

# The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics



# **The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics**

**Final Report  
Prepared for the Virginia Department of Conservation**

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Principal Investigators:

J.M. Bowker  
USDA Forest Service  
Southern Forest Research Station

John C. Bergstrom and Joshua K. Gill  
University of Georgia  
Department of Agricultural and Applied Economics

## Introduction

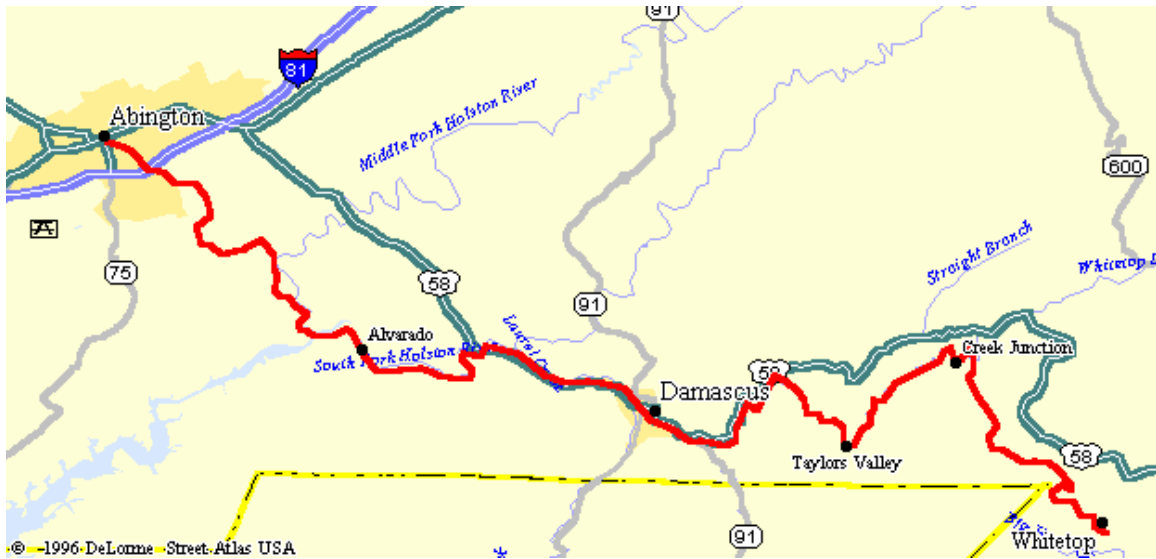
This report is one in a three part series looking at linear recreation corridors, or trails, in Virginia. The intent of the series is to quantify a number of issues related to recreational trail use across different types of trails in the State. These issues broadly include: (1) trail use, (2) user demographics and preferences, (3) economic benefits to users, and (4) economic impacts to the local communities. Because of limited resources, gathering information from an extensive cross-section of trails in the state was not feasible. Therefore, as a starting point, three trails with different attributes and locations were chosen. The trails selected for this study include the Virginia Creeper Trail, the Washington and Old Dominion Trail, and the New River.

This report focuses on the Virginia Creeper Trail (VCT), a rail trail in the southwestern part of the state. The report is organized as follows. First, a brief description and history of the VCT are provided. Next, the specific objectives of the VCT study are presented. This is followed by a description of the research design employed at the site. A series of results sections follows. The first part provides estimates of trail use. The second part includes statistical information about user demographics, trip profiles, attitudes and management preferences. The final part of the results section explores the economic benefits accruing to trail users and the economic impacts on the region stimulated by trail use. The report concludes with a summary and interpretation of key findings.

## The Virginia Creeper Trail

The Virginia Creeper Trail (VCT) is a 34-mile long rail trail with trailheads in Abingdon (elevation 2065) and Whitetop Station (elevation 3576), Virginia. The midpoint of this rail trail is the town of Damascus, Virginia. Damascus (elevation 1930) is known as “Trail Town, USA”, as it is located at the intersection of five major trails: The Appalachian National Scenic Trail, The Virginia Creeper National Recreation Trail, The Transcontinental Bicycle Trail, The Iron Mountain Trail, and The Daniel Boone Trail. All or parts of these trails are included in the Jefferson National Forest and the Mount Rogers National Recreation Area. Aside from these major points the VCT has access points with parking at: Watauga, Alvarado, Straight Branch, Taylor’s Valley, Creek Junction, and Green Cove. Permitted uses include foot travel, horseback travel, and biking.

Historically, the VCT’s origin as a recreation resource can be traced to the abandonment by Norfolk & Western in 1977 of the rail line connecting White Top and Abingdon (Davis & Morgan 1997). Around this time, members of the Abingdon community, led by Dr. French Moore, Jr. and Dr. Dave Brillhart, brought forth the idea of transforming the corridor into a rail trail. However, they faced stiff opposition from local landowners who wanted the right-of-way returned to them as well as time constraints due to the timetable for destruction of the bridges and trestles along the corridor (Davis & Morgan 1997).



Map of the Virginia Creeper trail. Courtesy of James Menzies.

Around this time the USDA Forest Service bought most of the upper portion of the right-of-way above Damascus with the idea of creating a hiking/biking trail. This became part of the Mount Rogers National Recreation Area. Damascus received funding from the Virginia Commission for Outdoor Recreation (VCOR) to buy the right-of-way connecting to the federal lands. Abingdon was unable to procure the funds to purchase the right-of-way until funding was provided through the TVA to buy the corridor connecting Abingdon and Damascus (Davis & Morgan 1997). With the TVA's funding and funding to keep the bridges in tact, the 34-mile corridor was now protected.

Today, the VCT is an interesting mix, with half of the corridor owned by the federal government and half owned by local governments. It represents a unique collaboration between city governments, federal government, and local grassroots effort, including The Virginia Creeper Trail Club ([www.vacrepertrail.org](http://www.vacrepertrail.org)).

## Objectives

Consistent with the broader overall objectives of examining the economic benefits and impacts of recreation trails throughout the state of Virginia, the specific objectives for the Virginia Creeper Trail (VCT) study were to:

1. Estimate annual trail use
2. Describe trail users and their current trip
3. Examine user attitudes / preferences pertaining to
  - a. trail attributes
  - b. management / policy
  - c. trail benefits
4. Estimate local economic impacts from nonlocal visitor spending
5. Estimate net economic benefits for all trail users.

## Research Design

The research design for the VCT study was based on a stratified random

sampling approach. Primary data for this study consisted of two components: trail exit counts and trail user surveys. Trail counts were obtained using stratified random sampling approach (Cochran 1977). A similar methodology is currently being used by the USDA Forest Service to estimate visitation across all national forests (English, Kocis, Zarnoch, Arnold 2002). Strata were identified by an expert panel of locals and nonlocals familiar with the trail and trail users. These experts included volunteers from the recreation retail trade, USDA Forest Service, National Park Service, Virginia Department of Conservation and Recreation, Virginia Trails, and Virginia Creeper Club.

The identified strata included season, exit type and day type. Seasons were broken into winter (November through April) and summer (May through October). Exits consisted of two types of trail heads, high use (H) and low use (L). High use exits included Abingdon and Damascus, while the seven low use exits included Whitetop Station, Green Cove, Creek Junction, Taylor's Valley, Straight Branch, Alvarado, and Watauga. Day types were divided into Saturdays (S), Sundays/Fridays/Holidays (SFH), and non-holiday weekdays (WD). During the winter season, sampling units included the complete day. In the summer, because of the increased window of daylight and subsequent trail usage, days were segmented into mornings (8 am to 12pm), afternoon (12 pm to 4 pm) and evening (4 pm to 8 pm). Overall, the winter season contained 1629 total cells in 6 site-day combinations ( $[2 H + 7 L] * [26 S + 60 SFH + 95 WD]$ ). Accounting for time of day, the summer season contained 4968 total cells in 18 site-day-

time combinations ( $[2 H + 7 L] * [26 S + 56 SFH + 102 WD] * 3$  time windows).

### **Winter Sampling**

Winter sampling covered the period from November 1, 2002 through April 30, 2003. Based on available volunteer labor, a total of 40 sample days were allocated across the 6 site-day combinations (three day types and two site types) as follows: 15 Saturdays, 15 Sunday/Friday/Holidays, and 10 Weekdays. Within each day type, dates for sampling were randomly selected. On each selected day, trained interviewers were assigned to both high exit sites and to two of the seven low exit sites, randomly chosen. Desired coverage for the 40 sample days included 80 observations from high exit sites ( $2 * [15 + 15 + 10]$ ) and 80 observations from the low exits sites ( $2 * [15 + 15 + 10]$ ). However, interviewers failed to show on their allotted days about 50 percent of the time. This appeared to follow no discernable pattern.

Ultimately, a total of 77 site-day combinations were sampled or roughly 5 percent of the 1629 cells. However, coverage for the high exit sites on Saturdays and Sunday/Friday/Holidays was nearly 25 percent, which is large for this kind of study. This is especially important, as the expert panel's ex ante estimate of relative use for these two strata was more than 80 percent of the total for the winter season. The program and output used to generate the stratified random sample, along with the spreadsheet count information across sites and days, are available from the authors. It should be noted that on some of the missing days at Damascus, a proxy count procedure was used. These counts were based on shuttles sold by

one of the local bicycle outfitters and a factor accounting for the outfitter's approximate market share.

In addition to counting each exiting trail user, interviewers used a two-stage procedure for administering surveys to exiting trail users. First, a screener survey (Appendix A - Screener) was used to determine if the trail user(s) was local (living or working in Washington or Grayson counties) or nonlocal. Much of the information on the Screener was directly observable by the interviewer, e.g., race, group size, gender, activity mode, and approximate age. However, individuals had to be asked whether they were local and whether they would be willing to participate in a more detailed 5-minute interview.

Based on the response and willingness to participate, the exiting user received a detailed local survey or one of two versions of the nonlocal survey (Appendix A – Local, Nonlocal A, Nonlocal B). These surveys were designed to obtain information relevant to the multiple objectives of the study. Common to all survey versions were sections about current trip profile, annual use profile, and household demographics. The Local and Nonlocal A versions contained questions about personal benefits from trail use, as well as attitude and preference questions about trail issues, area amenities, trail maintenance, fees, and acceptable use. The Nonlocal B version contained components for trip related expenditures in the local area and for the entire recreation trip.

The two-stage procedure and each survey instrument were pre-tested, first among study collaborators and Creeper Club members, and then with trail users on Friday and Saturday, September 20-21, 2002. The only substantial change in

sampling procedure resulting from the pre-test was that the original nonlocal survey was broken into two versions to accommodate the 5-minute interview time constraint.

### **Summer Sampling**

Summer sampling followed basically the same procedure as winter sampling and covered the period from May 1, 2003 through October 31, 2003. A total of 45 sample days were allocated across the 6 site-day combinations as follows: 15 Saturdays, 15 Sunday/Friday/Holidays, and 15 Weekdays. Within each day type, dates for sampling were randomly selected. On each selected day, interviewers were assigned to both high exit sites and at two of the seven low exit sites, randomly chosen. In addition, summer day length necessitated breaking the survey periods per day into three segments (morning, afternoon, evening). For each selected site-day combination, the survey time period was randomly selected. Desired coverage for the 45 sample days included 90 observations from high exit sites ( $2 * [15 + 15 + 15]$ ) and 90 observations from the low exits sites ( $2 * [15 + 15 + 15]$ ). Interviewers were more reliable than in winter. They failed to show less than 30 percent of the time and there appeared to be no discernable pattern.

A total of 107 site-day combinations were sampled or roughly 2 percent of the 4968 cells. Coverage for the high-exit sites on Saturdays and Sunday/Friday/Holidays was approximately 10 percent. The program and output used to generate the stratified random sample, along with the spreadsheet count information across sites and days, are available from the authors. As in winter, some of the missing days at Damascus were filled

using a proxy count procedure based on shuttle sales and estimated market share.

As in winter, the two-stage screener and detailed survey procedure was followed. However, to increase the precision of expenditure estimates for the economic impact portion of the study, the ratio of Nonlocal B to Nonlocal A surveys distributed was increased.

## Trail Counts

### Winter Counts

Seventy-seven site-day combinations, randomly selected, were sampled for trail use in the winter season across the 6 winter strata (high and low exit Saturday - HS, LS; high and low exit Sunday/Friday/Holiday – HSFH, LSFH; high and low exit weekdays, HWD, LWD). Following Cochran (1977, pp. 89-99) means and variances, along with relative population weights, for each stratum cell were estimated. Combining this information, winter visitation for the entire trail is estimated to be 23,614.1 with a 95 confidence interval for mean visitation ranging from 20,628.8 to 26,599.3.

