

Blue Ridge Parkway Scenic Experience Project Phase 2 Final Report

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The Blue Ridge Parkway Scenic Experience Project Phase II Final Report

Executive Summary

The Blue Ridge Parkway Scenic Experience Project Phase II extended Phase I research by applying the same visitor survey to the northern North Carolina section of the Blue Ridge Parkway. This section extends from Asheville north to the Virginia-North Carolina state line. The study was designed to answer four key questions: *What are the benefits from the various attributes of the Blue Ridge Parkway scenic experience? How will visitation to the Parkway change if scenic quality changes? How much are visitors willing to pay to preserve scenic quality along the Parkway? How much are they willing to pay to improve visibility?* Key results from the northern North Carolina study are as follows:

General Findings

- Parkway visitors are extremely loyal; on average, they have been visiting over 19 years. They are generally very satisfied with their experiences on the Blue Ridge Parkway.
- Despite the fact that visitors to the Parkway do not pay an entrance fee to enjoy the park, it is clear from this study that visitors derive significant economic value from their Parkway visitor experience. This is based on results from both the expenditures that they make while on their trips, and their stated willingness to pay for the benefits that the Parkway provides.
- Respondents indicated that the scenic quality along the northern North Carolina section of the Parkway is an important reason for their visitation. They indicated they would take fewer trips if scenic quality declines, and would make more trips with scenic quality improvements.
- Respondents stated they would be willing to contribute to preserving scenic quality along the northern North Carolina section of the Parkway, as well as to improved visibility in this region.
- This study verifies what many people already know: that scenic beauty, visibility, and recreational amenities are important to visitors to western North Carolina.
- The significance of this study is that it estimates the economic value that visitors to the Blue Ridge Parkway receive from the unpriced amenities of scenic beauty and visibility. In other words, just because people don't pay for the scenic beauty of this region doesn't mean that they have no value for it. On the contrary! Our study suggests that respondents value scenic beauty and visibility very highly.

What are the benefits from the various attributes of the Blue Ridge Parkway scenic experience?

- Visitors are very satisfied with the northern North Carolina section of the Blue Ridge Parkway. When asked to describe their *ideal* Parkway scenario, nearly 2/3 of respondents indicated that the current level of overlooks, hiking trails, and activity areas is their ideal level.
- About half of respondents indicated that their ideal Parkway scenario would include an improvement in scenic quality for roadside and overlook areas. This is consistent with

other findings in this research that suggest that scenic quality is a particularly important attribute for this sample of visitors.

- For this sample, trails and activity areas were not ranked as important as scenic quality and the number of overlooks.
- If the scenic quality of *overlook areas* was improved, the average respondent indicated their gain in satisfaction would be over \$200 a year.
- Improving *roadside* scenic quality has benefits of the same magnitude as improving overlook scenic quality for this sample: just over \$200 a year per person on average.
- If the scenic quality of *overlook areas* declined, the average respondent indicated their lost satisfaction would be \$468 a year.
- The loss of satisfaction from a decline in *roadside* scenic quality was valued by respondents at \$519 annually.
- The policy implication of these results is similar to that of Phase I: it would be more efficient for the Parkway to expend resources on *maintaining current levels* of scenic quality rather than on improving scenic quality.

How will visitation and expenditures change if view quality changes?

- The average visitor reported spending an average of \$603 during their 3.5 day trip, or about \$170 per day.
- Visitors say they will make fewer trips if scenic quality declines on the northern North Carolina section of the Blue Ridge Parkway. *Our model predicts that a large portion of these visitors will completely stop visiting this section of the Parkway if scenic quality declines.*
- This result is consistent with responses to other questions of the survey which indicated that almost half of this sub-sample would stop visiting the Parkway under various scenarios of scenic quality decline.
- Respondents indicated they will take on average nearly 2 more trips annually if scenic quality improves on the northern North Carolina section of the Parkway.
- Any changes in scenic quality that lead to changes in visitation to the Blue Ridge Parkway will imply changes in visitor expenditures and their corresponding economic impact. Visitor expenditures are estimated to increase under status quo scenic quality conditions, but the growth in expenditures will slow and possibly stagnate as scenic quality declines.

How much are visitors willing to pay to preserve scenic quality?

- On average, respondents indicated they were willing to pay \$151.14 per person annually in order to preserve the scenic quality of the northern North Carolina section of the Blue Ridge Parkway.

How much are visitors willing to pay to improve visibility?

- On average, respondents stated that they would be willing to pay an additional \$328 per year in federal income taxes if it were earmarked to improve visibility along the Blue Ridge Parkway in North Carolina.

1.0 Area Description and Motivation for Study

The Blue Ridge Parkway (BRP) is a linear national park extending 469 miles from Shenandoah National Park in Virginia to Great Smoky Mountains National Park in North Carolina. The park is a scenic motor road that was designed by landscape architects to enable visitors to enjoy the scenic beauty of the region primarily from their vehicle. There are several activity areas along the Parkway including restaurants, campgrounds, and interpretive areas in addition to access to hundreds of miles of hiking trails. Research indicates that the primary reason most visitors make a trip to the Parkway is to enjoy the views (Brothers and Chen, Kask et al). In fiscal year 2002, over 21.6 million recreation visits were made to the Blue Ridge Parkway making it the most visited national park unit.

The Blue Ridge Parkway is long and narrow; on average, the park is only 800 to 1000 feet wide. This means that most of what Parkway visitors are viewing on their trips is outside the park's boundaries and thus outside the park's direct control. Over time, the scenic quality along the Parkway has changed. Some of this is natural change as trees grow up and block certain views, or die off as a result of age or storms. However, a majority of the modification in the scenic views along the Parkway is a result of human induced land use change such as logging, road building, and residential development. Many of the scenes along the Parkway are either agricultural scenes or views off the Blue Ridge escarpment to valleys below. Agricultural views are the fastest changing scenes in America, and the most likely to be impacted by suburban development (American Farmland Trust). Since 1948, 75% of farmlands along the Parkway changed from farms to alternative uses. In North Carolina, 10,000 farm acres remain along the Parkway, down from 48,000 in 1948 (USDA). In 2003, a twenty-eight mile section of the Parkway through Roanoke Virginia was designated one of ten "Last Chance Landscapes" by the national nonprofit organization Scenic America (Blue Ridge Parkway).

Parkway officials have documented the views along the Parkway in great detail since they are the park's greatest resource. They use this Scenic Quality Assessment to identify critical sites for preservation. The Parkway and their nonprofit partners are aware of the costs of preserving view quality since they must allocate scarce resources to implement view preservation; activities such as increased vegetation management, or purchase of conservation easements, leases, or land are options available to the park for this purpose. The Blue Ridge Parkway Scenic Experience Project estimates the benefits of scenic quality preservation that were not previously known. Introducing visitor preferences into the decision process provides benefit estimates that are comparable to mitigation costs, thus improving the efficiency of park budgets.

2.0 Project Description

2.1 The Blue Ridge Parkway Scenic Experience Project

The Blue Ridge Parkway Scenic Experience Project addressed two fundamental questions faced by Parkway managers regarding the scenic experience of Parkway visitors:

- *What are the benefits from the various attributes of the Blue Ridge Parkway scenic experience?*
- *How will visitation change if view quality changes?*

The project was implemented in two phases. Phase One was focused on the southwest Virginia section of the Parkway, between Roanoke Virginia and the Virginia-North Carolina state line. The Phase One survey was implemented in summer and fall 2000; results are available in Kask et al. The second phase of the study examined the northern North Carolina section of the Parkway, from Asheville north to the North Carolina-Virginia state line. The remainder of this report addresses Phase Two of the Blue Ridge Parkway Scenic Experience Project.

2.2 Phase Two: North Carolina

2.2.1 Study Design Modifications

Phase Two of the Blue Ridge Parkway Scenic Experience Project essentially duplicated Phase One with minor modifications; Kask et al provides a complete discussion of the design process. There were two modifications made to the Phase One surveys for Phase Two: editorial changes and content changes. The visitor survey designed for Phase One of the project was modified to reflect the new region of focus. The editorial changes to the survey included changing the photographs and other supporting materials used to provide background for respondents, and changes in the data and wording of the survey so that it reflected the northern North Carolina section of the Parkway. All of the visual images and background data contained in the Phase Two survey were representative of the scenic quality of the northern North Carolina section of the Parkway. The only significant content change to the survey instrument was the inclusion of a question (on a subset of the surveys) that asked respondents about their willingness to pay for visibility improvements. Appendix 1 provides additional detail on the survey design.

2.2.2 Survey Implementation

Summer and fall are the prime seasons for visits to the Blue Ridge Parkway. In order to gather a representative sample, survey implementation was staggered over summer and fall 2002 and included both weekend and weekdays. The last set of implementation days coincided with peak fall leaf color, when the Blue Ridge Parkway tends to experience its highest visitation levels. Implementation occurred at two central locations where visitors routinely stop and visit for an extended period, the Folk Art Center near Asheville and the Moses H. Cone Memorial Park near Blowing Rock. Eight days at each site yielded a total of 640 usable responses.

3.0 *The Sample: Who Were our Survey Respondents?*

In summary,

- The average visitor sampled on the northern North Carolina section of the Parkway was 50 years old, had no children under 18 living in their household, and reported an income higher than the national and regional averages. Over two-thirds of respondents held a Bachelor's degree or higher.
- This sample appears to be better educated and relatively more affluent than the visitors sampled in Phase I of the study in the southwest Virginia section of the Parkway.
- *Respondents love the Parkway!* They have been visiting on average for more than 19 years, and about half the sample reported visiting the Parkway more than once a year. This sample was more likely to have visited the North Carolina sections of the park than the sections in Virginia.
- Overall, respondents are very satisfied with the Blue Ridge Parkway. In particular, respondents assigned their greatest satisfaction for the number of overlooks and the scenic quality of roadside and overlook areas.
- Respondents spent on average 3.5 days on their trip to the Parkway, had 2 other people in their party, and spent an average of \$603. The most common reason for making their trip was to enjoy the scenic views along the Parkway.
- Respondents noticed several different types of changes along the Parkway (single houses, subdivisions, air pollution). The most frequently cited top concern of these was air pollution; 22% of the sample identified it as their greatest concern among the changes they noticed.
- The national issues that respondents believe require government action were most frequently education, the environment, and health care.
- This sample indicated they are supportive of resource protection efforts, and believe that there are many actors who have a role to play in protecting the environment. Most respondents identified support for federal, state, *and* local government involvement in environmental and resource protection and half of respondents supported the notion that users of the Parkway should pay to protect it.

3.1 Demographics, Visitor Activities, Perceptions of the Blue Ridge Parkway

3.1.1 Demographics

The average respondent in our study’s sample was 50 years old, held a Bachelor’s degree, and had an average household income of \$65,000 a year. A majority of our respondents, 58%, were male. Most respondents (73.3%) did not have any children under 18 living in their household. Those respondents with children (171, or 26.7%) had an average of 1.75 children under 18 living in their household. This sample appears to be better educated and more affluent than the averages for North Carolina and the nation. Demographic results and comparisons are summarized in Table 1.

Table 1: Visitor demographics as compared to the region, nation, and previous studies

| | Sample | NC ^{1,2} | VA ^{1,2} | SC ^{1,2} | Nation ^{1,2} | Brothers and Chen (1996) | Phase I Sample ³ (2002) |
|--|---------------------|-------------------|-------------------|-------------------|-----------------------|-------------------------------|------------------------------------|
| Median Age ¹ | 49.9 (n=633) | 35.3 | 35.7 | 35.4 | 35.3 | 49%>55 years | 35.4 |
| Female ² | 42% (n=636) | 51% | 51% | 51.4% | 50.9% | 45% | 48% |
| % with Bachelor's Degree or Higher ² | 71% (n=639) | 22.5% | 29.5% | 20.4% | 25.5 | 48.7% | 47% |
| Average Household Income ² | \$65,242 (n=640) | \$39,184 | \$46,677 | \$37,082 | \$41,994 | 50% between \$30,000-\$59,999 | \$37,629 |
| ¹ US Census Bureau, ² Profile of General Demographic Characteristics by State. ³ Kask et al, 2002. | | | | | | | |

Not surprisingly, North Carolina was the home of the largest single group of visitors in our sample. Over half of the respondents in our sample were from North Carolina (50.7%). Other states with a significant number of visitors captured in our survey include Florida, 12.2% of sample, South Carolina (4.7%) and Georgia (5.3%). Just over one percent (1.3%) of our sample were international visitors. The zip code origin of sample visitors is summarized in Table 2.

Table 2: Zip code origin of sample visitors

| State (n=598) | Frequency | Percent | Brothers and Chen 1996 | Phase I Sample 2002 |
|--------------------------|------------------|----------------|---------------------------------------|------------------------------------|
| VA | 19 | 3.2% | 33% | 34.7% |
| NC | 303 | 50.7% | 20.1% | 32.4% |
| SC | 28 | 4.7% | 2.5% | 1.9% |
| GA | 32 | 5.3% | | |
| FL | 73 | 12.2% | 4.2% | 1.3% |
| TN | 28 | 4.7% | | |
| International | 8 | 1.3% | | |
| Other | 107 | 17.9% | 40.2% | 29.6% |

As expected, respondent occupations varied. The largest single occupational type identified by respondents was managerial, with 46% of the sample identifying with that category. Twenty percent (20%) of our sample was retired. These results are tabulated in Table 3.

Table 3: Occupations of respondents

| Occupation (n=640) | Count | Percentage |
|---------------------------|--------------|-------------------|
| Managerial | 293 | 46% |
| Service | 43 | 7% |
| Farming/Forestry | 10 | 2% |
| Support | 32 | 5% |
| Precision | 11 | 2% |
| Operator | 8 | 1% |
| Homemaker | 26 | 4% |
| Student | 23 | 4% |
| Retired | 127 | 20% |
| Other | 61 | 10% |

3.1.1.2 Opinions and Concerns

It is often interesting to know what survey respondents think to get a sense of the full picture of the typical Parkway visitor. The national issues identified by respondents that, in their opinion, require government action are tabulated in Table 4. Our sample indicated that education, health care, and the environment were perceived as most important.

