19. R.T. Michael and G.S. Becker. On the New Theory of Consumer Behavior. Swedish Journal of Economics, 75, 1973, pp. 378-396.
20. D.J. Aigner and J.A. Hausman. Correcting for Truncation Bias in the Analysis of Experiments in Time-of-Day Pricing of Electricity. The Bell Journal of Economics, Vol. 11, No. 1, Spring 1980, pp. 131-142.
21. SAS User's Guide, 1979 Edition, SAS Institute, Inc., Raleigh, N.C., 1979.

Publication of this paper sponsored by Committee on Energy Conservation and Transportation Demand.

Fuel Crises, Economic Uncertainty, and Outdoor Recreational Travel

MARY R. KIHL

ABSTRACT

An assessment was made of the effects of fuel availability, fuel price, and general economic conditions on attendance at national parks. The findings indicate that American propensity for outdoor recreational travel is strong enough to withstand the challenge of fuel shortage or economic uncertainty. This study demonstrates the resilience of outdoor recreational travel patterns in the decade 1973 to 1982. The challenges of two severe fuel shortages in 1974 and 1979 and periodic recessions, most notably in 1981-1982, caused only momentary and inconsistent variations in the outdoor recreational travel patterns of the American traveling public.

The focus of this study was a sample of 35 national parks selected from the list of national parks included in "The Statistical History of the National Park System" and a parallel sample of state parks selected from nine states in different regions of the country. First, a procedure is presented for considering the potential associations between attendance figures and fuel availability, fuel price, and the economy. Second, an assessment is made of the findings of a series of regression analyses, pertaining to both the national and the state samples. Third, available origin and destination information is reviewed so that the possibility of substituting closer trips to state parks for longer trips to national parks can be considered. The findings are then summarized and assessments presented.

PROCEDURE

Attendance patterns at national parks are frequently regarded as a barometer of outdoor recreational travel (1). This is in part because of the availability of a relatively consistent source of comparable data. For energy-related studies national park attendance has the additional merit of representing the choice of long-distance travel. Because travel to national parks generally requires advance planning, such travel could be deferred in response to concerns about fuel availability, fuel price, or the economy. The existing body of literature on national parks is substantial. Most of it is concerned with predicting demand for particular attractors or particular parks; for example, Cesario (2) cites and assesses numerous studies that have constructed models that use measures of park attendance as dependent variables and a variety of influencing factors as independent variables. Burton (3) reviews recreational forecasting studies in both the United States and England, and Cheung (4) assesses outdoor recreation participation models. Cheung's model incorporated population size, accessibility, alternative opportunities, and attractiveness into a regression model. No attempt is made in this study to add to this body of literature. Instead this study seeks to provide an aggregate longitudinal analysis of the impact of fuel availability, fuel price, or the economy on park attendance (5) and examine the potential for state parks as alternative attractors. [McAllister and Klett (6) introduced the effects of alternative recreational opportunities into a gravity model which would predict demand, but does not assess such impacts in a broadly based analysis of travel patterns.]

The 35 national parks in the study sample were selected from the list of national parks included in "The Statistical History of the National Park System" provided by the U.S. Department of the Interior. All facilities designated as national parks, as distinguished from national monuments, national forests, or national recreational areas, were included. An attempt was made to update and amplify the data supplied by the Interior Department through direct contact with each of the parks. Aggregate figures for 1981 and 1982 were requested as was information on the state of origin of the visitors. About 15 parks were able to provide updated aggregate attendance figures, but only 5 supplied

figures on the origin of visitors and even these data were not sufficiently consistent for a statistical analysis.

Parallel data on attendance at state parks were requested from and supplied by nine states. The states were selected for inclusion on the basis of the following criteria: either they were home states for a large number of travelers to those national parks supplying data on travelers' origins or they were states with a national park within their borders. In addition, an effort was made to include representation from states in different census regions of the country: the Northeast, the South, the Midwest, the Mountain States, the Southwest, and the Far West. The states included were Arizona, California, Colorado, Florida, New York, Ohio, Pennsylvania, Texas, and Virginia.

