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THE ECONOMIC VALUES OF TOURISM'S SOCIAL IMPACTS

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Abstract: The identification and management of tourism's actual and perceived social impacts in destination communities has recently received significant attention. Research has enhanced the understanding of these impacts and their incorporation into tourism policy. The contingent valuation (CV) method is presented as a technique for furthering this understanding and incorporation. By measuring selected social impacts in an economic metric, CV facilitates benefit-cost analysis of mitigation projects and contributes to integrated analysis of tourism's diverse impacts. Results from a CV application in Oregon (USA) communities indicate a mean annual household willingness-to-pay of \$110 (policy model) to \$186 (commodity model) to reduce tourism-related traffic congestion. Results for mitigation of noise and provision of low-income housing are also presented. **Keywords:** social impacts, contingent valuation, benefit-cost analysis. Copyright © 1996 Elsevier Science Ltd

Résumé: Les valeurs économiques des impacts sociaux du tourisme. Les impacts sociaux réels et perçus du tourisme ont reçu récemment une attention considérable. On présente la méthode de l'évaluation contingent (EC) pour rehausser la compréhension des impacts du tourisme et améliorer la politique touristique. En mesurant certains impacts sociaux en termes économiques, la méthode EC facilite l'analyse des coûts et bénéfices des projets de mitigation et contribue à une analyse intégrée des impacts du tourisme. Une application EC dans des communautés américaines indique la bonne volonté des gens de payer de \$110 (modèle politique) à \$186 (modèle de marchandises) par ménage pour réduire les embouteillages causés par le tourisme. On présente aussi des résultats pour la réduction du bruit et pour le logement à loyer modéré. **Mots-clés:** impacts sociaux, évaluation contingent, analyse coûts-bénéfices. Copyright © 1996 Elsevier Science Ltd

INTRODUCTION

Significant contributions have been made recently to the understanding of tourism's actual and perceived social impacts in destination communities and the factors that affect resident attitudes toward tourism. The improved understanding of these impacts facilitates their incorporation into the policymaking process. Nonetheless, the methodologies used in this research do not measure social impacts in a metric consistent with those used to measure economic impacts (e.g., a metric of number of jobs or economic value). As a result,

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economic benefits and costs tend to dominate decisions concerning tourism planning and development (Choy 1991:326).

Tourism's impacts typically are grouped into three categories: economic, sociocultural, and environmental/ecological (Bull 1991; Pearce 1989; Ryan 1991). Tourism's non-economic (i.e., social and environmental) impacts can be either positive or negative (Bull 1991:163). However, because tourism often disrupts social and environmental systems at destinations, non-economic impacts tend to be negative on the whole (Liu, Sheldon and Var 1987:18). Therefore, their exclusion leads to overestimation of the net social benefits of tourism development. Because different tourism development paths generate different impacts, exclusion may also lead to selection of a path that is less socially desirable than alternative paths. Assuming that increasing social welfare is the goal of economic development programs, non-economic impacts should be valued and incorporated into the policymaking process.

This article introduces the contingent valuation method as a technique for measuring the economic value of selected actual social impacts associated with tourism. The focus is on deriving two sets of economic value estimates. The first set comprises value estimates for the benefits of mitigation programs. These benefits can then be compared to program costs, thereby enabling policymakers to determine the absolute and relative desirability of these programs. The second set comprises value estimates for the impacts themselves, independent of mitigation programs. Policymakers can incorporate these values into analyses of tourism's overall desirability (Dwyer and Forsyth 1993).

Traditional Evaluation of Social Impacts

During the past three decades, analysts have identified many impacts associated with tourism development, with economic impacts being perceived generally as positive and with social and environmental impacts being perceived generally as negative (Liu, Sheldon and Var 1987:18). Significant research (Ap 1992; Belisle and Hoy 1980; Bystrzanowski 1989; Getz 1994; Lankford and Howard 1994; Liu and Var 1986; Liu, Sheldon, and Var 1987; Madrigal 1993; Milman and Pizam 1988; Pearce, Moscardo and Ross 1991; Perdue, Long and Allen 1990; Pizam 1978) has been undertaken to evaluate social impacts, which are defined broadly for purposes of this article to include sociocultural and sociophysical impacts. These studies generally focus on one or more of the relationships shown in Figure 1. For example, Crotts and Holland (1993) evaluated the association between level of tourism activity and a set of "quality of life" variables, including income and crime rates (relationship between steps 1 and 2).

Most research in this field has focused on how tourism development generates perceived impacts (relationship between steps 1 and 3T), including: changes in perceived availability of recreational and entertainment opportunities; quality of police and fire protection; rate of

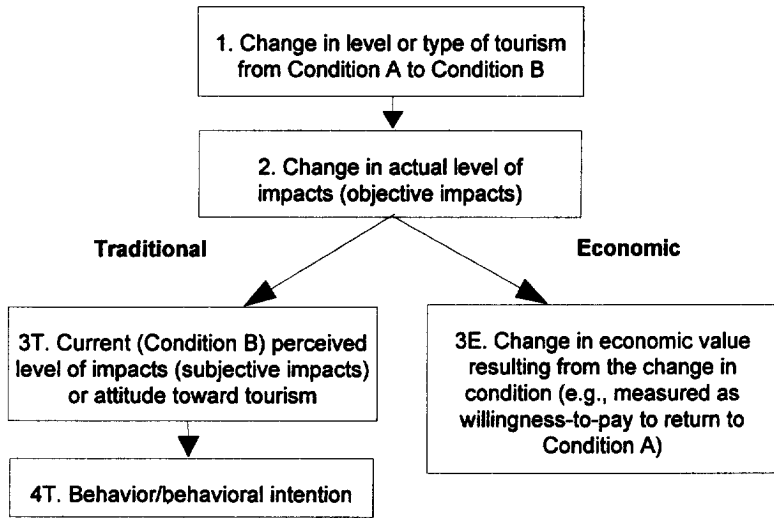


Figure 1. Traditional and Economic Evaluation of Tourism's Social Impacts

crime; level of congestion (e.g., on roads and in downtown areas); and preservation of, and pride in, local culture. Several factors have been postulated, and/or empirically shown, to affect the relationship between steps 1 and 3T (for recent reviews see Getz 1994; King, Pizam and Milman 1993; Lankford and Howard 1994; Pearce 1989). These factors include: degree of benefit from, and control of, tourism development; rate, level, and type of tourism development (which affects level and nature of contact between tourists and residents); differences (e.g., economic, linguistic, and cultural) between tourists and residents; social and economic structure of resident community; and resident demographic characteristics, including length of residence.