Table 4: National issues ranked as important or most important by sample visitors

| Issue (n=640) | Count | Percent |
|------------------|-------|---------|
| Environment | 561 | 88% |
| Public Safety | 470 | 73% |
| Unemployment | 369 | 58% |
| Healthcare | 557 | 87% |
| Education | 567 | 89% |
| Inflation | 223 | 35% |
| National Defense | 386 | 60% |
| Other | 23 | 4% |

We also asked respondents a series of opinion questions concerning government, land use, the environment, and the Parkway. These results are shown in Table 5. The clearest result from this series of questions confirms what previous research and anecdotal evidence has suggested in the past: *visitors love the Parkway!* When asked about their agreement with the statement, “The Parkway is a national treasure,” a full 90% of our survey’s respondents indicated that they strongly agreed (4 or 5 on a scale of 1 to 5). A related result indicates that most respondents (81%) strongly agree with the statement, “Protecting the nation’s resources is very important to me.” Similarly, two thirds of the sample (67%) strongly disagreed with the statement, “There is so much undeveloped land that we need not worry about development.”

Table 5: Levels of agreement with given statements

| Statement | Respondent Answers | | | | | | | | | | | |
|---|------------------------|-----|-----|-----|-----|-----|-----|-----|---------------------|-----|-----------------|----|
| | 1 Strongly disagree | | 2 | | 3 | | 4 | | 5 Strongly Agree | | 6 Don't know | |
| | # | % | # | % | # | % | # | % | # | % | # | % |
| "The federal government should not own more land." (n=637) | 222 | 35% | 113 | 18% | 137 | 22% | 64 | 10% | 78 | 12% | 23 | 4% |
| "State governments should help the Parkway." (n=639) | 23 | 4% | 9 | 1% | 107 | 17% | 166 | 26% | 320 | 50% | 14 | 1% |
| "Preserving our environment should be a top priority in <i>local</i> communities." (n=639) | 18 | 3% | 18 | 3% | 110 | 17% | 150 | 23% | 340 | 53% | 3 | 0% |
| "There is so much undeveloped land that we need not worry about development." (n=639) | 428 | 67% | 86 | 13% | 82 | 13% | 21 | 3% | 19 | 3% | 3 | 0% |
| "The Parkway is a national treasure." (n=639) | 8 | 1% | 3 | 0% | 42 | 7% | 78 | 12% | 499 | 78% | 9 | 3% |
| "The users of the Parkway should pay to protect it." (n=637) | 77 | 12% | 54 | 8% | 183 | 29% | 202 | 32% | 108 | 17% | 12 | 2% |
| "Protecting the Parkway's scenic resources should be a top priority for the <i>federal</i> government." (n=639) | 34 | 5% | 29 | 5% | 170 | 27% | 205 | 32% | 196 | 31% | 5 | 0% |
| "Protecting our nation's resources is very important to me." (n=638) | 15 | 2% | 5 | 0% | 94 | 15% | 180 | 28% | 336 | 53% | 8 | 1% |

Generally speaking, respondents in this sample appear to be supportive of state and local government involvement in resource protection. For example, over two-thirds of respondents strongly agreed (4 or 5 on a scale of 1 to 5) with the statement “state governments should help the Parkway.” The same percentage of respondents (76%) strongly agreed (4 or 5 on a scale of 1 to 5) that “Preserving our environment should be a top priority in *local* communities” (emphasis in original). About two thirds (63%) of respondents strongly agreed (4 or 5 on a scale of 1 to 5) with the notion that “Protecting the Parkway’s scenic resources should be a top priority for the *federal* government” (emphasis in original). Our sample of respondents indicated less agreement on federal land ownership, and the idea that users of the Parkway should pay to protect it.

3.1.2 Visitor Activities

Respondents to the survey had been visiting the Parkway, on average, for over 19 years. Their most common reason for making the trip was to enjoy the scenic views along the Parkway (50% of sample) and their most common activity was visiting a scenic area (30% of sample). The typical party of three spent 3.5 days on their trip and about \$600. These results are summarized in Table 6, along with the summary statistics from Phase I of the study. This sample of visitors reported taking longer trips, yielding greater expenditures.

Table 6: Basic visitation information

| Trip Characteristic | Phase II Sample | Phase I Sample (n=821) |
|--|--|---|
| Average Number of Days in Trip (n=638) | 3.5 | 1.96 |
| Average Number of People in Party (n=639) | 3 | n/a |
| Average Total Trip Expenditures (n=634) | \$603.41 | \$245.92 |
| Average Expenditure/Day | \$172 | \$149 |
| Most Common Reason For Trip (n=564) | Enjoying the scenic views along the Parkway (48.8% of sample) | n/a |
| Average Number of Years Visiting the Parkway (n=639) | 19.5 | 20.6 |
| Most Common Activity (n=637) | Visiting a Scenic Area (30% of sample) | Visiting a Scenic Area (26.2% of sample) |

As indicated by the results reported above, the sample of Parkway visitors that completed our survey is very loyal. A minority of respondents (15.75%) was making their first trip to the Blue Ridge Parkway when they completed the survey. The same percentage of respondents (15.75%) indicated that they visit the Parkway once a year, while nearly half of all respondents (46.7%) indicated that they visit the Parkway more than once a year. Table 7 summarizes the visitation frequency of respondents. The visitors who were not on their first visit to the Parkway reported an average number of visits of 5.8 trips per year. Table 8 shows that our sample had been more likely to visit the southern section of the Parkway (between Asheville and the Great Smoky Mountains National Park) than the sections in Virginia.

Table 7: Visitation frequency

| Frequency (n=597 except where noted) | Number | Percentage |
|--|---------------|-------------------|
| First Visit (n=638) | 95 | 14.90% |
| 1 Visit Every Few Years | 87 | 14.57% |
| 1 Visit per Year | 95 | 15.91% |
| 2 Times Per Year | 70 | 11.72% |
| 3 Times Per Year | 55 | 9.21% |
| 4 Times Per Year | 46 | 7.70% |
| 5-11 Times Per Year | 87 | 14.57% |
| One Visit Per Month | 24 | 4.02% |
| Other | 44 | 7.37% |

Table 8: Parkway visitation by sections

| Parkway Section (n=638) | Number of sample who have visited | Percentage |
|-----------------------------------|--|-------------------|
| Northern Section | 326 | 51.1% |
| Southwest section | 344 | 53.9% |
| Middle section | 638 | 100% |
| Southern section | 537 | 84.2% |

While on the trip during which they completed the survey, respondents reported they participated in many different types of activities including visiting a scenic area, relaxing, visiting shops/craft galleries, hiking, and visiting a historical site/museum. The most common activities during their trip were reported most frequently as visiting a scenic area (30% of sample), hiking (15%), and touring (14%). Trip activity results appear in Tables 9 and 10.

Table 9: The most common activity while on this trip

| Parkway Activity (n=637) | Number | % of Sample |
|-----------------------------------|---------------|--------------------|
| Visiting a Scenic Area | 191 | 30% |
| Hiking | 98 | 15% |
| Touring | 91 | 14% |
| Relaxing | 54 | 8% |
| Camping | 48 | 8% |
| Visiting shops/craft galleries | 45 | 7% |
| Family outing | 43 | 7% |
| Visiting a historical site/museum | 23 | 4% |
| Other | 19 | 3% |
| Picnicking | 8 | 1% |
| Participating in a group outing | 7 | 1% |
| Fishing/hunting | 4 | 1% |
| Commuting | 3 | 0% |
| Creating art | 1 | 0% |
| Visiting a lodge | 1 | 0% |
| Rock climbing | 0 | 0% |

Table 10: Trip activities

| Trip Activity (n=586) | Number | % of Sample |
|-----------------------------------|---------------|--------------------|
| Visiting a scenic area | 425 | 73% |
| Relaxing | 310 | 53% |
| Visiting shops/craft galleries | 294 | 50% |
| Hiking | 283 | 48% |
| Visiting a historical site/museum | 235 | 40% |
| Touring | 209 | 36% |
| Family outing | 204 | 35% |
| Camping | 140 | 24% |
| Picnicking | 120 | 20% |
| Visiting a lodge | 52 | 9% |
| Participating in a group outing | 35 | 6% |
| Other | 32 | 5% |
| Fishing/hunting | 30 | 5% |
| Rock climbing | 28 | 5% |
| Creating art | 25 | 4% |
| Commuting | 17 | 3% |

3.1.3 Visitor Perceptions of the Blue Ridge Parkway: Satisfaction and Concerns

Overall, respondents indicated that they are very satisfied with the attributes of the Blue Ridge Parkway’s northern North Carolina section; results appear in Table 11. Based on the number of respondents who indicated they were very satisfied, it appears that the number of overlooks (82%) and the scenic quality of overlook (77.3%) and roadside areas (76.9%) were the areas that visitors had the greatest satisfaction. It is likely that the number of quality trails did not fare as well as some of the other attributes because a full one-fourth of respondents (25.2%) indicated that they didn’t know how satisfied they were. This indicates that they may not have had experience with hiking trails during their visits to the Parkway. Of the five attributes that were the focus of our study, the number and condition of activity areas generated the smallest amount of very satisfied respondents (66.2%). Overall, a very small number of respondents indicated that they had low satisfaction with any of the attributes: less than 4% for each attribute.

Table 11: Level of satisfaction for northern North Carolina Parkway attributes

| Parkway Characteristic | | Not at all satisfied 1 | 2 | 3 | 4 | Very satisfied 5 | Don't know |
|---------------------------------------|-----------|---------------------------|------|-------|-------|---------------------|------------|
| Number of overlooks | # | 4 | 15 | 57 | 136 | 387 | 38 |
| | (n=637) % | 0.6% | 2.4% | 8.9% | 21.4% | 60.8% | 6.0% |
| Scenic quality of overlooks | # | 5 | 21 | 91 | 162 | 331 | 28 |
| | (n=638) % | 0.8% | 3.2% | 14.3% | 25.4% | 51.9% | 4.4% |
| Scenic quality of roadside views | # | 3 | 16 | 107 | 192 | 297 | 21 |
| | (n=636) % | 0.5% | 2.5% | 16.8% | 30.2% | 46.7% | 3.3% |
| Number of quality trails | # | 0 | 15 | 119 | 124 | 213 | 159 |
| | (n=630) % | 0% | 2.4% | 18.9% | 19.7% | 33.8% | 25.2% |
| Number and condition of activity area | # | 0 | 18 | 138 | 196 | 224 | 59 |
| | (n=635) % | 0% | 2.8% | 21.7% | 30.9% | 35.3% | 9.3% |

Visitors reported noticing changes along the Parkway; these are summarized in Table 12. The most frequently noticed change was single houses, with 52% of respondents indicated they noticed these along the Parkway. This was followed by housing subdivisions (39%), power lines (33%), air pollution (32%), and telecommunication towers (31%). A fifth of respondents didn’t notice any of the items.

When asked if these changes *concerned* them, respondents indicated a different order than what they reported *noticing*. Air pollution was indicated as the greatest concern among the largest portion of respondents (22%). This was followed by housing subdivisions and single houses, with 19% and 15% of the sample reporting it as their greatest concern, respectively. Almost a fifth of respondents (19%) indicated that none of the items they noticed were a concern to them.

Table 12: Changes noticed on the northern North Carolina section and visitors' level of concern

| Changes noticed (n=636 except where noted) | Frequency of notice | | Greatest concern (n=631) | | 2 nd greatest concern (n=406) | |
|---|------------------------|-----|-----------------------------|-----|---|-----|
| | # | % | # | % | # | % |
| Single houses | 333 | 52% | 97 | 15% | 97 | 24% |
| Housing subdivisions | 247 | 39% | 119 | 19% | 69 | 17% |
| Commercial signs | 144 | 23% | 26 | 4% | 38 | 9% |
| Road cuts | 141 | 22% | 25 | 4% | 16 | 4% |
| Power lines | 207 | 33% | 14 | 2% | 49 | 12% |
| Electric transmission towers | 141 | 22% | 9 | 1% | 30 | 7% |
| Telecom towers | 197 | 31% | 35 | 6% | 46 | 11% |
| Logging | 104 | 16% | 30 | 5% | 30 | 7% |
| Air pollution | 201 | 32% | 139 | 22% | 28 | 7% |
| Didn't notice (n=628) | 127 | 20% | 123 | 19% | 1 | 0% |
| Other (n=630) | 23 | 4% | 14 | 2% | 2 | 0% |

4.0 The Value of Parkway Attributes and Changes in Scenic Quality

In summary,

- Visitors are very satisfied with the northern North Carolina section of the Blue Ridge Parkway. When asked to describe their *ideal* Parkway scenario, nearly 2/3 of respondents indicated that the current level of overlooks, hiking trails, and activity areas is their ideal level.
- About half of respondents indicated that their ideal Parkway scenario would include an improvement in scenic quality for roadside and overlook areas. This is consistent with other findings in this research that suggest that scenic quality is a particularly important attribute for this sample of visitors.
- For this sample, trails and activity areas were not ranked as important as scenic quality and the number of overlooks.
- If the scenic quality of *overlook areas* was improved, the average respondent indicated their gain in satisfaction would be over \$200 a year. If we aggregate this for all visitors to the Parkway in North Carolina, this implies a benefit of over \$2.4 billion annually to improvements in overlook scenic quality.
- Improving *roadside* scenic quality has benefits of the same magnitude as improving overlook scenic quality for this sample: just over \$200 a year per person on average, or over \$2.3 billion annually for all visitors to the North Carolina section of the Parkway.
- If the scenic quality of *overlook areas* declined, the average respondent indicated their lost satisfaction would be \$468 a year. If we aggregate this for all visitors to the Parkway in North Carolina, this implies a benefit of over \$5.4 billion annually to avoiding a decline in overlook scenic quality.
- The loss of satisfaction from a decline in *roadside* scenic quality was valued by respondents at \$519 annually. Aggregated, this implies lost satisfaction of nearly \$6 billion annually.
- The policy implication of these results is similar to that of Phase I: it would be more efficient for the Parkway to expend resources on *maintaining current levels* of scenic quality rather than on improving scenic quality.

4.1 Introduction

This chapter outlines the preferences of a sub-sample of respondents for various Parkway attributes as revealed through their selections in the choice model from version C of the survey. Appendix 3 contains specific details on the methodology and model specification.

4.2 Parkway Attributes and Visitor Preferences

Table 13 defines the five attributes representing the Parkway visitor’s recreational experience. The experience is a function of the number of overlooks, the scenic quality at overlooks and along the road, miles of hiking trails, and the number and condition of activity areas.