For each state both an urban park (one within an easy day's drive of a major city) and a rural park (requiring at least an overnight trip from a major city) were included. The expectation was that these state parks could serve as alternative but closer outdoor recreational trip generators. Travel to the more rural parks was expected to approximate the national travel patterns, whereas attendance at the more urban parks was expected to rise in years with fuel or economic crisis. Within each state the urban and the rural park that drew the largest number of attendees were selected. This was to ensure that these parks would be recognized by name and have attractiveness within their respective states.

Regression analysis was used to investigate the potential association between park attendance and fuel availability, cost, and the economy. To focus on explanations for relative changes in travel patterns, increase in park attendance was used as the dependent variable. This figure controlled for differences in overall attendance among parks and directed attention to relative changes in travel to the respective parks. The independent variables required a measure that would be reflective of fuel crises and a measure that would be reflective of economic conditions. The expectation was that the average daily supply of gasoline for each year would be a better barometer of fuel crises than the more elastic figure of gasoline price but both figures were obtained, the former from Statistical Abstracts and the latter from the U.S. Department of Energy monthly energy reports. Regressions were run using each variable independently.

Rate of unemployment was used as a rough surrogate for economic level, and it indicated considerable variation in the economy within the 10-year period. Unemployment for the individual states was used in association with the parallel studies of the state parks because of a need to reflect relative economic conditions at the travelers' place of origin. Unfortunately, there was no parallel consistent measure of the availability of gasoline at the state level. Controls in the form of the state or standard metropolitan statistical area (SMSA) population were also inserted into the regression equations as appropriate. [Bowes and Bloomis (7) have suggested the need to incorporate a correction factor for uneven population zones into the travel cost models developed by Clawson and Knetsch.] Because there was no way of identifying substitution of local travelers for distant travelers except where figures on origin of the traveler were supplied, these population figures provided a rough indicator of the potential for such substitutions.

Most studies of this type also include some measure of the intangible quality of park attractiveness (8-10), such as the number of park acres, hiking trails, and so forth. However, with a diverse set of parks including beaches as well as mountain camping locations, numbers of such attributes would be inappropriate. Consequently, as a rough measure of park attractiveness, this study used an index of park recognition that was based on an international travelers survey (11). It was assumed that parks recognized abroad would also be recognized attractors within the United States. In the survey sponsored by the U.S. Travel and Tourism Administration in the fourth quarter of 1982, international air travelers were asked to identify their specific destinations. The recognition index was constructed as follows:

- Park mentioned by fewer than 100 international travelers was assigned a value of 1.
- Park mentioned by 100 to 5,000 international travelers was assigned a value of 2.
- Park mentioned by more than 5,000 international travelers was assigned a value of 3.

More index points would have generated groups too small for manipulation in what was already a relatively small number of parks. This index places such well-known parks as Grand Canyon, Yellowstone, and Yosemite in the highest category as indicated in Table 1. The expectation was that economic levels and fuel crises would have a minimum effect on determination to visit such parks. What the study indicated, however, was that the recognition index was not a consistent indicator of attendance at national or state parks in general.

TABLE 1 Recognition Index for National Parks

Park Name	Index Value	Park Name	Index Value
Arcadia	1	Isle Royale	1
Arches	1	Kings Canyon	1
Badlands	2	Lassen Volcanic	1
Big Bend	1	Mammoth Cave	1
Biscayne	1	Mesa Verde	1
Bryce Canyon	2	Mount Rainier	1
Canyonlands	1	North Cascade	1
Capitol Reef	1	Olympia	2
Carlsbad	1	Petrified Forest	2
Crater Lake	1	Redwood	2
Everglades	2	Rocky Mountains	2
Glacier	1	Sequoia	2
Grand Canyon	3	Shenandoah	2
Grand Teton	1	Theodore Roosevelt	1
Great Smokies	2	Wind Cave	1
Guadalupe Mountains	1	Yellowstone	3
Hot Springs	1	Yosemite	3
		Zion	3