Of particular relevance for this article is the development of attitude scores derived from factor analysis of scale responses (e.g., Lankford and Howard 1994). Attitude score may become the metric of choice for measurement of attitudes. However, despite significant advances in theory and methods, measurement of tourism's social impacts utilizing traditional evaluation remains constrained by the lack of a metric that is, as yet, broadly accepted or common to other impacts. A promising complement to traditional evaluation is the measurement of impacts using the metric of economic value.

Economic Evaluation Using Contingent Valuation

As illustrated in Figure 1, the focus of economic evaluation is the change in economic value resulting from the change in condition. If the move from Condition A to Condition B involves an increase in the number of tourists, the resulting increase in actual social impacts will, overall, likely affect resident social welfare negatively. Therefore, there likely will be a decrease in economic value resulting from social

impacts associated with this change in condition (conversely, there likely will be an increase in economic value resulting from economic impacts associated with the change). One measure of this decrease in value is willingness-to-pay (WTP) to return to Condition A. Because the attitude toward, or perceived impact of, tourism is not of interest *per se*, the economic metric and methods are fundamentally different from those used in traditional evaluation. The benefit of using the economic value metric is that, given the assumptions and limitations inherent in economic methodology, this metric is broadly accepted and can be used to integrate economic, social, and environmental impacts.

Most goods and services are traded in relatively well developed markets. The behavior of consumers in these markets (the amount of each good they consume at different prices) provides the information needed by economists to determine the willingness of consumers to pay for each good. This WTP is a measure of the economic value of the good (Peterson, Driver and Brown 1990). However, many goods and services are not traded in markets; they are "non-market" goods. For example, many campsites on public land are free. Although consumers' WTP for these goods is generally positive, it cannot be determined by behavioral reactions to changes in the price of the good since the price is set to zero.

Economists have developed techniques for measuring WTP for non-market goods. One of these techniques is the contingent valuation (CV) method, which presents a hypothetical market to consumers. The behavioral intention reported in response to the hypothetical market is used in lieu of actual behavior as a basis for estimating WTP (CV can also be used to estimate willingness-to-accept). Some economists and psychologists question whether CV generates valid WTP estimates (Harris, Driver and McLaughlin 1989; Hausman 1993). Nonetheless, CV has gained wide acceptance as at least a "starting point" method for estimating WTP for non-market goods, provided rigorous survey research methods are followed and certain CV-specific methodological standards are met (Arrow, Solow, Portney, Leamer, Radner and Schuman 1993; Mitchell and Carson 1989). Moreover, many of the criticisms focus on respondent difficulty in valuing abstract and unfamiliar goods such as preservation of biodiversity. The analysis presented here includes valuation of programs that historically have been provided by government agencies: reduction in traffic congestion through road construction; reduction in noise and crime through increased police patrol; and provision of low-income housing through development incentives. These programs are relatively concrete and familiar, and thus easier to value using CV. In addition, these types of programs previously have been "purchased" by Oregon residents through the ballot measure process (Martinis 1994).

CV has been utilized primarily to value recreation amenities, scenic quality, species and ecosystem preservation, and reductions in health risk (Freeman 1993). In the tourism field, Bull (1991:153) describes CV (direct questioning) as a method for estimating visitor WTP for attractions, and Bostedt and Mattsson (1995) describe an application

to visitor WTP for forest characteristics in Sweden. This technique also has been applied to provision of goods and services at the community level, including reliable water supply (Howe and Smith 1994). However, a review of an exhaustive CV bibliography with 1,670 entries (Carson, Wright, Alberini, Carson and Flores 1994) produced very few studies, most unpublished, of CV valuation of traffic congestion, noise and crime, or low-income housing (Ahearn 1984; Research Chile 1991; Weinberger, Thomassen and Willecke 1991). More common are analyses of resident preferences for public funding of such programs (Ferris 1985; Schokkaert 1987). Navarro and Carson (1991) stress the need for valuing local amenities and public goods, like reduced crime, and propose the use of CV as an analytical technique. Indeed, the technique is very flexible and applicable to any good for which a suitable hypothetical market can be developed.

Tourism on the Oregon Coast

The economies of Oregon coast communities historically have depended on natural resource industries like wood products, fishing, and agriculture. Although these industries remain important, the wood products and fishing sectors in particular have undergone recent declines due to harvest restrictions. Conversely, tourism and retiree in-migration have played increasingly important roles in local economies. "Transfer payments" and "dividends, interest, and rent" are easily the largest contributors to personal income on the Oregon coast, representing 24 and 21%, respectively, of personal income (Davis and Radtke 1994). Their importance, which is greater for the coast than for the state or nation, reflects the large number of retirees living in the region.

The wood products industry (including paper) contributes 16% of coastal personal income, while tourism contributes 8%, fishing 5%, and agriculture 4% (Davis and Radtke 1994). Responses to surveys of residents in eight coast communities illustrate the variability of tourism's importance at the local level; of all employed respondents, the percent working in the tourism industry ranged from 4% in Coos Bay to 60% in Lincoln Beach. Residents were asked in an open-ended format to list the most important perceived benefits and problems associated with tourism. Not surprisingly, the most important benefits are economic in nature, including the generation of jobs and local business opportunities. Some residents also noted that tourism development increases the number and types of facilities available to residents and that tourists bring new ideas into the community.

The problems are similar to those found in many tourism-dependent communities, yet are also partly due to the nature of local geography and type of tourism development. Highway traffic is by far the most commonly perceived problem, noted by 47% of the respondents. Most of the coast region is a relatively narrow strip of land between the Pacific Ocean to the west and the Coast Range mountains to the east. US Highway 101 is the only main road that runs north-south, the primary route followed by tourists. In most areas Highway

Table 1. Desires for Future Changes in Types of Tourism

Type of Tourism	Desired Change in Next 5 Years ^a			
	Decrease	Stay about the Same	Increase	Don't Care
Hotels/Motels	3	55	38	5
Long-term Vacation Rentals	7	45	39	9
Short-term Vacation Rentals	17	43	33	7
Destination Resorts	6	36	41	17
Day Visitors	15	42	38	6

^aPercentage of respondents desiring each change.

101 comprises only one lane in either direction, and traffic is significantly slowed during tourism seasons by the high volume and presence of slow-moving recreational vehicles (RVs). This traffic can significantly increase travel time for residents. On the other hand, crime, reported as a problem by 14% of respondents, consists primarily of minor violations such as disorderly conduct by visitors. These minor violations are particularly disruptive to residents because they often occur at rented "vacation" homes located in residential areas. Additional reported problems include crowding in stores, bayfronts, and other areas, as well as competition for parking spaces. As with traffic, the linear nature of most coast communities exacerbates the problems of crowding and lack of parking; there simply is no place to put all the people and cars.