Various estimates of winter visitation by day-type and exit-type are reported in Table TC-1. Examining the table, a number of observations can be made. First, high exit sites, i.e., Abingdon and Damascus, account for about two-thirds

of winter visitation. Second, weekends and holidays account for about 70 percent of winter use. Finally, visitation on Sunday/Friday/Holidays is more than the other two day-types, although on a per day basis, Saturday use is highest among the day-types.

It should be noted that some caution is advised in interpreting the averages in Table TC-1. The reported averages do not imply “typical use” per se. For example, the high-exit average use for Saturdays is 217.4. However, visitation actually took place on only 10 of the 15 Saturdays sampled. On these Saturdays the average visitation is 326.1, with a maximum of 425 on Saturday, April 12, 2003. This difference is likely attributable to winter weather. In all, 33 percent (5 of 15) sampled Saturdays and 46 percent (7 of 15) sampled Sunday/Friday/Holidays had no counted visits. This phenomenon did not seem to occur on weekdays, probably indicating that winter weekday use is primarily by locals.

In addition to the exit counts, a total of 681 screener surveys were completed by exiting users. These screeners led to the completion of 250 detailed surveys from locals and another 166 detailed surveys from nonlocals. For the nonlocals, the returns for versions A and B respectively were 75 and 100. These returns translate to a 61 percent response rate.

**Table TC-1. Winter visitation by stratum.**

	Saturday	Sun/Fri/Holiday	Weekday	Season Totals
Low Exit	1,747.2	4,860.0	1,884.2	8,491.4
High Exit	3,904.7	5,784.0	5,434.0	15,122.7
Season Totals	5,651.9	10,644.0	7,318.2	23,614.1
Day-type average	217.4	177.4	77.0	

**Table TC-2. Summer visitation by stratum.**

	Saturday	Sun/Fri/Holiday	Weekday	Season Totals
Low Exit	11,866.4	8,820.0	7,282.8	27,969.2
High Exit	18,837.7	29,055.5	30,695.8	78,589.0
Season Totals	30,704.1	37,875.5	37,978.6	106,558.2
Day-type average	1,180.9	676.3	358.3	

### Summer Counts

One hundred and seven site-day combinations, randomly selected, were sampled for trail use in the summer season across the 6 summer site-day combinations (HS, LS, HSFH, LSFH, HWD, LWD). However, unlike the winter, sampling only occurred during a randomly drawn 4-hour time period (morning, afternoon, evening) on any randomly selected site-day combination. Following Cochran (1977, pp. 89-99) means and variances, along with relative population weights, for each stratum cell were estimated. Combining this information, summer visitation for the entire trail is estimated to be 106,558.2 with a 95 percent confidence interval for mean summer visitation ranging from 99,276.0 to 113,840.4.

Estimates of summer visitation by day-type and exit-type are reported in Table TC-2. While considerably larger, summer day-type averages follow a pattern similar to the winter. Saturdays averaged 1,180.9 visits, or almost 6 times as much use as during the winter. In fact, average use on weekdays in the summer exceeded even Saturday use during the winter. High exit sites, i.e., Abingdon and Damascus, accounted for more than 70 percent of summer visitation, while weekends and holidays accounted for about 64 percent of summer use. Interestingly, summer visitation for each of the three day-types exceeded visitation summed across all day-types over the winter.

A total of 749 summer visitors responded to the screener survey. Of these, 82.7 percent agreed to respond to the detailed survey. This led to 181 completed local surveys and 439 nonlocal surveys. The nonlocal returns resulted in 93 completed nonlocal Version A questionnaires and 346 completed Nonlocal Version B questionnaires.

### Study Totals

Combining totals for winter and summer sampling periods, visits to the Virginia Creeper Trail for the one-year period beginning November 1, 2002 through October 31, 2003 is estimated at 130,172.3. Again, a visit is defined as one person exiting the trail for a non-trivial amount of time. The 95 percent confidence interval for the mean number of visits during the sample period ranges from 119,905.0 to 140,439.4.

During the sampling period, a total of 1430 screener questionnaires were completed leading to the completion of 1036 detailed survey questionnaires. This implies an effective response rate of 72 percent. It should also be noted that, while not explicitly calculated, very few trail users refused to respond to the screener survey when approached. Local users screened totaled 618, while nonlocals totaled 690, or 47 percent and 53 percent respectively. Screener percentages lead to a decomposition of annual visits into 68,669 nonlocals and 61,503 locals. About 9 percent of

**Table TC-3. Annual visitation and trip totals by user type.**

	Primary Purpose Day User	Non-primary Purpose Day User	Primary Purpose Overnight User	Non-primary Purpose Overnight User
Nonlocal Visits	40,034	9,473	10,305	8,857
Local Visits	61,503	N/A	N/A	N/A
Visits by Type	101,537	9,473	10,305	8,857
Nonlocal Person-trips	33,642	7,578	5,725	3,918
Local Person-trips	61,503	N/A	N/A	N/A
Person-trips by type	95,145	7,578	5,725	3,918

screeener respondents did not indicate their origin.

In order to meet the economic modeling objectives of this study, it is necessary to further decompose visits by user type and to convert visits to person-trips. Table TC-3 reports visits and corresponding person-trips by four commonly used user type categories: primary purpose day user (PPDU), non-primary purpose day user (NPDU), primary purpose overnight user (PPON), and non-primary purpose overnight user (NPON). For locals, a visit and a trip are equivalent. For nonlocals, a trip may contain more than one visit. For example, an overnight visitor to the area could ride one part of the trail on Saturday and another part on Sunday. Hence, one trip would equate to two visits. Primary purpose implies that the visitor's main reason for being in the area is the VCT.

Information reported on the detailed nonlocal survey questionnaires was used to decompose the nonlocal visits into PPDU, NPDU, PPON, NPON and convert these into respective person-trip equivalents. Sample mean trips per year and visits per trip were used to derive visit shares for each category. These shares were in turn applied to total nonlocal visitation to obtain annual visits

in each category. Person-trips per category were then estimated by dividing visits in a category by the category's mean visits per trip.

As evidenced by Table TC-3, day users make up around 85 percent of all visits, with primary purpose day users accounting for 77 percent of total annual visitation. For nonlocals, day users account for 73 percent of their visits, while primary purpose day users make up 58 percent of nonlocal visitation. Overnight visitors to the area comprise about 27 percent of the nonlocal visits and about 15 percent of all visits.

Accounting for multiple visits per trip in the nonlocal categories, the 130,172 annual visits translates to 112,366 annual person-trips. Nonlocals comprise about 45 percent of this total, while local and nonlocal day users combined account for 85 percent of total person-trips. Nonlocal overnight users make up about 9 percent of all trips, while primary purpose overnight visitors account for only about 4 percent of person-trips. The latter being a pivotal group in determining the economic impact that the VCT has on the area's economy. Finally, primary purpose users (day use and overnight) together represent 100,870 person-trips or 90 percent of annual VCT usage as

measured by person-trips. This group is the key group in economic benefit estimation and its high share of person-trips implies the VCT is the key motivating force to its users rather than an ancillary attraction.

While reasonably confident in our annual trail use estimates of 130,172 visits and 112,366 person-trips, it is important to note some factors that should be considered in extrapolating our counts into the future. Two factors are likely to render the estimates somewhat conservative. First, because of weather conditions in 2003, particularly a rainy summer, Virginia experienced about a 20 percent decrease in usage across its state park system. Second, because of the time windows used in sampling (8am to 12pm, 12pm to 4pm, 4pm to 8pm), it is likely that visits were undercounted during the middle of the summer when day length is greatest. However, this potential undercount would most probably apply primarily to local walkers beginning and ending their VCT visit in the early morning.

A final caveat pertains to the “trap shyness” phenomenon. Here, a person once-sampled could have a tendency to avoid contact with the interviewer for

either the screener or the detailed questionnaire. Given the higher probability of this happening to those who are frequent visitors, e.g., locals, there is a chance that the ratio of locals to nonlocals estimated may be slightly biased toward nonlocals.

## Trail Users

This section of the report details three aspects of VCT users. The first part describes visitor demographics including age, race, gender, residence, and other socioeconomic factors. The second part reports on the user trip profiles and annual use of the VCT. Included are travel distances to, and on the VCT, primary activities, number of annual trips, and group size. The final part of this section details user attitudes and preferences pertaining to a number of area amenities (e.g., lodging, dining, guide services, shopping), trail related issues (e.g., benefits, safety, crowding, surfaces, structures), and policies (e.g., fees, alternative permitted uses). Information in this portion of the report was obtained via the Screener and On-site questionnaires described above.

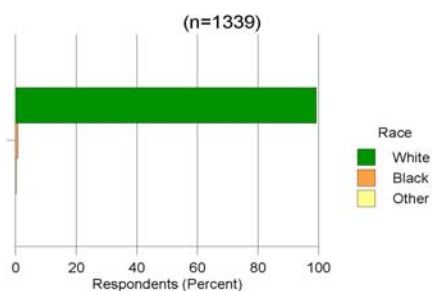


Figure 1. Percentage of respondents by race.

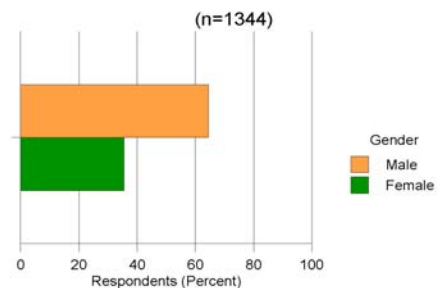


Figure 2. Percentage of respondents by gender.

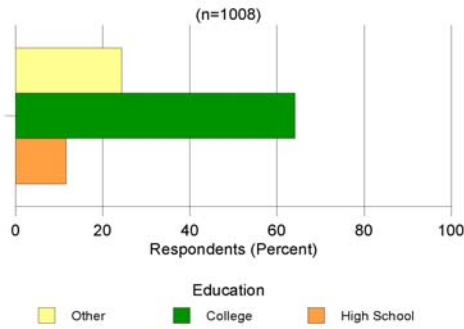


Figure 3. Percentage of respondents by education.

### Visitor Demographics

Users of the VCT are predominately white males. Of the 1498 individuals filling out a screener, 99.18 percent were white (Figure 1). Sixty four percent of users were male and 35 percent of users were female (Figure 2). The majority of adult VCT users (64%) had at least a college education. Twenty four percent of the respondents indicated that they had earned a degree above the undergraduate level and 11 percent of respondents indicated that they graduated from high school (Figure 3).

The average age of respondents was 47 years old. Over 50 percent of the respondents were between the ages of 36 and 55. Respondents between the ages of 56 and 65 comprised 18 percent of users. Those between the ages of 16 and 35 account for about 19 percent of the user population, while participants over the age of 65 account for 9 percent of the

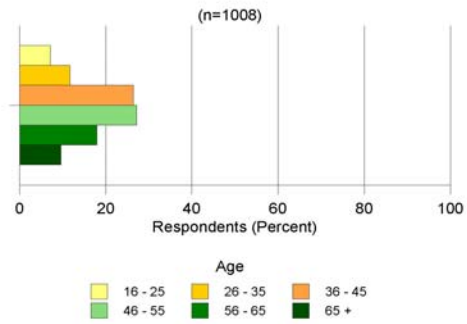


Figure 4. Percentage of respondents by age.

user population (Figure 4). These findings suggest that the VCT is an outdoor recreation resource attracting primarily middle aged users.

The average income for the entire sample is \$72,315. The average income for the local users was \$59,511, while the average income for the nonlocals was \$80,702. These means were calculated by multiplying the midpoints of each income category on the respective questionnaires by the frequency for each income category. For the entire survey, 54 percent of respondents indicated a household income between \$40,000 and \$120,000. Sixteen percent of respondents reported a household income less than \$40,000 and 12 percent of respondents reported a household income greater than \$120,000. Eighteen percent preferred not to answer this question (Figure 5).

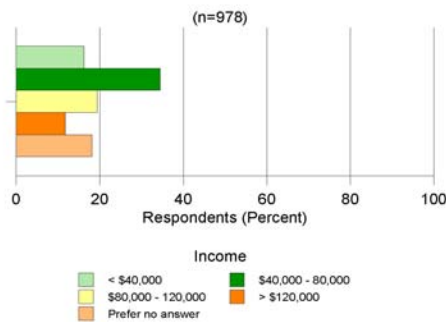


Figure 5. Percentage of respondents by income.

