The Value of the View: Valuing Scenic Quality Using Choice and Contingent Valuation Models

Leah Greden Mathews*, Susan Kask, and Steven Stewart

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Corresponding author, Associate Professor, Department of Economics, University of North Carolina at Asheville, One University Heights, CPO 2110, Asheville, NC 28804. (828)251-6551, fax (828)251-6572, lmathews@bulldog.unca.edu. Kask is Associate Professor in the Department of Economics and Business at Warren Wilson College; Stewart is Assistant Professor in the University of Arizona's SAHRA Department of Hydrology and Water Resources.

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Abstract

Scenic beauty contributes to residents' quality of life and also serves to attract visitors to recreational areas. Because of the dynamic relationship between people, land, and rural development, there is an increasing interest in estimating the value of scenic quality using nonmarket valuation techniques. This study estimates the value of scenic quality to Blue Ridge Parkway visitors using choice and contingent valuation models. Results suggest that further research into respondent perceptions of CM and CVM models, and the conditions under which they yield comparable estimates, is warranted.

Introduction

Scenic quality is an important amenity for many rural residents, and also serves to attract recreational visitors. Over the past ten years the southern Appalachian region has experienced significant population and economic growth, due in part to the scenic amenities of the rural areas in the region (McDaniel 2000). This population and economic growth imposes a cost to the region in the form of degraded environmental and natural resource quality (SAMAB 1996); scenic quality has also been impacted. Since many recreational visitors are attracted by scenic beauty, it is important for economic development officials and resource managers to understand how changes in scenic quality are valued by visitors in order to fully understand the dynamic interaction of people, land and rural development.

Visitors to the Blue Ridge Parkway, a national park in rural southwest Virginia and western North Carolina, come primarily to "see the views." This study reports on the values that Parkway visitors have for scenic quality derived from a split sample study which utilized both a contingent valuation and choice model, and discusses their policy relevance. The outline of the paper is as follows. First, contingent valuation and choice modeling for environmental valuation are briefly introduced. This is followed by a discussion of the study area and motivation for research, including study design and implementation. The results of the choice and contingent valuation models are presented next. The final section of the paper provides comparisons of the model estimates and a discussion of the policy implications and directions for future research.

Contingent Valuation and Choice Modeling for Environmental Valuation

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 and choice modeling. Contingent valuation models (CVM) seek to measure the value of a nonmarket good by evaluating a set of responses to hypothetical questions. CVM directly asks respondents about the values they place on a change in an environmental service. 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 travel cost and hedonic models (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 tradition 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 (Kask et al, Mathews et al).

Choice modeling is commonly used to estimate values for recreation services because of its ability to capture site location characteristics (Adamowicz et al 1997, Roe et al 1996). Choice models utilize a random utility framework to explain individuals' preferences for alternative profiles (Roe et al. 1996; Stevens et al. 1997). Choice models (CM) require the individual to choose from a series of possible policies, each having different levels of attributes (the quality of scenic views, 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).

A number of studies have compared the welfare estimates from CVM and CM studies (Mogas et al; Boxall et al; Hanley et al; Adamowicz et al 1998; Christie and Azevedo). It appears as if there is mixed evidence as to whether the CM and CVM methods will yield the same welfare estimates. This paper contributes to this literature by providing another example of the divergence of welfare estimates derived from CM and CVM.

Area Description and Motivation for Study

The Blue Ridge Parkway 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. The park thus contains scenic roadside areas and overlook pull-offs; the roadside views can be enjoyed while driving, while the overlooks are designed primarily for viewing large, sweeping vistas. 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, Mathews et al). In FY 2002, over 21.6 recreation visits were made to the Blue Ridge Parkway, making it one of the most visited national park units.

The Blue Ridge Parkway is long and narrow; on average, the park is only 800 feet wide. This means that most of what Parkway visitors are viewing is outside the park's boundaries and thus outside the park's direct control. The type of scenic views along the Parkway vary depending on the topography and road design along different sections of the Parkway. For example, in the southwest Virginia section of the park there are more farm scenes given that the region is primarily an agricultural plateau. Driving south from Virginia into North Carolina, the Parkway climbs in elevation and there are an increasing number of steep, rocky roadside views and more dramatic, sweeping vistas at the overlooks. Much of the land adjacent to the Parkway in North Carolina is managed by the U.S. Forest Service, leading to a distinction in the amount of public land holdings adjacent to the park in the Virginia and North Carolina sections.