Table 13: Parkway visitor experience attributes

| |
|--|
| Number of Overlooks in 100 miles: number of overlooks and the average distance between overlooks |
| Overlook Scenic Quality: percent of high, medium, and low quality views |
| Roadside Scenic Quality: percent of high, medium, and low quality views |
| Number of Quality Trails: miles of trails cleared, signed, rated, and maintained. Includes backcountry, stretcher, and interpretive trails. |
| Number and Condition of Activity Areas: number and condition of picnic areas, visitor centers, restrooms, museums, and other structures and facilities for maintenance, operations, repairs, new structures, etc. |

Table 14 shows the levels of each attribute for the current, high, and low scenarios. The *Current* column describes the status quo condition of each of the Blue Ridge Parkway attributes, while *High* and *Low* describe increases and decreases in Parkway amenities, respectively. The *High* and *Low* descriptions were derived using the expertise of Park staff to generate “best possible” and “worst case scenario” conditions for each attribute. These definitions were used by respondents both to answer questions about their ideal level of Parkway attributes, and to configure varying choices in the choice model.

Table 14: Attribute values for each scenario

| | High | Current | Low |
|--------------------------------|--|--|--|
| Number of Overlooks | 90 | 88 | 84 |
| Overlook view quality | | | |
| High quality (%) | 90 | 80 | 55 |
| Medium quality (%) | 10 | 15 | 30 |
| Low quality (%) | 0 | 5 | 15 |
| Roadside view quality | | | |
| High quality (%) | 45 | 38 | 30 |
| Medium quality (%) | 35 | 36 | 15 |
| Low quality (%) | 20 | 26 | 55 |
| Trails (miles) | 191 | 141 | 111 |
| Activity Areas (number) | 15 activity areas all in good condition | 13 activity areas 3 in poor condition 5 in fair condition 5 in good condition | 11 activity areas all in poor condition |

We asked respondents to describe their ideal Blue Ridge Parkway experience in terms of these attributes, and to rank the importance of each attribute relative to one another. Results of these responses appear in Table 15. As one might expect, most respondents did not indicate that their preferred level of an attribute be of a lower quality than the current state. Nearly two-thirds of individuals stated that their ideal number of overlooks, hiking trails, and activity areas is the current level. When it comes to scenic quality, however, about half of the respondents indicated their ideal would be improved scenic quality for both overlook and roadside views. These preferences were reinforced by the rankings which show that the number of overlooks and scenic quality of both roadside and overlook views are most frequently in the top 3 rankings by respondents in order of importance. For this sample, hiking trails and activity areas were not ranked as important as scenic quality and the number of overlooks.

Table 15: Attribute levels selected by visitors and their rank of importance

| Attribute (n=357) | Number of Overlooks | | Scenic Quality of Overlook Views | | Scenic Quality of Roadside Views | | Number of Quality Trails | | Number and Condition of Activity Areas | |
|----------------------|------------------------|------|--|------|---|------|-----------------------------------|------|---|------|
| Ideal Level | | % | | % | | % | | % | | % |
| High | 122 | 34.0 | 188 | 52.6 | 167 | 46.8 | 129 | 36.1 | 118 | 33.1 |
| Current | 229 | 64.0 | 164 | 45.9 | 187 | 52.3 | 217 | 60.8 | 231 | 64.7 |
| Low | 7 | 2.0 | 5 | 1.4 | 3 | 0.84 | 11 | 3.1 | 8 | 2.2 |
| Rank | | | | | | | | | | |
| 1 (Most Important) | 50 | 14.0 | 56 | 15.7 | 104 | 29.1 | 74 | 20.7 | 73 | 20.4 |
| 2 | 115 | 32.2 | 110 | 30.8 | 76 | 21.3 | 41 | 11.5 | 15 | 4.2 |
| 3 | 118 | 33.1 | 125 | 35.0 | 87 | 24.4 | 23 | 6.4 | 4 | 1.1 |
| 4 | 61 | 17.1 | 34 | 9.5 | 52 | 14.6 | 108 | 30.3 | 101 | 28.3 |
| 5 (Least important) | 13 | 3.6 | 32 | 9.0 | 37 | 10.4 | 111 | 31.1 | 164 | 45.9 |

4.3 Economic Value of Parkway Attributes: Increases or Decreases in a Single Attribute

Table 16 shows the *dollar value of a visitor's satisfaction received* from a one level increase in any one of the Parkway's scenic experience attributes, *assuming all other attributes remain at the current level*. These results reveal that respondents receive satisfaction valued at over \$200 for improved scenic quality of overlook view areas. This result has important policy implications. For example, if we assume that there are 11.62 million visitors to the North

Carolina section of the Parkway each year¹ and this sample is representative, then the benefits of improving scenic quality of overlook areas is estimated at \$2.4 billion each year on this section of the Parkway. If the costs of improving overlook scenic quality from current levels are less than this \$2.4 billion annually, then this would be an efficient expenditure since costs are less than benefits. However, if the costs of improving scenic quality are greater than the \$2.4 billion in annual visitor benefits, then efforts to improve scenic quality would not be efficient.

Respondents indicated similar gains in satisfaction for improvements in roadside view quality along the northern North Carolina section of the Parkway. The average respondent indicated that improving roadside scenic quality from current to high would increase their satisfaction by \$205.12 annually. When aggregated for the estimated 11.62 million visitors to the North Carolina section of the Parkway, this implies a visitor gain in satisfaction of over \$2.3 billion annually if roadside scenic quality is improved. Similar aggregation results can be yielded for overlook and hiking trails attributes. However, the welfare results for activity areas are unreliable since estimates are statistically insignificant in the model.

Table 16: Welfare calculations for a one level *increase* in attributes from the current level

| Attribute (Change in attribute) | Benefits | Unit of measure |
|--|-----------------------|--|
| OVERLOOK (88 → 90 overlooks) | \$60.05 | One overlook |
| LOOKHIGH (80% → 90% high quality views) | \$208.14 | Quality level change from current to high ¹ |
| ROADHIGH (38% → 45% high quality views) | \$205.12 | Quality level change from current to high ¹ |
| NUMTRAIL (141 → 191 miles) | \$283.00 | One mile of trail |
| ACTAREA (13 → 15 activity areas) | -\$75.13 ² | Quality level change from current to high ¹ |
| ¹ Overlook view quality, roadside view quality, and activity areas are measured as effects coded dummy variables. See Appendix 3 for more detail. ² Welfare results for ACTAREA are not reliable given their insignificance in the regressions. | | |

Table 17 shows the dollar value of lost satisfaction to visitors if any one of the attributes decreases from the current level, assuming all other attributes remain at their current levels (i.e., they do not change). These results are analogous to those in Table 17; only the *direction of change* is different.

It is interesting to note that the amount of lost satisfaction from a decline in scenic quality for both overlook and roadside areas is of a greater magnitude than the increase in satisfaction gained from an improvement in scenic quality. For example, respondents indicated that a loss of

¹ Annual Parkway visitation varies, and not all visitors to the Parkway are *recreational* visitors. A 10 year average (1993-2002) of official Parkway data for North Carolina recreational visits yields an average of 11,624,137 recreational visitors per year in North Carolina section of the Parkway (U.S. Department of Interior). While this average is less than the official North Carolina recreational visitor counts for calendar years 2001 (12,675,955) and 2002 (13,869,013) it is used throughout this report in order to be conservative with aggregated estimates.

satisfaction in the amount of \$468 would be incurred if overlook scenic quality declined from its current level. This is over twice the amount of gain in satisfaction that respondents said they would realize from improving overlook scenic quality. This is not surprising given that visitors currently enjoy high levels of scenic quality satisfaction, and people often feel a greater need to be compensated for a loss because of what is referred to as *loss aversion*. With the exception of trails (and activity areas, for which the welfare results are not reliable), respondents indicated their lost satisfaction from a decrease in each attribute outweighed their gain in satisfaction from improving the attribute.

Table 17: Welfare calculations for a one unit *decrease* in attributes from the current level

| Attribute (Change in attribute) | Costs | Unit of measure |
|--|-----------------------|--|
| OVERLOOK (88 → 84 overlooks) | \$121.29 | One overlook |
| LOOKLOW (80% high → 55% high quality views) | \$467.82 | Quality level change from current to low ¹ |
| ROADLOW (38% high → 30% high quality views) | \$519.17 | Quality level change from current to low ¹ |
| NUMTRAIL (141 → 111 miles) | \$171.49 | One mile of trail |
| ACTAREA (13 → 11 areas) | \$534.17 ² | Quality level change from current to low ¹ |
| ¹ Overlook view quality, roadside view quality, and activity areas are measured as effects coded dummy variables. See Appendix 3 for more detail. ² Welfare results for ACTAREA are not reliable given their insignificance in the regressions. | | |

There are policy implications that can be explored from Table 17 results as well. For example, if overlook scenic quality declines from current to low in the northern North Carolina section of the Parkway, then using the estimates derived above, we calculate that Blue Ridge Parkway visitors to North Carolina would suffer a loss of satisfaction in the amount of \$5.4 billion annually. This implies that avoiding the decline in overlook scenic quality—preserving scenic quality in overlook areas—would be valued at \$5.4 billion annually. Thus if overlook scenic quality preservation can be obtained for less than \$5.4 billion annually, it would be efficient to do so since the benefits in foregone loss satisfaction would outweigh the costs.

Respondents indicated similar loss in satisfaction from declines in roadside view quality. On average, the lost satisfaction resulting from a roadside view quality decline was estimated at \$519.17 annually. When aggregated, this implies a loss in satisfaction of over \$6 billion for recreational visitors to the North Carolina sections of the Parkway annually. Similar aggregation results can be yielded for the overlook and hiking trails attributes. However, the welfare results for activity areas are unreliable since estimates are statistically insignificant in the model.

The overall implication of this set of results is similar to that identified in Phase I of the Blue Ridge Parkway Scenic Experience Project. Because the satisfaction that respondents gain from improvements in attributes is less than the amount of satisfaction they would lose from a decline in the quality of attributes, *it would be more effective in terms of visitor satisfaction to use Parkway resources to maintain current levels of quality than on improvements.*

5.0 Visits and Expenditures

How much did these visitors spend?

- Respondents spent an average of \$603 during their 3.5 day trip, or about \$170 per day.
- Trip expenditures varied by visitor residence. These ranged from \$370.01 for North Carolina visitors to \$1284.26 for Virginia visitors. Per day average expenditures varied from \$119.50 for North Carolina visitors to \$336.35 for South Carolina visitors.
- Visitors spent about a third of their trip expenses on lodging; about a fourth of their expenditures went to pay for food.
- If the expenditures of this sample are representative, the annual direct economic impact of visitation to the North Carolina section of the Parkway is over \$6 billion a year.

How will their visits change if scenic quality changes?

- A sub-sample of respondents was asked if they would change the number of visits they make to the northern North Carolina section of the Parkway if scenic quality changed. These respondents reported visiting the Parkway on average 5.2 times per year. If scenic quality stayed the same, these visitors indicated they intended to make more trips next year: 6.7 trips instead of 5.2, on average.
- Visitors will make fewer trips if scenic quality declines on the northern North Carolina section of the Blue Ridge Parkway. *Our model predicts that a large portion of these visitors will completely stop visiting this section of the Parkway if scenic quality declines.* This is consistent with responses to other questions of the survey which indicated that almost half of this sub-sample would stop visiting the Parkway under various scenarios of scenic quality decline.
- These respondents indicated they will take on average nearly 2 more trips annually if scenic quality improves on the northern North Carolina section of the Parkway.

How will expenditures change if scenic quality changes?

- Our baseline scenario indicates an increase in expenditures in the magnitude of \$11-13 billion annually, assuming no change in scenic quality.
- If scenic quality declines on the northern North Carolina section of the Parkway, expenditure growth may drop off significantly. Annual expenditure declines in the range of \$3-\$14 billion annually are estimated under various assumptions.
- If scenic quality improves on this section of the Parkway, visitors said they would visit more frequently yielding an increase in expenditure growth. The estimated magnitude of this growth ranges from \$818 million to \$8 billion under various assumptions.

5.1 Visit Expenditures: How much did these visitors spend?

Table 18 presents a breakdown of the visit expenditures of survey respondents. On average, the 640 respondents in the full sample spent just over \$600 on their 3.5 day trip yielding an average expenditure per day of about \$170. As one might expect, when we examine expenditures by visitor residence—*is the visitor from North Carolina, Virginia, or Florida?*—we find that there is some variation in expenditures. The visitors with the lowest total visit expenditures (\$370.01) hail from North Carolina; this makes sense given that this group has to spend less money to reach the Blue Ridge Parkway than those who live farther away from the Parkway. In our sample, visitors from Virginia reported to have spent the most on their trips, \$1284.26. This range of total expenditures is due in part to the fact that visitors take trips of different lengths. On average, daily trip expenditures ranged from \$119.50 for North Carolina visitors to \$336.35 for South Carolina visitors.

Since this research was designed to estimate the nonmarket values that visitors have for the Blue Ridge Parkway rather than the economic impact of their visits, we did not ask respondents to itemize where they incurred their trip expenses. As a result, it is not possible to estimate the economic impact of this sample's expenditures in specific regions. However, if we assume that this sample is representative of the typical recreational visitor to the North Carolina section of the Parkway, we can calculate a rough estimate of their economic impact. We know that there are over 11.62 million recreation visitors to the North Carolina sections of the Parkway each year, and respondents indicated they spent an average of \$603 per trip. If we assume this expenditure is representative of the visitor party's total expenditures², and we know that average party size is 3, then we estimate the total economic impact of these visits at \$2,340,069,537 annually. This \$2.3 billion in direct expenditures is likely spread among many counties including those in the visitor's region of residence.

² Our survey asked respondents to indicate individual expenditures, not party expenditures. The reported average of \$603 in trip expenditures is thus an individual expenditure. Our assumption here that it is a party expenditure implies that these economic impact estimates are likely conservative.