Despite the tourism-related problems, the majority of residents believe that tourism has been positive for them individually and for their community. When asked their level of agreement with the statement "Overall, for me personally, the benefits of tourism outweigh the costs of tourism", 22% strongly agreed, 29% somewhat agreed, 23% were neutral, 11% disagreed, and 11% strongly disagreed. Agreement was greater in response to a similar statement focused on community, rather than personal, benefits. These beliefs contribute to desires for future increases in tourism development (Table 1). Increases are favored over decreases for all types of tourism, though short-term vacation rentals (less than 1 week) and day visitors are desired less than other types. Responses to other survey items suggest that this ranking is a result of the relatively low level of economic benefits and relatively high level of disruption associated with these two types of tourism.

ECONOMIC VALUES OF SOCIAL IMPACTS

Study Methods

The contingent valuation questions comprised one component of a larger survey of Oregon coast resident attitudes toward tourism and economic development generally. The study population comprised residents of eight geographically and economically diverse coastal

communities. The surveys were administered to 945 residents of these communities during November and early December 1993. In each community, a random sample of households was contacted by telephone using the random digit dialing technique (approximately 93% of the households in these communities had a telephone as of the 1990 US census). One member from each household was chosen at random, based on date of birth, to complete the telephone survey, which lasted an average of 15 minutes. All of the residents who completed the telephone survey were then asked to complete a mail survey. Half of those accepting the mail survey were sent a version focused on tourism while the other half were sent a version focused on more general issues. The principles of Dillman's (1978) "total design method" were followed in survey preparation, pretest, and administration.

A large number (873) of contacted households refused to participate in the telephone survey before hearing any details concerning the survey. High refusal rates are common in telephone surveys, due in part to the proliferation of telephone solicitation by businesses. Additional factors contributed to the high refusal rate for this survey. For example, the refusals included persons who were contacted in residential properties in the study communities but whose primary residence was outside the communities (many residential telephones on the coast are located in second homes and vacation rentals). Because these persons were not community residents, they were not in the study population. Therefore, the number of refusals overstates non-response within the population. Unfortunately, the proportion of total refusals that falls in this category is unknown. High response rates were achieved once residents were engaged in the survey. Only 17 (1.8% of the 945 completes) terminated the telephone survey midway. Of those completing the telephone survey, 793 (84%) accepted the follow-up mail survey. Of these, 571 (72%) completed and returned the mail survey. Most of the question items used in the present analysis were contained in the mail survey. The CV scenarios and some of the other question items were contained in the telephone survey.

The potential for unit and item non-response bias recently has received significant attention in the CV literature (Dalecki, Whitehead and Blomquist 1993; Mattsson and Li 1994; Mitchell and Carson 1989; Whitehead 1994). Non-response in CV surveys often is due to lack of interest in the subject matter. The responses to other survey questions and the low rate of midway terminations during the telephone survey, in which the CV scenarios were presented, suggest that this type of non-response bias was unlikely in this survey. Respondents were told that Oregon State University sponsored the survey, so sponsoring agency bias also was unlikely. Nonetheless, the large number of telephone refusals and the modest number of refusals to accept or return the mail survey may lead to sample non-response or sample selection bias insofar as these refusals are associated with demographic or attitudinal variables that affect WTP, such as household income or attitude toward civic involvement. As described in the *Study Results* section, WTP estimates were adjusted for differences between

sample and population demographic characteristics. Although it was not possible to identify and adjust for differences in attitudinal characteristics, the fact that most non-response occurred before respondents knew the survey topic suggests that there is no bias resulting from differences in attitudes toward the specific goods being valued.

Based on responses to the survey pretest, as well as discussion with community leaders, contingent valuation scenarios were created for programs that would: reduce traffic congestion on Highway 101 by 25 or 50% during busy periods (each respondent was presented either the 25 or 50% reduction scenario); reduce noise and minor crime by 30% during summer and holiday periods; and provide low-income housing for all qualifying families in the community. These programs were designed to address and value problems that are associated with tourism to varying degrees. The causal relationships between tourism development and actual impacts, such as a change in crime rates, remain subject to debate (Bystrzanowski 1989; Crofts and Holland 1993; Kelly 1993; Milman and Pizam 1988; Pearce 1989; Perdue, Long and Allen 1987; Sheldon and Var 1984). Quantification of these relationships is necessary to convert WTP for the programs presented in the CV scenarios, which reflect changes in actual levels of impacts, into WTP estimates for tourism development (i.e., to identify the relationship between steps 1 and 3E in Figure 1). Such quantification is not within the scope of the present article, which focuses on WTP for the scenario programs.

Nonetheless, an indication of these relationships is presented here. Figure 2 illustrates the correlation between tourism and traffic/noise/crime. Based on the 24 monthly data points from 1991 to 1992, the Pearson product-moment correlation coefficient between room tax and traffic is $r = 0.976$; between room tax and noise/crime it is $r = 0.373$. The measures used are imperfect; however, the relationships shown in Figure 2, combined with corroborative evidence, indicate that tourism significantly contributes to traffic congestion and

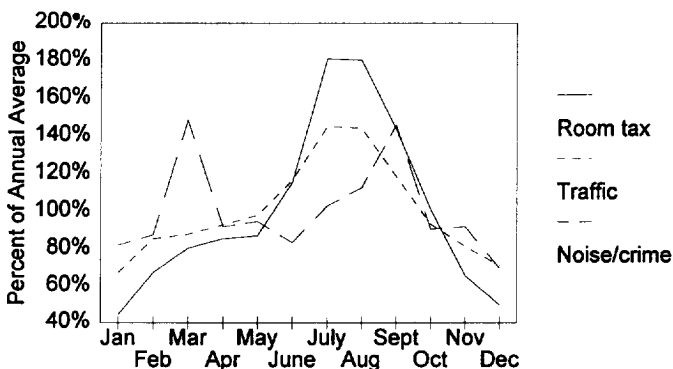


Figure 2. Link between Tourism, Traffic, and Noise/Crime (1991-92 two-year average, Newport). Source: Room tax from city of Newport (receipts); traffic from Oregon Department of Transportation (recorder north of Newport); minor crime from Oregon Criminal Justice Services Division (Newport vandalism, disorderly conduct, burglary, and liquor violations)

noise and minor crime in Newport. The relationships vary across communities, but generally show similar patterns. Tourism, though not the sole cause of the lack of low-income housing, appears to contribute to it by increasing housing costs and by attracting migrant workers who remain un- or underemployed and who often eventually are added to the list of those in need of low-income housing. Murphy (1985:99) describes a similar situation during the development of Disney World in Florida.