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. Since 1948, 75% of farmlands along the Parkway changed from farms to alternative uses (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. The Blue Ridge Parkway was one of the first national parks to develop and implement a Scenic Quality Assessment, a descriptive ranking system which uses input from local citizen teams to rate the scenic quality of the views according to criteria developed by landscape architects (Johnson et al). Parkway staff have taken these rankings and mapped them onto a Geographic Information System, 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 Parkway 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. Parkway officials thus know what it costs to preserve views; until this study, however, the Parkway did not have any information about the benefits to visitors of scenic quality preservation. Introducing visitor preferences into the decision process provides benefit estimates that are comparable to mitigation costs, thus improving the efficiency of park budgets.

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 Parkway scenic experience, and how will visitation change if view quality changes? This paper reports on one of the results of the first question: *what is the value of scenic quality preservation?* Additional results are available in Kask et al and Mathews et al.

Survey Design and Implementation

A survey was designed to provide managers with information about the values that visitors have for the scenic quality along the Parkway, as well as data about the tradeoffs that visitors are willing to make among park attributes. The survey was implemented in two sections of the park with distinct scenic quality amenities in 2000 and 2002; the 2000 sample yielded 860 responses while the 2002 sample yielded 640. The project utilized a split sample design with a subset of each sample's respondents presented with one of three surveys, version A, B, or C. Version C contained the choice model questions with the CVM question as follow-up, while version A respondents were just asked the contingent valuation questions. Version B respondents were asked a set of contingent visitation behavior questions which are not reported in this paper. All respondents were asked about trip behaviors including expenditures, and demographic information.

Scenic Quality Definition

As described above, the types of views in the Virginia and North Carolina sections of the Parkway are different: the Virginia section tends to have more agricultural and developed views, while North Carolina tends to have more forested, undeveloped views. In addition, the Parkway's own Scenic Quality Assessment describes the *quality* of the views in these two sections as also being different. As a result, we designed unique survey attributes for each section of the park thus the estimates from the two phases of our study (Virginia and North Carolina) are not directly comparable. The remainder of this paper will focus on the results from Phase II of the study implemented in North Carolina in 2002. The visitor experience while on the Blue Ridge Parkway yields different ways and types of consuming scenic quality (while driving, while enjoying a picnic at an overlook area, etc), which was part of the reason why in this study we defined scenic quality as two CM attributes. In addition, Parkway managers themselves have little control over the quality of *overlook* views since they do not own/manage the land directly in most cases, but they do have the ability to directly manage *roadside* scenic quality. Since the CM was developed in part to help Parkway managers learn about the tradeoffs that visitors are willing to make among attributes (see Mathews et al) so that their management process could be informed, it was necessary to have the overlook and roadside scenic quality as separate attributes in the CM. From an internal management perspective, this information is helpful since it allows park managers to improve the efficiency of their limited budget.

CM and CVM Model Design

Approximately a third of all respondents received the choice survey, version C, where they evaluated a series of nine choice sets with randomly assigned attribute combinations. Attribute values appear in Figure 1; a sample choice set is provided in Figure 2. A status quo option was available in each of the choice sets. The choice survey elicited information about whether visitors prefer more hiking trails, overlook areas, scenic quality of overlooks, roadside landscape management, activity areas, or some combination of these services. Using a monetary attribute in the survey, we estimated the benefit for each attribute and the tradeoffs that visitors are willing to make among attributes. The Parkway's Scenic Quality Assessment was used to define the attribute values for the two scenic quality attributes (roadside and overlook scenic quality), and Parkway staff helped to define the range of the scenic quality attributes. For example, the definition of High overlook view quality was based on information from resource managers who could judge how much scenic quality could be improved from existing conditions. Further discussion of scenic quality attribute definition is available in Mathews et al.