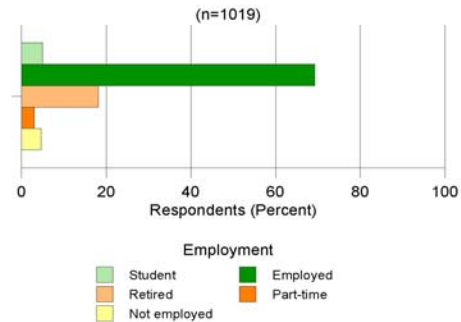
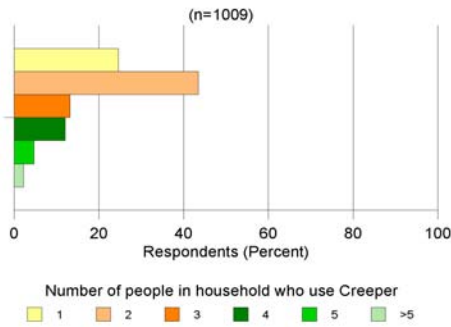


Figure 6. Percentage of respondents by employment



**Figure 7. Percentage of respondents by number of people in household who used the Creeper**

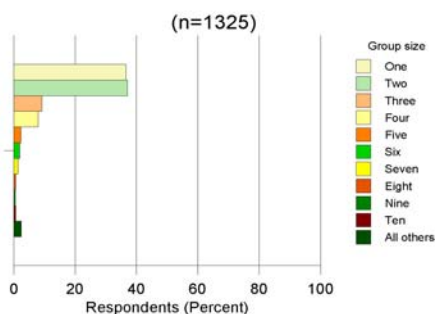
The survey indicates that the majority of VCT users are employed, 69 percent (Figure 6). Of the remaining respondents, 18 percent were retired, 5 percent were students, 4.5 percent were not currently employed, and 3 percent were employed part-time. One point of interest related to employment between the local and nonlocal populations was the difference in the numbers of users who were retired. Based on responses by the local population, over 25 percent of all VCT users were retired, while only 13 percent of nonlocal users reported being retired.

There were two questions regarding household size. The first question asked respondents only about household size.

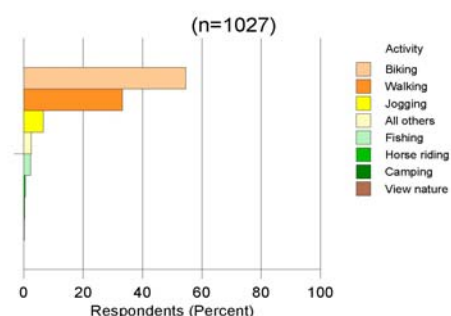
The second question asked respondents how many members of the household regularly used the VCT. The average household size for VCT users is 2.82. Eighty-eight percent of the respondents' households contained less than four people. The average number of people in a household who use the VCT is 2.36. Eighty-one percent of household members who use the VCT had fewer than 3 individuals (Figure 7).

### Trip Profile

For the entire sample the average distance traveled to reach the VCT was 154 miles. The average time spent traveling was 2.8 hours. For local users the average travel distance was 7.8 miles, with an average travel time of 15 minutes. Nonlocal users, on average, traveled 260 miles with an average travel time of 4.6 hours. The nonlocal travel distance includes metropolitan areas like Knoxville, Charlotte, Asheville, Chattanooga, Roanoke, Charlottesville, and Washington D.C. The annual number of trips to the VCT by nonlocals is 4.8; however, 77 percent of nonlocals took fewer than four trips per year. The remaining 23 percent took from 5 to 300



**Figure 8. Percentage of respondents by group size on trail**



**Figure 9. Percentage of respondents by primary reason to be on trail**

annual trips. The average number of monthly trips taken by local visitors is 11.77. Across 12 months, this equates to 141 annual trips to the VCT. Fifty-five percent of local users take less than 10 trips per month, while 45 percent take over 10 trips per year. This suggests that about half of the local users are very avid, visiting more than 200 times per year. The average time spent while on the VCT was 2.2 hours with an average reported on-trail travel distance of 12.9 miles.

Seventy-two percent of VCT users were in the area for the primary purpose of visiting the VCT. The average group size on the trail is 2.96. Eighty-eight percent of respondents traveled the trail in groups with less than four individuals (Figure 8). The remaining 12 percent of users traveled the trail in groups containing 5 to 50 individuals.

The primary activity for VCT users was biking (54.63%). Walking comprised 33 percent of the reported activity along the trail, while the remaining 12 percent of primary activities included jogging, camping, nature viewing, horse riding, and fishing (Figure 9). Primary activity was correlated with visitor origin. That is, 75 percent of nonlocals listed biking as their primary activity, while the majority of locals, 51 percent, listed walking as their primary activity.

### **Preferences and Satisfaction**

This section is divided into six parts. These parts include benefits received from VCT use, trail issues, area features, management issues, trail surfaces, and trail uses. The benefits section includes health & fitness, viewing nature, pet use, and community feelings. In this question, the respondent was asked to rate the level of different benefits they

received from using the VCT. The rating system is a likert scale with benefits being ranked as high, medium, low or none.

Trail issues included questions related to safety/security, crowding, parking, scenery, restrooms, conflicts, trail surfaces, and structures. Each item in the trail issues and area features sections consists of two likert scales, one measuring importance to the respondent and the other measuring the current condition of the item. The ordinal scale for the condition section contains rankings of excellent, good, fair, and poor. The ordinal scale for the importance section is high, medium, low or none.

The management issues section asks respondents to indicate whether they strongly agree, agree, disagree, or are uncertain about specific management questions. These questions include how they feel about maintenance as it relates to attracting visitors, whether a use fee is a good method to support maintenance, whether local taxes should be used to support trail maintenance, whether volunteers should be used to keep up trail maintenance, and whether or not crowding affects the quality of VCT trips.

The sections regarding trail surfaces and trail uses are set up in a different manner. The trail surfaces section asks respondents about three different surface types, paved, cinder, and/or crushed limestone. The respondents were asked whether they strongly support, support, are neutral, don't support, or don't know about each the three different surface types. The trail uses section asked respondents about their opinions about allowing different types of vehicles on the trail. Included among these vehicles were electric golf carts, gas golf carts,

motorized bikes, horse drawn carts, and ATV's. Regarding each of these different trail uses, respondents were asked if they, support for all users, support for disabled users, are neutral, don't support at all, or don't know.

**Trail Benefits**

Table TU-1 displays responses to questions related to various benefits that visitors gain from using the VCT. These benefits were ranked high (4), medium (3), low (2) and none (1). Health received the highest ranking of the four benefits categories. The mean response for health related benefits were 3.81. Eighty-three percent of respondents ranked health benefits as high. Health was followed by nature, which had a mean response of 3.79. Eighty-three percent of respondents ranked the benefit from the opportunity to view nature while on the VCT as high.

Benefit from sense of community (3.28) and the generic "other" category (3.21), followed health and nature. Fifty percent of respondents ranked benefits

from community feelings as high and only 16 percent ranked it as low or none. Sixty-seven percent of respondents indicated a high level of benefit for the "other" category. Among the most popular responses in this category were relaxation and fishing.

Finally, the category referring to benefit from animal companionship on the VCT was highly bi-modal with 32 percent indicating a high rating and 48 percent indicating no benefit. This is not surprising given the high proportion of walkers and locals using the trail and the roughly equal percentage of nonlocals and bikers.

The results for the VCT benefits questions suggest that health and fitness along with the opportunity to view nature are the most important benefits visitors get from the VCT. More than 95 percent of respondents listed benefits for these two categories as being high or medium, with over 80 percent listing high. These results also suggest that users do not receive as high a benefit

**Table TU-1. Personal benefits from using the Virginia Creeper Trail.**

Benefits	High (4)	Med (3)	Low (2)	None (1)	Mean	Rank
Health & fitness	83.28%	14.70%	1.86%	0.17%	3.81	1
Opportunity to view nature	82.77	14.02	2.70	0.51	3.79	2
A place to take my pets/animals	31.54	7.97	12.48	48.01	2.23	5
Provides a sense of community	49.91	34.14	10.40	5.55	3.28	3
Other	66.67	9.63	2.22	21.48	3.21	4

**Table TU-2. Trail issues: importance and observed condition.**

Trail issues	<u>Importance to you</u>				Mean	Rank
	High (4)	Med (3)	Low (2)	None (1)		
Safety/security	79.60%	18.04%	1.69%	0.67%	3.76	2
Amount of crowding	38.85	39.53	18.41	3.21	3.14	7
Parking	45.50	32.94	13.75	7.81	3.16	6
Natural scenery	86.72	10.92	1.68	0.67	3.83	1
Restrooms	53.65	26.49	14.77	5.09	3.28	5
No conflicts with others	51.31	19.79	14.19	14.71	3.07	8
Trail surfaces	64.01	39.65	5.42	2.13	3.57	4
Structures/bridges	72.85	23.64	1.93	1.58	3.67	3

Trail issues	<u>Observed condition</u>				Mean	Rank
	Excel (4)	Good (3)	Fair (2)	Poor (1)		
Safety/security	52.59%	40.86%	6.21%	0.34%	3.45	3
Amount of crowding	42.98	47.02	9.12	0.88	3.32	6
Parking	48.07	44.57	6.08	1.29	3.39	5
Natural scenery	72.05	25.87	1.91	0.17	3.69	1
Restrooms	40.56	41.48	12.59	5.37	3.17	8
No conflicts with others	52.80	39.65	5.42	2.13	3.43	4
Trail surfaces	40.25	48.33	9.49	1.93	3.26	7
Structures/bridges	54.36	38.55	6.18	0.91	3.46	2

from the VCT for sense of community or as a place to take pets. The lower scores for these two forms of benefits may also be driven by the significant percentage of nonlocals who are not part of the local community and are not likely to bring a pet on a trip.

### Trail Issues

The trail issues section of the visitor survey asked respondents to indicate the importance of various trail related issues and the condition of these issues. Specific issues included, safety/security, crowding, parking, scenery, restrooms, conflicts, trail surfaces, and structures.

By asking for importance and condition, one is potentially able to identify areas of concern to management. For example, if a particular issue is deemed to be very important, but the current condition is rated as poor, then it would most likely be an area worthy of management's attention.

Frequencies, mean responses, and rankings for all of the trail related issues asked in the visitor survey are reported in Table TU-2. The four trail issues that were consistently ranked the highest for importance were natural scenery (3.83), safety (3.76), structures/bridges (3.67), and trail surfaces (3.57). For each of

these categories, respondents indicated high or medium importance more than 90 percent of the time, with safety, scenery, and structures exceeding 95 percent. Among the least important issues, relatively speaking, were the related issues of conflicts (3.07), crowding (3.14), and parking (3.16). Nevertheless, these issues received high or medium importance votes from between 70 and 80 percent of respondents.

Frequencies, means, and rankings for observed conditions related to each of the trail issue categories are also reported in Table TU-2. Scenery (3.69), structures (3.46), safety (3.45), and conflicts (3.43) were ranked highest for their current condition. Ranking lowest in observed condition were restrooms (3.17) and trail surfaces (3.26). With the exception of scenery, it is important to note that the difference across condition means is less than that for the importance means.

The results for the trail issues section suggest a couple of things. First, the “4 S’s,” namely, scenery, safety, structures, and surfaces are front and center in importance to the large majority of visitors. Second, restroom and trail surface conditions are the most likely to rate “fair” or “poor” marks, and hence are issues management should be aware of, especially given the high importance rating of trail surfaces. Nevertheless, it should also be noted that all of the listed issues received good or excellent ratings from at least 80 percent of users. Moreover, restrooms was the only category to receive a poor rating by at least 5 percent of users and a combined fair or poor rating from more than 15 percent of respondents. Overall, results

in this section suggest that users are pleased with the conditions on the trail and that important trail-related issues are not being overlooked.

### **Area Features**

In this section, area features complementing visitor use of the VCT are examined. As in the previous section, respondents were asked to assess the importance and the observed condition of the following area features: lodging, trail-side camping, campgrounds, eating places, shopping for gifts, historical attractions, outdoor attractions, shuttle/bike rental services, and guide services. The listed features are general, hence the intent is to provide very basic information about user preferences for places and services that would complement their use of the VCT.