FINDINGS

As indicated earlier, a series of regression programs attempted to establish an association between variation in attendance at parks and the indicators of a fuel crisis or economic uncertainty. A quick overview of attendance figures at the national parks showed considerable declines in attendance coinciding with the fuel crisis years of 1974 and 1979 and with the economic downturns in 1975 and 1982. Eighty-three percent of the national parks registered declines in 1979, 73 percent in 1974, and 51 percent in 1977. Of those parks providing data for 1982, 90 percent reported declines in attendance.

Relationships between these variables proved to be insignificant, however, when the parks were viewed in the aggregate in terms of a regression equation. A model using increase in park attendance as the dependent variable and fuel barrels available, unemployment rates, and local population as

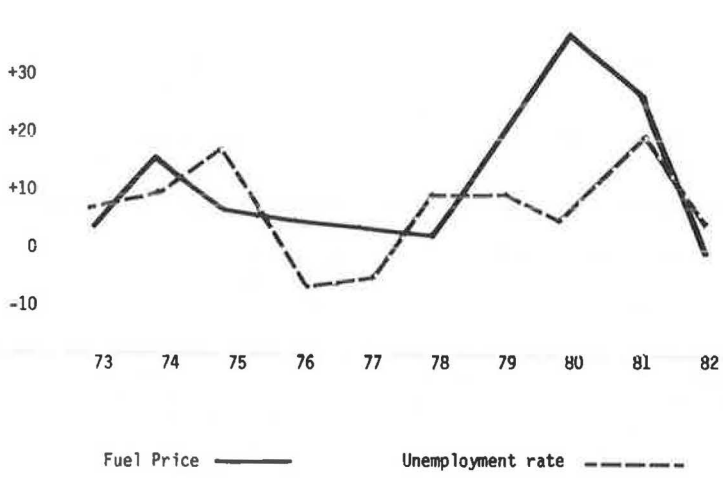

FIGURE 1 Relative increase in fuel price and unemployment rates by year.

independent variables generated an R-square value of only 0.02. For the state park sample, the same model generated only a slightly higher R-square value of 0.119. Substituting fuel price for barrels of fuel as a measure of the fuel crisis generated even lower R-square values: 0.002 for the national sample and 0.015 for the state sample, and eliminating the population figure reduced the R-square value even more.

The model was also tested by substituting changes in fuel price and unemployment rates. It was hypothesized that the traveling public might respond more to the degree of change in fuel prices and unemployment rates than to the actual numbers. The resulting R-square values were similar to those indicated previously: 0.03 for the aggregate national park sample and 0.19 for the aggregate state park sample.

A separate regression for 1979, the year with the highest percentage of decreases in park attendance, continued to yield a very low R-square value (0.06). The estimate for the intercept was 747.9 with the estimates for fuel barrels available, unemployment rates, and local population at -0.31, 43.38, and -0.01, respectively. The directionals did confirm that a decrease in fuel supply and an increase in the unemployment rate were associated with the decreased park attendance in 1979, especially where there was a lower local or state population. The F-value for the equation was, however, only 1.19--insignificant at even the 0.25 confidence level.

As Figure 1 shows, the years with the greatest increase in automobile fuel prices did not coincide with those years with the greatest increase in unemployment rates. In order to control for the possibility that the effects of one type of adverse conditions were offset by improvements in the other, individual models were developed for increases in fuel prices and increases in unemployment rates. Again, both models indicated insignificant levels of association with changes in park attendance. The correlation of changes in park attendance with changes in unemployment rates netted an R-square of only 0.04 while that associating increases in park attendance with changes in fuel prices was even lower, -0.02.