Preliminary analysis suggests that the actual increase in traffic caused by tourism is approximately 100%. On average across study communities, vehicle counts on Highway 101 during the peak tourism months of July and August are approximately twice that of January. It is likely that some of this may be due to increased residential or commercial traffic during peak months and that there is some tourism-related traffic in January. Assuming that these considerations are roughly off-setting, then approximately 50% of the traffic during peak months is attributable to tourism. It is more difficult to estimate the actual increase in noise/crime and demand for low-income housing attributable to tourism.

The following is a sample of the introduction to the CV section and the scenario used for congestion (wording for the other scenarios is available from the authors):

In this next section, I would like to ask you about programs that would deal with issues that are problems in some coastal communities. These programs cost money. One way of paying for them is for your community to set up an independent fund paid for by all local households. Fund revenues would be used only for the program described—they will not go to the government. These programs are hypothetical. However, your responses may be used to guide future policies, so please answer the questions as carefully as possible.

The Oregon Department of Transportation (ODOT) is currently developing options for reducing traffic congestion along Highway 101 by, for example, adding turning or passing lanes. Some of the cost of these options may have to be paid by local communities. We estimate that one option would reduce traffic congestion on Highway 101 by 25% during busy periods. This would mean there would be as little traffic congestion on 101 during August as there currently is during May.

If you had a chance to vote on a ballot measure that would reduce congestion on Highway 101 by this amount, but would require your household to pay \$[X] each year, would you vote for or against it? As with all ballot measures, at least half of the voters would have to support the measure for it to pass.

☐ For the measure ☐ Against the measure ☐ Don't know

The reference months (August and May) were adjusted for each community to reflect differences in traffic patterns. The amount [X], which is known as the bid, was randomly varied across respondents to obtain reactions to a range of program prices (based on pretest responses, a range of \$5–1,000 per year was used for this survey). An annual payment obligation of unspecified duration was used because

the programs would involve a permanent increase in annual expenses (such as salaries for additional police officers in the noise/crime scenario) or a one-time infrastructure investment (e.g., road construction for the congestion scenario) that would be financed by a bond requiring long-term (e.g. 15 to 20 year) annual payments.

The quality of results from CV surveys naturally depends on the quality of the survey itself. Certain principles should guide construction of CV surveys (Arrow et al 1993; Mitchell and Carson 1989).

The Scenario Should be Understandable, Plausible, and Meaningful. The presentation of questions in a form that is readily understandable to respondents is important for all types of survey research. However, respondents in CV surveys are faced with a task that is more difficult than in most questionnaires; they must not only identify their attitude toward an object, but must also make a decision concerning their preferences between the object and the stated amount of money. Moreover, the respondent is asked to make this decision with little previous experience because CV surveys are administered to value goods that generally are not bought and sold. To help insure valid responses, researchers must present a "market" that is as familiar and plausible as possible. Familiarity reduces the cognitive burden while plausibility increases respondent motivation to undertake the task of evaluating preferences to arrive at a valid response. In this case, highway improvements were presented as a method for reducing congestion. The Oregon Department of Transportation was, in fact, developing options during the period of the survey administration. Because this process involved community meetings and received coverage in the local press, the CV scenario based on this process likely was understandable and plausible. In addition, a reminder that responses could affect policy was included to increase motivation.

The Good being Valued Should be Well-Defined. The respondent must know exactly what he/she is being asked to "purchase" for the given price. Thus, it is important to specify as precisely as possible what the respondent will receive in exchange for the payment. In this case, the respondent will receive a 25% reduction in traffic congestion during busy periods. Reference months are provided to help the respondent identify the benefit provided by the program.

An Appropriate Elicitation Method Should be Used. There are various methods for eliciting the respondent's willingness to pay for the good. The congestion scenario presented above uses the dichotomous choice (DC) method, which asks respondents simply to determine whether their WTP for the good is greater or less than a specific amount (the bid). This amount is varied across respondents and the resulting votes are regressed on the bid and other variables to estimate maximum WTP (discussed later). Other methods are also available, including

the open-ended method in which respondents are asked to directly state their maximum WTP for the good.

The DC method generally is preferred for several reasons (Arrow et al 1993). First, it is familiar insofar as it mirrors the manner in which consumers typically purchase goods. Second, it reduces the cognitive burden of respondents. They do not need to precisely identify their maximum WTP, but simply whether it is greater than the bid. For example, a consumer in a store must simply decide whether his/her WTP is greater than the price of the good; the same is true for the CV scenario. Third, the DC method reduces opportunities for strategic responses. That is, the respondent can not state WTP of very small or large numbers, as is possible with the open-ended method, in an effort to affect the provision of the good being valued. Despite these strengths, the DC method suffers from some weaknesses. First, it is susceptible to "yea-saying", a form of social desirability bias that may lead some respondents to vote for programs even when their WTP is less than the bid (Berrens 1993; Kanninen 1995). Second, it is statistically less efficient than the open-ended method because less information concerning maximum WTP is provided. Therefore, more observations are needed to achieve a given level of efficiency. Researchers can increase efficiency by carefully selecting the distribution of bids (the bid structure) (Cooper and Loomis 1992; Kanninen 1995).

Rigorous Survey Research Methods Should be Used. The quality of results from CV surveys depends on the quality of not only the CV scenarios but also the overall survey process. For this reason, rigorous survey design, sampling, and survey administration methods should be followed. In order to provide conservative WTP estimates, Arrow et al (1993) recommend choosing conservative alternatives during survey design. In addition, efforts should be made to reduce non-response and, during analysis, to adjust for any bias.

Two transformations of vote responses were made before estimating WTP models. First, "yes" votes were constrained on the basis of income. The bids presented to respondents are random and reflect a wide range. As a result, some low-income households are presented with large bids. In a small number of such cases, respondents vote "yes" even though they may not be able to pay such prices. Previous researchers have arbitrarily converted such votes to "no" votes or to missing values (Duffield and Neher 1991; Mitchell and Carson 1989:268). This process increases the proportion of "no" votes, thereby generating a conservative estimate of WTP. For this analysis, positive votes were constrained by converting all such responses to "no" when the bid was greater than approximately 1% of reported annual household income (the precise percentage varies slightly because income categories were used in the survey). For example, any "yes" votes on

bids of \$100 or more by members of households with an income of less than \$10,000 per year would be converted to "no" votes.