Frequencies, means, and rankings for area feature importance are presented in Table TU-3. In sharp contrast to the high mean values for the trail issues reported above, sample means for area features not directly related to the VCT are low. For example, the top four area features include outdoor attractions (2.99), eating places (2.75), historical attractions (2.69), and shuttle/bike rentals (2.41). These rank between medium and low priority. Moreover, the remaining features ranked between low and no importance to VCT users. Four area features, guide services (1.70), lodging (1.76), trail camping (1.82), and campgrounds (1.83) had between 50 and 60 percent of survey respondents reporting an importance level of “none.” The low importance of overnight facilities is consistent with the fact that 85 percent of estimated visits to the VCT are by day users (Table TC-3).

**Table TU-3. Area features: importance and observed condition.**

Area features	Importance to you				Mean	Rank
	High (4)	Med (3)	Low (2)	None (1)		
Lodging	12.64%	10.29%	18.41%	58.66%	1.76	8
Trail camping	11.52	15.17	17.92	55.39	1.82	7
Campgrounds	11.09	16.00	18.55	54.36	1.83	6
Eating places	35.00	29.11	12.14	23.75	2.75	2
Shopping for gifts	11.45	14.49	27.37	46.69	1.90	5
Historical attractions	30.20	31.62	15.45	22.74	2.69	3
Outdoor attractions	46.80	24.73	9.96	18.51	2.99	1
Shuttle/bike rentals	26.98	21.52	17.81	33.69	2.41	4
Guide services	7.10	11.29	26.78	54.83	1.70	9

Area features	Observed condition				Mean	Rank
	Excel (4)	Good (3)	Fair (2)	Poor (1)		
Lodging	34.18%	55.70%	8.44%	1.69%	3.22	4
Trail camping	16.59	60.09	18.39	4.93	2.88	9
Campgrounds	19.74	57.46	17.54	5.26	2.91	7
Eating places	32.51	52.19	13.11	2.19	3.15	5
Shopping for gifts	22.55	56.73	18.55	2.18	2.99	6
Historical attractions	37.82	52.10	8.68	1.40	3.26	3
Outdoor attractions	48.72	45.15	5.10	1.02	3.41	2
Shuttle/bike rentals	50.15	43.96	4.02	1.86	3.42	1
Guide services	21.08	54.41	18.63	5.88	2.90	8

Using similar scales, sample mean ratings for observed conditions of area features were higher across the board than are the importance ratings. More than 80 percent of respondents rated the quality of shuttle/bike rentals (3.42), outdoor attractions (3.41), lodging (3.22), and historical attractions (3.26) in the area as good to excellent.

Trail camping (2.88), guide services (2.90), campgrounds (2.91), and shopping for gifts (2.99) were the lowest ranking area features. But, these averages are only slightly less than a “good” rating. Only campgrounds and guide services received “poor” ratings

by at least 5 percent of respondents. However, considering the large proportion of users who rate camping and guide services at low to no importance, attention to these services is probably not of near term importance.

Taken together, the trail issues and area features results appear to indicate that VCT users are focused on trail use and appearance first and foremost. With upwards of 85 percent of visits being day users, eating places and other outdoor attractions are the most important area features, and, they are being provided at good to excellent levels.

## Management Issues

In this section, visitor responses to five policy statements pertaining to general maintenance of the VCT, provision of maintenance, and crowding are reported (Table TU-4). Respondents were asked about the importance maintaining the trail to attract visitors, whether a use fee should be used to fund trail maintenance, whether local tax revenue should be used to fund trail maintenance, whether volunteer groups should be utilized for trail maintenance, and if they thought crowding would affect the quality of future visits. Over 99 percent of respondents strongly agreed (85%) or agreed (14.3%) that it is important to maintain the VCT in good condition to attract visitors to the region. This suggests that locals and nonlocals alike believe visitors to the VCT are important.

The next management issue pertained to the implementation of a use fee for funding trail maintenance and improvements. Here, the responses were almost evenly divided between support (48.5%) and opposition (43%), with 9 percent uncertain. Given the general nature of this question, i.e., no specifics regarding the amount or the implementation of the fee, it is difficult to determine whether opposition is to the idea of a fee in general, concern that the fee level could be excessive, or an alternative reason. It is interesting to note that 60 percent of nonlocals supported a user fee, while only 32 percent of locals supported this type of fee. Regardless, these results suggest that while fees are not universally opposed, more time and effort, devoted to obtaining additional information from users, perhaps through focus groups or a more detailed follow-up survey about

amounts and implementation, is warranted.

Next, respondents were asked how they felt about the use of local tax dollars as a method for funding VCT maintenance. Almost 79 percent of respondents indicated that they strongly agreed (31.1%) or agreed (47.8%) with the use of local tax dollars for trail maintenance. Only 12 percent of respondents explicitly disagreed with the use of local tax revenues for funding trail maintenance. Here, the local (89%) and nonlocal (71%) support is similar. The high local support for tax revenues funding maintenance on the VCT may explain the lower local support for a use fee because of the fear of double charging. Nevertheless, the strong local support for the use of local tax dollars to support maintenance on the trail suggests a belief that the VCT is a worthwhile public good. It should be noted, however, that locals who do not use the trail are not included in the sample.

The next management statement pertained to the use of volunteer groups as the main source of upkeep for the VCT. Sixty-two percent of respondents indicated that they strongly agreed or agreed with the use of volunteers groups for trail maintenance. Responses were virtually equal between locals and nonlocals. Twenty-seven percent of respondents disagreed with the notion that volunteers be relied upon as the main source of VCT maintenance, while 11 percent remained undecided.

The last management issue section asked respondents to indicate whether or not they were concerned about crowding and its effects on future visits. Only 36 percent of those surveyed strongly agreed or agreed that crowding would affect the quality of future visits. Over

56 percent of respondents disagreed with the statement used in the questionnaire. This indicates that crowding is neither a current nor immediate future concern among current VCT users.

Taken together, the responses to the management statements indicate overwhelming support for maintaining the condition of the VCT and attracting visitors to the area. Among the alternatives for funding maintenance and improvements, there appears to be strong support for continued use of local tax dollars with the help of volunteer groups. There is somewhat less support for a user fee (48% for, 43% against), with less than 1/3 of locals supporting this method of providing maintenance funding. Finally, based on reported results in this section (Table TU-4) and the trail issues section (Table TU-2), it appears that while crowding is important, the current condition is good to excellent (90%) and visitors do not seem to expect a change for the worse in the near future.

**Trail Surfaces**

In this section, respondents were asked to indicate their preferences about three trail surface alternatives, paved, cinder, and crushed limestone. Rather than rank the alternatives, respondents

were asked to indicate whether they supported, did not support, or were neutral about each surface type. Over 77 percent of users responding to the survey indicated that they did not support a paved surface for the VCT (Table TU-5). Fewer than 10 percent supported a paved surface, while almost 15 percent were neutral/undecided. Almost 80 percent of users support cinders as trail surface medium, while fewer than 10 percent opposed this type of surface. Over 54 percent of respondents indicated that they strongly supported or supported crushed limestone surfaces, while 26 percent opposed this surface type, leaving 20 percent undecided.

The above results indicate an overwhelming opposition to paving the VCT. Alternatively, crushed limestone (64%) and cinders (78%) are supported by large majorities of users. Respondents were not queried about their motivations for supporting surface types; however, it is possible that the lack of support for paved surfaces could relate to increased opportunities for conflicting uses like skate-boarding and roller-blading. Moreover, a paved trail would perhaps run counter to the importance users placed on natural scenery.

**Table TU-5. Preferences for trail surface types among Virginia Creeper Trail users.**  
[Strongly Support (SS), Support (S), Don't Support (DS), or Neutral/Don't Know (ND)]

Surface Type	SS	S	DS	ND
Paved surface	3.29%	5.02%	77.16%	14.54%
Cinder surface	39.83	38.62	9.14	12.41
Crushed limestone	22.49	31.66	26.12	19.72

**Table TU-6. Preferences by users for permitting alternative transportation sources on the Virginia Creeper Trail. [Support (SAU)for All Users, Support (SDU) only for Disabled Users, Don't Support (DS), or Neutral/Don't Know (ND)]**

Transportation alternative	SAU	SDU	DS	ND
Electric golf carts	1.77%	26.42%	48.23%	23.58%
Gas-powered golf carts	1.19	12.46	79.52	6.83
Motorized bicycles	3.07	11.77	78.33	6.82
Horse-drawn carts	11.11	9.23	62.22	17.44
ATV's	1.54	2.22	92.15	4.10

### Trail Uses

The last segment of preference information obtained from VCT users dealt with their opinions about trail use modes other than foot travel, horseback, or bicycle. Respondents were asked for each of the following modes: electric golf carts, gas-powered golf carts, motorized bicycles, horse-drawn carts, and ATV's; whether they support the mode for all users, support the mode only for disabled users, are neutral, do not support the mode, or do not care. Responses to these transportation or trail use alternatives are reported in Table TU-6.

With the exception of electric golf carts, the results are unambiguous. Close to 80 percent of users universally rejected the idea of allowing motorized bicycles or gas-powered golf carts on the VCT. However, in both cases, just over 10 percent felt these two modes should be allowed for disabled users. ATV's fared worse. Without exception, over 90 percent of respondents rejected ATV use on the VCT. Horse-drawn carts were supported by 11 percent for all users and another 9 percent for disabled users. Nevertheless, more than 60 percent of those surveyed did not support this mode, with another 17 percent neutral or undecided. Finally, while fewer than 2

percent of users felt that electric golf carts should be allowed for all users, only 48 percent opposed electric golf carts outright. Twenty-six percent of users felt that electric carts should be permitted for disabled users, leaving about 24 percent neutral or undecided about this transportation mode.

Overall, the findings in this section make it clear that the vast majority of VCT users are opposed to the use of gas-powered golf carts, motorized bicycles, ATV's, and horse-drawn carts along the trail, even for disabled users. However, there was some ambiguity about electric golf carts as fewer than 50 percent of users expressed outright opposition to their use, with about 50 percent of users being split between permitting disabled only use and being neutral or undecided.

### Economics

In this section of the report, two important economic aspects related to the use of the VCT are discussed, economic impacts and net economic benefits. Economic impacts basically trace and measure the effects of visitor spending on the regional economy. These effects are quantified in dollars of output and jobs. Net economic benefits or consumer surplus is a measure which

indicates the value of a resource. In the case of unpriced access to recreation resources like the VCT, it represents the dollar amount that individuals are willing-to-pay to use the resource above and beyond what they must pay to use the resource. More complete discussion of these and related concepts, such as price elasticity, along with estimates for the VCT are provided in the sections below and in a thesis by Gill (2004).

### **Economic Impact Analysis**

This section examines visitor expenditures and the resulting impact on the local economy. One of the primary objectives of this project was to estimate the economic impact to Washington and Grayson counties of nonlocal trips to the VCT. Nonlocal expenditures related to recreation use impact the local economy in the form of increased output, income, and jobs. These increases are quantified by performing economic impact analysis. Economic impact analysis estimates the changes in regional economic activity that result from some action, measured as changes in visitor spending, regional income, and/or employment (Moore, Gitelson, and Graefe, 1994; Stynes, 2004). There are three components necessary to perform impact analysis:

1. Obtain an accurate number of users and user types
2. Estimate average spending per person per trip for each user type
3. Estimate direct and secondary effects of visitor spending.

Impact analysis can be performed as ex ante or ex post analysis. Ex ante is used when trying to determine impacts from proposed or hypothetical changes and ex post analysis is used for projects that currently exist. In ex post analysis impacts are measured as changes in

economic activity resulting from the loss of visitors to the area. This method is frequently used when estimating the impacts of recreation visitors and the impacts they have on the local economy. With ex post impact analysis, it is assumed that visits and expenditures related to recreation would be lost to the local economy as a result of site closure. If there are other recreation opportunities within the region that could absorb visitors lost as a result of site closure, this assumption may not hold (Stynes, 2004).

Total economic impact is a combination of direct spending (direct effects) and secondary spending (secondary effects). Direct spending is the total amount spent by nonlocal visitors in the local economy. These expenditures represent the direct economic effects of recreation on the local region. The direct effects of visitor expenditure create a “ripple” effect within the local economy. Initial nonlocal expenditures stimulate local industries and businesses that supply the recreation and tourism sectors. This stimulation provides income to employers and employees that can be spent within the region. These effects related to visitor expenditures are termed secondary economic effects. Secondary effects are made up of indirect and induced effects. Indirect effects are changes in sales, income, or jobs to suppliers of the recreation and tourism sectors within the region. Induced effects are increased regional sales that result from income earned in recreation or supply sectors (Stynes, 2004).