We also employed a dichotomous choice contingent valuation model to estimate respondents' willingness to pay for scenic quality preservation. 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. Specific CVM question wording appears in Figure 3.

Results

Overall study results show that generally speaking, visitors are satisfied with their current experiences on the Parkway and in particular were quite satisfied with the scenic quality of both roadside and overlook areas. A complete discussion of the results can be found in Kask et al and Mathews et al. The remainder of this section will focus on the CM and CVM results. A summary of trip and demographic characteristics appears in Table 2.

Choice Model Results

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 3.

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 estimated the following specification:

$$Choice \ ? \ ASC1 \ ? \ ASC2 \ ? \ ? \ Cost \ ? \ ?_1 OLOOK \ ? \ ?_2 LOOKHIGH \ ? \ ?_3 LOOKLOW$$
$$? \ ?_4 ROADHIGH \ ? \ ?_5 ROADLOW \ ? \ ?_6 TRAILS \ ? \ ?_7 ACTINC \ ? \ ?_8 ACTDEC \ ? \ ?$$

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 4 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, and a small percentage (14%) of respondents indicated the number of overlooks were the most important attribute to them (Mathews et al).

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.[1] 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 (Mathews et al).

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:

$$CV = -\frac{1}{\beta_{\$}}\left(\textit{status quo utility} - \textit{utility of new policy}\right)$$

[1] 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.

where ß$ 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 5 reports welfare calculations for a one unit increase and decrease for each of the choice set attributes.

CVM Model Results

Descriptive statistics for the CVM model are reported in Table 6. 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 if 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. 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:

$$Choice\ ?\ ?\ ?\ ?_1 DCBID\ ?\ ?_2 Demographics\ ?\ ?$$

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 7. 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.

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^o is given by :

$$v^1(p^1, q^1, m ? CV, z) ? ?^1 ? v^0(p^0, q^0, m, z) ? ?^0$$

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:

$$CV ? \frac{1}{?_{BID}} ?status\ quo\ utility ? utility\ of\ new\ policy ?$$

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 8. 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.

Estimating Scenic Quality with CM and CVM: Discussion

Because of the discrete nature of the scenic quality changes that were posited in this study for purposes of choice model attribute definition, the CM welfare estimates are 'lumpy'. This means that respondent WTP for improvements (WTA for losses) are likely to be less useful for some purposes than the attributes whose values take on continuous values (such as hiking trails). However, given that policy makers are frequently forced to examine the extreme boundary conditions of their resources—i.e., *what will happen to visitation if all of this land is converted to residential housing*?--having an estimate of the WTP for improvements and WTA losses is policy relevant.

Since the CVM question we asked respondents dealt with their willingness to pay to preserve scenic quality (not specific to overlook or roadside areas), we are not able to directly compare welfare estimates in this case. However, the CM estimates of respondent WTA scenic quality losses ($467.82 for overlook quality, $519.17 for roadside quality) is significantly greater than the CVM estimates of WTP for scenic quality preservation ($151.14 in the joint model). This divergence appears to corroborate previous research (Mogas et al) and appears to indicate the need for further research to investigate potential embedding and other issues.

In particular, recall that we had two CVM treatments: one sub-sample received just the CVM question (version A) while the other received the CM questions followed by the CVM question (version C). We ran the CVM model with data from both treatments (versions A and C), then separately for version A. Our results indicate that the WTP estimate from version A respondents—who did not first respond to the series of

CM questions—have a lower estimated mean WTP for scenic quality preservation ($98.47) than version C respondents who engaged in both exercises ($220.43). When the version A respondents were run separately, a mean WTP of $92.13 was estimated. These results seem to suggest that the choice sets may have conditioned respondents in a manner distinct from those that did not receive the choice sets.

Conclusion

This study used a split sample design to query visitors to the Blue Ridge Parkway about their preferences for scenic quality. A choice model with scenic quality attributes and a contingent valuation model were estimated, which yielded divergent welfare estimates. Addressing the concern for the decline in scenic quality requires the allocation of scarce resources for view preservation, such as increased vegetation management, or purchasing conservation easements, leases, or land. Nonmarket valuation estimates can provide critical information to managers since benefit estimates can be used to gauge the efficiency of various management options. However, if benefit estimates derived from different nonmarket valuation models yield significantly different estimates then the decision process may not always be enhanced. It appears as if further research into respondent perceptions of CM and CVM models, and the conditions under which they yield comparable estimates, is warranted.

