ASSESSING THE IMPACTS OF TRAVEL AND TOURISM – MEASURING ECONOMIC COSTS

Chapter 33 in J.R. Brent Ritchie and Charles R. Goeldner, editors,
Travel, Tourism and Hospitality Research: A Handbook for Managers and Researchers, 2nd edition, John Wiley & Sons, New York, 1994.

Douglas C. Frechtling, Ph.D.
Associate Professor of Tourism Studies
The George Washington University
Washington, D.C.

The relationship of two kinds of incidental costs of tourism, fiscal costs and life quality costs to a community, are discussed. Methods of estimating the direct and secondary fiscal costs are presented, as well as comparing these costs to benefits. The role and method of discounting future costs and benefits is also detailed.

In a world where resources are scarce, measuring the economic benefits of tourism in an area without measuring the associated costs risks wasting limited public funds. Moreover, such an approach may also produce serious damage to the environment, rapidly escalating public service costs to support visitors, and significant declines in the quality of life for residents. This is true whether the project is a new facility, such as a hotel, additional infrastructure, like a new airport, or a marketing program to attract visitors.

Public officials cannot survive many projects that cost their constituents more than they return. Nor can the tourism industry maintain its credibility after promoting such projects to residents. Beyond the increased efficiency in using scarce resources, it is a wise policy for public officials and tourism industry operators to estimate the economic costs as well as the benefits of tourism projects.

There appears to be two main cases where researchers should apply cost analysis to travel and tourism. One is to examine the current situation to determine how much additional cost visitors are imposing on the community relative to conditions without visitors. When combined with benefits estimates, such information can guide officials in deciding whether and how to stimulate or restrict visitor volume. The other is to estimate the additional costs imposed by more visitors to a community, either from natural growth or produced by a prospective development, such as a new park, additional transportation capacity, or new marketing programs.

It is the second case that has received the most attention, especially in public water resource development projects, where the costs and recreational benefits of a

proposed project are estimated as part of the determination whether to proceed with the project or not (Waters and Valderrama 1984). Marketers in the public sector who are considering programs to increase visitor volume should consider the costs imposed by these additional tourists on local residents, both individuals and businesses.

INCIDENTAL COSTS

It is helpful to get the terminology right at the outset of cost analysis. One of the major failures of the marketplace economists recognize is that many economic activities indiscriminately impose costs on others for which no corresponding compensation is paid (Baumol and Blinder 1988, p. 250; Bull 1991, pp. 161-165). Tourists give rise to such costs when they produce air pollution, trash, noise and traffic congestion in a community. This is a cost to residents or government for which tourists pay no compensation.

Economists call such effects, *detrimental externalities (ibid.)* or *external diseconomies* (Samuelson and Nordhaus 1989, p. 771), and the costs they impose, *incidental costs* (*op. cit.*, p. 251). The sum of incidental costs of an activity and its *private costs*, those paid for by whoever generates the cost, is called the *social cost* of an activity, the total cost to society of the activity.[1]

Tourism imposes incidental costs on an area. The residents of the area (the "community") affected by the incidental costs of tourism can choose to deal with them in one of three ways: (1) they may accept a lower quality of life than they enjoyed without tourists; (2) they may redress the decline in their life quality through public expenditures for which the residents tax themselves, or (3) they may directly impose monetary costs on the tourists through taxes and fees. The latter two solutions comprise *fiscal costs* and differ by who bears the public or government costs: residents or tourists.

Table 1 lists a number of categories of incidental costs that can be considered in tourism impact studies. The table makes clear that any type of incidental cost can fall on residents (life quality costs) or on government (fiscal costs). Residents can decide whether to bear the fiscal costs through higher taxes on themselves, or shift them to the tourist through specific taxes, fees and fines on the activity, or through general taxes, such as on lodging, meals and rental cars.

---

[1]There is confusion over the meaning of the term, "social cost." Baumol and Blinder (1988) explicitly define it as the sum of private and incidental costs, while Samuelson and Nordhaus implicitly do so (see 1989, pp. 771-772). This makes sense as the costs of an economic activity, such as tourism, to *society* is equal to its compensated plus uncompensated costs. However, Bull (1991, p. 120), uses social costs to refer only to the uncompensated costs imposed on residents, and such terminology is loosely used elsewhere in tourism impact studies.