In this study, the direct, indirect and induced effects of VCT expenditures on Washington and Grayson counties were estimated using the IMPLAN model. IMPLAN (IMPact Analysis for

PLANning) is a computer-based, input-output economic modeling system designed specifically to conduct economic impact analysis that has been in use since 1979. IMPLAN was originally developed by the USDA Forest Service in order to provide a comprehensive, science-based system for estimating the economic impacts of natural resource related projects. In 1993, the Minnesota IMPLAN Group, Inc. (MIG, Inc.) was formed to privatize development of IMPLAN data and software for wider distribution and application. The IMPLAN modeling system has since been used in a multitude of private and public sector applications to estimate the economic impacts of natural resource related and non-natural resource related projects on regional economies.

With IMPLAN applications, regional economies may be as small as a single county or as large as multi-state regions. The IMPLAN modeling system has two major components; a nationwide database describing county-level economic activity and a computer model for constructing regional input-output models and estimating economic impacts from changes in economic activity. The IMPLAN modeling system is based on input-output accounting and analysis procedures used by the U.S. Bureau of Economic Analysis and recommended by the United Nations (Taylor, Winter, Alward, & Siverts, 1992; MIG, Inc., 1999).

When using an input-output model such as IMPLAN to estimate total economic impact, leakage must be accounted for before estimating total economic impacts. Leakages are the portion of sales that leave the local economy to pay for goods and services not produced in the area. These leakages

must be accounted for in order to get an accurate estimate of regional impacts. Only those dollars captured by the local economy should be used to determine total economic impact.

### **Estimation of Total Person Trips**

As described above, estimation of total economic impacts first requires estimates of total recreation visitation. Total visitation was estimated based on the stratified random sample described in previous sections of this report. The use estimate, based on the stratified random, provides an estimate of the annual number of visits taken to the VCT. In order to estimate economic impacts, this estimate was converted to person trips as described below. A person trip is defined as one person taking one trip to the VCT. Note that a visitor can take multiple visits to the VCT on the same trip (e.g., multiple visits over a several day trip).

To estimate total person trips, the percentage of nonlocal and local visitors to the VCT was determined first by asking each survey respondent whether he or she lived or worked in Washington or Grayson counties. Next, the mean number of annual trips and mean number of visits per trip per user type was determined. These were questions asked on each survey administered. Mean annual trips and mean visits per trip were multiplied to estimate mean visits per year. Mean visits per year were multiplied by each nonlocal user type to estimate sample visits per year. These nonlocal user types will be discussed in more detail in the next section.

The sample visits per nonlocal user type were aggregated to get total sample visits per year. Each sample visit per nonlocal user type was divided by the total sample visits per year to estimate

each user type's share of sample visits. The sample visit share for each nonlocal user type was multiplied by annual number of nonlocal visits to estimate annual number of visits per user type. The annual number of nonlocal visits was calculated from the use estimate. Annual visits per nonlocal user type were divided by the mean number of visits per trip per user type to estimate annual trips per user type. The annual trips per user type were aggregated to get annual person trips.

### **Estimation of Average Trip Expenditures**

The expenditures of importance in an economic impact analysis are nonlocal expenditures. Nonlocal expenditures represent "new" money being brought into the local economy, which increase total wealth in the economy resulting in economic growth.

Nonlocal expenditures by major spending categories were estimated from responses to trip expenditure questions included in the on-site VCT survey (Appendix A, Nonlocal B). The expenditure questions asked for information to determine group expenditures within 25 miles of the VCT and group expenditures for the whole trip. The expenditure questions also asked the respondent about the size of their spending party. Using this information, average per-person expenditures made within 25 miles of the VCT per user type were estimated. Table EI-1 shows the major expenditure categories included in the expenditure questions; private lodging, public lodging, food consumed in a restaurant or bar, food consumed outside of a

restaurant or bar, primary transportation, other transportation expenditures, bicycle rentals, shuttle or guide service, entry fees, and other expenditures.

VCT users were classified by user type. The four user types identified at the VCT were primary day users, nonprimary day users, primary overnight users, and nonprimary overnight users. A primary user is defined as a user who is in the impact region for the primary purpose of visiting the VCT. A nonprimary user is defined as a person in the impact region for another purpose, but chose to spend a portion of time on the VCT.

Based on these nonlocal user classifications, expenditure profiles were developed describing these user classifications in detail. These profiles contained the average per person expenditure made in each of the expenditure categories by each user type. These profiles estimated average expenditures for the entire trip and for expenditures made within twenty-five miles of the VCT. To estimate per person expenditures each expenditure category was divided by the average spending party size in each user classification.

It is important to note the treatment of expenditures for nonprimary users. Because these users were not in the local area for the primary purpose of using the VCT, there were two options for treating their spending information. The first option was to eliminate these nonprimary users from the impact analysis. The second was to apportion their expenditures based on the ratio of total trail time to total time spent in the area.

**Table EI-1. The expenditure profile from the nonlocal B survey of VCT users**

	A. Spending by your party within 25 miles of the Creeper Trail	B. Spending by your party for the whole trip
<b>Lodging:</b>		
Privately owned (motel, cottage, bed & breakfast)	_____	_____
Publicly owned (state or FS campgrounds)	_____	_____
<b>Food &amp; Beverage:</b>		
Food and drinks consumed at restaurants or bars	_____	_____
Other food and drinks (carry-out, groceries)	_____	_____
<b>Transportation:</b>		
Gasoline, oil, repairs	_____	_____
Other transportation (tolls, airfare, vehicle rental)	_____	_____
<b>Trail Related:</b>		
Bicycle rentals or service	_____	_____
Shuttle or guide service	_____	_____
Trail use, entry, or parking fees	_____	_____
<b>Any other expenses:</b>		
Other services or equipment	_____	_____

The second option was chosen and the nonprimary users were incorporated in the impact analysis. These users were retained because, while they were not in the local area primarily to use the VCT, they did use the trail and as such some of their expenditures can be attributed to this use.

There are examples of various apportioning strategies found in the literature. English and Bowker (1996) prorated expenditures made on multiple destination whitewater rafting trips by the number of sites visited. Other examples of portioning expenditures in impact studies include Cordell et al. (1990) and Bergstrom, Cordell, Watson, and Ashley (1990). Cordell et al. (1990) used portioning to allocate expenditures made by out-of-state visitors to four

Southeastern states to recreate at state parks. Cordell et al. (1990) also portioned visitor expenditures to the impact region around the state park visited. Bergstrom et al. (1990) used similar portioning techniques to allocate en route expenditures, impact region expenditures, and equipment expenditures associated with trips for river recreation.

To estimate expenditures attributed to the VCT by nonprimary users, average per person spending per expenditure category were multiplied by the ratio of total trail time to total time spent in the area. For day users the ratio used was on trail time, in minutes, divided by seven hundred and twenty minutes. This represents a 12-hour day. The equation for the portion of

expenditures attributed to the trail for nonprimary day users is:

$$VCTPER = [(TIMESP * CRUSE) / TOTIME] \quad (1)$$

where,

*VCTPER* = percentage of expenditures attributed to the VCT

*TIMESP* = on trail time in minutes

*CRUSE* = number of visits to the VCT in a trip

*TOTIME* = total time in the area, 720 minutes for day users

For overnight users the same equation was applied. However, *TOTIME* was the number of nights spent in the impact region times twelve hours times sixty minutes:

$$TOTIME = NIGHTC * 12 * 60 \quad (2)$$

Where,

*NIGHTC* = the number of nights spent in the impact region

Nonprimary overnight respondents stating they stayed more than fourteen nights in the impact region were rejected from the sample. Respondents staying

in the local area more than fourteen nights were greater than the 99<sup>th</sup> percentile of total responses. Equation 3.9 was multiplied by each expenditure

category to get the per category expenditures attributed to the VCT for nonprimary day users and nonprimary overnight users. For nonprimary day users this ratio was

$TIMESP * CRUSE / TOTIME = 0.24$ . For nonprimary overnight users this ratio was  $TIMESP * CRUSE / TOTIME = 0.09$ .

These expenditures were divided by the spending party size to estimate per person expenditures by category shown in Tables EI-2 through EI-5

Average per person expenditures per user type were: primary day use \$17.16, primary overnight \$82.10, nonprimary day use \$12.31, and nonprimary overnight \$7.02. The per-person per trip expenditures from the expenditure profiles were used to estimate total aggregate expenditures.

**Table EI-2. Expenditure profile for nonlocal primary VCT day users**

N=169, spending party = 3.34

Expenditure type	Within 25 miles	Entire trip	Per person within 25 miles expenditure	Per person per trip expenditure
Private lodging	0.00	14.69	0.00	4.39
Public lodging	0.00	0.09	0.00	0.02
Food in restaurants	21.29	38.13	6.37	11.41
Carry out food	2.65	6.49	0.79	1.94
Primary transportation	11.42	18.68	3.41	5.59
Other transportation	0.06	0.06	0.01	0.01
Bike rentals	11.68	12.98	3.49	3.88
Shuttle/guide	9.17	10.51	2.74	3.14
Use fees	0.14	0.14	0.04	0.04
Other expenses	0.89	1.42	0.26	0.42
<b>Total</b>	<b>57.32</b>	<b>103.22</b>	<b>17.16</b>	<b>30.90</b>

**Table EI-3. Expenditure profile for nonlocal primary VCT overnight users**  
 N=147, spending party = 4.5

Expenditure type	Within 25 miles	Entire trip	Per person within 25 miles expenditure	Per person per trip expenditure
Private lodging	126.95	211.86	28.21	47.08
Public lodging	22.29	29.30	4.95	6.51
Food in restaurants	99.43	137.02	22.09	30.44
Carry out food	27.69	40.02	6.15	8.89
Primary transportation	36.45	61.50	8.10	13.66
Other transportation	1.90	2.53	0.42	0.56
Bike rentals	17.28	18.44	3.84	4.09
Shuttle/guide	19.26	20.95	4.28	4.65
Use fees	0.00	0.00	0.00	0.00
Other expenses	17.56	18.32	3.90	4.07
<b>Total</b>	<b>369.47</b>	<b>539.34</b>	<b>82.10</b>	<b>119.85</b>

**Table EI-4. Expenditure profile for nonlocal nonprimary VCT day users**  
 N = 23, spending party = 4.30, Time share = .24

Expenditure type	Within 25 miles	Entire trip	Per person within 25 miles expenditure	Per person per trip expenditure
Private lodging	0.00	165.13	0.00	6.63
Public lodging	0.00	31.18	0.00	1.38
Food in restaurants	51.00	154.18	3.71	7.00
Carry out food	5.90	23.63	0.19	1.09
Primary transportation	59.00	82.18	4.86	5.71
Other transportation	0.00	72.72	0.00	2.73
Bike rentals	47.13	47.13	2.66	2.66
Shuttle/guide	3.90	3.90	0.13	0.13
Use fees	0.00	0.18	0.00	0.00
Other expenses	54.81	100.95	0.76	2.66
<b>Total</b>	<b>162.74</b>	<b>681.18</b>	<b>12.31</b>	<b>30.05</b>

**Table EI-5. Expenditure profile for nonlocal nonprimary VCT overnight users**  
 N = 94, spending party = 3.40, Time share = .09

Expenditure type	Within 25 miles	Entire trip	Per person within 25 miles expenditure	Per person per trip expenditure
Private lodging	125.17	175.53	2.50	4.40
Public lodging	46.19	47.89	0.27	0.30
Food in restaurants	97.32	120.51	2.07	2.79
Carry out food	17.23	28.19	0.25	0.62
Primary transportation	44.73	100.51	0.80	1.74
Other transportation	6.80	29.19	0.02	0.15
Bike rentals	17.25	17.59	0.38	0.41
Shuttle/guide	8.50	9.03	0.21	0.22
Use fees	0.00	1.06	0.00	0.00
Other expenses	3.40	3.93	0.45	0.47
<b>Total</b>	<b>366.59</b>	<b>533.43</b>	<b>7.02</b>	<b>11.15</b>

**Estimation of Total Economic Impacts**

The direct, indirect and induced effects of recreation expenditures per 1,000 person trip by the user categories described in the previous section were estimated by first multiplying average expenditures per person trip for each user category by 1,000. These direct expenditures per 1,000 person trips were then entered into the IMPLAN model, and the model estimated the total effects (direct, indirect and induced effects) of visitor expenditures by user category. These results are shown in Table EI-6.