Of the 1,160 total "yes" votes on bids for the three different programs, 46 (4%) were converted. Analysis of unconstrained WTP models indicates that the income constraint reduced estimated mean WTP by approximately 20%. The small percentage of votes converted had a relatively large impact on mean WTP because these votes were in response to large bids. Further analysis reported elsewhere (Lindberg, Johnson and Berrens 1995) indicates that the use of this income constraint is warranted; 32% of respondents whose congestion scenario bid was greater than 1% of income changed their votes from positive to negative when provided the opportunity to do so in the follow-up mail survey (vote changes were much less frequent among the vast majority of respondents, those for whom the bid was less than 1% of income). All vote conversions in this category are consistent with the recommendation of Arrow et al (1993) to be conservative in CV design and analysis.

Second, "no" votes were evaluated and excluded where appropriate. The goal of CV research generally has been to value a good, such as preservation of biodiversity, independent of the manner in which it is provided and paid for (the payment vehicle). Therefore, CV researchers typically follow up a negative vote with questions designed to ascertain the reason for that vote. If the vote reflects that the good is not worth the bid amount to the respondent, the vote is treated as a valid "no" and retained in the sample. If the vote reflects a protest against the payment vehicle or other scenario component, the vote is treated as a protest and excluded from the sample. Positive votes can be treated in a similar manner. However, scenario components tend to generate negative, rather than positive, externalities, so researchers primarily focus on "no" votes.

The objective of the present research is twofold: to evaluate the desirability of specific mitigation programs, and to estimate the economic values of reductions in actual social impacts associated with tourism development. Thus, two models are developed for each scenario. The first is the "policy" model, which reflects valuation of the mitigation program (i.e., the reduction in congestion *and* the method for achieving the reduction). Because each program necessarily includes provisions for payment and implementation, the valuation of each program should include valuation of these components. Therefore, the policy model retains all "no" votes, including those reflecting protest against the payment vehicle or other scenario component. Because respondents are valuing the scenario components, these components should be as specific and realistic as possible. However, some level of generality is necessary because actual mitigation programs will vary across communities. For example, the scenario presented a generic payment vehicle, payment by each household into an independent fund. Because the actual payment vehicle utilized for the

program likely will negatively affect WTP, the gain in generality from using a generic payment vehicle is achieved at the possible expense of upward bias in value estimates.

The second model is for the "commodity", which reflects the value of the reduction in congestion independent of the method for achieving it. This model utilizes the traditional method of excluding protest "no" votes, which leads to higher estimated WTP than for policy models. However, the follow-up system used in this survey is more thorough than is typically the case. For example, an initial response that the negative vote was due to opposition to taxes was followed by a question probing whether the opposition was due to an inability to pay more taxes, opposition in principle, attitudes toward government waste, or other reason. Responses to such additional questions were used to determine whether "no" votes should be excluded, retained, or, in a small number of cases, converted to positive. [Lindberg, Johnson and Berrens (1995) provide additional information regarding this system and other methodological issues relevant to this study.] All follow-up questions were open-ended. Despite this thoroughness, the evaluation of "no" votes remains imperfect. Some respondents vote negative for a combination of reasons. In some cases, these multiple reasons were identified during the survey and "no" votes were allocated in a conservative manner (i.e., a manner favoring allocation as valid negative votes). However, it simply is not possible to fully explore the reasons for such votes in the course of a telephone survey. Therefore, some imprecision remains in estimates of economic value for the commodity models.

Study Results

For DC CV models, discrete choice analytical methods such as logit and probit are used to estimate the probability of a "yes" vote as a function of the bid and independent variables, like income, that are expected to influence WTP. Initial logit and probit models were estimated for this analysis. The logit model generated a better fit for the data so it was used for the remaining analysis. The form of the logit model is

$$\ln[P/(1-P)] = Z = \text{const} + \alpha \text{bid} + X\beta + \epsilon,$$

where \ln is the natural logarithm, P is the probability of a "yes" vote, Z is an index, const is a constant, α is the coefficient on the bid, X is a matrix of observations on a vector of independent variables, β is a vector of coefficients on these independent variables, and ϵ is the error term. The logit model assumes that the logistic curve is the cumulative probability function for Z ; the probit model assumes the normal curve. The equation for predicted WTP can then be derived as follows:

$$\text{WTP} = (\text{const} + X\beta)/(-\alpha).$$

For models using the natural log of the bid, the WTP equation is

modified to:

$$\ln(\text{WTP}) = (\text{const} + X\beta)/(-\alpha).$$

The linear model is used in this analysis because it generated a better fit than the log model. A derivation of the equation for WTP and the associated confidence intervals is presented in Cameron (1988, 1991). A more heuristic derivation is provided in Whitehead (1990).

An initial model for each scenario commodity and policy was estimated. Certain categorical variables, like education, can be incorporated either as interval variables or as sets of dummy variables. Both options, including log and exponential transformations of the interval variables, were tested and the option generating the higher adjusted pseudo R^2 was used for further model refinement. Variables that were not significant at the $P = 0.10$ level or better were dropped. The sets of dummy variables were retained only when they passed likelihood ratio tests at the $P = 0.05$ level or better. Individual dummy variables within a set were retained even if they were not significant. Additional analysis showed that dropping insignificant individual dummy variables did not noticeably affect WTP estimates.

Results for the final logit models are shown in Table 2. Variables that were insignificant in, and thus omitted from, all models include employment status (whether employed and whether in tourism/retail sector) and gender. Table 3 describes each of the included variables. The pseudo R^2 measures for logit analyses are different, and usually lower, than the R^2 measure used in ordinary least squares (OLS) (Hensher and Johnson 1981). Thus, despite pseudo R^2 values that are lower than typical OLS R^2 values, goodness-of-fit measures for these models are in fact above average for CV analysis. Likelihood ratio tests indicate that each model is significant at better than the 0.01 level.