Table 1: Direct Incidental Costs of Tourism to a Community - Alternative Quality of Life Costs and Fiscal Costs

Quality of Life Costs	Fiscal Costs
Traffic congestion	Highway construction, police servic public transportation, port and terminal facilities
Crime	Police services, justice system
Fire emergencies	Fire protection
Water pollution	Water supply and sewage treatment
Air pollution	Police services, public transportatior
Litter	Solid waste disposal, police services
Noise pollution	Police services, zoning
Destruction of wildlife	Police services, park and recreation facilities, forestry maintenance, fish game regulation
Destruction of scenic beauty	Park and recreation facilities, police services
Destruction of social/cultural herit	Maintenance of museums and histor sites, police services
Disease	Hospital and other health maintenar facilities, sanitation facilities, food service regulation
Vehicular accidents	Police services, justice system

Study of the costs of travel and tourism should consider all of the direct incidental costs indicated in Table 1. It may well be that the nature and volume of the visitors will not produce any costs in several of the categories listed. For example, visitors to New York City will not impose costs on residents related to regulation of hunting and fishing or forestry management. And if an area is developing a facility or service that would attract few additional visitors, then the contribution to incidental costs in many of the categories may be negligible. However, the point is that the potential cost of visitors in each category should be explicitly examined if a study of the incidental costs of tourism is to be comprehensive.

SECONDARY INCIDENTAL COSTS

So far, the costs of visitors have been described only at the primary level, that is, those costs directly attributable to visitors. However, there are also indirect or secondary cost effects that can operate, as indicated in Table 2.

If the development of a new tourism facility attracts enough additional visitors, there may be an increase in the number and size of business establishments in the community, requiring an increase in the labor force and thus the resident population. As resident population increases, this imposes additional fiscal and life quality costs on the community. Some of the costs of additional residents will be similar to those imposed by additional visitors, and can be categorized as in Table 1. We can then use the same measurement techniques for assessing their impact.

Often, some of the costs imposed by additional residents to serve a larger visitor volume may not appear to residents to be travel-related. For example, the children of the additional residents will require an increase in educational expenses in the community. They may also require additional hospital facilities as well (Baumol, *et* al. 1970, pp. 161-177).

One of the most troublesome areas of indirect costs is in welfare or income maintenance programs. For example, it has been alleged that tourism in certain regions provides highly seasonal job opportunities, attracting a work force that settles in and requires unemployment compensation and other income transfer programs during off-peak seasons (Cournoyer 1975, pp. 205-227). And the opening of Florida's Walt Disney World attracted a surplus of unskilled migrant labor that forced the city of Orlando to hire additional police and expand shelters (Zehnder 1975 quoted in Murphy 1985, p. 99)

Table 2 details the indirect quality of life costs and the corresponding indirect fiscal and life quality costs that might be imposed on a community by an increase in the work force to serve an increase in visitor volume. They differ from those costs identified in Table 1 in that they are not generated directly by visitors, but indirectly. The two tables are intended to be exhaustive, but additional costs may be identified by others.

Table 2: Indirect Incidental Costs of Tourism to a Community Generated by Labor Inflow - Alternative Quality of Life Costs and Fiscal Costs

Quality of Life Costs	Fiscal Costs
Crime	Police services, justice system, education, employment services
Vehicular accidents	Police services, justice system
Disease, other threats to health	Hospital and other health maintenar facilities, sanitation facilities, public housing
Vagrancy, homelessness	Public housing, urban renewal, housing subsidies, public welfare
Traffic congestion	Police services, highway constructio public transportation
Uneducated electorate	Education

The larger resident population will impose an increased burden on education and hospital facilities. If these are not expanded, the community as a whole deteriorates somewhat as the ignorant and sick threaten to increase in number. The additional population may put increased pressure on already declining neighborhoods, require more urban renewal to prevent an increase in crime and street congestion, with concomitant declines in property values and the visual aesthetics of the community.

If the work force expands to take on additional, highly seasonal jobs, welfare payments and counseling costs may increase; otherwise, crime and disease may well grow. Finally, the population increase may expand the work force considerably more than the additional jobs produced by visitors, as the spouses and children of the travel-related employees look for work. In the absence of economic development programs, long-term residents may experience declines in opportunities for employment and income growth available to them.

The presence of visitors gives rise to indirect incidental costs, as the business and labor population expands to meet increased demand. These indirect costs may be fiscal or life quality, depending on how the residents decide to handle them. There is an additional set of public expenditure programs, however, that do not have direct counterparts on the life quality side. These might be termed "fiscal overhead expenditures" and relate to the operation and management of government. They include financial administration, general control, and interest on the general debt.

It is not immediately evident whether these government expenditures should be included among travel-generated fiscal costs. On the one hand, we could argue that fiscal overhead costs are sensitive to the size of government, and that part of government is attributable to servicing travel and tourism activity. On the other hand, we could argue that government primarily exists to serve its citizens, and that these overhead costs should not be allocated to non-resident visitors: they would continue unabated in the absence of visitors. Moreover, public officials are occasionally able to cut back on these overhead expenses while the costs of servicing visitors is rising.

If we decide to include fiscal overhead costs in our accounting of travel-generated fiscal costs, we can allocate them by the proportion that travel-related fiscal costs bear to total budget net of overhead costs. For example, if an exhaustive study of fiscal costs attributable to tourists indicates that one-third of the government's non-overhead expenditure items are attributable to them, then one-third of the fiscal overhead costs can be attributed to visitors as well.