Total economic impacts of total estimated trips to the VCT were then estimated by multiplying the estimates of total person visits by user category (Table TC-3, in units of 1,000 trips) by the estimated impacts per 1,000 person trips reported in Table EI-6, and then summing up these total impacts by category. The final results are reported in Table EI-7.

Table EI-6 shows the economic impacts per 1000 person trips for each

user type on the economy of Washington and Grayson counties. Primary overnight trips created the most impact on the local economy, \$114,398 in total output per 1000 person-trips, 2.1 full time job equivalents, and \$62,956 in total value added. This is logical because overnight users spend more money in local shops and eateries and spend money in local hotels. Primary day trips account \$23,606 in total output per 1000 person trips, 0.4 full time job equivalents, and \$11,592 in total value added. These numbers are larger than the nonprimary overnight users because all of the expenditures made by the primary user types are attributed to the VCT. Nonprimary users had their expenditures apportioned based on time spent on the VCT to time spent in the area. The total output per 1000 person-trips for nonprimary overnight users was more than double the total output per 1000 person trips for nonprimary day users.

**Table EI-6. Estimated Economic Impacts of Virginia Creeper Rail-Trail Use per 1,000 Person Trips in Washington County and Grayson County, VA, 2003 dollars.**

Economic Impact Indicators	Economic Impact Per 1,000 Person Trips			
	Primary Day Use	Primary Overnight	Nonprimary Day Use	Nonprimary Overnight
Output	\$23,606	\$114,398	\$14,968	\$6,411
Employment	0.4	2.1	0.2	0.1
Total Value Added	\$11,592	\$62,956	\$6,864	\$3,611
a. Labor Income	\$7,647	\$41,867	\$4,506	\$2,379
b. Other Property Type Income	\$2,623	\$4,077	\$1,508	\$ 821
c. Indirect Business Taxes	\$1,323	\$7,012	\$ 851	\$ 411
Output Multiplier	1.35	1.33	1.32	1.35
Employment Multiplier	1.33	1.23	1.00	1.00
Total Value Added Multiplier	1.44	1.37	1.44	1.37

**Table EI-7. Estimated Total Economic Impacts of Virginia Creeper Rail-Trail Use in Washington County and Grayson County, VA, 2003 dollars.**

Economic Impact Indicator	Total Economic Impact
Output	\$1,587,627
Employment	27.4
Total Value Added	\$921,362
Labor Income	\$610,372
Other Property Type Income	\$126,098
Indirect Business Taxes	\$104,153

Table E1-7 presents the total impacts of VCT person trips on the economies of Washington and Grayson counties. Total output from VCT trips is estimated at \$1.59 million. These trips support approximately 27.4 new full time job equivalents annually. The total value added associated with VCT trips is estimated at \$921,362.

### Visitor Spending

Measuring the economic impacts of nonlocal visitor spending in the Grayson and Washington economies is the correct way to assess the contribution of the VCT toward the local economy. However, it may also be of interest to note the total amount of spending by both locals and nonlocals related to their use of the VCT. For example, locals reported spending just under \$200

annually, most of which within the local economy on items directly related to their use of the VCT. In the period from November 2002 through October 2003, locals accounted for about 61,305 trail visits (Table TC-3). Conservatively, this represents between 600 and 800 unique individuals. Hence, spending by locals related to VCT use is likely on the order of \$120,000 to \$160,000 annually or, on average, slightly more than \$2 per visit.

Nonlocal spending related to use of the VCT was considerably higher. Nonlocals accounted for an estimated 68,769 trail visits, which equate to about 50,863 person-trips (Table TC-3). Combining person-trip expenditures for entire trips across the various types of nonlocal users (Tables EI-2 through EI-5) with estimated person-trips by the four types of nonlocal users results in total nonlocal spending related to VCT use of approximately \$2.2 million. Combined with local spending, this amounts to about \$2.5 million annually, most of which is in the state of Virginia.

### Net Economic Benefits

To make effective planning and policy decisions, land managers often need information which provides quantifiable measures of public preferences and values associated with different recreation resources. For many recreation venues like the VCT, fees are either not charged or are minimal. Hence, market clearing prices are unavailable as indicators of value. Consequently, alternative economic valuation methods have been developed for unpriced goods and services, like access to the VCT. In this study the travel cost method (TC) is used to develop a model describing visitor behavior which can be ultimately used to estimate individual and aggregate

consumer surplus resulting from recreation access to the VCT. The technique relies on establishing a relationship between the costs incurred by travelers to a site and the number of trips taken. Hof (1993, p.54) demonstrates that this relationship can be exploited to derive consumer surplus for recreation access to a site. As an economic benefit or welfare measure, consumer surplus is the amount by which an individual's willingness to pay for a good exceeds what the individual must pay for the good. While not directly comparable to market price, consumer surplus is accepted for use in benefit/cost calculations for project related economic efficiency analyses (Pearce and Holmes 1993, USDA Forest Service 1994). The travel cost method has been used extensively in outdoor recreation research to value site access as well as changes in site quality (Betz, Bergstrom, & Bowker, 2003; Betz, 2000; Bowker and Leeworthy, 1998; Siderelis and Moore 1995).

The general travel cost demand model for visitor behavior is typically specified as:

$$TRIPS = f(TC, SC, INC, SE, TP, OTH) + u, \quad (3)$$

where, for the  $i^{th}$  household, *TRIPS* are the annual number of primary purpose trips to a recreation site; *TC* is the travel cost per trip; *SC* is the cost of visiting a substitute site; *INC* is annual income; *SE* is a vector of socioeconomic variables which could include age, gender, race, and the like; *TP* is a vector of taste and preference variables which could include variables for activity preferences and experience at the site or in a given activity; and *OTH* is a vector which could include other variables such as site

quality indicators. The variable  $u$  is included to account for random error.

Data for the VCT empirical model were obtained from the on-site questionnaires (Appendix A). Only on-site visitors listing the VCT as their primary destination are included. Under these conditions, the data are zero-truncated and endogenously stratified. Failure to account for zero-truncation has been shown to have large effects on model estimates (Zawacki et al 2000) while the effects of endogenous stratification have been shown to be relatively minor (Ovaskainen, Mikkola, & Pouta, 2001). For the VCT, a zero truncated negative binomial regression specification is used. A number of preliminary specifications and assumptions were explored with the final model parameterized as follows:

$$\ln TRIPS = \beta_1 + \beta_2 TC + \beta_3 SUB + \beta_4 INC + \beta_5 HIGH + \beta_6 AGE + \beta_7 NYM + \beta_8 BIKE + \beta_9 SEX + u. \quad (4)$$

Variables listed in Equation 4 are defined in Table EB-1. Regression parameters are represented by the vector of  $\beta$ 's and are estimated using LIMDEP. Travel distances and times used to compute the travel cost variable  $TC$  were estimated using PCMiller software. Two versions of the model are estimated based on alternative assumptions about this variable. The first version omits the opportunity cost of travel time, while the second version assumes a cost of travel time equaling  $\frac{1}{4}$  the household wage rate. Finally, the for error term,  $\exp(u)$  is assumed to follow a gamma distribution with a mean of 1.0 and constant variance  $\sigma$ .

**Table EB-1 — Definition of variables included in the VCT trips model.-**

<u>Variable Name</u>	<u>Definition</u>
<b>TRIPS</b>	<b>Annual VCT trips by the traveling unit (mean=71).</b>
TC	Distance (\$0.131/mile) and time (valued at $\frac{1}{4}$ the household wage rate) travel cost (dollars) per VCT trip.
SUB	Binary variable indicating whether or not the respondent felt there was a viable substitute for the VCT.
INC	Annual household income (1000s)
NUM	Number of people living in the household that use the VCT
AGE	Age of respondent (years)
SEX	Gender variable (male=1, female=0)
BIKE	Activity variable (1= biking, 0 =all other activities)
HIGH	Avidity variable (1= annual trips >30, 0= annual trips < 30)

Regression results and means of the explanatory variables are reported in Table EB-2. The estimated parameter for *TC* in both models is highly significant and has the expected sign, indicating that trips decrease with increased distance and consequent costs. Also, highly significant are *BIKE* and *HIGH*. The negative sign for *BIKE* implies that for any given distance, the number of trips bikers take will be less than non bikers (primarily walkers). This result is probably driven by the high number of locals that regularly walk the trail and by the fact that walkers living farther away are likely to have better substitutes for the VCT than bikers. The positive sign on the *HIGH* coefficient suggests the presence of a group that have a strong attachment to the trail that cannot be explained by cost and other socioeconomic variable difference. The *SEX* and *INC* variables are marginally significant. Other factors equal, males are likely to take more VCT trips than females. This is not uncommon for many outdoor recreation endeavors. The negative sign on the *INC* coefficient suggests that as income increases, people take fewer trips. This too is not uncommon in outdoor recreation studies and could be caused by having more different kinds of substitute activities and destinations available because of increased discretionary income. The coefficients on the *AGE*, *NUM*, and *SUB* variables were not statistically significant. These variables are retained in the model primarily because of theoretical reasons. However, the *NUM* variable is used to convert trips and consumer surplus per group to a per-person basis facilitating aggregation with trail counts.

Average per-trip consumer surplus estimates for groups traveling to the

VCT can be estimated using the negative inverse of the travel cost coefficient ( $CS = -1/\beta_2$ ). Assuming no cost for time, average consumer surplus per group per VCT trip is \$42.54 with a 95-percent confidence interval of (\$38.53 - \$46.54). Using the model results which account for the opportunity cost of time the per trip group consumer surplus is \$72.63 with a 95-percent confidence interval of (\$65.98 - \$75.28). On a per person per trip basis, the estimated consumer surplus assuming no time cost is \$22.78, while assuming an opportunity cost of  $\frac{1}{4}$  the household wage, the per person per trip consumer surplus is \$38.90.

An estimate of the total annual recreation use value of the VCT can be obtained by combining estimated number of primary purpose person trips (100,870 from columns 1 and 3, Table TC-3) with estimated per trip consumer surplus. Two estimates are reported. The annual net economic value of primary purpose VCT trips valued at zero opportunity cost of time is \$2,297,818 ( $100,870 * \$22.78$ ). The annual net economic value of primary purpose VCT trips with opportunity cost of time valued at  $\frac{1}{4}$  the wage rate is \$3,923,843 ( $100,870 * \$38.90$ ).

These aggregate values are consistent with previous trail related studies. Siderelis and Moore (1995) reported a range of \$1.9 million (Lafayette/Moraga Trail), \$4 million (Heritage Trail) and \$8.5 million (St. Mark's Trail) in aggregate value. Adjusted to 2003 dollars these values would be \$2.3 million, \$5 million and \$10.6 million respectively. The trail in Siderelis and Moore (1995) with characteristics most similar to the VCT is the Heritage Trail. This trail is a 26-mile rural rail trail in Iowa. The estimated use reported by Siderelis and

**Table EB-2. Truncated negative binomial regression parameter estimates and standard errors of alternative cost specification models for annual VCT trips.**

Variable	\$.131 per mile No time cost N= 801	\$.131 per mile ¼ the wage rate N= 800	Mean
Constant	2.173 (.157)	2.1648 (.1599)	
TC	-.0235*** (.0011)	-.0137*** (.0006)	#
SUB	.0546 (.0684)	.0236 (.0684)	.37
INC	-.000002** (.000001)	-.0000018* (.0000011)	70,300
HIGH	2.961*** (.0855)	3.0108*** (.0834)	.46
AGE	.0022 (.0023)	.00209 (.0023)	47
NUM	.0019 (.0261)	-.02705 (.0271)	2.39
BIKE	-.2909*** (.0716)	-.3137*** (.0719)	.55
SEX	.1115* (.0608)	.0999* (.0621)	.54
Overdispersion $\sigma$	.6360*** (.0567)	.6449*** (.0577)	

\*\*\* Significant at the .01 level. \*\*Significant at the .05 level. \*Significant at the .10 level.

# Mean travel costs are \$25.01 and \$40.22 for no time cost and ¼ the wage rate time cost respectively.

Moore (1995) for the Heritage Trail was about 135,000 annual visits.