The logit model is converted to a WTP equation, here using the model for the noise commodity as an example:

$$\begin{aligned} \text{WTP}(\$) = & -302.88 + 57.16 * \text{HHINC} - 72.38 * \text{INCINT} \\ & - 9.70 * \text{PROPVAL} + 102.46 * \text{DPROPVAL} \\ & + 50.77 * \text{IMPORTANT} + 46.06 * \text{G8} \end{aligned}$$

HHINC is total annual household income, INCINT is a variable allowing piecewise regression on income, PROPVAL is assessed value of the respondent's home, DPROPVAL is a dummy variable for respondents with assessed values of \$200,000 or more, IMPORTANT is perceived importance of noise and minor crime within the community, and G8 is response to a statement concerning the role of local government in controlling negative aspects of tourism and other development. The WTP equation is then used to calculate predicted values for WTP. The distributions of predicted WTP for the noise commodity and policy are shown in Figure 3. The difference in predicted WTP between these two models reflects the negative externalities incorporated into the policy values. Other researchers (Carson 1991:137; Hanemann

Table 2. Logit Models for the CV Scenarios

Variable	Noise		Congestion		Housing	
	Commodity	Policy	Commodity	Policy	Commodity	Policy
Constant	-2.87 ^c	-3.33 ^c	-1.44	-1.65 ^a	-2.58 ^c	-4.43 ^c
BID (each $\times 10^{-2}$)	-0.95 ^c	-1.03 ^c	-0.67 ^c	-0.77 ^c	-0.92 ^c	-1.03 ^c
HHHC	0.54 ^c	0.40 ^c	0.27 ^c	0.18 ^c		0.32 ^c
INCINT	-0.69 ^c	-0.53 ^b				-0.41 ^a
PROPVAL	-0.092 ^a		-0.20 ^b		0.18 ^b	
DPROPVAL	0.97 ^a		1.77 ^c	0.84 ^a		
RENTOWN			1.33 ^b		-1.00 ^b	
IMPORTANT	0.48 ^c	0.43 ^c	0.69 ^c	0.54 ^c	0.94 ^c	1.07 ^c
WTOURISM					0.35 ^b	
YEARSRES					0.019 ^b	0.015 ^b
Dummies for Highest Level of Education						
Completed High School					0.48	0.53
Completed Vocational					2.01 ^c	1.06 ^a
Some College					0.64	0.46
Completed College					0.69	0.42
Completed Graduate School					0.82	0.52
Dummies for Age						
30-39			-0.92 ^a	-0.86 ^a	-1.04 ^b	-0.61
40-49			-0.96 ^a	-1.15 ^b	0.32	0.72
50-59			-0.100 ^a	-1.03 ^b	-0.37	-0.27
60+			-0.83	-0.74	-0.91 ^a	-0.63

Dummies for Desired Growth				
Stay as Now		-1.25 ^b	-0.96 ^a	
Grow a Little		-1.15 ^b	-0.82	
Grow a Lot		-1.50 ^b	-0.99 ^a	
Dummies for Communities				
Seaside			0.42	
Cannon Beach			-0.023	
Newport			0.67	
Goos Bay			0.17	
Bandon			-0.36	
Dummies for Order of CV Scenarios				
Order 1		0.63 ^b	0.48 ^a	
Order 2		0.45	0.42	
G1	0.44 ^c	0.18 ^b		0.20 ^b
G8		0.40 ^c	0.34 ^c	0.23 ^a
CHLO			0.30	
			0.27 ^b	
Maddala R^2	0.29	0.26	0.26	0.29
McFadden R^2	0.25	0.23	0.22	0.25
Adjusted for df	0.23	0.19	0.18	0.22
Correctly Predicted (%)	72	72	73	72
Mean WTP	144	105	109	116
95% CI for Mean WTP	118-171	85-126	82-136	94-138
Median WTP	148	108	109	123
Population (adjusted) Mean WTP	130	95	110	103
No. of Observations	443	481	497	477
			430	

^aSignificant at the $P=0.10$ level or better.^bSignificant at the $P=0.05$ level or better.^cSignificant at the $P=0.01$ level or better.

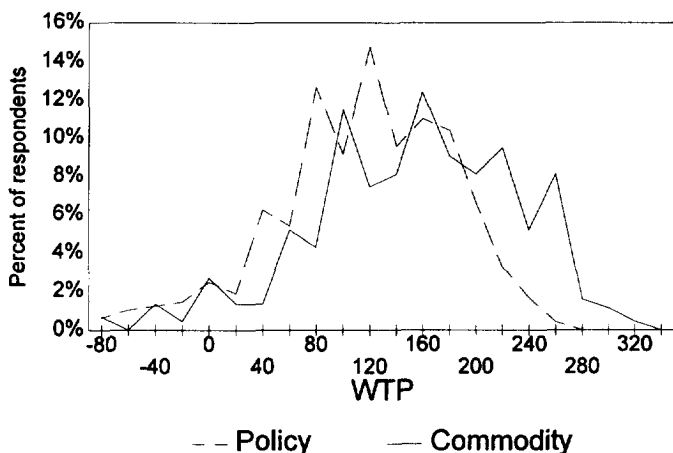


Figure 3. Predicted WTP—Noise

1994:24) have recognized the importance of these externalities as determinants of WTP. For example, Hampicke, Tampe, Kiemstedt, Horlitz, Walters and Timp (1991) found that the mean WTP for an environmental preservation program was DM19 (\$13) per month when respondents were told the program would be implemented by a private foundation. The mean WTP decreased by 37% to DM12 (\$8) per month when respondents were told the program would be implemented by the government. The sensitivity of WTP to program components can also be used to complement existing knowledge concerning the desirability of alternative programs designed to achieve a specific objective, such as reduction in congestion; CV surveys reflecting alternative programs can be conducted to identify the one which generates the greatest net economic value.

Some of the predicted values are negative in both models. This is a statistical artifact that can be avoided by specifying the bid variable in log, rather than linear, form. However, there are also conceptual reasons for negative WTP values, particularly in policy models. For example, a respondent may believe the program would involve an increase in tax payments to the government. Some respondents may place a negative value on this externality that is greater than the positive value placed on the reduction in congestion; the net WTP will then be negative.

Refusals to initiate or complete the survey, as already noted, may lead to biased population estimates of WTP. This problem may be exacerbated by item non-response. A blank or "don't know" response was treated as a missing value, and the observation was omitted from the analysis. However, the majority of omitted observations were a result of "don't know" responses to the CV scenario itself or, in the case of the commodity models, omission of protest "no" votes. Because there was relatively little item non-response for the independent variables, imputation procedures were not used. Rather, population means were used to correct for both unit and item non-response.

The distributions of the HHINC, INCINT, education, and age vari-

Table 3. Description of Included Variables

BID	The bid amount presented to respondent.
HHINC	8-Category variable for total annual household income before taxes.
INCINT	Variable allowing piecewise regression on income, with break at annual household income >\$40,000.
PROPVAL	8-Category variable for assessed value of home. Set to zero for non-homeowners.
DPROPVAL	Dummy variable for respondents with assessed home value of \$200,000 or more.
RENTOWN	Dummy variable for home ownership. Renters=0, owners=1.
IMPORT	Response to question about importance of scenario-related issues: congestion, low-income housing, noise/minor crime. Not important=1, somewhat important=2, very important=3.
WTOURISM	Desire for future change in tourism industry. Decrease=-1, stay the same=0, increase=1.
YEARSRES	Length of residence in community, in years.
G1	Response to statement "Local government works hard to address the concerns of local residents" using 5-point Likert scale. Strongly disagree=1, strongly agree=5.
G8	Response to statement "Local government should take an active role in controlling negative aspects of tourism and other development". Same scale as G1.
CHILO	Respondents were presented one of two congestion scenarios: 25 or 50% reduction in traffic on Highway 101 during busy periods. This variable is a dummy that takes on the value of 0 for the 25% reduction and 1 for the 50% reduction.

