Consumer Reactions to the Standby Motor Fuel Rationing Plan

JOHN L. CROMPTON AND RICHARD J. GITELSON

A study is reported which assessed the reactions of automobile travelers to potential gasoline rationing and pricing situations which are projected to occur if the 1980 standby motor fuel rationing plan is implemented.

There are good reasons to think that the problems gasoline shortages created in the 1970's were but previews of the coming attractions of the 1980's—not in every year, but in some.1

This type of assessment appears to be widely supported by government officials and politicians and increasingly recognized by the general public. In the past, federal reaction to energy shortfalls has taken the form of a variety of ad hoc, spontaneous, and uncoordinated actions, owing to the lack of a coordinated energy plan for dealing with such contingencies. The lack of conformity in responding to a shortfall caused uncertainty among drivers, and this uncertainty had the effect of magnifying the impact of shortfalls on inhibiting travel.

In 1980 the President and the Congress finally agreed upon a motor fuel rationing plan. The perceived value of this standby motor fuel rationing plan is that it injects more certainty into a highly unstable environment as well as offering a relatively equitable solution to the problem. The study reported here was concerned with assessing the reactions of automobile travelers to potential rationing and pricing situations that are projected to occur when the standby rationing plan is implemented.

The automobile travel industry in the United States consists of a wide variety of disparate types of businesses. When all these businesses are aggregated and considered as a total industry, the size of that industry makes it one of the largest in the United States. In 1979, American travelers spent $126 billion on trips to places 100 miles or more from home. Over 83% of this travel was by automobile. This is considerably more than Americans spent for clothing, for the purchase of automobiles, or for national defense. In fact, the only items in the family budget that exceeded the spending for travel were food, housing, and income taxes.2

The travel industry supports about 5 million jobs and is one of the top three industries in almost all of the 50 states.

Some indication of the impact of gasoline shortages on this industry was provided in a report by the Texas Tourist Development Agency. This agency estimated that if gasoline stations were closed during weekends, at least 14,000 travel-related jobs would be jeopardized and $19 million in state tax receipts and $560 million in total travel revenue would be lost in the state of Texas alone.

BACKGROUND TO THE STANDBY MOTOR FUEL RATIONING PLAN3

The starting point of the energy crisis could be identified as November 15, 1973. On that day President Nixon recommended that all gasoline stations be closed from Saturday evening to Monday morning. This reduced availability of gasoline brought the energy problem to the forefront of attention for the American people. One of the leading legislators associated with developing the standby plan observed:

Gasoline rationing is very, very good to contemplate if you have not studied it and do not think about how to implement it. The more familiar one gets with gasoline rationing, the more horrendous it is in its administration, the more unfair it is, and the more wasteful it is. It is nevertheless necessary under some circumstances.4

Developing a program for rationing gasoline is an extraordinarily complex undertaking. Any gasoline rationing plan will inconvenience large numbers of automobile users and will cause hardships to many persons. However, when a serious shortfall occurs, gasoline rationing is likely to assure access to some gasoline by all motorists at a reasonable controlled price, help to eliminate waiting lines, stabilize the market for gasoline, and mitigate the economic dislocations caused by a severe petroleum shortage.


After Congress rejected an earlier plan, the President’s standby motor fuel rationing plan became effec-
tive in August 1980 when the Congress failed to disapprove of it. Under the terms of the plan, the President has two options, if he wishes to put it into effect: (1) If the President finds that a shortfall with respect to projected normal demand of at least 20% is likely, he may implement rationing unless either house of Congress disapproves within 15 days; (2) If the President wishes to implement rationing at a lower percentage of shortfall, he may do so if both houses approve within 30 days.

IMPLEMENTING THE STANDBY PLAN

The two practical alternatives for distributing ration allocations to individuals are on the basis of licensed drivers or registered vehicles. In both cases, lists are maintained by states' departments of motor vehicles. The Department of Energy concluded that a plan based on vehicle registrations would be more equitable and less difficult to implement than one based on drivers' licenses.

The Department of Energy will distribute the ration rights by printing and mailing ration checks to the estimated 140 million eligible recipients, who will in turn, exchange the checks for ration coupons at designated issuance points. Issuance points will include such organizations as commercial banks, savings and loan associations, major employers, credit unions, post offices, state and local government agency offices, and major retail establishments such as supermarkets and department stores.