There is another area where it is unclear whether additional incidental costs for the community as a whole are involved. This includes the redistribution effects of tourism projects. A new highway or transportation terminal located far from the old one may well cause a decline in the receipts of those businesses established near the obsolete facilities. However, businesses near the new road or terminal will thrive.

As another example, the hotels located in a community may be enjoying very high occupancy rates. Then a government program (low interest loans, loan guarantees, special infrastructure) stimulates additional hotel construction. After the new property opens, the original hotels suffer declines in occupancy and in return on investment.

As one other, the additional visitors generated by a new public visitor-related facility may push up wage rates and property values in the community. Now employers must pay their workers more, and those wishing to buy property must pay more to those who already own it.

DISTRIBUTIONAL EFFECTS

These are distributional aspects of increased visitor demand. Income or wealth is transferred from one group in the community to another as the result of visitors. We can envision five major groups that may be differentially affected by the presence of tourists in a community (after Pearce 1989, p. 215):

1. Tourism-related businesses - owners, operators, employees
2. Non-tourism-related businesses

3. Public authorities
4. Residents
5. Tourists

Most of the cost impacts on tourism-related businesses and tourists are covered under private costs, that is, are expressed through exchange transactions in the market place. However, we can imagine uncompensated costs, especially to tourists, where crowding reduces the quality of the *tourists*' lives. And there are subgroups within these who may be affected differently from other subgroups: residents living near the most popular tourists centers will suffer more than those living well away.

Since we have no objective way of determining whether the community is better or worse off as a result of intra-community transfers related to tourists, and no additional output has been produced by the transfer, it is recommended that this be excluded from cost analysis (Prest and Turvey 1967, p. 160).

We can make one judgment here, however. If it can be shown that a tourism program primarily benefits non-residents at the expense of residents through shifting benefits to the former away from the latter, then the project is clearly costly from the residents' point of view. This can happen, for example, if locally-owned and staffed hotels lose business to properties owned by absentee owners, staffed by imported labor and operated with imported goods and services. It is clear here that the gross economic benefits of the project are not benefits to the residents, and some are actually costs in terms of lost jobs and income.

It is important that the range of costs of tourism that are examined are consistent with the spectrum of benefits. It is not correct to calculate the indirect costs of additional visitors without recognizing the indirect benefits in terms of additional income and tax revenues in the community. It may be that the study of the costs and benefits of a given tourism project must be limited by available funds to the direct implications to the community. In such a case, the researchers must make sure that the cost and benefit implications are consistent, and that the scope of one side is not expanded beyond the scope of the other.

It should be clear that the optimum scope of cost analysis of tourism-related projects can be summarized as broad, deep and long: broad in covering all incidental costs in the community; deep to include the indirect costs from population increases from an expanded work force to meet enlarged visitor demand; and long to cover the distant as well as the near future. This last aspect will be covered more fully in a succeeding section on the appropriate social rate of discount.

MEASUREMENT

It is difficult to measure the direct incidental costs of travel and tourism (Bull 1991, p. 164). Many simplifying and sometimes subjective assumptions are made to arrive at final cost estimates. As the state of the art progresses, the subjective content can be reduced to produce the reliable objective estimates that are most useful.

Measuring the indirect costs is even more difficult, requiring an additional analytical step. First, assumptions must be made about the link between visitor demand and the resident businesses and individuals who service this demand. Once this is established, we must then determine the relationship between those servicing visitors and the incidental costs of their activities. This two-step process may increase the subjective content of the estimates, and reduce their accuracy.

Little work appears to have been done in measuring the indirect costs of travel and tourism (Zehnder 1975 is the only study this author is aware of). This subject needs more serious attention before it can be considered as accurate as measurement of secondary benefits.

The incidental cost measurement problem is facilitated to the extent residents have chosen to translate quality of life costs into fiscal costs, particularly, public expenditures.

FISCAL COSTS

Measurement of the fiscal costs of visitors to the community involves apportioning some of each category listed in Table 1 to visitors. The final estimates of visitor-related fiscal costs will be quite sensitive to the measurement method employed, so special care should be taken to develop objective and accurate techniques.

Looking at the direct fiscal costs of visitors, there are two basic issues. One is how to measure the *net* fiscal costs of visitors. Many of the program costs listed in Table 1 are at least partially offset by user charges in the community. Street and highway construction and maintenance programs are funded by motor gasoline taxes. The costs of developing and operating museums, historic sites, parks and recreation areas may be offset by admission or user fees. The cost of fish and game regulation may be financed entirely by license fees. The question is, should we subtract the revenue from user charges and deal only with the net costs of each program, or address user charges paid by visitors on the benefit side and deal with the *gross* costs of each program attributable to visitors on the cost side?

If we are only interested in the cost side, the former approach might be preferable. This gives us the net costs of visitors which must be picked up by the residents. However, in doing so, we run the risk of neglecting to include travel-generated fiscal revenue not directly attributable to specific programs, such as sales and

gross receipts taxes. Since these taxes are usually not earmarked for offsetting specific costs (i.e., are a general benefit), they are apt to be excluded in calculating the net costs of each visitor-related public service.