Table 18: Mean visit expenditures by category

| Region | # of visitors | Lodging | | Food | | Souvenirs and retail | | Gas and travel | | Other | | Total expenditure this visit | Total expenditure per day | Mean number of days this visit |
|-------------------------------|---------------|----------|-----|----------|-----|----------------------|------|----------------|-----|----------|-----|------------------------------|---------------------------|--------------------------------|
| n=640 | | | % | | % | | % | | % | | % | | | |
| NC | 303 | \$137.51 | 37 | \$94.71 | 26 | \$71.73 | 19 | \$41.23 | 11 | \$31.61 | 8.5 | \$370.01 | \$119.50 | 3.1 |
| FL | 72 | \$553.42 | 45 | \$312.37 | 25 | \$129.58 | 10.5 | \$116.63 | 9.4 | \$62.10 | 5 | \$1229.85 | \$128.71 | 9.6 |
| GA | 34 | \$152.15 | 25 | \$118.48 | 20 | \$91.32 | 15 | \$229.88 | 38 | \$19.55 | 3 | \$600.56 | \$240.22 | 2.5 |
| SC | 28 | \$365.21 | 33 | \$192.46 | 17 | \$142.89 | 13 | \$221.25 | 20 | \$195.36 | 17 | \$1117.18 | \$336.35 | 3.3 |
| VA | 19 | \$345.26 | 27 | \$326.21 | 25 | \$378.68 | 30 | \$156.47 | 12 | \$81.94 | 6 | \$1284.26 | \$280.47 | 4.6 |
| International | 8 | \$182.75 | 37 | \$128.75 | 26 | \$146.88 | 30 | \$25.00 | 5 | \$15.00 | 3 | \$498.38 | \$137.48 | 3.6 |
| Other | 41 | \$242.54 | 34 | \$153.44 | 21 | \$143.07 | 20 | \$95.71 | 13 | \$88.80 | 12 | \$723.56 | \$213.42 | 3.4 |
| VB Sample | 254 | \$204.13 | 33 | \$137.84 | 22 | \$100.41 | 16 | \$102.53 | 17 | \$73.52 | 12 | \$613.07 | \$187.78 | 3.3 |
| Project Full Sample | 640 | \$208.63 | 35 | \$143.73 | 24 | \$110.70 | 18 | \$93.74 | 16 | \$51.96 | 9 | \$603.41 | \$172.40 | 3.5 |
| Phase I Full Sample | 821 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | \$245.92 | \$149.33 | 1.96 |
| Brothers et al. 95-96 sample* | 276 | \$ 99.44 | 37% | \$ 87.13 | 33% | \$ 14.27** | 5% | \$ 44.83 | 17% | na | na | \$ 264.08 | \$ 112.85 | 2.34 |

*Includes only non-resident visitors; values quotes in 1995/6 dollars.
 **Includes only souvenirs.

5.2 How will visitation change if scenic quality changes?

One of the primary research questions of this study was,

- *How will visitation change if view quality changes?*

To estimate the change in visitation resulting from a change in scenic quality, we asked a subset of our sample if they were planning to return next year and then a series of hypothetical questions. Two of these questions described a level of scenic quality decline, and then asked if visitors would change their number of trips if scenic quality declined in that way. These are described in this section as scenarios A and B. Scenario A assumed that half of the moderate quality views dropped one quality level resulting in low quality views, while Scenario B assumed 15% of the high quality views and ½ of the moderate quality views dropped one scenic quality level resulting in more low quality views overall. The third question assumed that scenic quality in this section of the Parkway was improved: half of the moderate quality views were improved resulting in more high quality views. This was Scenario C.

There were 254 respondents for the version B sub-sample that was used to derive these results. 240 of these respondents indicated they were planning to return to the northern North Carolina section of the Parkway next year; these responses are used to predict changes in visitation resulting from scenic quality changes. The respondents who were not planning on returning were asked to indicate their reasons; these are outlined in Table 22 later in the chapter.

Table 19 shows the average visitor’s change in visits in response to scenic quality changes. Visitors in this sub-sample indicated they expected to take over 6 trips to this section of the Parkway in the next year. If scenic quality declines in the way that was described in Scenario A, these respondents said they would take on average 2 fewer trips to the Parkway next year (4.7 down from 6.46). Similarly, if scenic quality declined in the manner described by Scenario B, respondents indicated they would take 3 fewer trips next year on average (3.6, down from 6.46). In sum, these visitors said they would take fewer trips if scenic quality declined.

Table 19: The change in visits given a change in scenic quality

| Sample | Number of Visitors | Mean Expenditure | Expenditure per day | Expected Number of Visits Next Year | A ½ moderate ↓ low | | B 15% high and ½ moderate ↓ low | | C ½ moderate ↑ high | |
|-------------|--------------------|------------------|---------------------|-------------------------------------|--------------------------|----------|---------------------------------------|----------|---------------------------|----------|
| | | | | | # yes | # visits | # yes | # visits | # yes | # visits |
| VB Sample | 254 | \$613.07 | \$187.78 | 6.46 | 53 | 4.7 | 58 | 3.6 | 63 | 9.8 |
| Full sample | 640 | \$603.41 | \$172.40 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

The final two columns in Table 19 indicate that if scenic quality improves along the Parkway as we described in Scenario C, respondents said they would take more trips. On average, this sample said they would take 3 additional trips in the following year if scenic quality were improved on this section of the Blue Ridge Parkway.

Table 20 shows in greater detail the impact of changing scenic quality on visitation under the 3 scenarios, including the predicted number of visits using our model estimates. This model (outlined in greater detail in Appendix 4) generates the predicted number of trips for a person of average age, gender, experience with the Parkway, and travel costs. The remainder of this section uses this model’s estimated results to examine changes in visitation and expenditures.

On average, nearly 90% of respondents indicated that they would return to the northern North Carolina section of the Parkway next year. Without any changes in scenic quality, these visitors expected to make on average one more trip next year, making 6.7 trips per year up from a current average 5.2 trips per year. Interestingly, only a fraction of respondents—between 1/5 and ¼, depending on the specific question—indicated they would change their visitation because of a change in scenic quality. However, these respondents appear to be particularly sensitive to scenic quality changes. They will nearly completely stop visiting this section of the Parkway all together if scenic quality declines the way that was described in Scenario A or B. While this dramatic shift in visitation may not seem particularly realistic, it may signal something about these particular visitors. It may be that these respondents were “protesting” being asked about their visitation under scenic quality decline, indicating that they are particularly sensitive to this issue. This interpretation appears consistent with the impact of scenic quality improvements on visitors to this section of the Parkway (and with results that appear in Table 21). This study

found that if scenic quality improves, the average respondent would make nearly two more trips per year.

Table 20: Change in visits next year given a change in scenic quality

| Scenic Quality change | Proportion of parties that change visits | Number of visitor parties ^a | Average number of visits this year | Expected number of visits next year | Change in number of visits next year ^b |
|--|--|--|------------------------------------|-------------------------------------|---|
| No change | .88 | 17,730,683 | 5.2 | 6.46 | + 1.26 |
| A ½ moderate ↓ low | .22 | 3,900,750 | 5.2 | 4.67 | -0.53 |
| B 15% high & ½ moderate ↓ low | .24 | 4,255,364 | 5.2 | 3.63 | -1.57 |
| C 1/2 moderate ↑ high | .26 | 4,609,977 | 5.2 | 9.87 | +4.67 |
| Model estimate | | | | | |
| No change | .88 | 17,730,683 | 5.2 | 6.70 | +1.50 |
| A ½ moderate ↓ low | .22 | 3,900,750 | 5.2 | 0.32 | -4.88 |
| B 15% high & ½ moderate ↓ low | .24 | 4,255,364 | 5.2 | 0.21 | -4.99 |
| C 1/2 moderate ↑ high | .26 | 4,609,977 | 5.2 | 7.05 | +1.85 |
| a) We assume our sample proportions are representative of the general group of North Carolina recreational Parkway visitors. That is, we assume that there are 11.62 million annual visitors to this section who visit with 3 visitors per party, yielding 3,874,712 party visits; each visits 5.2 times per year for a total of 20,148,504 annual visitor parties. We assume the number of days visiting by each party does not change. b) As compared to this year (2002, the year the data was collected). | | | | | |

We asked respondents to identify the scenic conditions that would cause visitors to stop coming to the Parkway completely; these are summarized in Table 21. Nearly a third of the respondents in this sub-sample indicated they would not change their visits because of a change in scenic quality. However, over half of this sub-sample indicated they would stop visiting the Parkway under varying degrees of scenic quality decline.

Table 21: The scenic conditions that would cause visitors to completely stop coming to the Parkway

| Condition (n=178) | Count | Percentage |
|---|--------------|-------------------|
| a) If all of the High Quality views drop one scenic quality level resulting in Moderate Quality views | 28 | 15.7% |
| b) If half of the High Quality views drop two scenic quality levels resulting in Low Quality views | 43 | 24.2% |
| c) If all of the Moderate Quality views drop one scenic quality level resulting in Low Quality views | 28 | 15.7% |
| d) If my favorite view(s) become(s) Low Quality view(s) | 9 | 5.0% |
| e) My visits won't change because of a change in the scenic quality of the views | 51 | 28.7% |
| f) Other | 16 | 9.0% |

While most respondents in our sample indicated they would be returning to the Blue Ridge Parkway in the following year, there were some individuals who would not return the next year (n=14). Half of these individuals stated that they would return but it wouldn't be within that time frame (one year). Others planned to visit other sections of the Parkway, some of which more convenient to their homes. Table 22 summarizes the reasons visitors stated that they would not be back next year.

Table 22: The reasons visitors stated that they would not return next year

| Reasons (n=14) | Number selecting this reason for not returning next year |
|--------------------------------|---|
| Only visit to parkway | 0 |
| Visit other sections | 3 |
| Will be back but not next year | 7 |
| Other | 4 |
| Total | 14 |

5.3 How will expenditures change if scenic quality changes?

We use the results presented in Tables 18 and 20 to estimate the change in expenditure growth; these results appear in Table 23. The calculations assume that visitors spend their travel expenditures in their home regions, thus the average trip expenditure used in these calculations excludes gas and travel expenses. This yields an average trip expenditure of \$510.54 (\$613.07 total expenditure - \$102.53 gas/travel).

Given that this sub-sample of respondents indicated they were sensitive to scenic quality declines in this section of the Parkway, there is potential for a significant change in visitor

expenditures if scenic quality were to decline. Our baseline expenditure growth scenario indicates an increase in expenditures in the magnitude of \$11-13 billion annually; this assumes no change in scenic quality and is based on the fact that respondents indicated they would visit more times per year with no changes in scenic quality. Under our two scenarios depicting scenic quality decline, Scenarios A and B, we estimate that expenditure growth will be slowed at least by ¼ (\$3.5 billion annually), and perhaps even wiped out all together. In other words, since some respondents indicated that they will completely stop visiting the Parkway under scenic quality decline scenarios, trip expenditures may stagnate or even decline (Scenario B, model estimate results).

If scenic quality improves on the northern North Carolina section of the Blue Ridge Parkway, visitors indicated they would visit more frequently thus yielding an increase in expenditure growth. The estimated magnitude of this growth ranges from \$823 million to \$8 billion under various assumptions.

Table 23: Summary of the change in visitor expenditure from scenic quality changes*

| Scenic Quality change | Change in expenditure/visitor ^a | Visitor expenditure growth | Change in expenditure growth | Net change from current expenditures |
|---|--|----------------------------|------------------------------|--------------------------------------|
| no change | \$643.28 | \$11,405,801,187 | n/a | ++ |
| A ½ moderate ↓ low | -\$270.59 | \$7,841,035,704 | -\$3,564,765,482 | + |
| B 15% of high and ½ of moderate ↓ low | -\$801.55 | \$5,257,531,213 | -\$6,148,269,973 | + |
| C ½ moderate ↑ high | \$2,384.22 | \$19,431,502,244 | \$8,025,701,057 | +++ |
| Model estimate | | | | |
| No change | \$765.81 | \$13,578,334,746 | n/a | ++ |
| A ½ moderate ↓ low | -\$2,491.44 | \$872,634,313 | -\$12,705,700,433 | 0 |
| B 15% of high and ½ of moderate ↓ low | -\$2,547.59 | -\$521,408,054 | -\$14,099,742,800 | 0 |
| C ½ moderate ↑ high | \$944.50 | \$14,402,087,054 | \$823,752,308 | ++ |

a) Change in number of visits next year (from Table 20) multiplied by \$510.54 in trip expenditures. These expenditures of \$510.54 are reported average trip expenditure (\$613.07) net of gas and travel expenditures (\$102.53), which are assumed to be spent outside the region.

6.0 The Value of Scenic Quality Preservation

Are respondents willing to pay for scenic quality preservation?

- On average, respondents indicated they were willing to pay \$151.14 annually in order to preserve the scenic quality in the northern North Carolina section of the Blue Ridge Parkway.
- This estimate was calculated using a standard economic model for valuing goods which are not exchanged in markets, a contingent valuation model. Our question asked respondents whether or not they would be willing to pay a certain amount for scenic quality preservation.
- The \$151 in additional income taxes that respondents stated they would be willing to pay to preserve scenic quality represents a very small percentage of the average income reported by our respondents, 0.25%.
- Respondents' probability of responding *yes* to the willingness to pay question was significantly affected by the number of years a person has been visiting the Parkway, gender, whether the individual expressed a belief that environmental issues were a top concern for the nation, and the dollar amount presented in the question. Income was not a significant factor when estimating the probability of a *yes* response.
- If we assume this sample is representative of all recreational visitors to the Blue Ridge Parkway in North Carolina, then aggregate annual willingness to pay for scenic quality preservation in the northern North Carolina section of the Parkway is estimated at over \$870 million annually.

We asked respondents on two of the three versions of the survey (versions A and C) if they would be willing to pay for scenic quality preservation on the northern North Carolina section of the Parkway. Specific details of the model are found in Appendix 5; basic results are outlined here.

The average willingness to pay for scenic quality preservation on the northern North Carolina section of the Parkway was estimated at \$151.14 using 352 responses from survey versions A and C. This corresponds to a very small percentage of the average respondent's income (\$60,085), a fraction of one percent (0.25%). Respondents' probability of responding *yes* to the willingness to pay question were found to be significantly affected by the number of years a person has been visiting the Parkway, gender, whether or not the individual believed that environmental issues were a top national issue requiring government action, and the dollar amount presented in the question. Income was not a significant factor when estimating the probability of a *yes* response.