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Table 1: Choice Model Attribute Values

	High	**Current**	**Low**
Number of Overlooks	90	88	84
Overlook view quality High quality (%) Medium quality (%) Low quality (%)	90 10 0	80 15 5	55 30 15
Roadside view quality High quality (%) Medium quality (%) Low quality (%)	45 35 20	38 36 26	30 15 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

Figure 1: Sample Choice Set

CHOICE SET # 1 Please select the option that best represents your preferences regarding the characteristics of the southwest Virginia portion of the Blue Ridge Parkway.

I select Option A Option B Option C

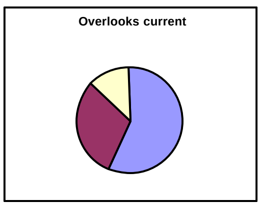
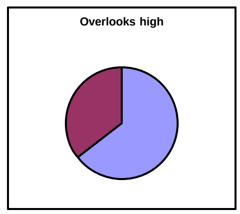
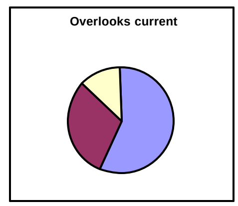
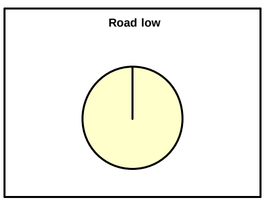
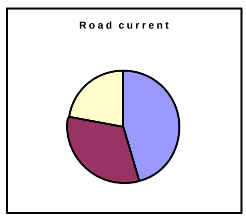
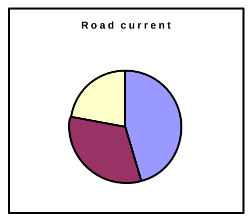
Parkway Characteristic			**Current state**
Annual Supplemental Payment from Preferred Funding Source	**$125**	**$80**	**$0**
Number of Overlooks in 100 miles	**28 overlooks** **Average distance between overlooks is** **2 miles**	**23 overlooks** **Average distance between overlooks is** **4 miles**	**23 overlooks** **Average distance between overlooks is** **4 miles**
Overlook Scenic Quality Percent of High Quality Views Medium Quality Low Quality			
Roadside Scenic Quality Percent of High Quality Views Medium Quality Low Quality			
Number of Quality Trails Miles of trails cleared, signed, rated, and maintained. Includes, backcountry, stretcher, and interpretive trails.	**0**	**35**	**13.2**
Number and Condition of Activity Areas Areas where visitor services are provided, such as visitor centers and picnic areas. At a minimum, restrooms are provided.	**4 Activity Areas** **All in Poor Condition**	**9 Activity Areas** **All in Good Condition**	**6 Activity Areas** **1 in Poor Condition** **4 in Fair Condition** **1 in Good Condition**

Figure 2: Contingent Valuation Question

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.)

Table 2: Trip and Demographic Characteristics

Characteristic (sample size)	Sample Average
Median Age (n=633)	49.9
Percent Female (n=636)	42%
Percent with Bachelors Degree or Higher (n=639)	71%
Average Household Income (n=640)	$65,242
Average Number of Days in Trip (n=638)	3.5
Average Number of People in Party (n=639)	3
Average Total Trip Expenditures (n=634)	$603.41
Average Expenditure/Day	$172
Most Common Reason For Trip (n=564)	Enjoying the scenic views along the Parkway (48.8% of sample)
Average Number of Years Visiting the Parkway (n=639)	19.5
Most Common Activity (n=637)	Visiting a Scenic Area (30% of sample)

Table 3: 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

Table 4: 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			

Table 5: Choice Model Welfare Results

	Welfare Change	
Attribute	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*

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

Table 6: 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

Table 7: CVM Regression Results: Joint VA/VC model

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
Chi^2 = 72.166

Table 8: CVM Regression Results: Version A Only

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