Base Categories for each Set of Dummies:

Education	Some high school.
Age	18-29 years.
Growth	Decrease in number of people living in community in the next 5 years.
Communities	Combined set of the small, adjacent communities of Glendened Beach, Depoe Bay, and Lincoln Beach.
Order	The presentation order for the scenarios was varied. For the base, congestion was presented first. For Order 1, congestion was presented last. For Order 2, congestion was presented second.

ables for the samples of observations included in the models were compared to the distributions for the population comprised of these communities. The population distributions were based on 1990 US census data for the three counties in which the study communities are located. Although inter-county differences were minimal, a weighted average was computed based on survey sample size from each county. There were modest, but noticeable, differences between the population distributions and the sample distributions, with the samples being on average somewhat older, better educated, and wealthier

than the population. Therefore, population means for these variables (or related dummy variables) were substituted into the WTP equations to generate an adjusted mean WTP for each model. The adjusted means are shown below median WTP in Table 2. For the commodity models, the adjustment also accounts for any differences in these demographic variables between those included in the sample and those excluded because of protest "no" votes.

CONCLUSION

Evaluation of Results

Table 2 and the resulting WTP equations are consistent with a conceptual model of factors affecting WTP. First, the more important the problem is in the view of the respondent, and thus the greater the benefit from mitigation, the higher the WTP. Positive and significant coefficients for the IMPORTANT variables in all models support this relationship. Second, the more *able* the respondent is to pay, the greater the *willingness* to pay. Positive and significant coefficients for HHINC support this relationship. However, the negative INCINT coefficient in some models suggests that WTP may level off and actually drop at higher income levels. The coefficients for the property value variables are more difficult to interpret. On the one hand, property value measures ability to pay, thereby explaining positive signs. On the other hand, it is possible that respondents assume the fee will be paid through property taxes despite the explicit omission of taxes as a payment vehicle in the scenario wording. This belief likely will reduce WTP insofar as property owners feel they will bear a disproportionate burden for financing the program. This result illustrates the difficulty of discriminating between valuation of the commodity and that of the policy. Ideally, respondents objecting to the relative financing burden will be identified and excluded from the commodity model. In practice, full discrimination is not possible.

Third, WTP is lower for respondents who object to the program for one or more related reasons, including a belief that government should not be involved in the program, that the program will not achieve its goals, or that the program will generate negative externalities. The consistently positive and significant coefficients for G8 and, to a lesser degree, G1 (a measure of perceived local government responsiveness) show that WTP increases with the beliefs that government should take an active role and that it is responsive to citizen concerns. The negative coefficients on the dummy variables for desired growth in the congestion models may reflect a concern by respondents that the congestion program will reduce traffic flow through, or stops in, their community. These measures will reduce business opportunities and thereby negatively impact future growth. The coefficient on RENTOWN (a dummy variable indicating whether the respondent owns his home) is significant in only two models, and has a different sign for each. For the housing commodity model, the sign may reflect a belief by homeowners that development of low-income housing will negatively affect their property value or the quality of their neigh-

borhood. It may also reflect that renters might be more likely to benefit from the program.

Of course, other factors also affect WTP. One of these factors is the pride in, and willingness to sacrifice for, the community. Coefficients on several variables, including IMPORTANT and the growth dummies, likely reflect the expected benefit of the programs to others in the community. Similarly, the positive and significant signs on YEARSRES (length of residence) may be due to an increase in willingness to sacrifice for the community as length of residence increases. In addition, half of the sample completed general mail surveys that contained attitudinal questions regarding what makes the communities special. Models based on this subsample show positive and significant correlation between WTP and the stated importance of being able to count on neighbors to help out.

Some coefficients are more difficult to interpret. Education is only modestly significant and only for the housing models. The generally negative signs for age coefficients suggest that younger respondents (those in the base category of 18–29) have higher WTP than older respondents. The community dummy variables were significant in only one model, and then only as a set rather than individually. This result suggests that the role of local factors in generating support for programs is largely picked up in other variables, such as IMPORTANT. Further, the coefficients on CHILO (a dummy variable indicating the level of reduction in congestion) had the proper sign but were insignificant, suggesting that respondents either did not discriminate well between the two different levels of the good provided or did not highly value the incremental benefit provided by the 50% reduction program.

Although there are no previous analyses that are directly comparable, and can thus be used to evaluate the (convergent) validity of these results, the few similar analyses have produced generally similar results. For example, Ahearn (1984:84) estimated a mean annual household WTP of \$51 for a 33% reduction in the risk of burglary in Oregon communities. Adjusted for inflation, this equals \$74 in 1993 dollars. Navarro and Carson (1991:145) used an election returns method to infer that the average San Diego household is willing to pay \$138/year to increase jail and court capacity in an effort to reduce crime. Weinberger, Thomassen and Willecke (1991) estimated mean household WTP of DM30/month (\$241/year) for a noise reduction in German communities.

Benefits of Economic Valuation

CV surveys, like attitudinal ones, can be used to identify resident concerns about tourism or economic development generally. The significance of the coefficient on IMPORTANT shows that there is a strong correlation between concerns and CV-based estimates of WTP. Unlike attitudinal surveys, CV surveys can also be used in a benefit–cost analysis framework to evaluate the absolute and relative desirability of mitigation programs. For example, mean WTP can be mul-

multiplied by the number of households in the community to estimate the benefits of each mitigation program. These benefits can then be compared to estimates of program costs to determine which programs generate positive net present value (NPV).

Any mitigation program will generate externalities. Therefore, mean WTP for the policy models, which reflect valuation in the presence of these externalities, should be used for benefit–cost analysis of the mitigation programs. The confidence intervals around mean WTP illustrate that uncertainty exists in estimating WTP (or any other dependent variable in a regression model). As a result, the desirability of the programs involves some uncertainty unless the programs generate positive NPV, even when using the lower bound, or negative NPV, even when using the upper bound.