Further investigation led to an attempt to apply the model to the attendance records for each park individually. The results of this analysis indicated considerable variation among the parks. Although the model was significant at the 0.1 confidence level and produced an R-square of 0.81 for Hot Springs, Arkansas, for example, it continued to be insignificant in explaining changes in the attendance at a number of other parks. The R-square values for the model when population of the host state was included and when it was removed are indicated in Table 2 (national parks) and Table 3 (state parks). The data in both tables clearly indicate the impact of local population on attendance. For states with large populations, such as California, the number of potential local visitors was far more significant than

TABLE 2 R-Square Values for National Parks Included in the Sample

Park	R-Square with Population, Fuel, and Unemployment	R-Square with Only Fuel and Unemployment
Arcadia, Maine	.02	.008
Arches, Utah	.05	.005
Badlands, S. Dak.	.03	.01
Big Bend, Tex.	.42	.42
Biscayne, Fla.	.64	.52
Bryce Cannon, Utah	.77[a]	.46
Canyonlands, Utah	.15	.14
Capitol Reef, Utah	.47	.17
Carlsbad Caverns, N. Mex.	.49	.49
Crater Lake, Oreg.	.04	.02
Everglades, Fla.	.87[b]	.50
Glacier, Wash.	.79[a]	.42
Grand Canyon, Ariz.	.67	.28
Grand Teton, Wyo.	.64	.64[a]
Great Smokies, Tenn.	.47	.27
Guadalupe Mountains, Tex.	.37	.36
Hot Springs, Ark.	.81[a]	.80[c]
Isle Royale, Mich.	.51	.50
Kings Canyon, Calif.	.11	.03
Lassen Volcanic, Calif.	.42	.20
Mammoth Cave, Ky.	.24	.20
Mesa Verde, Colo.	.56	.42
Mt. Rainier, Wash.	.35	.30
North Cascade, Wash.	.55	.51
Olympia, Wash.	.20	.14
Petrified Forest, Ariz.	.38	.34
Redwood, Calif.	.63	.20
Rocky Mountains, Colo.	.11	.09
Sequoia, Calif.	.62	.62[a]
Shenandoah, Va.	.09	.05
Theodore Roosevelt, N. Dak.	.52	.44
Wind Cave, S. Dak.	.12	.02
Yellowstone, Wyo.	.29	.22
Yosemite, Calif.	.20	.18
Zion, Utah	.15	.13

[a]Significant at the 0.1 confidence level.

[b]Significant at the 0.05 confidence level.

[c]Significant at the 0.025 confidence level.

TABLE 3 R-Square Values for State Parks Included in the Sample

Park	Rural or Urban	R-Square with Population, Fuel, and Unemployment	R-Square with Only Fuel and Unemployment
Yuma, Ariz.	R	.90	.73
Picacho, Ariz.	U	.38	.36
Roosevelt, Pa.	U	.48	.40
Pymatuni, Pa.	R	.83	.77
Humbolt, Calif.	R	.90	.34
Huntington Beach, Calif.	U	.21	.17
Pocahontas, Va.	U	.62	.46
Hungry Mother, Va.	R	.83	.33
Cherry Creek, Colo.	U	.71	.25
Lathrop, Colo.	R	.90	.89[a]
Tyler, Tex.	U	.35	.28
LBJ, Tex.	R	.67	.39
Fugh Taylor Birch, Fla.	U	.98[b]	.90
Myakka River, Fla.	R	.27	.21
Jones Beach, N.Y.	U	.61	.26
Walkins Glen, N.Y.	R	.37	.26
Houston Wood, Ohio	U	.34	.32
Lake Hope, Ohio	R	.96[b]	.53

[a]Significant at the 0.05 confidence level.

[b]Significant at the 0.025 confidence level.

either the measure for the fuel crisis or the economy. Understandably, out-of-the-way parks in states with lower population levels were affected more by national concerns about fuel and the economy.

A quick review of Table 3 (state parks) appears to support the expectation of differences between patterns of attendance in urban and rural parks. Rural parks appear to be affected much more by fuel shortages and the economy than the more urban parks, a finding that might suggest the substitution of a trip to a nearby recreational park for a more distant one. Yet, taken as a whole, the differences between urban and rural park attendance proved to be insignificant. This was true especially when local population was removed from the model.