### Price Elasticity

The results of the regression analysis above can also be used to calculate the price elasticity of demand,  $\epsilon_p$ . The price elasticity of demand is a unit-less measure representing the percentage change in trips in response to a given percentage change in price. For the models estimated above, the price elasticity can be estimated as,  $\epsilon_p = \beta_2 * TC$ , where,  $\beta_2$  and  $TC$  are as defined above. For the no time cost and ¼ wage rate time cost models above the price

elasticities calculated at the mean travel costs are -0.605 and -0.567, respectively. These values are within the ranges reported by Siderelis and Moore (1995) and Betz et al (2003) of -0.207 to -0.430 and -0.681, respectively.

Price elasticity between 0 and -1 suggests that as price or travel cost increases, visits will decrease. However, price response is considered inelastic, i.e., the percentage decrease in visits will be less than the percentage increase in price. For example, consider  $\epsilon_p = -0.605$  and an average per trip travel cost of \$25.01 from the no time cost model above. Imposing a \$5 use fee (per group

trip) would increase price by 20 percent. However, group visitation would only be expected to decline by about 12 percent. This assumes, of course, that visitors respond to a use fee as they would to an increase in gasoline price. In the short run, given emotion and political situations, this assumption is tenuous, especially as a use fee is not already being implemented at the site.

## Summary and Conclusions

This primary intent of this report has been to assess the economic impacts and economic benefits of recreation use on the Virginia Creeper Trail. Additional and related objectives included estimating annual trail visitation by various types of users, describing visitors and visitor behavior, and examining visitor attitudes and preferences associated with VCT use.

A stratified random sampling procedure was used to obtain counts of visits and to survey users about their behavior, attitudes, and preferences. On-site sampling took place from November 2002 through October 2003. Recreation visits to the VCT during that time were estimated to be 130,172 with a 95 percent confidence interval of 119,905 to 140,439. Locals accounted for about 61,503 visits (47%), while nonlocals accounted for 68,669 visits (53%). Seasonally, summer (April through October) accounts for more than 80 percent of total visits.

Allowing for overnight trips by nonlocals with multiple VCT visits per trip to the area yielded an estimate of 112,366 annual person-trips by locals and nonlocals. For nonlocals, the majority of these, 33,642, were primary purpose day use. Primary purpose overnight use accounted for 5,725 trips,

while the two nonprimary purpose categories, nonprimary purpose overnight and nonprimary purpose day use accounted for 3,918 and 7,587 trips, respectively. The vast majority of visitors, 111,010 visits (85%) or 102,723 person-trips (91%), are day users.

An assessment of visitor demographics indicates that VCT users both local and nonlocal are white (99%), male (64%), and college educated (64%). The average adult user age is 47, and users over the age of 56 account for nearly 30 percent of trail use. Household income for VCT users averages more than \$72,315 per year, with about 25 percent of users indicating they are retired.

Locals live an average of 8 miles from their chosen trailhead, which for 65 percent of locals is Abingdon. Locals visit the VCT on average about 11 times per month, with 55 percent taking fewer than 10 trips per month. Primary activities for this group include walking (52%), biking (26%), and jogging (13%). Average time spent on the trail is just over an hour and results in a distance covered of about 5 miles.

Nonlocals traveled an average of 260 miles and 4.6 hours to reach the VCT. Fifty percent of nonlocals came from less than 160 miles. Whitetop Station (45%) was the trailhead most commonly entered by this group followed by Abingdon (23%) and Damascus (17%). Nonlocals averaged about 4.8 trips to the area per year, but 77 percent took fewer than 4 trips annually. The vast majority of nonlocals listed biking (75%) as their main activity, while 20 percent listed walking. Average time spent by this group on the trail was just under 3 hours with a reported distance covered of 17 miles.

The overwhelming majority of visitors listed health and the opportunity to view nature as their greatest personal benefits from VCT use. About half the users claimed to receive a high level of benefit from the trail contributing to their sense of community, while about 30 percent of users obtained a high level of benefit associated with being able to bring their pets to the trail.

Trail issues most important to users were scenery, safety, structures, and surfaces – the “four S’s.” All of these issues were considered of high or medium importance to over 90 percent of VCT users. The highest ranking issues with respect to observed conditions by users were also the “four S’s.” This bodes well for management, suggesting that effort and outcomes devoted to trail management are in line with user preferences.

Area features complementary to the VCT experience were far less important to users than trail attributes. Among the most important area features were other outdoor attractions, eating places, historical attractions, and shuttle/bike rentals. Among the least important area features for VCT users were those related to camping. These results are not surprising given that 80-90 percent of the visits are for day use. In virtually all cases, the ranking for observed conditions of area features exceeded the importance ranking, with shuttle/bike rentals and outdoor attractions receiving the highest condition rankings. Again, this suggests that goods and services provision in the area is keeping pace with user preferences.

Among the management issues associated with the trail, there seems to be little ambiguity among VCT users about a couple of issues. First, users strongly oppose alternative forms of

transportation such as golf carts, motor bikes, and especially ATV’s. While about 30 percent of users support the use of electric golf carts for the physically disabled, gas powered forms of transportation, even for disabled users, got very little support. Second, fewer than 10 percent of users supported paving the VCT. Both cinder (79%) and crushed limestone (64%) were the surfaces most supported by users.

Over 99 percent of users felt that it is important to maintain the VCT in a condition that will attract visitors to the region. To do so, most (89%) users felt local tax revenues should be used. However, over half the users felt that volunteer groups should be the primary source of trail maintenance. Visitors were evenly split about imposing a use fee to help fund trail maintenance.

VCT users, including locals and nonlocals, spent about \$2.5 million over the sample period related to their recreation visits. Of this amount, nonlocal visitors spent about \$1.2 million directly in the Washington and Grayson county economies. This nonlocal visitor spending in the area generated \$1.6 million in economic impacts and supported close to 30 jobs.

Finally, although access to the VCT is “free,” there is a substantial economic value that accrues to recreation visitors from access to the trail. Using conventional economic methods, it was determined that, on average, the net economic benefit to users of the VCT is between \$23 and \$38 per person per trip. These values can be aggregated across the estimated 100,870 primary purpose trips per year leading to an estimated range of between \$2.3 million and \$3.9 million in net economic benefits to VCT users.

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## Appendix A. Survey Versions

### Virginia Creeper Screener Questionnaire

1. Survey # \_\_\_\_\_
2. Interviewer: \_\_\_\_\_
3. Interview Site: \_\_\_\_\_
4. Date: \_\_\_\_\_
5. Activity/Mode: Bike            Walk            Jog    Pet    Equestrian            Fish  
Hike            Camp            Other \_\_\_\_\_
6. Time: \_\_\_\_\_
7. Race: W B O
8. Gender: M F
9. Age <16 >16
10. Group Size: \_\_\_\_\_

READ INTRODUCTION B I am a volunteer conducting a survey on behalf of Virginia Trails, the US Forest Service, the Virginia Creeper, and the state of Virginia. I would like to ask you about your trail use. This information will help managers develop better plans for trails throughout Virginia.

9. Do you live or work within Grayson or Washington County? Y N
10. Could we ask you about 5 minutes of questions? Y N

IF 9=Y AND 10=Y → LOCAL QUESTIONNAIRE  
IF 9=N AND 10=Y → NONLOCAL QUESTIONNAIRE

11. Is there a reason why you cannot help us?
  - A. No time
  - B. No interest
  - C. Already been surveyed
  - D. Other \_\_\_\_\_

## Virginia Creeper On-Site Local Questionnaire

1. Survey # \_\_\_\_\_
2. What is your residence Zip Code? \_\_\_\_\_
3. Where did you enter the Creeper today?  
A. Abingdon B. Damascus C. Whitetop D. Watauga  
E. Alvarado F. Creek Jct G. Green Cove H. Taylor's Valley I. Straight Branch  
J. Other \_\_\_\_\_
4. How long did it take to get from home/work to where you entered the trail?  
\_\_\_\_\_minutes
6. What is your primary reason for being on the trail today?  
A. Biking B. Walking C. Jogging  
D. Camping E. View Nature F. Horse Riding G. Fishing H. Other \_\_\_\_\_
7. How much time did you spend on the trail \_\_\_\_\_hours \_\_\_\_\_minutes
8. How far did you go (roundtrip)? \_\_\_\_\_miles
9. How many, including yourself, were in your group? \_\_\_\_\_ people
10. Were you part of an organized group? Yes No Group name: \_\_\_\_\_
11. What seasons do you use the Creeper?  
A. Spring B. Summer C. Fall D. Winter
12. Counting this visit, how many times have you visited the Creeper in the past 30 days?  
A. 1 B. 2 – 5 C. 6-10 D. 11- 15 E. 16-25  
F. 26-35 G. 36-45 H. More than 45
13. In the past 30 days, what percent of your visits to the CREEPER were on weekends/holidays?  
\_\_\_\_\_percent.
14. In the past 30 days, how many trips have you made to other rail trails like the CREEPER?  
A. None B. 1 C. 2 - 5 D. 5 - 10 E. 10 - 20 F. More than 20
15. About how much do you spend each year on goods and services related to your use of the CREEPER?  
A. less than \$50 B. \$50-100 C. \$100-250 D. \$250-500 E. \$500-1000  
H. More than \$1000
16. About how much of this money is spent Washington or Grayson County?  
A. more than 75% B. 50-75% C. 25-50% D. less than 25%

Please rate the degree to which you receive the following benefits from the Creeper.

- |                                    |      |     |     |      |
|------------------------------------|------|-----|-----|------|
| 1. Health & fitness                | High | Med | Low | None |
| 2. Opportunity to view nature      | High | Med | Low | None |
| 3. A place to take my pets/animals | High | Med | Low | None |
| 4. Provides a sense of community   | High | Med | Low | None |
| 5. Other _____                     | High | Med | Low | None |

Please rate the following trail issues: first importance to you and then conditions you observed today.

Trail Issues:	Importance to you				Current conditions			
1. Safety/security	High	Med	Low	None	Excel	Good	Fair	Poor
2. Amount of crowding	High	Med	Low	None	Excel	Good	Fair	Poor
3. Parking	High	Med	Low	None	Excel	Good	Fair	Poor
4. Natural scenery	High	Med	Low	None	Excel	Good	Fair	Poor
5. Restrooms	High	Med	Low	None	Excel	Good	Fair	Poor
6. No conflicts with others user type: _____	High	Med	Low	None	Excel	Good	Fair	Poor
7. Trail surfaces	High	Med	Low	None	Excel	Good	Fair	Poor
8. Structures / Bridges	High	Med	Low	None	Excel	Good	Fair	Poor

Please rate these area features: first importance to you and then conditions (only if they apply).

