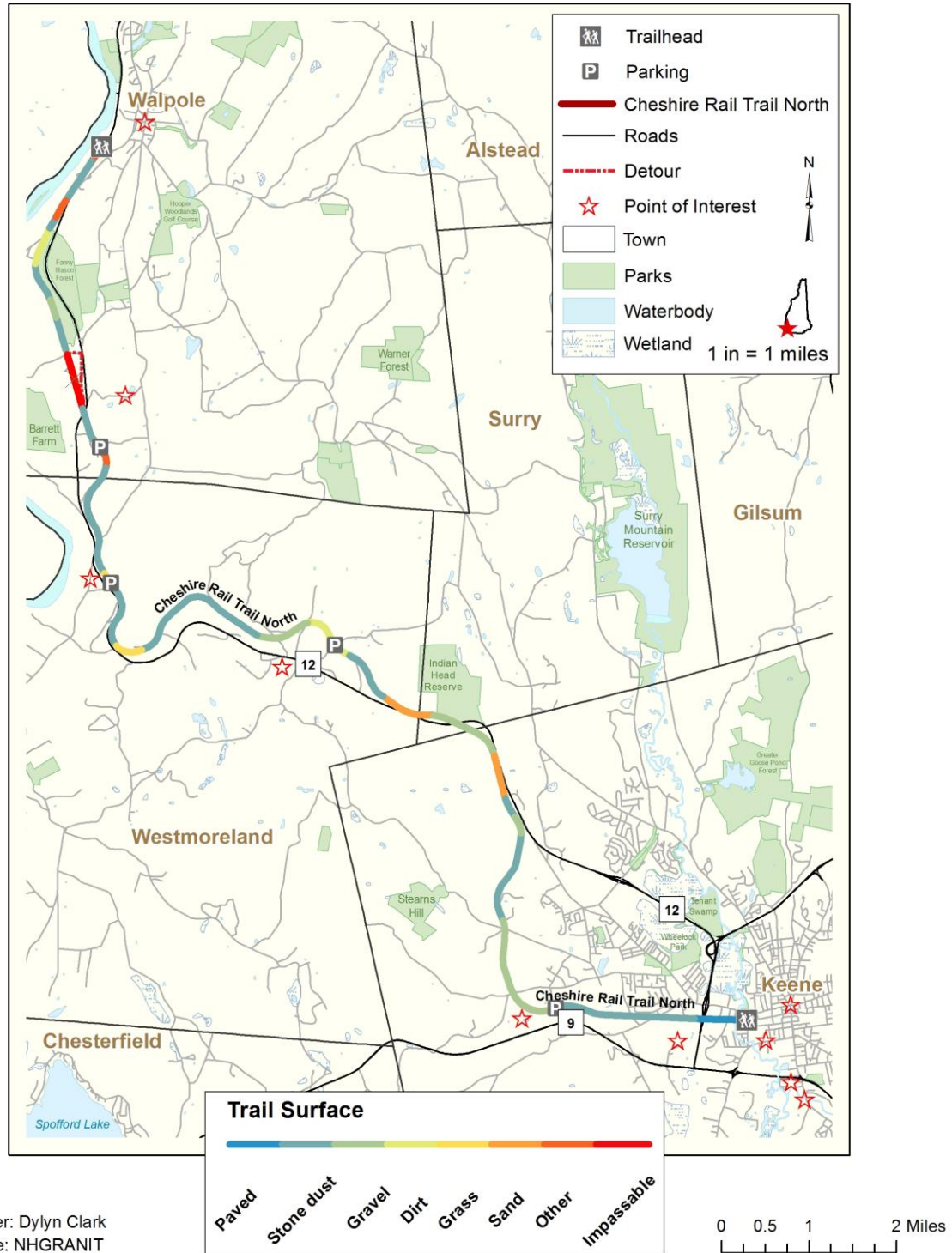
Cheshire Rail Trail North



Cartographer: Dylun Clark
Data Source: NHGRANIT