It seems far more advisable to maintain a strict distinction between costs and benefits. All of the fiscal costs generated by visitors should be totaled on one side, and all of the fiscal receipts derived from visitors should be summed on the other, and then comparisons made. This has the advantage of including all revenue items, whether related to a specific service or not, on the benefit side with other benefits. Similarly, we can compare gross fiscal costs with other social costs. All is laid out explicitly, with no "off balance-sheet accounting" to worry about.

Table 3 indicates the units of measurement suggested for apportioning public service costs between visitors and residents. In each case, we need to estimate both total use and visitor use. We then distribute the total program costs in each category to visitors according to the proportion of use generated by visitors.

Table 3: Suggested Units of Measurement for Direct Fiscal Costs of Tourists

Fiscal Cost Category	Unit of Measurement
Highway construction and maintenance	Vehicle-miles
Fish and game regulation	Licenses sold
Park and recreation facilities	Site visitor days or visits (admission
Museums and historic sites	Site visits (admissions)
Port and terminal facilities	Arrivals and departures
Forestry maintenance	Site visitor-days or visits
Public transportation	Passengers
Police services	Daily census
Fire protection	Daily census
Hospital and health care facilities	Daily census
Environmental regulation	Daily census
Health and sanitation services	Daily census
Water supply and sewage treatmer	Daily census

Trash and litter disposal	Daily census

It should be understood that in many cases the measurement units suggested are imperfect indicators of actual visitor consumption of public services. However, they have the virtue of being readily available from visitor surveys and resident population data. Further research is required on better indicators of visitor use of public services.

The fiscal cost categories are drawn from Table 1. While most of the units of measurement are self-explanatory, a few words about the "daily census" measure are required. The "daily census" is the average number of people present each day in the area under study for some period, usually a year. If the area studied is a local community, commuters from outside the community boundaries should be included along with residents and visitors. If the area is a state, it is unlikely commutation will add much relative to the total of residents and visitors.

The average daily census measure is an estimate of the average number of people present in the community for one year is computed as follows:

$$ADC_{c,y} = \frac{VD_{c,y} + \left(RP_{c,y} * 365 days\right) + \left(\frac{CP_{c,y} * 236 days}{3}\right)}{365 days} \quad (1)$$

where
c = community
y = year
ADC = average daily census
VD = annual visitor-days produced by tourists
RP = average annual resident population
CP = average daily commuters from outside the community

This is the sum of the number of visitor-days spent in the area or the year plus the product of resident population and 365 days in the year, plus a measure of commuter-days, divided by 365 days. Average daily commuter population is represented by the number of daily commuters multiplied by the one-third of a day they spend in the community each day, the product multiplied by 236 days as an average work year, recognizing weekends, holidays and vacations as non-work days without commuting.

The daily census approach assumes that the cost of a given public service is a function of the number of people present in the area daily. The costs of the service can

then be apportioned between visitors and others in the same proportion that the daily census is composed, that is (Baumol et al. 1970, pp. 149-160):

$$VP_{s,c,y} = \frac{VD_{c,y}}{365 * ADC_{c,y}} \quad (2)$$

where
s = given public service
c = community
y = year
VP = tourist proportion of the service's costs
VD = annual visitor-days produced by tourists
ADC = average daily census

It is attractive to the researcher to apply the daily census approach to estimating all or nearly all public program costs (Office of Business and Economic Development 1981). However, this tendency should be resisted in favor of measures that more accurately represent actual visitor usage of the program or facility. This allows for valid estimation of public costs related to visitors even if visitor activity patterns change but visitor volume does not.

While a very simple concept, the daily census approach appears well-suited for a number of public services (Travel Data Center *et al.* 1979). It was used, for example, to apportion costs of police protection and sewage treatment between visitors and others in the state of Delaware (*ibid.*) Tatzin, however, has applied a different approach to estimating the tourist-related costs of "public goods" (1978). Public goods are those services supplied by public agencies that are not depleted by an additional user and for which it is generally difficult to exclude people from its benefits (Baumol and Blinder 1988, p. 255).

Tatzin developed "probability of use" coefficients for each public service. These represented the likelihood that the average tourist would use the given service. Such coefficients were easy to develop for certain public services analogous to private businesses, such as the zoo. Here, tourist-days visiting the zoo were divided by total visitor-days to obtain the coefficient. For public goods, such as police protection, he relied on the judgment of knowledgeable officials.

Then he developed "relative cost coefficients," which represent the intensity with which tourists consume a public service. This, too, is based on informed judgment. For example, he found that police officials indicated that tourists place demand largely on patrol services, while residents use these as well as juvenile, investigative and other police services (*ibid.*, p. 55).

Finally, he combined these coefficients with the total budgets for each service to obtain public expenditures per visitor-day for each service for each type of tourist.