Clearly differences in individual parks accounted for far more of the variability in attendance records than was indicated by the aggregate model. Attendance at individual national parks, such as Grand Teton, Hot Springs, and Sequoia, appears to have been more highly affected by national concerns about fuel and the economy than attendance at less well-known, remote parks such as Arcadia and Arches. Telephone discussions and notes from those responsible for data collection at the parks helped to confirm observations about the importance of concerns specific to a given park in determining attendance. Factors, such as reports of poor fishing, road construction, marketing campaigns, and the installation of new electronic counters, were used to explain changing attendance patterns at different parks.

As indicated previously, insufficient comparable data were available to allow an assessment of changes in attendance patterns of visitors to national parks or to determine whether the use of aggregate attendance figures masked the substitution of visitors from short distances for those from long distances. Nevertheless, some preliminary observations can be made from the information supplied by five parks: Rocky Mountain, Petrified Forest, Carlsbad Caverns, Capitol Reef, and Yellowstone. Although these parks were arbitrarily selected and, therefore, observation cannot be generalized, they do represent a fairly good cross section of the parks in the national park study. They are in five different states and include two parks ranked at 1 on the recognition index, two ranked at 2, and one ranked at 3.

Because information was supplied in different forms by these parks, a simplified common method of analysis was applied to all. Visitor index scores were constructed for each park for each year for which information was supplied, and the names of the five states supplying the greatest number of visitors were noted. A value of 1 was assigned to the host state of the park, 2 to a neighboring state, 3 to another state in the same region as the park, 4 to a state in an adjacent region, and 5 to a state across the country (12). These scores were then weighted to indicate the ranking of highest down to fifth highest number of visitors. The scores for the appropriate states were then multiplied by the weights and the total scores for individual years were obtained by adding the weighted state scores.

For example, in 1980 the highest number of visitors to Capitol Reef Park in Utah was from Utah; the second highest number of visitors was from California, a state in the region; the third highest number was from Colorado, a neighboring state; the fourth highest number was from Arizona, a state in the region; and the fifth highest number was from Florida, a state across the country. Therefore the total visitor index score was 34. The procedure for assigning visitor index scores is given in Table 4.

TABLE 4 Procedure for Assigning Visitor Index Scores

State Contributing Most Visitors	Index Value		Weight		Score
Utah	1	x	5	=	5
California	3	x	4	=	12
Colorado	2	x	3	=	6
Arizona	3	x	2	=	6
Florida	5	x	1	=	5
Total visitor index score					34

Higher scores indicated a greater number of visitors from distant states. When these visitor scores were compiled for each year for which information was supplied, the scores appeared to be remarkably consistent for each park.

- The scores for Capitol Reef were 34 in 1980, 33 in 1977, 33 in 1976, and 35 in 1975.
- For Petrified Forest the scores were 47 in 1982, 41 in 1981, 48 in 1980, and 48 in 1940.

- Rocky Mountain had scores of 39 in 1975, 1974, and 1953.
- Carlsbad Caverns had scores of 38 in 1979, 37 in 1968, 38 in 1964, and 40 in 1960.
- Yellowstone showed the greatest variation: 37 in 1981, 37 in 1980, 44 in 1977, and 52 in 1976.

Only Yellowstone showed any substantial substitution of more local for more distant visitors in recent years. Generally, the variation was minor, one state replacing a neighboring state in the list of the five states providing the highest number of visitors to a particular park. With so small a sample it is impossible to detect a general trend. Nevertheless, these observations do lend support for initial statements about persistent trends in travel patterns.

CONCLUSIONS

In general, the American traveling public appears determined to pursue plans to visit national parks despite the challenges provided by fuel shortages and economic uncertainty. A closer look at individual parks indicated that the impacts of such national concerns were more apparent at some parks than at others. Additional case studies would be needed to determine why attendance at some parks has been affected more than that at others. The recognition index used in this study proved to be inconclusive in providing explanations. It was true that parks with high recognition levels, such as Grand Canyon, were not affected significantly despite remote locations, but attendance at a number of less well-known parks also proved to be affected insignificantly.