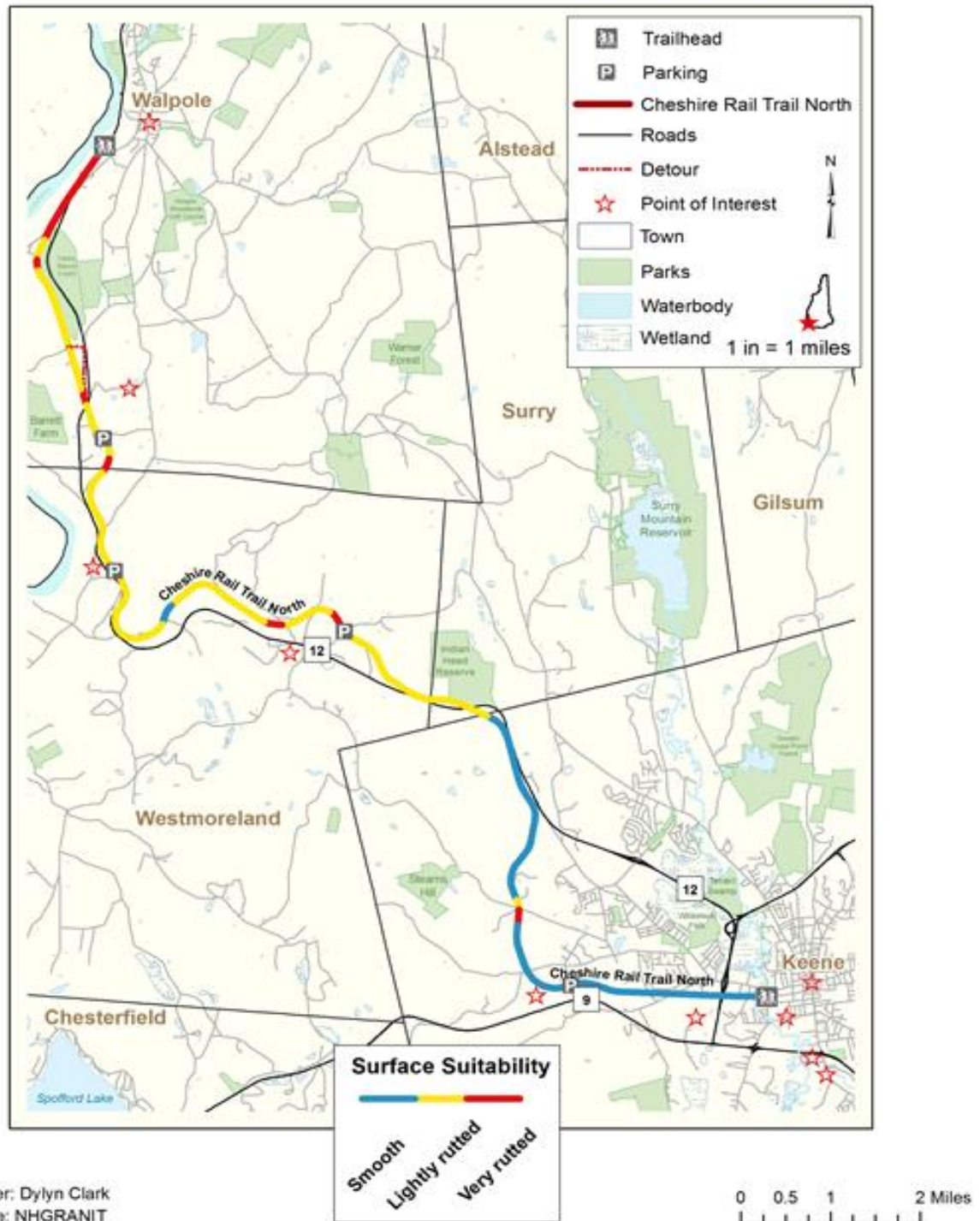
0 0.5 1 2 Miles

Cheshire Rail Trail North, Surface

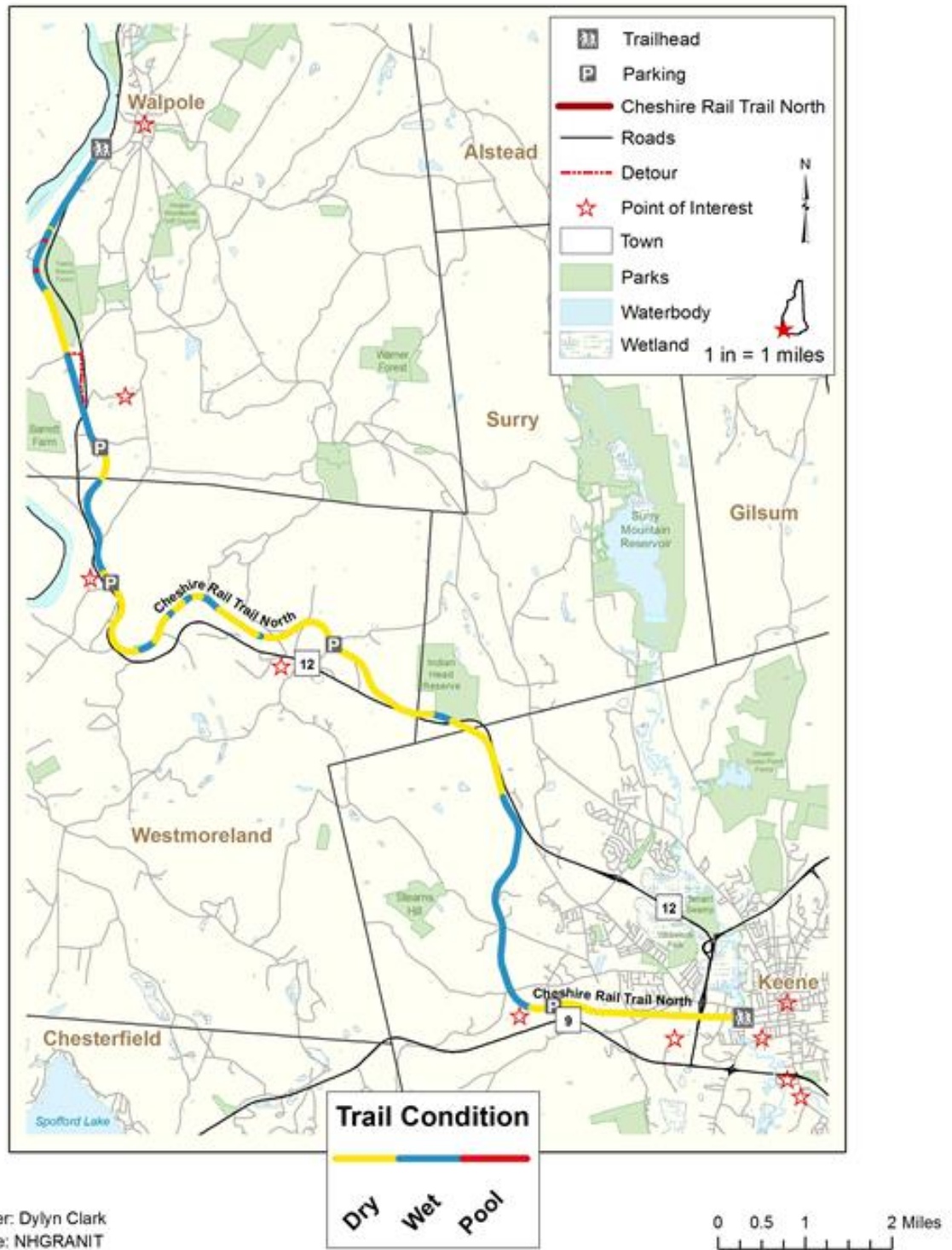


Cartographer: Dylun Clark