After national reserves and priority allocations have been made, allocations will be made by the Department of Energy to the states on a basis which takes into account historic differences in the use of gasoline among states. The basic eligibility for ration allotments will be determined by vehicle registration records maintained in the individual states' departments of motor vehicles.

The Department of Energy will establish different allotments for different types of vehicles. Allotments will be based on an average annual fuel consumption of vehicles in various categories and will be made for each type of vehicle. All vehicles within a given category (for example, all passenger cars) will receive the same ration allotment in a given state regardless of fuel efficiency. This will give a significant advantage to fuel-efficient vehicles and should provide an incentive for their use during a period of rationing.

Implementing this standby plan would be the biggest distribution problem government has ever addressed—even bigger than social security. It will take a minimum period of 7 to 9 months to implement from the time a national emergency shortfall is declared, and it may take as long as 15 months. In this interim period some alternative strategies such as odd-even days or weekend closing would have to be implemented by the states.

Under the standby plan, ration coupons that have not been redeemed will be freely transferable on a white market. There will be no regulation of the price at which they are transferred. Hence, those who wish to exceed their allocated ration may do so by purchasing coupons from willing sellers.

RATIONING AND PRICING IMPLICATIONS

OF THE STANDBY PLAN

The ration allocation to each vehicle will depend upon the magnitude of the supply shortfall and the particular situation existing within each state. However, if a 20% shortfall should occur, the Department of Energy provides the following estimate of per vehicle allocation:

The average amount of gasoline used in a month by the average American is about 60 gallons; a 20 percent shortfall would mean that driver would receive 48 gallons per month. From that figure amounts have to be taken off to supply a National reserve and a State reserve, necessary to meet emergencies. In addition the plan provides priority special allotments for certain designated users such as agricultural needs, public health and service, and commerce. This would leave the average driver in the average State with between 40 and 42 gallons a month. Hence, if a 20 percent shortfall occurred, the average driver would receive about a one-third shortfall in his or her gasoline use as his or her basic allocation.

State allocations will be based on historical use patterns which vary quite extensively, as do the number of commercial entities within a State which qualify for priority allocations. When these variations are taken into account, it has been estimated that the average motorist will receive coupons allowing the purchase of 40-42 gallons of gasoline per vehicle a month, give or take 8 gallons, depending on whether the motorist lives in a high consumption or low consumption state.

For any gasoline above this basic allowance, citizens will have to buy surplus coupons in the white market. The Department of Energy estimates that the coupons will sell at $1.60 per gallon, which when added to the existing price of, say, $1.10 per gallon, means that these extra gallons will cost $2.70 per gallon.

OBJECTIVES OF THE STUDY

The primary objective of the study reported here was to investigate the reactions of different types of automobile travelers to future gasoline rationing and increases in gasoline prices. Insight into the form which rationing will take, and the likely magnitude of price increases which will accompany its associated white market, is provided by the President's standby motor fuel rationing plan. Assessment of the probable impact of implementing this plan is important to policymakers, especially those concerned with the $126 billion travel and tourism industry.

The travel industry traditionally recognizes three major market segments. Hence, it was hypothesized that reactions to rationing and price increases were likely to differ according to whether the traveler was on business, visiting friends or relatives, or on a pleasure vacation. In addition, the study sought to identify differences among subsegments of respondents within each of the primary market segments. The subsegments were defined on the basis of sociodemographic variables and trip behavior.

METHODOLOGY

Instrument Development

A pilot study in which approximately 92 respondents were interviewed at the Texas State Highway Department's welcome center at Orange,
Texas, was completed in the late summer of 1978. As a result of this experience, major revisions were made to the data collection instrument and in selection of appropriate analytical techniques.

The revised instrument was subsequently tested at the Texarkana welcome center in the spring of 1980. It encountered some respondent resistance because of its length. Hence, it was shortened from four pages to one page and further pilot tested before the study commenced. After data collection was one-fourth complete, the positive reaction of respondents encouraged the researchers to attach a second page to the questionnaire. When all data had been collected, a regression procedure was performed which indicated that the addition of the second page did not significantly change respondents' answers to questions on the first page.