Attendance patterns at state parks generally mirrored those of national parks rather than providing any clear indication that they became alternative closer destinations when travel to national parks was more difficult. State parks near cities did not generate significantly different attendance patterns from more rural parks when the model was controlled for local population size. Again, further study would be needed to explain why some state parks seemed to be more affected than others.

A study of this type can offer no proven explanation for the apparent resilience of outdoor recreational travel patterns. Several potential explanations, however, are suggested for further study.

It is possible that in times of fuel shortages the American traveling public will make alternative provisions for in-town regular trips, such as work or shopping trips, and reserve their automobiles for planned vacations or weekend trips to state parks (13). Where public transit or carpools are viable alternatives for daily travel, this type of tradeoff might well be feasible.

The national survey conducted in connection with the Third Nationwide Outdoor Recreation Plan offered further support for the findings of this study (14). The study indicated that expenditures for recreational participation have been affected less by inflation or recession than by other types of expenditures (15). The survey was conducted in 1977 after the first major increase in fuel prices and before the second. Respondents were asked whether the increase in price of gasoline had caused them to take fewer outdoor recreational trips. Fifty percent answered no, 47 percent answered yes, and 3 percent had no opinion. When asked whether the price of gasoline caused them to make shorter trips, 49 percent answered yes, 47 percent answered no, and 4 percent had no opinion. Changing travel patterns among 49 percent of the traveling public would indeed make a difference in attendance patterns, and it is true that for most parks attendance did decline in years of crisis.

One-half of the respondents, however, indicated that they had not made fewer recreational trips. This group would not have deferred a planned trip to a national or state park. The respondents to the national survey were also asked whether doubling the fuel price would affect their future travel to outdoor recreation. Eighty percent said that it would. However, despite a doubling of the gasoline price from $0.62 in 1977 to more than $1.20 in 1982, this study revealed little actual change in recreational trips, at least not in trips to national or state parks. The focus on relative increases or decreases in attendance by park indicated that even in 1979 the level of decrease was only significant for a few parks.

Further study would be needed to indicate whether there was an increase in use of city parks during the crisis years of the 1970s. Individuals who deferred travel to national parks also might have found that travel to state parks represented too great an expenditure of fuel or funds and may have substituted a visit to a city or regional park.

REFERENCES

1. B. Duffield. The Nature of Recreational Travel Space. In Recreational Economics and Analysis, G.A.C. Searle, ed., London Graduate School of Business Studies, Jan. 1972.
2. F.J. Cesario. A New Method for Analyzing Outdoor Recreation Trip Data. Journal of Leisure Research, Vol. 7, No. 3, 1975, pp. 200-215.
3. T. Burton and A.J. Veal. Experiments in Recreation Research. Rowman and Littlefield, Totowa, N.J., 1971.
4. H.K. Cheung. A Day-Use Park Visitation Model. Journal of Leisure Research, Vol. 4, 1972, pp. 139-155.
5. M. Olsen. Assessing the Social Impacts of Energy Conservation. In Social and Political Perspectives on Energy Policy, K. Gentemann, ed., Praeger, N.Y., 1979, p. 76.
6. D. McAllister and F. Klett. A Modified Gravity Model of Recreational Activity with an Application to Ski Trips. Journal of Leisure Research, Vol. 8, No. 1, 1976, pp. 21-33.
7. M.D. Bowes and J. Bloomis. A Note on the Use of Travel Cost Models with Unequal Zonal Populations. Land Economics, Vol. 56, No. 4, 1980, pp. 465-470.
8. F.J. Cesario. A New Method for Analyzing Outdoor Recreation. Journal of Leisure Research, Vol. 10, No. 2, 1978.
9. H.M. Van Lier. Comments on the Article of F.J. Cesario. Journal of Leisure Research, Vol. 10, No. 2, 1978.
10. F.J. Cesario. A New Method for Analyzing Outdoor Recreation Trip Data: A Reply. Journal of Leisure Research, Vol. 10, No. 2, 1978.
11. Transportation Systems Center, U.S. Department of Transportation. In-flight Survey: United States Travel and Tourism Administration Survey of International Air Travelers. U.S. Travel and Tourism Administration of the U.S. Department of Commerce and the National Park Service, U.S. Department of the Interior, 1982.
12. J. Knetsch. Assessing the Demands for Outdoor Recreation. In Outdoor Recreation Planning, B.L. Driver, ed., University of Michigan, University Microfilms, Ann Arbor, 1970, pp. 131-136.