Data Source: NHGRANIT

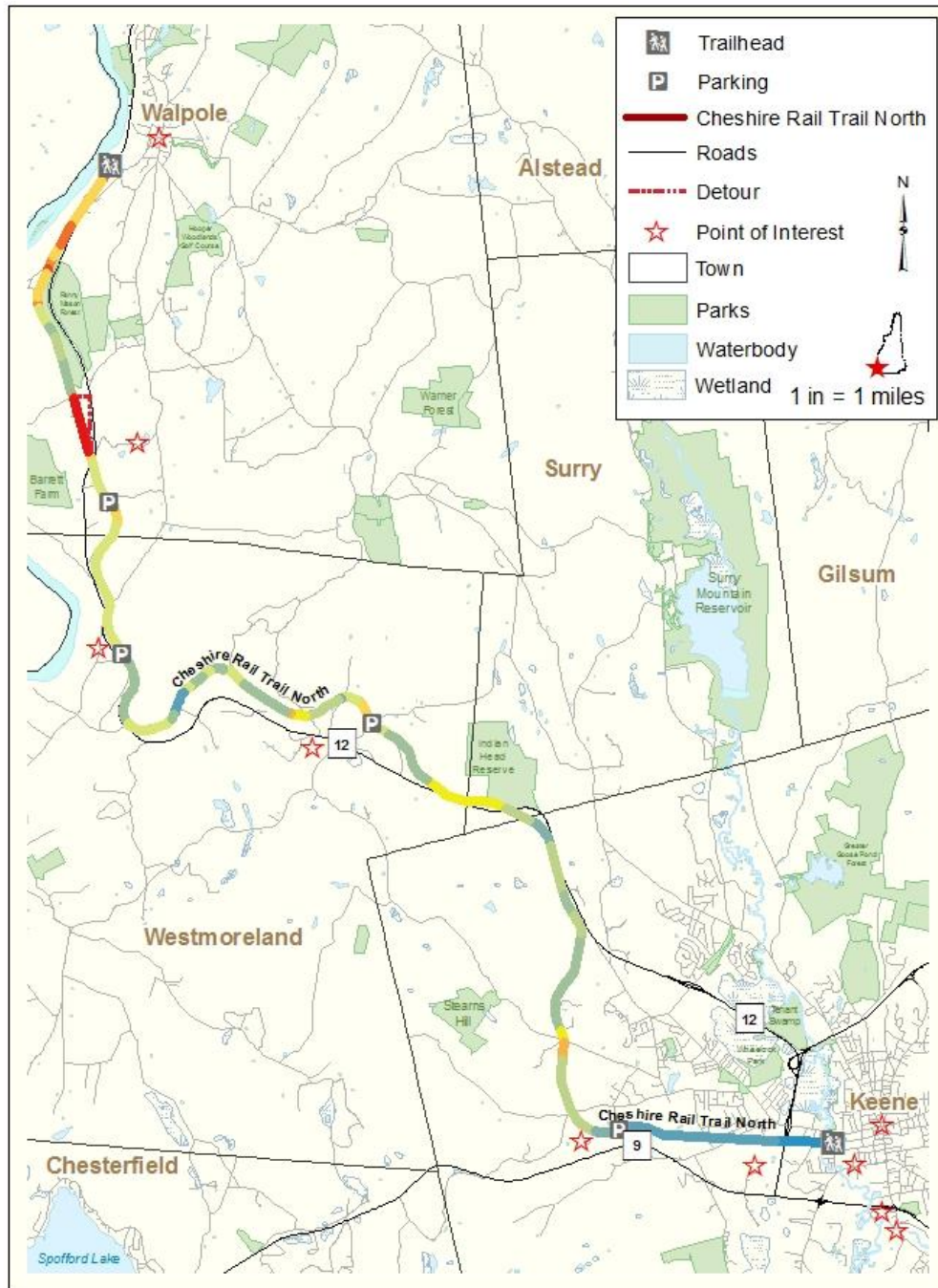
Cheshire Rail Trail North, Texture



Cheshire Rail Trail North, Moisture