We can aggregate this annual willingness to pay estimate using a series of assumptions. There are an estimated 11.62 million recreational visits to the North Carolina sections of the Blue Ridge Parkway each year. If we assume that these visitors make 5 trips annually, then there are

an estimated 2,324,827 visitors to the Parkway's North Carolina sections each year. Assuming this sample is representative of all recreational visitors to the Blue Ridge Parkway in North Carolina, aggregate annual willingness to pay for scenic quality in the northern North Carolina section is estimated at over \$350 million annually.

7.0 The Value of Improved Visibility

Are respondents willing to pay for improved visibility?

- On average, respondents indicated that they would be willing to pay an additional \$328 per year in federal income taxes if it were earmarked to improve visibility along the Blue Ridge Parkway in North Carolina.
- This estimate was calculated using a standard economic model for valuing goods which are not exchanged in markets, a contingent valuation model. Our question asked respondents whether or not they would be willing to pay a certain amount of additional federal income taxes in order to improve visibility.
- The \$328 in additional income taxes that respondents stated they would be willing to pay for visibility improvements represents a very small percentage of the average income reported by our respondents, 0.5%.
- Respondents' probability of responding *yes* to the willingness to pay question was significantly affected by the number of years a person has been visiting the Parkway, whether the individual expressed a belief that environmental issues were a top concern for the nation, and the dollar amount presented in the question. Income was not a significant factor when estimating the probability of a *yes* response.
- If we assume this sample is representative of all recreational visitors to the Blue Ridge Parkway in North Carolina, then aggregate annual willingness to pay for improved visibility in the northern North Carolina section of the Parkway is estimated at over \$1.8 billion annually.

Visibility and scenic quality are related, but are not the same concept. Scenic quality refers generally to *what* you see while on a trip to the Blue Ridge Parkway while visibility refers to *how clearly* you can see it. The scenic quality of a particular view will thus encompass what you see (farm house, mountains, fence, trees) as well as the composition of items in the view (how do the house, mountains, fence, and trees appear in relation to one another?), whether or not the view is framed by trees or other objects, and so on. Poor visibility can detract from what would ordinarily be a high quality view, and thus visibility affects the experiences of Blue Ridge Parkway visitors. The focus of our research is on scenic quality, not visibility or the interrelationships between the two concepts. However, given the importance of visibility to Parkway visitation, we elected to include a question about visibility in Phase II of the study. Specifically, we asked the 240 respondents of survey version B about their willingness to pay for improved visibility along the Parkway. Details of the question format and model appear in Appendix 6.

Respondents indicated that they would be willing to pay over \$300 in additional federal income taxes annually in order to improve visibility in the northern North Carolina section of the Parkway. While this may seem like a significant amount of money, when expressed as a fraction of these respondents' annual income, it is a very small percentage: 0.5%, or less than one

percent. Respondents' probability of responding *yes* to the willingness to pay question were found to be significantly affected by the number of years a person has been visiting the Parkway, whether or not the individual believed that environmental issues were a top national issue requiring government action, and the dollar amount presented in the question. Income was not a significant factor when estimating the probability of a *yes* response.

We can aggregate this annual willingness to pay estimate using a series of assumptions. Using the estimated 2.3 million distinct recreational visitors to the North Carolina sections of the Blue Ridge Parkway each year calculated in the previous section, and assuming this sample is representative of all recreational visitors to the Blue Ridge Parkway in North Carolina, aggregate annual willingness to pay for improved visibility in the northern North Carolina section is estimated at over \$760 million annually.

8.0 Conclusions and Implications

The Blue Ridge Parkway Scenic Experience Project Phase II extended previous Phase I research by applying the same visitor survey to the northern North Carolina section of the Blue Ridge Parkway. It was implemented during summer and fall 2002 with the aim of answering two key research questions: *What are the benefits from the various attributes of the Blue Ridge Parkway scenic experience?* and *How will visitation change if view quality changes?* In addition, we asked the related questions: *How much are visitors willing to pay to preserve scenic quality?* *How much are visitors willing to pay to improve visibility?*

Our results suggest that Parkway visitors are extremely loyal; on average, they have been visiting over 19 years and make 5 trips per year. Survey respondents indicated their support of resource protection efforts, and the belief that there are many actors who have a role to play in protecting the environment. Most respondents identified support for federal, state, *and* local government involvement in environmental and resource protection and half of respondents supported the notion that users of the Parkway should pay to protect it.

Despite the fact that visitors to the Parkway do not pay an entrance fee to enjoy the park, it is clear from this study that visitors derive significant economic value from their Parkway visitor experience. This is clear from both the expenditures that they make while on their trips, and their stated willingness to pay for the benefits that the Parkway provides. In addition, this sample clearly indicated that the scenic quality along the northern North Carolina section of the Parkway is an important reason for their visitation. They indicated they would take fewer trips if scenic quality declines, and would make more trips with scenic quality improvements. In addition, they would be willing to contribute to preserving scenic quality along the northern North Carolina section of the Parkway, as well as to improved visibility in this region.

These results can be useful to the Blue Ridge Parkway since they, like other national parks, are severely constrained to maintain the quality of the Parkway experience with limited funds. In particular, this research and the findings from Phase I of the study can help the park to prioritize requests for funding as well as facilitate internal budget efficiency. In addition, nonprofit organizations may be interested to learn about these results. Much of what one can see while driving on the Blue Ridge Parkway is outside the park's boundaries, so it is often nonprofit organizations such as the Blue Ridge Parkway Foundation and local land trusts that work to help protect scenic quality along the Parkway. Knowing that visitors have stated their willingness to pay to preserve scenic quality is a logical first step to continue and even increase efforts to do so.

This study verifies what many people already know: that scenic beauty, visibility, and recreational amenities are important to visitors to western North Carolina. What is significant about this study is that it estimates the economic value that visitors to the Blue Ridge Parkway receive from these unpriced amenities. In other words, just because people don't pay for the scenic beauty of this region doesn't mean that they have no value for it. On the contrary! Our study suggests that respondents value scenic beauty and visibility very highly.

Appendix 1: Overview of Methodology Used to Conduct the Blue Ridge Parkway Scenic Experience Project, Phase II

The economic tools of nonmarket valuation are designed to estimate the values of the goods and services that are not readily exchanged in a market such as the value of scenic quality, a natural soundscape or visibility. There are several nonmarket valuation methods available to aid decision makers, each with its strengths and limitations (Freeman 1993, Hausman 1993, Smith 1996); selection of the appropriate method depends upon the nonmarket 'good' under study. For this study we use stated preference approaches since we estimate benefits from a visitor's Parkway scenic experience. In this case, it is not possible to measure visitor preferences using market goods, the typical manner in which preferences are revealed by consumers. The stated preference approach is sometimes referred to as a "direct" approach to understanding preferences since it involves directly asking individuals to state their preferences for some characteristic of the environment or natural resource in question.

Within the stated preference category of nonmarket valuation, there are several different methods that can be used to estimate the value of environmental amenities and natural resources including contingent valuation, contingent behavior and choice modeling. Contingent Valuation and Contingent Behavior models seek to measure the value of a nonmarket good by evaluating a set of responses to hypothetical questions. *Contingent valuation* methods directly ask respondents about the values they place on a change in an environmental service. Although contingent valuation questions take on several forms, the dichotomous choice format asks:

Would you be willing to pay \$X in order to preserve scenic quality along the Parkway?

The respondent in contingent valuation is asked to balance the gain in welfare due to improvement in her attribute bundle with the loss in welfare from forgone income to pay for the bundle. The maximum willingness to pay that we would expect from the individual is the payment that just leaves the respondent indifferent between having the original attribute bundle and original income and having the improved bundle and income reduced by her willingness to pay. This would leave utility (or her satisfaction) constant.

In a *contingent behavior* model, people are asked a direct question such as:

Assume that you notice during this trip on the northern North Carolina section of the Blue Ridge Parkway that views change by X. Would you change your number of visits next year? If yes: My new number of visits would be ____.

If we aggregate the results of many responses to this question, we can estimate the demand for trips as a function of scenic quality.

Contingent behavior and contingent valuation approaches are somewhat controversial because they rely on a person's stated intentions in contrast to the actual, observed behavior used in the travel cost and hedonic models discussed above (Diamond and Hausman 1994, Kahn and

Bjornstad 1996). Despite the controversy, many economists agree that contingent methods do provide useful information for evaluating policy changes such as those considered in this report (Arrow et al 1994). Bockstael and McConnell (2002) suggest that individuals who are currently engaged in the activity that is being modeled would not have difficulty understanding the context of the contingent questions, and thus responses may not exhibit the same sensitivity to the hypothetical scenario as in traditional contingent valuation/behavior surveys. This suggests that our sample is well suited for contingent methods since they are *very* experienced with the Parkway: they have been visiting on average for more than 19 years.

Choice models require the individual to choose from a series of possible policies, each having different levels of attributes (scenic views quality, quantity of overlooks and trails, and costs, for example). This allows the researcher to obtain the marginal value (implicit price) of each attribute, as well as welfare measures for any policy that has attributes contained within the span of those presented in the survey (Louviere et al. 2000). One frequently mentioned advantage of a choice model is that it directly provides marginal values for attributes as well as willingness to pay (WTP) for policies that have multiple effects. In contrast, contingent valuation studies are designed to obtain the value for a single policy change. The policy can represent a change in a single attribute (WTP to provide views) or multiple attributes (additional overlooks that provide trails and altered view quality).

In this study, we use multiple methods to answer our research questions since no one method would be sufficient. The remainder of this section provides a mapping of the research questions and nonmarket valuation methods used to answer those questions; the specifics of the individual models are discussed in separate appendices as noted below.

The Blue Ridge Parkway Scenic Experience Project entailed two primary research questions:

- (1) What are the benefits from the various attributes of the Blue Ridge Parkway scenic experience?
- (2) How will visitation change if view quality changes?

In order to answer research question (1), we needed to estimate the benefits that visitors receive from the Blue Ridge Parkway scenic experience. A choice model was used for this purpose. This type of model is ideally suited to estimate the value of specific characteristics of a good; in this case, the 'good' in question is the Blue Ridge Parkway. Specific details of this model and background on the methodology appear in Appendix 3.

In order to answer research question (2), we needed to investigate respondents' visit behavior under alternative conditions, including both an improvement and degradation of Parkway scenic quality. To do this, we employed a contingent behavior model. Specific details of this model and estimation procedures can be found in Appendix 4.

In addition to these primary research questions, we also asked respondents to indicate their willingness to pay for scenic quality preservation along the northern North Carolina section of the Blue Ridge Parkway. We used a dichotomous choice contingent valuation model to do this. Specific details of this model and estimation procedures are outlined in Appendix 5.

Given the interest in air quality and visibility issues in North Carolina, and their importance to the visitor experience on the Blue Ridge Parkway, we asked a subset of our respondents to indicate their willingness to pay for improved visibility. The specific details of this model and estimation procedures are outlined in Appendix 6.

In order to avoid overwhelming an individual respondent with an excessively lengthy survey instrument, we generated three versions of the survey (version A, version B, and version C) which were randomly assigned to respondents. The exact wording of survey questions can be found in Appendix 7, which also provides a question-by-question tabulation of the results in Parts I and III of each survey. These sections were identical in versions A,B, and C and contained questions regarding visit behavior and demographic information. Part II of the survey was different in each version; it contained the nonmarket valuation questions. Table A.1.1 provides a list of the various nonmarket valuation models used in this study, the amenities in question, the payment vehicle used, and the corresponding survey version.

Table A.1.1 Nonmarket Valuation Methodologies Used in the Blue Ridge Parkway Scenic Experience Project

| Survey Version | Methodology | Amenity in Question | Payment Vehicle | Results Reported in Section | Appendix |
|----------------|----------------------|-------------------------|-----------------------|-----------------------------|----------|
| A | Contingent Valuation | Scenic Quality | License plate fee | 6 | 5 |
| B | Contingent Valuation | Visibility | Federal income taxes | 7 | 6 |
| B | Contingent Behavior | Visitation Levels | <i>Not applicable</i> | 5 | 4 |
| C | Choice Model | Parkway Characteristics | Federal taxes | 4 | 3 |
| C | Contingent Valuation | Scenic Quality | Private donation | 6 | 5 |

Appendix 2: Survey Implementation

The Blue Ridge Parkway Scenic Experience Project, Phase II was implemented during summer and fall 2002 in the northern North Carolina section of the Blue Ridge Parkway. Given that within this section there appear to be somewhat distinct ‘visitor markets’ focused around Asheville and Boone, we elected to survey simultaneously at two sites to ensure that we would capture a representative sample of visitors to this section. The first implementation site was the Folk Art Center, located at milepost 382 in Asheville. The Folk Art Center is a museum gallery and gift shop for the Southern Highlands Craft Guild. It also offers craft demonstrations, a visitor center and restrooms. The second implementation site was Flat Top Manor at the Moses H. Cone Memorial Park (milepost 294.1), a historic home near Blowing Rock which currently houses a Southern Highlands Craft Guild gift shop and a visitor center. Visitors stopping at Moses H. Cone Memorial Park will also find restrooms, many miles of hiking and carriage trails, and spots to picnic and fish. Both sites are very popular among Parkway visitors, and typically generate leisurely visitor stops.

The implementation protocol for Phase II was the same as for the first phase of our study. Parkway visitor data suggest that there is a difference between summer and fall visitors; families with children make up a larger portion of summer visitors and older individuals account for more fall visits. In addition, there is a perceived difference between weekend and weekday visitors with more retirees making Parkway visits during the week. In order to capture a representative sample of each type of visitor, we included implementation days on both weekends and weekdays during the summer and fall of 2002. Each of the two sites hosted a survey team in August, September, and October. The August and September implementation periods were Saturday and Sundays, while the October implementation included two week days, Thursday and Friday, in addition to the weekend days. During the September and October implementation periods the weather was rainy and foggy which meant there were fewer visitors to the Parkway and thus fewer respondents.

In sum there were 8 days of implementation at each of the two sites for a total of 16 field implementation days; these yielded a total of 640 usable responses. The survey was a self-administered survey completed on computer; a paper version of the survey was available for those who preferred that medium. A distinct majority of respondents, 93.3%, completed the survey on computer. Survey versions (A,B,C) were randomly assigned to respondents so that neither the survey assistants nor the implementation manager was aware of the version that respondents were taking.