13. P. Hazen. Recreational Travel Planning from the Federal Highway Administration Perspective. Proc., First Annual Conference on Recreation Planning and Development, Vol. II, 1979, p. 509.
14. The Third Nationwide Outdoor Recreation Plan, Appendix II. Heritage Conservation and Recreation Service, Dec. 1979.
15. The Third Nationwide Outdoor Recreation Plan, Executive Report. Heritage Conservation and Recreation Service, Dec. 1979, p. 23.

Publication of this paper sponsored by Committee on Social, Economic and Environmental Factors of Transportation.

The Scenario Analysis Process and Long-Range Transportation Planning

JOHN M. MORDECAI

ABSTRACT

An 18-month study of a prototype application of a scenario planning methodology for public planning is documented. The scenario technique is intended to address concerns about long-range planning in the light of uncertainties about the future by considering the interaction of a few key variables. By assigning values to each of the variables and considering their interaction, a panel of policy makers generates several hypothetical scenarios of the future that provide a context for considering directions for future public policy. The key variables were oil supply, economic activity, and technological change. The scenario process is described and a summary is given of the substantive findings. Also the value of scenario analysis as an adjunct to the ongoing, conventional transportation planning process is assessed.

It is fairly accurate to describe long-range transportation planning as a process that projects future conditions based on existing trends and implicit assumptions about the key interrelationships between transportation and other factors, such as land use or the economy. The projected future conditions describe a set of needs on which plans and programs are based. Of course, the problem with this conventional approach is that it breaks down when the future is not a neat extension of the present or when the assumed relationships are altered. This was illustrated by the energy supply disruptions of the 1970s, which created departures from expected trends in travel behavior and gave new importance to sets of interactions that had never before been given serious attention, such as the linkage between the demand for transportation and the ability of the government to finance transportation investments. The demonstration project conducted by the Baltimore, Maryland, Regional Planning Council from fall 1981 to spring 1982 was an effort to focus more attention on unexpected changes in energy and other conditions that have a significant bearing on transportation and to consider more fully the interactions among transportation, energy, and other matters of primary importance to the region.

The project used a planning technique called multiple scenario analysis, which has been used frequently by private industry and research groups to improve planning for an uncertain future. The process consists of examining the interaction of a limited number of key factors that are expected to have a fundamental influence on future needs. By assigning several plausible but widely differing values to the selected factors and combining them in different ways, several hypothetical pictures of the future can be derived. Individually, the alternative future conditions pose unique problems and demand individualized public responses; collectively, they are intended to encompass the full range of possible futures and assure that the planning process has addressed them.

In the Baltimore study, a group of officials from the public and private sectors examined four futures (called scenarios) that were typified by variations in (a) availability of energy for transportation, (b) economic conditions, and (c) commercialization of technology. The interactions of the key variables with regional conditions brought to light a number of transportation issues (some were already part of the conventional transportation planning process and some were new) that demanded consideration of new policy and program responses and suggested important linkages between transportation and other functional areas of the regional planning process. The intent of the study was to generate discussion of these new concerns and to consider public-policy options in response to them.

STUDY CONTEXT, THE BALTIMORE REGION

The Baltimore region lies in the lower portion of the northeast corridor, which includes Boston, New