Cheshire Rail Trail North, Valued

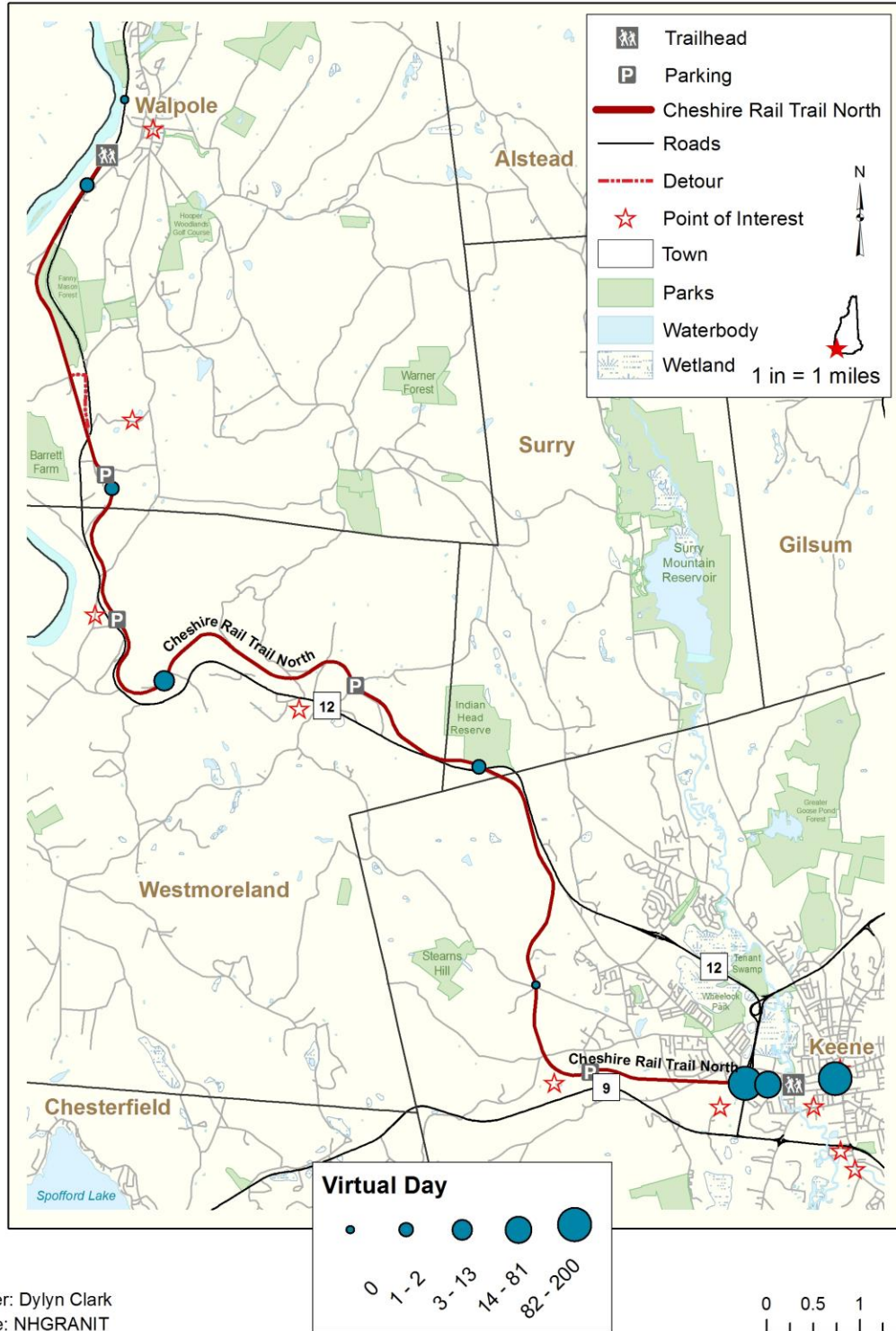


Cartographer: Dylun Clark
Data Source: NHGRANIT

Best Good Poor Impassable

0 0.5 1 2 Miles

Cheshire Rail Trail North, Bike Count



Cartographer: Dylun Clark
Data Source: NHGRANIT