The two methods share the same objective -- to estimate the public services costs per visitor-day -- but differ in concept. The average daily census method assumes that the tourists' intensity of consuming most public goods cannot accurately be determined. Tatzin's approach assumes that informed judgment provides sound estimates of this intensity. It is interesting to note that he concludes, "The public costs of tourism result largely from the mere presence of tourists." This suggests the average daily census method is equal to Tatzin's model in accuracy, although it is far less demanding in terms of researchers' time and costs.

Tatzin appears to have disregarded the overhead costs of administration, financial control, debt service and other programs that support the public services that tourists consume. The U.S. Travel Data Center pro-rated these expenditures based on the proportion of certain fiscal costs shared between visitors and residents/commuters (1979).

One other attempt to measure the costs to local government of tourists used a limited number of public expenditure categories, but attributed all of their costs to tourists (Yochum and Agarwal 1987, p. 143). However, important categories were excluded, such as fire protection, suggesting this cost estimation procedure was incomplete.

QUALITY OF LIFE COSTS

Putting actual dollar values on the life quality costs is quite difficult. One conceptual approach is to estimate what residents would be willing to pay to return to their pre-visitor level of risk of destruction of flora, fauna, human life and health, natural and scenic beauty, historical and cultural heritage sites, and amount of crowding and congestion. However, we cannot actually ask the residents hypothetical questions because what they respond they would pay and what they would actually pay for reducing each visitor-related life quality cost are likely to be quite different.

Moreover, the cost categories require trade-offs since the resident has a fixed budget and visitor-related costs would have to be accommodated within it, along with his maintenance, nurture, recreation and other expenses. Finally, the resident has an incentive to understate the amount he would be willing to pay for collective goods such as police protection and pollution control. Since the amount of these services each consumes is equal and unrelated to the cost each would pay, each resident would hope to get someone else to pay more than he does by understating the value he puts on it (Prest and Turvey 1967, pp. 167-168; Waters and Valderrama 1984).

The measurement of life quality costs associated with travel and tourism in a community has not been adequately addressed in past research. Some investigators have tried to estimate relative life quality costs of alternative activities. These have generally been limited to environmental consequences of visitation, and suggest that certain classes of visitors pursuing certain activities have lower benefit-cost ratios than others (Northeast Markets, *et al*. 1974, pp. 155-174). However, these studies incorporate large subjective components in the estimation methods.

It could be argued that the residents have the ability to redress life quality costs of visitors by transferring them as fiscal costs through taxes and fees on the visitors. If they do not choose to do so, this reasoning goes, then the life quality costs cannot be significant to the residents. Therefore, the calculation of fiscal costs is sufficient to cover incidental costs.

A counter argument to this one is that individual residents do the benefit-cost calculus on their own and a majority decide that the life quality reduction suffered is more than offset by personal economic benefits attributable to visitors. But this does not resolve the issue of whether the community is collectively better off with additional visitors or without them. It may be that the majority of voters feel they are better off, but that the minority, which may well bear most of the cost burden or value the quality of their environment most highly, bear net costs large enough to offset the majority's net benefits.

Further study of such reasoning and its implications, and methods of quantifying life quality costs of tourism, is required before this issue can be settled.

OTHER ISSUES

There are additional issues in analyzing the costs of travel and tourism that deserve study. However, so little attention has been given them so far that it is difficult to suggest even conceptual solutions at this time.

It was mentioned above that the redistributional aspects of a development project in a community can be ignored since income and wealth would be transferred among community members. However, if it could be shown, for example, that the construction of a new terminal would benefit absentee property owners while demolition of the old terminal would hurt resident owners, then the community would experience a net cost from this aspect of the project.

Moreover, in some communities there may be a broad consensus that all public projects should help the poor rather than the rich. In such a community, if a project reduced the business and employment opportunities of the poor, say around an old

terminal, and increased those of the more advantaged around the proposed site for new construction, then it would have unfavorable redistributional costs from the community's standpoint.

As another issue, we have assumed that the fiscal costs of redressing certain effects of visitation do not exceed the life quality costs the resident would endure in the absence of these fiscal costs. The amount a community is willing to tax itself or its visitors to limit congestion or protect the environment is assumed to be fairly representative of the life quality costs that would be imposed on the residents. However, this may not always be true. Inefficient public programs could cost the community or its visitors far more than they return in redressing life quality costs.

We have not addressed the point that certain kinds of visitors are more costly to service than others. For example, one study has found that convention visitors to a city produced some of the highest costs among visitor types (Tatzin 1978). Such information is crucial for the community deciding whether to attract new visitors or dissuade current ones.[2] One wonders how many scarce public resources have been spent to attract market segments that cost the community more than they return.