Appendix 3: Modeling Framework: The Choice Model

Choice models examine individuals' preferences by asking them to consider the tradeoffs that they are willing to make with respect to changes in environmental attributes. In contrast to contingent valuation, which asks individuals to explicitly state their willingness to pay for a proposed change in environmental quality, preferences in a choice model are "revealed" as the respondent is asked to consider a series of scenarios where they must choose their most preferred outcome from a series of possible outcomes (choice sets). This allows the researcher to obtain the tradeoffs that an individual is willing to make between any attributes presented in the choice sets, as well as allow the estimation of willingness to pay.

Within the survey, the consideration of substitutes is part of the selection process. The utility or satisfaction of an alternative received by a respondent is a function of the levels of each of the alternative's attributes. Because there are multiple alternatives from which the respondent can choose, she can use the levels to judge the relative merits of each alternative. Thus the role of substitute levels is explicitly recognized. In traditional contingent valuation, the role of substitutes is relegated to a reminder sentence or two in the description of the good.

We utilize a random utility framework (RUM), which is widely used in dichotomous choice contingent valuation and travel cost modeling, to explain individuals' preferences for alternative sets of scenic experience characteristics on the Blue Ridge Parkway. RUM models rely on choice behavior and assume that individuals will choose the alternative that gives them the highest level of utility. In other words RUM models estimate the probability that an individual will select an alternative based on the levels of the attributes of each possible alternative. If the utility of alternative i is greater than the utility of alternative j , the individual will choose it. Utility is comprised of both deterministic (scenic quality, number of trails, income, etc) and random, individual-specific, components that are unobservable to the researcher. The RUM framework is directly estimable from choice model data and is estimated using the nested logit techniques that have been developed in the transportation and marketing research literature. For a review of choice and conjoint modeling techniques, see Adamowicz et al (1994), Boxall et al (1996), or Roe et al (1996).

One hundred and fifty two subjects completed the computerized version of our choice model survey. The choice model required individuals to consider changes in the levels of six attributes: cost (represented as changes in federal income tax payments), number of overlooks in the 190 miles of Parkway within North Carolina, overlook scenic quality, roadside scenic quality, number of quality trails, and number and condition of activity areas. The choice set attributes overlook view quality, roadside view quality and number and condition of activity areas each take on three qualitative levels. The three choice set attributes are represented in the analysis by the variables LOOKHIGH, LOOKLOW, ROADHIGH, ROADLOW, and ACTINC and ACTDEC, which are effects coded. Descriptive statistics are provided in Table A.3.1.

Table A.3.1 - Choice model descriptive statistics

| Variable | Mean | Std.Dev. | Minimum | Maximum | Cases |
|----------|----------|----------|---------|---------|-------|
| COST | 91.2074 | 121.3924 | 0 | 400 | 4104 |
| OLOOK | 87.6745 | 1.9996 | 84 | 90 | 4104 |
| LOOKHIGH | -0.2524 | 0.8597 | -1 | 1 | 4104 |
| LOOKLOW | -0.3302 | 0.7849 | -1 | 1 | 4104 |
| ROADHIGH | -0.2600 | 0.8573 | -1 | 1 | 4104 |
| ROADLOW | -0.3336 | 0.7859 | -1 | 1 | 4104 |
| TRAILS | 125.1279 | 55.6487 | 0 | 191 | 4104 |
| ACTINC | -0.3709 | 0.7923 | -1 | 1 | 4104 |
| ACTDEC | -0.3709 | 0.7923 | -1 | 1 | 4104 |

The choice model asks the individual to choose his most preferred from a set of three possible states of the Blue Ridge Parkway. Each respondent was asked a series of nine of these questions. The choice is posited to be a function of Parkway characteristics as well as cost of providing them. The model is estimated using conditional logit which accounts for the characteristics of the chosen bundle of attributes as well as those not chosen. We estimate the following specification:

$$Choice = ASC\ 1 + ASC\ 2 - \alpha Cost + \beta_1 OLOOK + \beta_2 LOOKHIGH + \beta_3 LOOKLOW + \beta_4 ROADHIGH + \beta_5 ROADLOW + \beta_6 TRAILS + \beta_7 ACTINC + \beta_8 ACTDEC + \varepsilon$$

The alternative-specific constants (ASC 1 and ASC 2) in a discrete-choice model, much like the constant term in a traditional binary logit model, serve to incorporate any variation in the dependent variable that is not explained by the choice set attributes or respondent characteristics. Table A.3.2 reports the results of the conditional logit regression.

All variables are of the theoretically correct sign and the joint power of the model is acceptable as evidenced by a Chi-squared value of 81.33. Model coefficients are robust to the inclusion and deletion of additional variables, suggesting that these variables, which represent the attributes in the choice model, explain much of the choice behavior.

The variable COST is negative and significant which suggests that individuals are less likely to choose costly options. OLOOK is positive, but insignificant at traditional levels, suggesting that respondent choices were not strongly influenced by changes in the number of overlooks on the northern North Carolina section of the Blue Ridge Parkway. This result may be due to the small variance in the levels presented in our study (the status quo level was 88 overlooks; high and low were 90 and 84, respectively). This result appears to be consistent with preferences for Parkway attributes indicated by the overall sample in that most respondents are very satisfied with the current number of overlooks (see Table 11), and a small percentage (14%) of respondents indicated the number of overlooks were the most important attribute to them (see Table 15).

Table A.3.2 - Choice model regression results

| Regression results | | | | |
|--------------------|-------------|------------|--------|----------|
| Variable | Coefficient | Std. Error | T-stat | Mean |
| COST | -0.0006 | 0.0003 | -1.825 | 91.2074 |
| OLOOK | 0.0181 | 0.0159 | 1.137 | 87.6745 |
| LOOKHIGH | 0.1763 | 0.0543 | 3.244 | -0.2524 |
| LOOKLOW | -0.2274 | 0.0587 | -3.872 | -0.3302 |
| ROADHIGH | 0.1853 | 0.0545 | 3.402 | -0.2600 |
| ROADLOW | -0.2472 | 0.0586 | -4.218 | -0.3336 |
| TRAILS | 0.0034 | 0.0006 | 5.4 | 125.1279 |
| ACTINC | 0.0759 | 1.6252 | 0.047 | -0.3709 |
| ACTDEC | -0.1970 | 1.6249 | -0.121 | -0.3709 |
| ASC1 | 0.2987 | 0.1250 | 2.39 | 1.000 |
| ASC2 | 0.3689 | 0.1281 | 2.879 | 1.000 |

N = 1368
Log-likelihood = -1461.708
Log-likelihood (constant only) = -1502.372
Chi-squared 81.32788

LOOKHIGH, which represents the effect of increases in overlook view quality, was positive and significant, while LOOKLOW, which represents decreases in view quality, was negative and significant.³ The variable ROADHIGH, which indicates increases in roadside views, was positive and significant. ROADLOW was negative and significant.

Trails, which represents the number of quality trails in the NC section of the BRP, was positive and significant, indicating a higher probability of selection as the number of trails expands.

ACTINC and ACTDEC, which represent increases and decreases in the number and condition of activity areas were insignificant, suggesting that activity areas do not influence choices. This appears to be consistent with results from the full sample which reveal that nearly half of respondents place activity areas as their least important Parkway attribute (see Table 15).

Welfare calculations

The conditional logit coefficients can be used to calculate welfare measures following traditional welfare techniques (Cameron 1988). As is the case with the calculation of willingness to pay in traditional contingent valuation type models, compensating variation is given by:

³ These are effects coded variables. To find the coefficient of the omitted (status quo) level, we take the sum of the negative of each of the coefficients that are included: e.g. the status quo level of overlook views, LOOKSQ would be calculated thus: LOOKSQ= $-(-0.2524)+(-0.3302)=0.5826$.

$$CV = -\frac{1}{\beta_s}(\text{status quo utility} - \text{utility of new policy})$$

where β_s is the coefficient on the PMT (or other monetary) variable and the utilities are given by the coefficients of the variables in the regression equation. Table A.3.3 reports welfare calculations for a one unit increase and decrease for each of the choice set attributes.

Table A.3.3 - Choice model welfare results

| Attribute | Welfare Change | |
|---------------------------------------|----------------|-----------|
| | Increase | Decrease |
| Number of Overlooks | \$60.05 | -\$121.29 |
| Overlook View Quality | \$208.14 | -\$467.82 |
| Roadside View Quality | \$205.12 | -\$519.17 |
| Number of Trails | \$283.00 | -\$171.49 |
| Number of Activity Areas ¹ | -\$75.13 | -\$534.17 |

¹Welfare results for Activity Areas are not reliable given their insignificance in the regressions.

Appendix 4: Modeling Framework: Contingent Behavior Model

To answer the second research question, *how will visitation change if scenic quality changes?*, we needed to present visitors with scenarios describing scenic quality change along the Blue Ridge Parkway. First, though, we needed to communicate to respondents the status quo scenic quality level of the views in this section. To do this, we relied on previous Parkway research, the scenic quality assessment. The Blue Ridge Parkway was one of the first national parks to develop and implement a Scenic Quality Assessment, a descriptive ranking system which used input from local citizen teams to rate the scenic quality of the views according to criteria developed by landscape architects (Johnson, Orr, and Rotegard). Parkway staff have taken these rankings and mapped them onto a geographic information system (GIS), thus creating a unique park-wide snapshot of the existing scenic quality of the park that is used to identify critical sites for preservation. The Scenic Quality Assessment yielded categories of high, medium, and low quality views. In this research, we described the status quo view quality as the percentage of existing views that had been rated as high, medium, or low quality as part of the Scenic Quality Assessment.

The contingent choice survey asked respondents to indicate their visitation behaviors under varying scenic quality conditions. Three scenarios representing both increases and decreases in quality were presented to each respondent; respondents were asked to state their level of visits in response to the alternative view quality level that was presented. This data was used in combination with expenditure data to estimate the economic impact of these changed visit levels that is reported in section 5 of this report.

We utilized a count-data modeling framework (poisson regression) to examine the contingent behavior decisions. In this framework, as with the choice and contingent valuation surveys, individuals are queried about their perceptions of the BRP experience, their rankings of the importance of BRP attributes, and their expenditures. They are then asked to provide an accounting of their visits in the past year and whether they expect to visit more or less next year. In the contingent behavior data, our baseline or status quo is the subject's statement about the expected number of visits next year.

We employed 240 subjects in the contingent behavior analysis; these were the respondents to version B of the survey. The contingent behavior task is a bit more cognitively burdensome than either the contingent valuation or choice model tasks. Individuals are required to evaluate a scenario change and then project their change in visitation for each of three scenarios. For some participants, this led to inconsistencies or gaps in the reported data. We adjusted for omissions by postulating a conservative change in trips based on the individual's response to the baseline visitation question. For example if the new number of trips was reported as 5-10, and the value from the baseline case was 4, a value of 5 was entered for the new number of trips in the modified scenario. If the baseline trips was 7, a value of 7 was entered for new number of trips. If a response of "many more" or "many less" was received, a value of 1/3 more or 1/3 less than the baseline case was entered.

The baseline case, or status quo, asked the individual to state how many trips she would take next year if conditions on the Blue Ridge Parkway remain as they are today. Regression results are reported in Table A.4.1.

Table A.4.1- Contingent behavior baseline case

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|-----------------|---------------------------------|-----------|--------|-----------|
| Constant | 0.4782 | 0.0876 | 5.459 | |
| FEMALE | 0.6791 | 0.0381 | 17.82 | 0.4304 |
| AGE | 0.0256 | 0.0016 | 16.083 | 49.0295 |
| TRAVEL | -0.0058 | 0.0004 | -13.61 | 105.6100 |
| YEARS | 0.0257 | 0.0010 | 25.471 | 18.8101 |
| Predicted trips | 6.7047 | | | |
| Welfare= | \$1,164.95per survey respondent | | | |
| Welfare/trip | \$173.75per trip/per respondent | | | |

The number of years of experience with the Blue Ridge Parkway (YEARS), the individual's age (AGE) and whether the individual was female (FEMALE) were all positive and significant, indicating that increases in those variables increase the number of projected trips. Trips decline as the cost of trips (TRAVEL) increases. The average number of predicted trips in the *status quo* scenario (no change in conditions) for the sample is 6.70 trips per year. The predicted welfare or value of a trip is \$173.75

Next we examine three hypothetical scenarios involving scenic quality changes. In Scenario A, half of the moderate quality views decrease to low quality views. These results are reported in Table A.4.2. The coefficients are similar to the status quo case except that females (FEMALE) are less likely to take trips under the changed conditions than are males. In this instance, the predicted number of trips declines to .319. The average individual is less likely to take trips in the future as the quality of views is degraded. The welfare per trip declines to \$43.79. This scenario leads to a welfare loss per person per year of \$1150.95 relative to the base contingent behavior scenario. This is due to a decrease in the value of a trip and a subsequent decrease in the number of predicted trips taken.

Table A.4.2 - Contingent behavior regression results: Decreased quality – Scenario A

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|-----------------|--------------------------------|-----------|---------|-----------|
| Constant | 1.9209 | 0.1544 | 12.438 | |
| FEMALE | -1.8918 | 0.1334 | -14.187 | 0.4304 |
| AGE | 0.0070 | 0.0030 | 2.333 | 49.0295 |
| TRAVEL | -0.0228 | 0.0019 | -11.912 | 105.6118 |
| YEARS | -0.0096 | 0.0029 | -3.359 | 18.8101 |
| Predicted trips | 0.3198 | | | |
| Welfare | \$14.00per survey respondent | | | |
| Welfare/trip | \$43.79per trip/per respondent | | | |

Now we consider Scenario B, a case in which 15% of the high quality views and 50% of the medium quality views drop one scenic quality level, resulting in more low quality views overall. These results are reported in Table A.4.3. The coefficients are all significant at the .95% level or better. Females and older participants are less likely to take trips than others as evidenced by negative signs on AGE and FEMALE; other variables have the same signs as in the status quo case. In this instance, the predicted number of trips declines to .210, while welfare per trip drops to \$55.17. The total welfare loss per respondent relative to the baseline case is \$1153.30 per year.