Area Features:	Importance to you				Current conditions			
1. Lodging	High	Med	Low	None	Excel	Good	Fair	Poor
2. Trail camping	High	Med	Low	None	Excel	Good	Fair	Poor
3. Campgrounds	High	Med	Low	None	Excel	Good	Fair	Poor
4. Eating places	High	Med	Low	None	Excel	Good	Fair	Poor
5. Shopping for gifts	High	Med	Low	None	Excel	Good	Fair	Poor
6. Historical attractions	High	Med	Low	None	Excel	Good	Fair	Poor
7. Outdoor attractions	High	Med	Low	None	Excel	Good	Fair	Poor
8. Shuttle/ bike rentals	High	Med	Low	None	Excel	Good	Fair	Poor
9. Guide services	High	Med	Low	None	Excel	Good	Fair	Poor

Please state whether you Strongly Agree, Agree, Disagree, or are Uncertain about the following 5 statements:

1. It is important to maintain the Creeper in good condition to continue to attract visitors to the region. SA A D U
2. A use fee for the Creeper would be a good way to provide funds for maintenance/improvements. SA A D U
3. Local tax revenues should be used to help fund maintenance on the Creeper. SA A D U
4. Volunteer groups should be the main source of maintenance on the Creeper. SA A D U

5. I am concerned that crowding will affect the quality of my future visits to the Creeper.  
SA A D U

Please rate trail surfaces on the Creeper by stating whether you Strongly Support, Support, are Neutral, Don't Support, or Don't Know for each of the following:

- |                      |    |   |   |    |    |
|----------------------|----|---|---|----|----|
| 1. Paved surface     | SS | S | N | DS | DK |
| 2. Cinder surface    | SS | S | N | DS | DK |
| 3. Crushed limestone | SS | S | N | DS | DK |

Please give us your opinion about the following uses on the Creeper by stating whether you Support for All Users, Support only for Disabled Users, are Neutral, Don't Support, or Don't Know about the following:

- |                           |    |     |   |    |    |
|---------------------------|----|-----|---|----|----|
| 1. Electric golf carts    | SA | SDU | N | DS | DK |
| 2. Gas-powered golf carts | SA | SDU | N | DS | DK |
| 3. Motorized bicycles     | SA | SDU | N | DS | DK |
| 4. Horse-drawn carts      | SA | SDU | N | DS | DK |
| 5. ATV's                  | SA | SDU | N | DS | DK |

#### DEMOGRAPHIC INFORMATION

1. How many people, including yourself, are in your household? \_\_\_\_\_
2. How many people, including yourself, in your household use the Creeper? \_\_\_\_\_
3. What is the highest level of education in your household?  
A. High school    B. College    C. Other \_\_\_\_\_
4. What is your age?    A. 16-25    B. 26-35    C. 36-45    D. 46-55  
E. 56-65    F. 65 plus
5. What is your employment status? (circle all)  
A. Student    B. Employed    C. Retired    D. Part-time    E. Not currently employed
6. Which interval represents your annual household income?    A. Under \$40,000  
B. \$40,000 - \$80,000    C. \$80,000 - \$120,000    D. More than \$120,000  
E. Prefer not to answer this question

THANK YOU FOR YOUR TIME

## Virginia Creeper On-Site Nonlocal Version A Questionnaire

1. Survey # \_\_\_\_\_
2. What is your residence Zip Code? \_\_\_\_\_  
or Country of residence \_\_\_\_\_
3. Where did you enter the CREEPER today? A. Abingdon B. Damascus C. Whitetop  
D. Watauga E. Alvarado F. Creek Junction G. Green Cove  
H. Taylor's Valley I. Straight Branch J. Other \_\_\_\_\_
4. What is your primary activity on the trail today? A. Biking B. Walking  
C. Jogging D. Camping E. View Nature F. Horse Riding  
G. Fishing H. Other \_\_\_\_\_
5. How much time did you spend on the trail today \_\_\_\_\_ hours  
\_\_\_\_\_ minutes
6. How far did you go (roundtrip)? \_\_\_\_\_ miles
7. How many, including yourself, were in your group? \_\_\_\_\_ people
8. Were you part of an organized group? Yes No Group name  
\_\_\_\_\_
9. On this trip, how many nights will you be staying away from home within 25 miles of Creeper? \_\_\_\_\_ nights
10. Are you staying at: A. Cottages B. Motel/Hotel C. Private Home  
D. Bed & Breakfast E. Govt Campground F. Private Campground  
G. Camping along trail H. Other
11. On this trip, how many different times will you use the Creeper? \_\_\_\_\_ times
12. Is the CREEPER the primary reason for your visit to the area? Yes No
13. Including this visit, how often have you visited this area to use the Creeper in the last 12 months? \_\_\_\_\_ times
14. Including this visit, how often have you visited any other rail trails in the last 12 months? \_\_\_\_\_ times
15. Besides the Creeper, what rail trail do you visit most?  
Name \_\_\_\_\_ State \_\_\_\_\_

Please rate the degree to which you receive the following benefits from the Creeper.

- |                                    |      |     |     |      |
|------------------------------------|------|-----|-----|------|
| 1. Health & fitness                | High | Med | Low | None |
| 2. Opportunity to view nature      | High | Med | Low | None |
| 3. A place to take my pets/animals | High | Med | Low | None |
| 4. Provides a sense of community   | High | Med | Low | None |

5. Other \_\_\_\_\_ High Med Low None

Please rate the following trail issues: first importance to you and then conditions you observed today.

Trail Issues:	Importance to you				Current conditions			
1. Safety/security	High	Med	Low	None	Excel	Good	Fair	Poor
2. Amount of crowding	High	Med	Low	None	Excel	Good	Fair	Poor
3. Parking	High	Med	Low	None	Excel	Good	Fair	Poor
4. Natural scenery	High	Med	Low	None	Excel	Good	Fair	Poor
5. Restrooms	High	Med	Low	None	Excel	Good	Fair	Poor
6. No conflicts with others user type: _____	High	Med	Low	None	Excel	Good	Fair	Poor
7. Trail surfaces	High	Med	Low	None	Excel	Good	Fair	Poor
8. Structures / Bridges	High	Med	Low	None	Excel	Good	Fair	Poor

Please rate these area features: first importance to you and then conditions (only if they apply).

Area Features:	Importance to you				Current conditions			
1. Lodging	High	Med	Low	None	Excel	Good	Fair	Poor
2. Trail camping	High	Med	Low	None	Excel	Good	Fair	Poor
3. Campgrounds	High	Med	Low	None	Excel	Good	Fair	Poor
4. Eating places	High	Med	Low	None	Excel	Good	Fair	Poor
5. Shopping for gifts	High	Med	Low	None	Excel	Good	Fair	Poor
6. Historical attractions	High	Med	Low	None	Excel	Good	Fair	Poor
7. Outdoor attractions	High	Med	Low	None	Excel	Good	Fair	Poor
8. Shuttle/ bike rentals	High	Med	Low	None	Excel	Good	Fair	Poor
9. Guide services	High	Med	Low	None	Excel	Good	Fair	Poor
10. Information	High	Med	Low	None	Excel	Good	Fair	Poor

Please state whether you Strongly Agree, Agree, Disagree, or are Uncertain about the following 5 statements:

1. It is important to maintain the Creeper in good condition to continue to attract visitors to the region. SA A D U
2. A use fee for the Creeper would be a good way to provide funds for maintenance/improvements. SA A D U
3. Local tax revenues should be used to help fund maintenance on the Creeper. SA A D U
4. Volunteer groups should be the main source of maintenance on the Creeper. SA A D U
5. I am concerned that crowding will affect the quality of my future visits to the Creeper. SA A D U

Please rate trail surfaces on the Creeper by stating whether you Strongly Support, Support, are Neutral, Don't Support, or Don't Know for each of the following:

- |                      |    |   |   |    |    |
|----------------------|----|---|---|----|----|
| 1. Paved surface     | SS | S | N | DS | DK |
| 2. Cinder surface    | SS | S | N | DS | DK |
| 3. Crushed limestone | SS | S | N | DS | DK |

Please give us your opinion about the following uses on the Creeper by stating whether you Support for All Users, Support only for Disabled Users, are Neutral, Don't Support, or Don't Know about the following:

- |                           |    |     |   |    |    |
|---------------------------|----|-----|---|----|----|
| 1. Electric golf carts    | SA | SDU | N | DS | DK |
| 2. Gas-powered golf carts | SA | SDU | N | DS | DK |
| 3. Motorized bicycles     | SA | SDU | N | DS | DK |
| 4. Horse-drawn carts      | SA | SDU | N | DS | DK |
| 5. ATV's                  | SA | SDU | N | DS | DK |

#### DEMOGRAPHIC INFORMATION

1. How many people, including yourself, are in your household? \_\_\_\_\_
2. How many people, including yourself, in your household use the Creeper?  
\_\_\_\_\_
3. What is the highest level of education in your household?    A. High school  
B. College                    C. Other \_\_\_\_\_
4. What is your age?    A. 16-25                    B. 26-35                    C. 36-45                    D. 46-55  
E. 56-65                    F. 65 plus
5. What is your employment status? (circle all)  
A. Student    B. Employed    C. Retired            D. Part-time            E. Not currently employed
6. Which interval represents your annual household income?  
A. Under \$40,000            B. \$40,000 - \$80,000            C. \$80,000 - \$120,000  
D. More than \$120,000            E. Prefer not to answer this question

THANK YOU FOR YOUR TIME

## Virginia Creeper On-Site Nonlocal Version B Questionnaire

1. Survey # \_\_\_\_\_
2. What is your residence Zip Code? \_\_\_\_\_ or Country of residence  
\_\_\_\_\_
3. Where did you enter the CREEPER today? A. Abingdon B. Damascus C. Whitetop  
D. Watauga E. Alvarado F. Creek Jctn G. Green Cove H. Taylor's Valley  
I. Straight Branch J. Other \_\_\_\_\_
4. What is your primary activity on the trail today? A. Biking B. Walking C. Jogging  
D. Camping E. View Nature F. Horse Riding G. Fishing  
H. Other \_\_\_\_\_
5. How much time did you spend on the trail today \_\_\_\_\_ hours  
\_\_\_\_\_ minutes
6. How far did you go (roundtrip)? \_\_\_\_\_ miles
7. How many, including yourself, were in your group? \_\_\_\_\_ people
8. Were you part of an organized group? Yes No Group name: \_\_\_\_\_
9. On this trip, how many nights will you be staying away from home within 25 miles of Creeper? \_\_\_\_\_ nights
10. Are you staying at: A. Cottages B. Motel/Hotel C. Private Home  
D. Bed & Breakfast E. Govt Campground F. Private Campground  
G. Camping along trail H. Other
11. On this trip, how many different times will you use the Creeper? \_\_\_\_\_ times
12. Is the CREEPER the primary reason for your visit to the area? Yes No
13. Including this visit, how often have you visited this area to use the Creeper in the last 12 months? \_\_\_\_\_ times
14. Including this visit, how often have you visited any other rail trails in the last 12 months? \_\_\_\_\_ times
15. Besides the Creeper, what rail trail do you visit most?  
Name \_\_\_\_\_ State \_\_\_\_\_

Please state whether you Strongly Agree, Agree, Disagree, or are Uncertain about the following 6 statements:

1. It is important to maintain the Creeper in good condition to continue to attract visitors to the region. SA A D U

2. A use fee for the Creeper would be a good way to provide funds for maintenance/improvements. SA A D U
3. Local tax revenues should be used to help fund maintenance on the Creeper. SA A D U
4. Volunteer groups should be the main source of maintenance on the Creeper. SA A D U
5. I am concerned that crowding will affect the quality of my future visits to the Creeper. SA A D U
6. Electric golf carts should be allowed for disabled users of the Creeper. SA A D U

We would like to ask you about your **ESTIMATED EXPENSES** for this trip to the Creeper. The information will be used to calculate the economic effects of rail trails on state and local economies.

- 1) How many nights total will you be away from home on this trip? \_\_\_\_\_ nights  
 How many, including yourself, are in your spending party? \_\_\_\_\_ people

In Column A below, estimate spending by your party within 25 miles of the Creeper Trail. In Column B estimate spending by your party for your whole trip.

Note: If your trip is not yet complete, include what you expect to pay where appropriate. For example, if you spent \$10 on gas to get here and you need another \$10 worth of gas to get home, enter \$20 for gas. Remember to report all spending for your party (e.g., family, scout group, friends sharing expenses, or just yourself) and include the correct number of people for your spending party.

	A	B
	Spending by your party within 25 miles of Creeper Trail	Spending by your party for the whole trip
<b>Lodging:</b>		
Privately owned (motel, cottage, bed & breakfast)	_____	_____
Publicly owned (state or FS campgrounds)	_____	_____
<b>Food &amp; Beverage:</b>		
Food and drinks consumed at restaurants or bars	_____	_____
Other food and drinks (carry-out, groceries)	_____	_____
<b>Transportation:</b>		
Gasoline, oil, repairs	_____	_____
Other transportation (tolls, airfare, vehicle rental)	_____	_____
<b>Trail Related:</b>		
Bicycle rentals or service	_____	_____
Shuttle or guide service	_____	_____
Trail use, entry, or parking fees	_____	_____

Any other expenses:

Other services or equipment \_\_\_\_\_

#### DEMOGRAPHIC INFORMATION

1. How many people, including yourself, are in your household? \_\_\_\_\_
2. How many people, including yourself, in your household use the Creeper?  
\_\_\_\_\_
3. What is the highest level of education in your household? A. High school    B. College  
C. Other \_\_\_\_\_
4. What is your age?    A. 16-25        B. 26-35        C. 36-45        D. 46-55  
E. 56-65        F. 65 plus
5. What is your employment status? (circle all)  
A. Student    B. Employed    C. Retired        D. Part-time    E. Not currently employed
6. Which interval represents your annual household income?    A. Under \$40,000  
B. \$40,000 - \$80,000        C. \$80,000 - \$120,000        D. More than \$120,000  
E. Prefer not to answer this question

THANK YOU FOR YOUR TIME