In this chapter, we have sometimes talked in terms of the additional costs of attracting additional visitors. Optimally, this should be in terms of the *marginal* costs of these visitors: that is, how much additional social cost would be imposed by one thousand more visitors. Usually this question is answered by assuming the marginal cost of serving one thousand more visitors would be the same as the *average* cost of serving one thousand current ones. This may not be true. If visitors, such as convention delegates, are served by a project with a large fixed cost such as a convention center, then the marginal cost of servicing an extra thousand could actually be less than the average cost. In other cases, the marginal cost could exceed the average cost because a facility has reached its service capacity. Far more study is required before we can be completely comfortable with our projections of the cost implications of additional visitors.

This discussion has ignored the concept of *opportunity costs*, the value of the lost opportunity to the economy of using financial or other resources in the alternative activity with the highest returns (Bull 1991, p. 159; Murphy 1985, p. 103). There are always alternative ways of employing public funds, labor, land, and capital to investing them in tourism promotion and development. Returns on the highest-valued

[2]In 1985, Fort Lauderdale, Florida, determined, at least qualitatively, that the community's costs of hosting 350 thousand college-age visitors every spring was greater than their expenditures. The community embarked on a marketing campaign to discourage such visitors and encourage new visitor markets, such as families, seniors, and convention delegates. By 1991, the number of spring young people had fallen below 15 thousand, yet total visitor volume and revenues were far greater than in 1985.

alternative use should be subtracted from the tourism benefits to obtain a sound economic measure of the benefits to the economy.

However, measuring the opportunity cost of a tourism project or program requires the researcher to determine the value of what might have been: jobs which might have been produced, wages which might have been paid, financial returns that might have accrued. This requires a great deal of subjectivity and speculation, activities which the researcher is not comfortable in applying, and that are subject to abuse by those wanting to prove tourism programs are or are not wise uses of scarce resources. This probably explains why little work has been done in this area (see Bryden 1973 quoted in Murphy 1985, p. 103, for one example).

Another area of costs not specifically addressed is the phenomenon of rising prices in a community experiencing an influx of tourists (Bull 1991, pp. 135-136; Pearce 1989, pp. 212-213). This is most apt to occur in relatively undeveloped areas where the tourists add considerably to the average daily census (*eg.*, Long 1991, p. 212). Land and housing prices, in particular, may rise rapidly, pricing many residents out of the market. Food prices may show extreme seasonal fluctuations, reflecting the ebb and flow of tourists.

This is certain a cost to residents. However, quantifying costs to the community is hindered by increased revenue of some residents who are able to capitalize on the situation. In addition, dual markets may arise, where locals pay lower prices for food and other items than are charged the tourists (Bull 1991, p. 136.). Additional study is required to map out the dynamics of this phenomenon, to determine the distributional consequences and the net impact on the residents.

Finally, further research is required on more accurate ways to measure the incidental costs of tourism. Much is conjectural at this point. Better measurement techniques will help ensure better decisions.

COMPARING BENEFITS AND COSTS

Once the economic benefits and the economic costs of travel have been computed on a sound and consistent basis, then we are in a position to determine whether a given tourism project or program is good for an area in economic terms, or whether it costs residents more than they gain. Similarly, we can analyze whether additional visitor promotion provides net benefits, and what direction this promotion should take (Travel Data Center *et al.* 1979).

Estimation of the ratio of benefits to costs is straightforward once these two magnitudes have been measured. Researchers must be clear about how they are measuring each, however. One British study compared tourism-related public service

costs in a local area to total visitor expenditures and found the ratio to be quite low (Heely quoted in Murphy 1985, p. 102) This finding is irrelevant to determining whether tourism benefits the community. Visitor expenditures are not a good measure of tourism benefits to the community, nor do public service costs include all visitor-imposed costs. Rather, this finding helps local authorities to determine how much to invest in developing the visitor market. Certainly, local authorities in this case should not spend anything to stimulate tourism if the £3.1 million they spent servicing visitors was not recouped in public revenues.

There is one additional issue that relates to the timing of costs and returns from public investment projects designed to serve travelers that must be resolved.

THE SOCIAL RATE OF DISCOUNT

When residents through their government contemplate investing public funds in a travel-related development project, such as a park or recreation area, highway, or visitor information facility, they should examine the total construction, operation and maintenance costs of the project. These costs, as well as benefits from the project, stretch out into the future as far as the useful life of the facility.

The total costs of the project stretch out in time over its useful life. However, we cannot simply sum over the time stream of costs because a dollar's worth of cost five years from now is not worth the same as a dollar's worth of cost today. We need a factor that will put all costs, no matter what year they occur, in terms of a consistent "present value." Benefits should be similarly treated.

A great deal has been written on devising a "discount rate" for valuing the streams of benefits and costs of a public investment project (Mikesell 1977). The debate has been quite technical and is not settled to the satisfaction of all. However, there is a strong case to be made for adopting a single approach for determining a public agency's "social rate of discount," the interest rate for collapsing all of the costs and benefits of a project over time into a consistent current value.