Table A.4.3 - Contingent behavior regression results: Decreased quality--Scenario B

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|-----------------|--------------------------------|-----------|--------|-----------|
| Constant | 2.4953 | 0.2223 | 11.223 | |
| FEMALE | -0.2844 | 0.1353 | -2.101 | 0.4304 |
| AGE | -0.0520 | 0.0056 | -9.272 | 49.0295 |
| TRAVEL | -0.0181 | 0.0028 | -6.424 | 105.6118 |
| YEARS | 0.0282 | 0.0047 | 6.009 | 18.8101 |
| Predicted trips | .2101 | | | |
| Welfare | \$11.59per survey respondent | | | |
| welfare/trip | \$55.17per trip/per respondent | | | |

Table A.4.4 reports the results of Scenario C, the case in which half of the moderate quality views are *increased* to high quality views. The signs of all variables except TRAVEL are positive and significant at the 99% level. Predicted trips are 7.05 and welfare per trip increases to \$176.71, a slight increase over the baseline case. The total welfare gain per individual is \$80.98 per year.

Table A.4.4 - Contingent behavior regression results: Increased quality--Scenario C

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|-----------------|---------------------------------|------------------|-------------------|---------------------|
| Constant | 0.6722 | 0.0854 | 7.873 | |
| FEMALE | 0.6283 | 0.0376 | 16.73 | 0.4304 |
| AGE | 0.0229 | 0.0016 | 14.588 | 49.0295 |
| TRAVEL YEARS | -0.0057 0.0257 | 0.0004 0.0010 | -13.597 25.639 | 105.6118 18.8101 |
| Predicted trips | 7.0508 | | | |
| Welfare | \$1,245.93per survey respondent | | | |
| welfare/trip | \$176.71per trip/per respondent | | | |

Table A.4.5 summarizes the predicted change in the number of annual visits that result from changes in scenic view quality.

Table A.4.5 Predicted changes in trips resulting from changes in scenic quality

| View Quality | Predicted Number of Trips | Change in Trips per Year |
|-----------------------|------------------------------|-----------------------------|
| Current View Quality | 6.7047 | <i>Not applicable</i> |
| Decreased: Scenario A | 0.3198 | -6.3849 |
| Decreased: Scenario B | 0.2101 | -6.4946 |
| Increased: Scenario C | 7.0508 | +0.3461 |

Appendix 5: Modeling Framework: The Contingent Valuation Method for Estimating Willingness to Pay for Scenic Quality Preservation

Background

The contingent valuation method is sometimes referred to as a "direct" approach to estimating willingness to pay since it involves directly asking individuals to state their preferences for some characteristic of the environment or natural resource in question, e.g. state their willingness to pay. For example, *what is the most you would be willing to pay in order to recreate in Yosemite National Park?* It is "contingent" valuation because it asks people how they would act if they were placed in certain possible situations. In contrast with the revealed preference methods, the stated preference method of contingent valuation does not use actual observed market behavior as the basis of benefit measurement. Contingent valuation has been used extensively in measuring the benefits of a variety of public goods, especially environmental quality. This is likely due in great part to the flexibility and applicability of the methodology, since contingent valuation can be tailored to study "virtually anything that can be made comprehensible to respondents" (Field 1994, 151). This includes goods and services such as the existence value for endangered species (Boyle and Bishop 1987, Bowker and Stoll 1988). Variations on the contingent valuation method include contingent ranking and contingent choice surveys, where respondents rank and select their preferred outcomes, respectively.

Application

In this study we employed a dichotomous choice contingent valuation model to estimate respondents' willingness to pay for scenic quality preservation along the northern North Carolina section of the Blue Ridge Parkway. The contingent valuation data were collected in a standalone survey, version A, which was designed specifically to obtain contingent valuation data, as well as in version C as a follow up response to the choice model questions. We utilized two different payment vehicles: a license plate fee (version A) and a private donation to a non-profit foundation (version C). Both payment vehicles are realistic: North Carolina just began to offer a specialty license plate to support the Blue Ridge Parkway Foundation, and several organizations exist which act to preserve scenic quality in North Carolina including land trusts which purchase conservation easements. The bid amounts varied from \$10 to \$200 and were randomly assigned. We utilized follow-up questions to get respondents to reveal their maximum willingness to pay and explain zero willingness to pay responses. In addition, we asked respondents to reveal how likely they would be to actually follow through with the purchase of the license plate or donation to the non-profit organization.

The specific question series that was used was the following:

- a) Blue Ridge Parkway research indicates that 47% of the views in the northern North Carolina section of the Parkway are currently high quality views. However, views along the Parkway may change. It is possible that 30% of the high quality views may be degraded to a lower quality condition. Would you be willing to purchase a special license plate which costs an additional \$X annually in order to ensure that the scenic quality in the northern North Carolina section is preserved in its current state? (Circle one.)
 1. Yes
 2. No

b) The **most** I am willing to pay annually is \$_____ in order to ensure that scenic quality would be preserved on the northern North Carolina section of the Blue Ridge Parkway. (Fill in a dollar amount.)

The bid amount, \$X, was randomly assigned to each participant from a distribution ranging from \$10 to \$200.

Descriptive statistics are reported in Table A.5.1. The variable BID represents the requested tax payment from the individual, LOGINC is the natural logarithm of INCOME, the household income for the individual. YEARS measures the number of years that the individual has been visiting the Blue Ridge Parkway. FEMALE takes the value 1 if the respondent is female and 0 otherwise. ENVISS is equal to 1 if the individual said that environmental issues are the most important national issues requiring government action. CVMONLY takes the value 1 if the response is from survey version VA.

Three hundred fifty two responses comprise the grouped analysis. Survey version VA generated 200 useable responses, while version VC generated 152.

Table A.5.1 Descriptive statistics for VA and VC contingent valuation data

| Variable | Mean | Std.Dev. | Minimum | Maximum | Cases |
|----------|----------|----------|----------|----------|-------|
| BID | 85.65341 | 61.43001 | 10 | 200 | 352 |
| LOGINC | 11.00352 | 0.656191 | 8.922658 | 11.65269 | 352 |
| YEARS | 19.07386 | 15.98504 | 0 | 60 | 352 |
| FEMALE | 0.414773 | 0.493384 | 0 | 1 | 352 |
| ENVISS | 0.883523 | 0.321253 | 0 | 1 | 352 |
| CVMONLY | 0.568182 | 0.496035 | 0 | 1 | 352 |
| INCOME | 70774.15 | 33335.27 | 7500 | 115000 | 352 |

The Model

Multinomial logit was used to estimate the dichotomous choice contingent valuation model (CVM). The logit model regresses the yes/no response to the CVM question on the explanatory variables, BID, LOGINC, YEARS, FEMALE, ENVISS, and CVMONLY. The generalized specification is:

$$Choice = \alpha + \beta_1 DCBID + \beta_2 Demographics + \varepsilon$$

The model generates the probability that the yes/no responses are generated by the explanatory variables. The results of the regression of the joint VA/VC CVM data are found in Table A.5.2. The coefficients of the explanatory variables in the logit model speak to the probability of observing the variable on the left hand side. A positive explanatory variable leads to an increase in the probability that the left hand side variable, CHOICE is observed.

Table A.5.2 CVM regression results: Joint VA/VC model—Scenic quality preservation

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|----------|-------------|-----------|--------|-----------|
| Constant | 0.992125 | 2.247994 | 0.441 | |
| BID | -8.52E-03 | 2.04E-03 | -4.177 | 85.65341 |
| LOGINC | -0.14117 | 0.19796 | -0.713 | 11.00352 |
| YEARS | 2.83E-02 | 8.23E-03 | 3.434 | 19.07386 |
| FEMALE | 0.628556 | 0.258924 | 2.428 | 0.414773 |
| ENVISS | 1.85588 | 0.404004 | 4.594 | 0.883523 |
| CVMONLY | -1.03922 | 0.254893 | -4.077 | 0.568182 |

N = 352
 Log-likelihood = -198.265
 Log-likelihood (constant only) = -234.348
 Chi² = 72.166

The model's parameters are jointly significant as represented by McFadden's rho-squared value of .154, and a likelihood ratio of 72.166. The explanatory variables are all of the theoretically correct sign and all except LOGINC are significant at the 99% level. That LOGINC is not significant suggests that there are no income effects in the model. BID is negative and significant; as the requested increase in money to pay for improvements increases, individuals are more likely to say "no" to the CVM question.

Individuals who have more experience with the Parkway are more likely to say "yes" to the CVM question than those with less experience as represented by the positive sign on YEARS. FEMALES are more likely to respond "yes" as are those who believe environmental issues are the most important national issue that requires government action (ENVISS). The variable CVMONLY is negative and significant, indicating that individuals in the VA treatment were less likely to respond "yes" than those in the VC treatment. Recall that those in the VC survey were asked the CVM question as a follow up to their main task – evaluating the choice model scenarios. It is likely that the CVM responses of the VC sample were conditioned by the scenarios that were evaluated prior to answering the CVM question.

We can use the parameters estimated in the logit regression to generate willingness-to-pay for the policy to protect Blue Ridge Parkway views. The change in welfare is found by calculating the payment, CV, that makes an individual just indifferent between the level of indirect utility provided by the status quo, say indirect utility level v^1 , and the level of indirect utility provided by v^0 is given by :

$$v^1(p^1, q^1, m - CV, z) + \varepsilon^1 = v^0(p^0, q^0, m, z) + \varepsilon^0$$

where p^i represents prices, quality attributes are given by q^i , income is represented by m , and individual characteristics are given by z . Solving for CV gives:

$$CV = \frac{1}{\beta_{BID}} (\text{status quo utility} - \text{utility of new policy})$$

The joint model leads to a mean willingness-to-pay of \$151.14 if the data are considered together. The joint model can be used to obtain willingness-to-pay for the VA and VC subsamples by substituting the value “1” for VA and “0” for VC for the variable CVMONLY when calculating the grand mean. In this case \$98.47 is WTP for the VA sample and \$220.43 is the value for the VC sample.

Because of the significance of the variable CVMONLY, the model was run again without the choice model data. The results are presented in Table A.5.3.

Table A.5.3 CVM regression results: Version A only—Scenic Quality Preservation

| Variable | Coefficient | Std error | T-stat | Mean of X |
|---|-------------|-----------|--------|-----------|
| Constant | 0.894184 | 3.08707 | 0.29 | |
| BID | -1.21E-02 | 2.79E-03 | -4.333 | 85.35 |
| LOGINC | -0.23043 | 0.274285 | -0.84 | 10.99351 |
| YEARS | 2.93E-02 | 1.03E-02 | 2.846 | 19.39 |
| FEMALE | 0.735633 | 0.336333 | 2.187 | 0.415 |
| ENVISS | 2.171968 | 0.570503 | 3.807 | 0.865 |
| N = 200 | | | | |
| Log-likelihood -114.802 | | | | |
| Log-likelihood (constant only) = -138.379 | | | | |
| Chi ² = 47.153 | | | | |

The regression results are similar to those of the joint data. All variables are significant at the 95% level or better. The explanatory variables are jointly significant as represented by a McFadden rho-squared of .170. The mean willingness-to-pay for the scenario is \$92.13.

Appendix 6: Modeling Framework: The Contingent Valuation Method for Estimating Willingness to Pay for Visibility Improvements

The contingent valuation (CVM) scenario in survey version B evaluates individuals' willingness to pay to protect visibility rather than Blue Ridge Parkway scenic quality as in the VA and VC analysis presented in Appendix 5. Individuals were asked to consider the following question:

Improvements to visibility are difficult to achieve with local efforts since some of the pollutants that cause reductions in visibility are transported from long distances. As a result, policies to significantly improve visibility along the northern North Carolina section of the Blue Ridge Parkway would need to be coordinated at a regional or federal level. Would you be willing to pay an additional \$Y per year in federal income taxes if it were earmarked to improve visibility along the Blue Ridge Parkway in North Carolina?

The presented BID, \$Y, was assigned randomly and took on values between \$10 and \$400.

Two hundred forty useable responses were obtained from version B survey respondents. Descriptive statistics are reported in Table A.6.1.

Table A.6.1 - Descriptive statistics: Version B CVM data

| Variable | Mean | Std.Dev. | Minimum | Maximum | Cases |
|----------|----------|----------|----------|----------|-------|
| WTP | 0.6000 | 0.4909 | 0 | 1 | 240 |
| BID | 125.4167 | 132.4923 | 10 | 400 | 240 |
| LOGINC | 11.0424 | 0.6125 | 8.922658 | 11.65269 | 240 |
| YEARS | 18.7375 | 16.9859 | 0 | 99 | 240 |
| FEMALE | 0.4333 | 0.4966 | 0 | 1 | 240 |
| ENVISS | 0.8958 | 0.3061 | 0 | 1 | 240 |

The visibility CVM regression followed the same techniques and model specification described in Appendix 5. Regression results are reported in Table A.6.2. The explanatory variables indeed explain the choice to protect or not, as evidenced by McFadden rho-squared of .102. The variable BID is negative and significant, indicating a decreased likelihood of saying “yes” as the cost of a program to improve visibility increases. YEARS and ENVISS are positive and significant; people with more experience with the Blue Ridge Parkway and those who believe environmental issues are the most important national issues requiring government action are more likely to pay to protect visibility. Mean willingness-to-pay for a program to improve visibility in the North Carolina section of the BRP is \$327.99, calculated using the method reported in Appendix 5.

Table A.6.2 – CVM regression results: Version B—Visibility

| Variable | Coefficient | Std Error | T-stat | Mean of X |
|----------|-------------|-----------|--------|-----------|
| Constant | -1.46274 | 2.650061 | -0.552 | |
| BID | -2.39E-03 | 1.06E-03 | -2.245 | 125.4167 |
| LOGINC | 2.14E-02 | 0.231903 | 0.092 | 11.04237 |
| YEARS | 4.23E-02 | 9.91E-03 | 4.271 | 18.7375 |
| FEMALE | 0.315354 | 0.295018 | 1.069 | 0.433333 |
| ENVISS | 1.204725 | 0.463803 | 2.597 | 0.895833 |

n = 240
Log likelihood = -144.890
Log-likelihood (constant only) = -161.522
Chi² = 33.264

Appendix 7: Summary of answers to survey questions

Note: Results reported here are for the full sample (versions A, B, and C combined together) unless otherwise noted. The total number of responses per item ($n=_$) are reported with each question.

Part 1: Introduction

1) How many years have you been visiting the Blue Ridge Parkway?

Average: 19.5 years (n=639)

2) In addition to the northern North Carolina section that you are currently in (section C on the map), which sections of the Parkway have you visited? (n=638)

- a) The northern section - Shenandoah National Park to Roanoke.
326 respondents, 51.1% of sample
- b) The northern North Carolina section - Roanoke to the Virginia state line.
344 respondents, 53.9% of sample
- d) The southern section - Asheville to the Great Smoky Mountains National Park.
537 respondents, 84.2% of sample

3) How often do you visit the **northern North Carolina** section of the Parkway (section C) **each year**?