Considerations beyond NPV are likely to arise when evaluating the desirability of these programs. First, implementation of programs may require approval of bond measures. Because a majority of voters is necessary for approval, the median WTP, rather than the mean, should be used to evaluate the likelihood of approval. The median and mean are quite similar in these models, but this will not always be the case. Second, assuming that residents will be asked to pay for the programs, which need not be the case, an important issue is *how* they should pay. Those projects undertaken at the community level likely will be financed by property taxes. Because both property taxes and WTP tend to be correlated with income, property taxes likely will be more effective than a flat tax in terms of converting WTP to program finance. Table 4 shows how population (adjusted) WTP for the noise commodity model varies across income categories. WTP declines at the higher income levels because INCINT was significant and negative in this model. Despite this decline at high income levels, there is a positive correlation between income and WTP for the majority of the population.

Estimates of WTP are useful in evaluating the desirability of both mitigation programs and tourism development itself. Policy decisions concerning whether to pursue tourism development and, if so, of what type and level, have been made on the basis of comparing expected economic, social, environmental, and other impacts. These decisions

Table 4. Relationship between Income and Predicted WTP for Noise Commodity Model

Total Annual Household Income before Taxes (\$)	Predicted WTP (\$)	Percentage of Population
< 10,000	36	19
10,000–19,999	93	24
20,000–29,999	151	19
30,000–39,999	208	14
40,000–49,999	192	11
50,000–74,999	177	10
75,000–99,999	162	2
≥ 100,000	147	2

have been complicated by the use of different metrics for different impacts. The CV technique enables analysts to measure some of the social and environmental impacts in an economic metric. For example, CV can be used to estimate WTP to mitigate tourism-related trampling of near-shore tidal areas or negative impacts on resident viewsheds. It should be stressed that not all impacts can be measured in economic terms. Nonetheless, by measuring some of these impacts in economic terms the analyst can provide important information to decision makers (Freeman 1993).

Application Issues

As an example, consider a benefit-cost analysis of the transition from no tourism (Condition A) to current tourism development (Condition B) in one of the coast communities. Several tourism-related positive and negative impacts can be identified, for which economic value estimates are needed. One of the negative impacts is increased traffic congestion. CV is employed to measure the economic value, in this case negative, of this impact. Several issues arise in such an analysis.

1. The appropriate measure of economic value is one such issue. Because the present analysis is of change from the "no tourism" condition, the theoretically appropriate measure is willingness-to-accept (WTA) for the decrement caused by transition from "no tourism" to "current tourism" (other analyses may be based on different property rights, which may lead to WTP being the appropriate measure). However, the scenario necessary for obtaining WTA estimates would increase the cognitive burden for respondents substantially beyond the level necessary for the WTP surveys used here. Because WTP also generates conservative (i.e., lower bound) estimates of value, it is considered a desirable alternative to WTA (Arrow et al 1993). The WTP estimate for the congestion commodity model (\$186), rather than the policy model (\$110), is appropriate because the desired estimate is the value of the change in the commodity.

2. The economic value estimates derived in this article are not for tourism *per se*, but for actual impacts that may be only partly caused by tourism. Thus, as illustrated above, the proportion of traffic congestion that is attributable to tourism must be identified. This proportion can then be used to estimate the value of traffic congestion caused by tourism development. For example, it can be used to convert WTP for a 25 or 50% reduction in traffic congestion to WTP for a condition of no tourism-induced traffic congestion.

3. The values of tourism's varied impacts need to be combined to estimate tourism's overall value. Previous CV research has shown that the total value of a good tends to be less than the sum of the values of its components (Carson 1991). For instance, the total value of preserving a species may be less than the sum of the on-site (e.g., wildlife viewing) and off-site (e.g., existence and bequest) values associated with that species. This is known as the problem of sub-additivity. In the present case, if WTP were estimated for all tourism

impacts individually, the sum of these estimates would likely overestimate the actual value for tourism as a whole. However, the tendency toward overestimation will be offset to some degree by the practical impossibility of estimating WTP for all impacts. These other impacts can be significant. For example, McConnell (1977) estimated annual WTP of \$20 (\$48 in 1993 dollars) for reduced beach congestion. If the WTP of Oregon coast residents is at all similar, beach congestion represents a significant addition to the cost of tourism development; indeed, 5% of surveyed residents report that they have stopped going to beaches because of the number of tourists there. Unfortunately, the net effect of subadditivity and the omission of some values is indeterminate. Ideally, the WTP for tourism's combined social impacts would be valued in a single scenario, but the scenario for such a valuation likely would be unrealistic and too complex (Gregory, Lichtenstein and Slovic 1993).

4. Valuation of the different types and levels of tourism development would help communities determine their most desirable development path. Estimation of these values requires identifying a valuation function for the impacts. That is, WTP must be estimated for the different levels of actual impacts associated with different types and levels of development. Although the vast majority of studies have found a relationship between level of impact and WTP, CV critics maintain that WTP is not sufficiently responsive to level of impact (Carson and Mitchell 1993). The insignificance of the coefficient on CHILO in the present study may signify that value does not differ between these two particular levels of congestion. However, it may also reflect an inability of the survey to pick up a difference that does exist.

Further refinement and application of CV to measure the economic value of tourism's social impacts will lead to more accurate benefit-cost analyses than have been possible to date. Because benefit-cost analyses are costly in both time and money, the development path prescribed by such analyses should be compared to those prescribed by alternative planning approaches, such as the LAC process (Stankey, Cole, Lucas, Petersen and Frissell 1985), that incorporate social values, as well as to results of *laissez-faire* approaches. Analysis of differences in outcomes resulting from each approach can be used to identify the most cost-effective approach for a given situation.

In short, this article presents a technique for measuring the economic value of actual social impacts associated with tourism. Although CV results should be critically evaluated and complemented with results from other techniques where possible, the CV technique has been endorsed by economists as a valid method for estimating value (complementary methods include traditional evaluation and non-CV economic evaluation, using techniques such as discrete choice analysis (Adamowicz, Louviere and Williams 1994)).

In the tourism field, CV analysis can provide value estimates that are useful both for practical decisions regarding the desirability of specific mitigation programs and for conceptual integration of tourism's varied impacts. This integration can guide fundamental development decisions regarding what type and level of tourism to target. In addition, it can guide more specific decisions, such as selection of

desired market segments. This selection historically has been based primarily on relative benefits, such as expenditure levels, across segments. Integration of varied impacts, and thus integration of benefits and costs, enables selection of market segments based on net benefits (i.e., benefits less costs). Insofar as tourism's sustainability is a function of net benefits, CV and related methods contribute to achieving sustainability by facilitating integration, and thus evaluation, of both positive and negative impacts. □ □

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