Government should be interested in maximizing efficiency in the use of the area's total economic resources. Specifically, this means that a dollar's worth of resources withdrawn from the private sector for public investment should earn the same rate of return as it would in the private sector. If the dollar earns less in the public project, then society is worse off after the public investment than before because a less productive alternative has been implemented.

Consequently, in evaluating the cost stream, government should determine the "opportunity cost of capital" in the private sector, that is, what the investment funds required for the public project would have earned if left in the private sector. This

interest rate is then used to discount future benefits, and compound present and future costs.

On the benefit side, a dollar's worth of some benefit, say income, in the future is worth less than a dollar received today (Samuelson and Nordhaus 1989, pp. 733-735). There are several ways of justifying this position, but one of the most lucid is to consider that a dollar received today can be invested in the private sector and earn a return, such as interest or dividends. So we say that a dollar received today is worth five percent more than a dollar received one year from now because we can invest today's dollar and earn five percent in a year. The other side of this coin is that the dollar received one year from now is worth five percent less than the dollar received today.

In the general case, if the interest rate of rate of return is *r*, and the number of years we are awaiting to receive the dollar's worth of income is *n*, then a dollar's worth of benefit received today is worth $\$(1+r)^n$ at the end of *n* years. This is also a measure of the return foregone by waiting to year *n* to receive our dollar's worth of benefit. That is, a dollar's worth of benefit in year *n* is worth $\$1/(1+r)^n$ today.

The resulting general equation for computing the present value of future benefits is,

$$PVB = B_0 + \frac{B_1}{(1+r)} + \frac{B_2}{(1+r)^2} + \ldots + \frac{B_n}{(1+r)^n} + \frac{S_n}{(1+r)^n} \qquad (3)$$

where
PVB = present value of benefits,
B_t = dollar value of benefits in time period *t*
r = opportunity cost of capital or some other social discount rate
n = life of the project in years
S = salvage value at end of the project's life.

While there is some debate over how to estimate the present value of future costs, the popular approach is to discount the current and future costs of a project in the same manner that benefits are discounted (see Mikesell 1977 for discussion of alternatives).

$$PVC = C_0 + \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \ldots + \frac{C_n}{(1+r)^n} \qquad (4)$$

where:
PVC = present value of costs
C_t = dollar value of costs in time period *t*
r = opportunity cost of capital
n = life of project in years

Finally, the present value of benefits is divided by the present value of costs, and if the ratio is higher than for any alternative use of the investment funds, then the project should be undertaken.

The comparison of the costs and benefits of a public investment project is quite sensitive to the discount rate employed. Most of the costs are incurred early in the project's life, so the present value of the costs does not vary much with the discount rate employed. On the other hand, the benefits flow over the life of the project rather than at the front end, many accruing far into the future. Thus the present value of benefits *declines* rapidly as the discount rate increases.

It has been a common practice in some public investment areas to keep the discount rate low to maximize the ratio of benefits to costs and insure project acceptance (Mikesell 1977, pp. 3-6). All this ensures is that investment resources are wasted as they are taken from their higher return uses in the private sector to be used in lower return projects by government.

In order to determine the opportunity cost of capital in the private sector relevant to a given project, we first determine whether the project has private sector counterparts. Campgrounds, resorts, transportation terminals and several other types of public investment projects are often financed by the private sector. In this case, the appropriate social rate of discount is the comparable real before-tax rate of return for the same project in a similar risk class.

If there is no private sector counterpart to the project being studied, then it is suggested that the average real rate on long term U.S. government bonds be used, with additional premiums to account for the risk of the investment and the average corporate tax rate on total returns to private capital investment.

This approach will help ensure that the social rate of discount is not set too low, distorting the flow of investment funds in the private sector and reducing economic welfare in general.

When all is said and done, benefit-cost analysis is just one fairly blunt tool in the decision-makers kit. In wielding this tool, it would be well to note the following perspective:

> Cost-benefit analyses can seldom provide complete answers. They are intended primarily to provide more information to decision-makers concerning the major trade offs and implications existing among the alternatives considered. This information would then be available for use by decision-makers, along with any other information available -- *eg.*, that pertaining to political, psychological, and other factors which may not have been included in the cost-benefit study. (Senate Committee on Government Operations 1967, p. 4).

CONCLUSION

These three chapters have attempted to address the nature, classification and measurement of the economic benefits and costs of tourism in a comprehensive manner. This broad coverage of issues and alternatives necessarily prohibits detailed examination of any one topic. However, the sources used are amply documented for those who wish to learn more about a single subject.

More attention has been devoted to the benefit side of tourism than the cost side. This is not because determining benefits is more important than understanding costs, but rather reflects the research resources that have gone into the two areas (Murphy 1985, p. 78). Future efforts are best directed at developing better techniques to measure costs in an objective manner, for it is here our knowledge is weakest. This ignorance gives rise to radical attacks on tourism as an activity and an industry from time to time, attacks that are ill-founded but capture the public's attention. We would all be better served by objective cost measurement rather than the speculation that has characterized many cost discussions so far.