- a) This is my first time 95 respondents, 14.90% of sample (n=638)
- b) Once every few years 87 respondents, 14.57% of sample (n=597)
- c) 1 time/year 95 respondents, 15.91% of sample (n=597)
- d) 2 times/year 70 respondents, 11.72% of sample (n=597)
- e) 3 times/year 55 respondents, 9.21% of sample (n=597)
- f) Once a month 24 respondents, 4.02%% of sample (n=597)
- g) 4 times/year 46 respondents, 7.70% of sample (n=597)
- h) 5-11 times/year 87 respondents, 14.57% of sample (n=597)
- i) Other _____ 44 respondents, 7.37% of sample (n=597)

4) How many days are you traveling on the **northern North Carolina** section of the Blue Ridge Parkway during this trip?

Average number of days in trip: 3.5 (n=638)

5) How many people are in your party today (including yourself)?

Average number of people in party: 3 (n=639)

6) What was the most important reason for planning your trip to the Parkway?¹ (n=564)

- | | |
|---|----------------------------------|
| a) Enjoy the scenic views along the Parkway | 290 respondents, 48.8% of sample |
| b) Have a peaceful vacation | 127 respondents, 21.4% of sample |
| c) Escape from work pressures | 93 respondents, 15.7% of sample |
| d) Feel close to nature | 143 respondents, 24.1% of sample |
| e) Experience new and different places | 81 respondents, 13.6% of sample |
| f) Get away from crowds | 83 respondents, 14.0% of sample |
| g) Get some fresh air | 100 respondents, 16.8% of sample |
| h) Get some exercise | 78 respondents, 13.1% of sample |
| i) Tell others about it at home | 39 respondents, 6.6% of sample |
| j) Spend time with my family/friends | 156 respondents, 26.3% of sample |
| k) Get away from commercialized sites | 83 respondents, 14.0% of sample |
| l) Other | 63 respondents, 10.6% of sample |

¹Respondents were able to choose more than one item.

7) Visitors to the Parkway use it in many different ways. Please circle the type of activities you are participating in **during this trip on the northern North Carolina** section of the Parkway.

- | | |
|--------------------------------------|---|
| a) Camping | 140 respondents, 24 % of sample (n=586) |
| b) Hiking | 283 respondents, 48 % of sample |
| c) Visiting a scenic area | 425 respondents, 73 % of sample |
| d) Visiting a historical site/museum | 235 respondents, 40 % of sample |
| e) Fishing/hunting | 30 respondents, 5 % of sample |
| f) Picnicking | 120 respondents, 20 % of sample |
| g) Rock climbing | 28 respondents, 5 % of sample |
| h) Family outing | 204 respondents, 35 % of sample |
| i) Touring (motorcycle, car) | 209 respondents, 36 % of sample |
| j) Commuting | 17 respondents, 3 % of sample |
| k) Visiting a lodge | 52 respondents, 9 % of sample |
| l) Visiting shops/craft galleries | 294 respondents, 50 % of sample |
| m) Relaxing | 310 respondents, 53 % of sample |
| n) Creating art | 25 respondents, 4 % of sample |
| o) Participating in a group outing | 35 respondents, 6 % of sample |
| p) Other | 32 respondents, 5 % of sample |

My most common activity on this section of the Parkway for this trip is: _____

Most common activity while on this trip

| Parkway Activity ^a (n=637) | Number | % of sample |
|---------------------------------------|--------|-------------|
| Visiting a Scenic Area | 191 | 30% |
| Hiking | 98 | 15% |
| Touring | 91 | 14% |
| Relaxing | 54 | 8% |
| Camping | 48 | 8% |
| Visiting shops/craft galleries | 45 | 7% |
| Family outing | 43 | 7% |
| Visiting a historical site/museum | 23 | 4% |
| Other | 19 | 3% |
| Picnicking | 8 | 1% |
| Participating in a group outing | 7 | 1% |
| Fishing/hunting | 4 | 1% |
| Commuting | 3 | 0% |
| Creating art | 1 | 0% |
| Visiting a lodge | 1 | 0% |
| Rock climbing | 0 | 0% |

8) Below we list several possible expenses associated with a trip on the Blue Ridge Parkway. Please tell us how much you expect to spend, or have spent, *for this particular trip on the northern North Carolina section* of the Parkway. Please use the categories below to help you calculate your total expected expenses.

| | | |
|-------------------------------------|-------------------|---------|
| Lodging | Average: \$208.63 | (n=627) |
| Food and drink | Average: \$143.73 | (n=625) |
| Souvenirs and other retail items | Average: \$110.70 | (n=629) |
| Gasoline and other travel expenses | Average: \$93.74 | (n=630) |
| Other trip expenses | Average: \$51.96 | (n=623) |
| Total expenses for this trip | Average: \$603.41 | (n=634) |

9) Considering the **northern North Carolina** section of the Parkway and how you use it, how satisfied are you with each of the following characteristics on **this section of the Blue Ridge Parkway?** (Please circle a level of satisfaction for each characteristic.)

Level of satisfaction for northern North Carolina Parkway attributes

| Parkway Characteristic | Not at all satisfied 1 | 2 | 3 | 4 | Very satisfied 5 | Don't know |
|--|---------------------------|------------|--------------|--------------|---------------------|--------------|
| Number of overlooks # (n=637) % | 4 0.6% | 15 2.4% | 57 8.9% | 136 21.4% | 387 60.8% | 38 6.0% |
| Scenic quality of overlooks # (n=638) % | 5 0.8% | 21 3.2% | 91 14.3% | 162 25.4% | 331 51.9% | 28 4.4% |
| Scenic quality of roadside views # (n=636) % | 3 0.5% | 16 2.5% | 107 16.8% | 192 30.2% | 297 46.7% | 21 3.3% |
| Number of quality trails # (n=630) % | 0 0% | 15 2.4% | 119 18.9% | 124 19.7% | 213 33.8% | 159 25.2% |
| Number and condition of activity area # (n=635) % | 0 0% | 18 2.8% | 138 21.7% | 196 30.9% | 224 35.3% | 59 9.3% |

10) Changes are occurring along the **northern North Carolina** section of the Parkway that can affect scenic quality. During your most recent visit to this section of the Parkway, did you notice any of the following?

- a) Single houses 333 respondents, 52% of sample (n=636)
- b) Housing subdivisions 247 respondents, 39% of sample
- c) Logging 104 respondents, 16% of sample
- d) Commercial signs 144 respondents, 23% of sample
- e) Road-cuts 141 respondents, 22% of sample
- f) Power lines 207 respondents, 33% of sample
- g) Electric transmission towers 141 respondents, 22% of sample
- h) Telecommunication towers 197 respondents, 31% of sample
- i) Air pollution 201 respondents, 32% of sample
- j) Other 23 respondents, 4% of sample
- k) Didn't notice any of these 127 respondents, 20% of sample

11) Of those items you circled in the question above, please rank the items that you are most concerned about for the **northern North Carolina** section of the Blue Ridge Parkway. List your top four concerns, beginning with the item you circled that you are most concerned about.

Item of Greatest Concern for the northern
 North Carolina section of the Parkway _____
 2nd Greatest Concern _____
 3rd Greatest Concern _____
 4th Greatest Concern _____

Changes noticed on the northern North Carolina section and visitors' level of concern

| Changes noticed | Greatest concern (n=631) | | 2 nd greatest concern (n=406) | |
|------------------------------|--------------------------|-----|--|-----|
| | # | % | # | % |
| Single houses | 97 | 15% | 97 | 24% |
| Housing subdivisions | 119 | 19% | 69 | 17% |
| Commercial signs | 26 | 4% | 38 | 9% |
| Road cuts | 25 | 4% | 16 | 4% |
| Power lines | 14 | 2% | 49 | 12% |
| Electric transmission towers | 9 | 1% | 30 | 7% |
| Telecom towers | 35 | 6% | 46 | 11% |
| Logging | 30 | 5% | 30 | 7% |
| Air pollution | 139 | 22% | 28 | 7% |
| Didn't notice (n=628) | 123 | 19% | 1 | 0% |
| Other (n=630) | 14 | 2% | 2 | 0% |

PART 3: Demographics

14) What year were you born? 19 _____ Average age: 49.9 (n=633)

15) What is your gender? (n=636) Male 58%
Female 42%

16) How many children under the age of 18 live in your household?

Average of total sample: 0.47 children/person (n=640)
Percentage of sample with children in household: 26.7% (n=640)
Average for those that do have children: 1.75 children/person (n=171)

17) What is your zip code in the US? _____
If you live outside the US, what is your **Country** of Residence? _____

Zip code origin of sample visitors

| State (n=598) | Frequency | % | Brothers and Chen 1996 Sample | Phase I Sample |
|---------------|-----------|-------|-------------------------------|----------------|
| VA | 19 | 3.2% | 33% | 34.7% |
| NC | 303 | 50.7% | 20.1% | 32.4% |
| SC | 28 | 4.7% | 2.5% | 1.9% |
| GA | 32 | 5.3% | | |
| FL | 73 | 12.2% | 4.2% | 1.3% |
| TN | 28 | 4.7% | | |
| International | 8 | 1.3% | | |
| Other | 107 | 17.9% | 40.2% | 29.6% |

18) Which of the following *best* describes the highest level of education that you have completed?

- a) Grade school 11 respondents, 2% of sample (n=639)
- b) Completed high school or GED 94 respondents, 15% of sample (n=639)
- c) Completed AA 55 respondents, 9% of sample (n=639)
- d) Completed BA or BS 216 respondents, 34% of sample (n=639)
- e) A graduate degree 237 respondents, 37% of sample (n=639)
- f) Other 18 respondents, 3% of sample (n=640)

19) Which of the following *best* describes your present occupation? (n=640)

| | |
|--|--------------------------------|
| a) Managerial or professional specialty | 293 respondents, 46% of sample |
| b) Service occupation | 43 respondents, 7% of sample |
| c) Farming, forestry, or fishing | 10 respondents, 2% of sample |
| d) Technical, sales support | 32 respondents, 5% of sample |
| e) Precision production, craft, or repair occupation | 11 respondents, 2% of sample |
| f) Operator, fabricator or laborer | 8 respondents, 1% of sample |
| g) Homemaker | 26 respondents, 4% of sample |
| h) Student | 23 respondents, 4% of sample |
| i) Retired | 127 respondents, 20% of sample |
| j) Other | 61 respondents, 10% of sample |

20) Which of the following *best* describes your total household income, before taxes, in 2001?

| | | |
|---------------------|--------------------------------|---------|
| a) Less than 10,000 | 38 respondents, 6% of sample | (n=640) |
| b) 10,000 to 19,999 | 15 respondents, 2% of sample | |
| c) 20,000 to 29,999 | 42 respondents, 7% of sample | |
| d) 30,000 to 39,999 | 60 respondents, 9% of sample | |
| e) 40,000 to 49,999 | 49 respondents, 8% of sample | |
| f) 50,000 to 59,999 | 65 respondents, 10% of sample | |
| g) 60,000 to 69,999 | 58 respondents, 9% of sample | |
| h) 70,000 to 79,999 | 66 respondents, 10% of sample | |
| i) 80,000 to 89,999 | 50 respondents, 8% of sample | |
| j) 90,000 to 99,999 | 52 respondents, 8% of sample | |
| k) over 100,000 | 145 respondents, 23% of sample | |

Average Household Income: \$65,242 (calculated using the midpoint of given intervals)

21) Please choose what *you* consider to be the 5 most important of the following national issues that require government action, and rank them according to importance. (1= most important through 5 = least important.)

| | <u>Issues chosen as "most important" or "important" by respondents</u> | |
|---------------------|--|---------|
| a) Environment | 561 respondents, 88% of sample | (n=633) |
| b) Public safety | 470 respondents, 73% of sample | (n=631) |
| c) Unemployment | 369 respondents, 58% of sample | (n=626) |
| d) Health care | 557 respondents, 87% of sample | (n=635) |
| e) Education | 567 respondents, 89% of sample | (n=626) |
| f) Inflation | 223 respondents, 35% of sample | (n=613) |
| g) National defense | 386 respondents, 60% of sample | (n=618) |
| h) Other | 23 respondents, 4% of sample | (n=597) |

22) Indicate your level of agreement with the following statements. There are no right or wrong answers. Your responses are confidential.

Levels of agreement with given statements

| Statement | Respondent Answers | | | | | | | | | | | |
|---|------------------------|-----|-----|-----|-----|-----|-----|-----|---------------------|-----|-----------------|----|
| | 1 Strongly disagree | | 2 | | 3 | | 4 | | 5 Strongly Agree | | 6 Don't know | |
| | # | % | # | % | # | % | # | % | # | % | # | % |
| "The federal government should not own more land." (n=637) | 222 | 35% | 113 | 18% | 137 | 22% | 64 | 10% | 78 | 12% | 23 | 4% |
| "State governments should help the Parkway." (n=639) | 23 | 4% | 9 | 1% | 107 | 17% | 166 | 26% | 320 | 50% | 14 | 1% |
| "Preserving our environment should be a top priority in <i>local</i> communities." (n=639) | 18 | 3% | 18 | 3% | 110 | 17% | 150 | 23% | 340 | 53% | 3 | 0% |
| "There is so much undeveloped land that we need not worry about development." (n=639) | 428 | 67% | 86 | 13% | 82 | 13% | 21 | 3% | 19 | 3% | 3 | 0% |
| "The Parkway is a national treasure." (n=639) | 8 | 1% | 3 | 0% | 42 | 7% | 78 | 12% | 499 | 78% | 9 | 3% |
| "The users of the Parkway should pay to protect it." (n=637) | 77 | 12% | 54 | 8% | 183 | 29% | 202 | 32% | 108 | 17% | 12 | 2% |
| "Protecting the Parkway's scenic resources should be a top priority for the <i>federal</i> government." (n=639) | 34 | 5% | 29 | 5% | 170 | 27% | 205 | 32% | 196 | 31% | 5 | 0% |
| "Protecting our nation's resources is very important to me." (n=638) | 15 | 2% | 5 | 0% | 94 | 15% | 180 | 28% | 336 | 53% | 8 | 1% |

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