The seven gasoline rationing or pricing scenarios which were included in the instrument were based on situations which the Department of Energy projected were likely to occur if the standby plan is implemented. Three of these scenarios were concerned with rationing. The standby plan projected a basic allocation to the average motorist of approximately 40 gallons per vehicle per month, if a 20% shortfall in petroleum supplies occurred. Since this figure would either increase or decrease according to the situation in a particular state, the impacts of rationing at 30, 40, and 50 gallons per vehicle per month were explored.

It is projected that, from the time a crisis occurred, a 9- to 15-month period would be required before the standby plan could be implemented. Interim measures would have to be taken to effect the necessary immediate response which a 20% shortfall would demand. Past experience has shown that one of these interim responses is likely to be the widespread closing of gasoline stations during weekends. The travel industry is particularly concerned with the impact of weekend closing, since of the total person-trips to destinations 100 miles or more from home some 40% are weekend trips. Hence, this rationing scenario was also included.

Finally, respondent reactions to price rises of 25¢, 75¢, and $1.25 were sought. White market purchases of ration coupons are likely to cost approximately $1.60. The lower two price levels reflect possible price increases which may occur, without a major crisis, under the same market operating conditions as those which have raised prices so rapidly to their existing levels or by increases in the gasoline tax. President Carter's proposal for a 10¢ per gallon tax increase was rejected by Congress in 1980 but it is possible a similar proposal may emerge in the future. Indeed, presidential candidate John Anderson proposed a 30-cent per gallon tax increase on gasoline as a means of reducing demand. This is a substantial increase over the average 14 cents a gallon tax currently paid by American motorists, but it is relatively small when compared to the $1.83 per gallon tax in Italy and the $1.62 per gallon tax in France.

The price scenarios were intended to reflect a rapid short-term increase instigated through new OPEC pressures, by imposition of a substantial increase in the federal gasoline tax, or by purchases on the white market in the event of rationing. The scenarios were not intended to reflect escalation brought about over a longer time period as a result of gradual inflation. In such longer term situations, the impact of inflation would make such increases less likely to meet consumer resistance since the price of other products which may serve as reference points that determine expectation, and consumers' own incomes, would also be inflated.

It was recognized that presenting gasoline rationing and price increases as mutually exclusive scenarios was an oversimplification. If the standby plan is implemented both are likely to occur together. However, the plans for dealing with this combined impact proved to be too complex for respondents to evaluate the implications meaningfully. It was concluded that seeking reactions to the interactive effect of various levels of rationing and pricing would result in a loss of validity. It seems likely that the interactive effect of both rationing and price increases would have greater negative impact on travel than either strategy alone. Hence, it was rationalized that the results of this study would represent a minimal impact of the standby plan on travel behavior.

To identify the impacts of these scenarios on the travel behavior of different types of travelers, a series of sociodemographic and trip variables also was included in the data collection instrument.

Data Collection Procedures

All data were collected by personal interviews administered by three trained interviewers at four Texas state welcome centers. There are 14 welcome centers in the state of Texas. These centers are located on the border of the state adjacent to major interstate highways serving the state. Initially, three visitor centers were chosen for the study, Orange, Texarkana, and Wichita Falls. Their selection was based on geographic considerations as they represent primary access points into Texas from the south, northeast, and north respectively. Gainsville, which is located on another major access route from the north, was subsequently substituted for Wichita Falls because of the light traffic flow experienced at Wichita Falls during the period when the questionnaire was being administered. A regression procedure indicated that the different sites did not influence the study results.

The welcome centers provide travelers with restrooms and information concerning various attractions and destinations within the state. Most of this information is located in the lobby area and is readily available to visitors. However, visitors must interact with one of the welcome center representatives in order to receive a state map and specific travel assistance. Visitors are made aware of this service when they enter the welcome center by one of the representatives.

Center representatives directed travelers who approached them to study interviewers, after they had helped travelers with their specific questions. Travelers were told that the study concerned trip decisions based on various fuel prices and ration plans, and that the standardized interview would take 3 to 5 minutes to complete. Over 92% of those requested by the center...
representatives to take part in the study completed the standardized interview.

The sample used in this study consisted of 1,816 respondents. Dates and locations for the interviews were randomly selected from May through the middle of July 1980, which constituted the study period, in order to obtain a reasonably diverse cross-section of respondents and to increase generalizability of the results. These are shown in Table 1.