The greatest rewards in terms of better public tourism development decisions will come with associating reliable estimates of economic benefits and costs with individual market segments. If agencies know which segments produce the greatest ratios of benefits to costs, they can invest their marketing dollars in attracting these segments, and their investment dollars in building the facilities that appeal to them.

This author hopes the future will bring a stronger interest in identifying the costs of tourism programs, and that this field will develop in stature and respectability. A field of study such as tourism impact best develops by building research upon research. The field will develop faster and to the greater good of the public and the industry to the extent that researchers share their findings and substitute sound quantitative techniques for judgment. It is disturbing to see today a number of tourism impact studies relying on the judgment of experts as they did 20 years ago. This is partly in response to the frustrations of trying to grasp the elusive concepts and practices of tourism, tourists, and the tourism industry.

But no field of study develops without diligence, perseverance in the face of difficulty, vision, and refusing to settle for second best. It is our hope tourism economic impact research will prove this rule again in the next twenty years.

BIBLIOGRAPHY

Baumol, William J., *et al.* (1970), *The Visitor Industry and Hawaii's Economy: A Cost-Benefit Analysis*, Princeton, NJ: Mathematica, 300 pp.

Baumol, William J., and Alan S. Blinder (1988), *Economics Principles and Policy: Microeconomics*, 4th edition, San Diego: Harcourt Brace Jovanovich, Publishers, 566 pp.

Bryden, J. M. (1973), *Tourism and Development*, Cambridge, UK: Cambridge University Press.

Bull, Adrian (1991), The Economics of Travel and Tourism, New York: John Wiley & Sons, 260 pp.

Cournoyer, Norman G. et al. (1975), Travel and Tourism in Massachusetts, Amherst, MA: University of Massachusetts, 250 pp.

Heeley, J. (1980), "Tourism and Local Government with Special Reference to the County of Norfolk" (2 vols.), unpublished Ph.D. dissertation, University of East Anglia, Norwich, England.

Long, Veronica H. (1991), "Government-Industry-Community Interaction in Tourism Development in Mexico," in M. Thea Sinclair and M. J. Stabler, editors, *The Tourism Industry: An International Analysis*, Wallingford, UK: C.A.B. International, pp. 205-222.

Mikesell, Raymond F. (1977), *The Rate of Discount for Evaluating Public Projects*, Washington, D.C.: American Enterprise Institute, 64 pp.

Murphy, Peter E. (1985), *Tourism, , A Community Approach*, New York: Routledge, 216 pp.

Northeast Markets, Arthur D. Little, and William Fothergill (1974), *Tourism in Maine: Analysis and Recommendations*, Yarmouth, ME, Northeast Markets, Inc., 250 pp.

Pearce, Douglas (1989), *Tourism Development*, 2nd edition, Harlow, England: Longman Scientific & Technical, 356 pp.

Prest, A. R. and R. Turvey (1967), "Cost-Benefit Analysis: A Survey", *Surveys of Economy Theory, Volume III, Resource Allocation*, New York: St. Martin's Press, pp. 155-207.

Samuelson, Paul A., and William D. Nordhaus (1989), *Economics*, 13th edition, New York: McGraw-Hill Book Company, 1053 pp.

Senate Committee on Government Operations, U.S. (1967), *Criteria for Evaluation in Planning State and Local Programs*, Washington, D.C.: U.S. Government Printing Office, 42 pp.

Tatzin, Donald L. (1978), "A Methodological Approach to Estimating the Value of Public Services Consumed by Tourists", *Using Travel Research for Planning and Profits, Ninth Annual Conference Proceedings,* Salt Lake City: The Travel Research Association, pp. 53-60.

Travel Data Center, U.S., and Fothergill/Beekhuis Associates (1979), *Delaware Tourism Policy Study*, Dover, DE: Delaware State Travel Service, 252 pp.

Tyrrell, Timothy J., William K. B. Emerson, and David E. Molzan (1982), *The Economic Impact of Tourism on Westerly, Rhode Island,* Kingston, RI: University of Rhode Island Agricultural Experiment Station, 71 pp.

Waters, Robert C., and Ramiro Valderrama (1984), "Derivation of Unit-Day-Values for Recreation Benefit Valuation in Water Resource Planning Based on a Comprehensive Theoretical Framework," technical completion report prepared for the Geological Survey, U.S. Department of the Interior, Washington, D.C., July, 28 pp.

Yochum, Gilbert R., and Vinod B. Agarwal (1987), "An Economic Evaluation of Advertising Expenditures for the City of Virginia Beach," *Travel & Tourism: Thrive or Survive, Eighteenth Annual Conference Proceedings,* Salt Lake City, UT: Travel and Tourism Research Association, pp. 131-145.

Zehnder, L. E., (1975), *Florida's Disney World: Promises and Problems*, Tallahassee, FL: Peninsular Publishing,