### TABLE 1
**DATA COLLECTION TIMES AND LOCATIONS**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>Orange</td>
</tr>
<tr>
<td>16-17</td>
<td>Texarkana</td>
</tr>
<tr>
<td>24-25</td>
<td>Orange</td>
</tr>
<tr>
<td>30-31</td>
<td>Orange</td>
</tr>
<tr>
<td>June</td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td>Wichita Falls</td>
</tr>
<tr>
<td>10-11</td>
<td>Texarkana</td>
</tr>
<tr>
<td>18-19</td>
<td>Orange</td>
</tr>
<tr>
<td>27-28</td>
<td>Gainsville</td>
</tr>
<tr>
<td>July</td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>Gainsville</td>
</tr>
<tr>
<td>10-11</td>
<td>Gainsville</td>
</tr>
<tr>
<td>15-16</td>
<td>Orange</td>
</tr>
</tbody>
</table>

Characteristics of the Sample

At the beginning of the study it was intended that three primary market segments would be investigated: business travelers, travelers visiting friends and relatives, and travelers on a pleasure vacation. It has been shown that each of these groups exhibits different travel characteristics. Therefore, it was hypothesized that each segment would react differently to rationing and price increases.

However, initial data analysis suggested the existence of a fourth segment among the study population. This segment was composed of respondents who combined a pleasure vacation with a visit to friends and relatives. It has been shown that each of these groups exhibits different travel characteristics. Therefore, it was hypothesized that each segment would react differently to rationing and price increases.

However, initial data analysis suggested the existence of a fourth segment among the study population. This segment was composed of respondents who combined a pleasure vacation with a visit to friends and relatives. It was decided to include this segment in the analysis for two reasons. First, a substantial proportion of the sample indicated their trip had these combined purposes. Second, a series of chi-square tests indicated that these respondents exhibited a different sociodemographic profile and different trip behavior than either the pleasure vacation segment or the visit friends and relatives segment.

Data were collected from 2,160 respondents of whom 1,816 (84%) were categorized into one of these four travel categories. The remaining responses were discarded for the purpose of this analysis. The number and proportion of the sample in each of the four primary market segments is shown in Table 2.

### TABLE 2
**PURPOSE OF TRIP**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasure vacation</td>
<td>32</td>
<td>579</td>
</tr>
<tr>
<td>Visit friends or relatives</td>
<td>23</td>
<td>414</td>
</tr>
<tr>
<td>Business</td>
<td>19</td>
<td>341</td>
</tr>
<tr>
<td>Pleasure vacation and visit</td>
<td>26</td>
<td>482</td>
</tr>
<tr>
<td>friends or relatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>1816</td>
</tr>
</tbody>
</table>

The salient sociodemographic characteristics of the sample included:

1. Respondents in all four primary segments were predominantly male, reflecting the tendency of males to serve as spokesmen for travel groups.
2. The main difference in age profiles was the relatively large proportion (34%) of those visiting friends and relatives who were in the over-59 age group. In the other three segments the modal age was the 30-39 cohort.
3. Household income levels of respondents in three of the four segments were reasonably similar with modes in the $16,000-$24,000 cohort or the $24,000-$32,000 cohort. Those traveling on business reported generally higher household incomes with 26% of them reporting over $40,000.

The trip behavior characteristics of the sample were unsurprising. Salient features included:

1. Compared to the other three segments, a large proportion of businessmen (46%) were on trips of three days or less.
2. Only 17% of that segment were on a trip of 8 days or more, compared to 43, 34, and 66% for the pleasure vacation, visiting friends and relatives, and vacation/visiting segments, respectively.
3. The modal group size for three of the segments was two, but 44% of those traveling on business were traveling alone which was the mode in that segment.
4. The planning horizon of business travelers was shortest (67% planned their trip less than two weeks ahead of time). The modal trip planning period for pleasure vacationers and the vacation/visiting segments was one to three months. Like business respondents, those visiting friends and relatives reported a mode of less than two weeks, indicating relatively little trip planning was undertaken.
5. Eighty-eight percent of the total sample were on a trip in excess of 100 miles and there were no significant differences between these respondents and those traveling on trips of less than 100 miles.
6. The main difference between the four segments in the one-day distance traveled from home to the primary destination was the farthest distance traveled by the vacation/visiting segment (40% of this group were on a trip of over 1,000 miles and a further 27% on a 501-1,000 mile trip).

These characteristics illustrate the wide representation from many subsegments included within the total sample, suggesting that the study offers reactions to gasoline rationing and price increases from a wide cross-section of automobile travelers.

### ANALYSIS

Respondent Reactions to Price Increases

Respondents in each of the four primary market...
segments were asked if they would still have made their present trips in the same vehicles if various levels of price increase were in effect. The results are graphically displayed in Figure 1 and summarized in Table 3.

If the price of gasoline was increased by 25¢ per gallon, it would have a relatively small negative impact on any of the four market segments. Only between 8% and 11% of respondents from each segment indicated they would not have made their present trips.

When the price increase was raised to 75¢ per gallon a radically different picture emerged. At this level, only approximately one-third of respondents in the three nonbusiness segments indicated they would have definitely made their trips. Analysis of variance and Duncan's multiple range tests statistically confirmed that there was a significant difference (.01 level) among these three segments and the business segment in which almost twice as many respondents (61%) indicated their trips definitely would have been undertaken.

Given a price increase of $1.25 per gallon respondents reacted similarly, but more emphatically, than they reacted to the 75¢ level of increase. Only 17% of pleasure vacationers and vacation/visitors and 23% of those visiting friends and relatives were confident they would still make their present trips with a gas increase of $1.25 per gallon over present prices. Again Duncan's test statistically confirmed (.01 level) the difference in the business segment in which 53% of respondents confirmed their trips would proceed.

Respondent Reactions to Rationing

Respondents were asked if they would still have made their present trip in the same vehicle if various levels of gasoline rationing were in effect. The results are summarized in Table 3 and graphically displayed in Figure 2.

The impact of rationing even at the relatively generous level of 50 gallons per vehicle per month was severe in all four market segments but Duncan's test identified that three significantly different levels of severity were apparent (.01 level). Least affected were business travelers, almost half of whom would have still made the trip. Most affected were the pleasure vacation and vacation/visiting segments, of whom less than one-quarter would have undertaken the trip, while one-third of those visiting friends and relatives were confident their trip would have proceeded.

The same three levels of severity, identified at the 50-gallon level, again were statistically apparent when gasoline rationing was reduced to 40 gallons. In three of the four market segments, a reduction in the gasoline allowance of one-fifth, from 50 gallons to 40 gallons, resulted in a decrease of over one-half in the number of respondents indicating they would still make the trip. The business segment was a little more resistant, but even there only 32% of respondents would have proceeded. At this level of rationing, long distance automobile travel, for all purposes except business, appears likely to become almost extinct since only 10, 11 and 15% of respondents in the pleasure vacation, vacation/visiting, and visiting friends or relatives segments,
FIGURE 2
THE PROPORTION OF RESPONDENTS IN EACH OF THE FOUR PRIMARY MARKET SEGMENTS WHO WOULD HAVE UNDERTAKEN THEIR PRESENT TRIP GIVEN THREE DIFFERENT RATIONING SCENARIOS

respectively, were confident they would have made the trip.

As expected, the trend toward a decreasing number of trips in all segments continued when the gasoline allowance was reduced to 30 gallons per month per vehicle. The same three statistically significant different levels of impact identified in the previous two rationing scenarios reappeared. However, from a practical standpoint, the proportion of travelers still confident of making the trip at this level of rationing is so low in the three nonbusiness segments (6, 11, and 7%) that any differences among them are unimportant. The reduced rationing allowance had relatively little additional negative impact on business automobile travel.

Finally, insight was sought into the impact on respondents’ present trips if gasoline were not readily available on weekends. This had the least impact of any of the rationing scenarios, suggesting that many respondents could schedule their trips to avoid traveling longer distances at weekends. Duncan’s multiple range tests indicated statistically significant differences (.01 level) among business travelers, who were affected least by weekend unavailability; those vacation/visiting or visiting friends and relatives; and pleasure vacationers, who were affected most, with only one-third of them indicating they would still make the trip. Although weekend unavailability had a less inhibiting effect on automobile trips than the other three rationing scenarios in all four primary market segments, its likely effect is still devastating.

Reactions of Subsegments of Respondents to Price Increase and Rationing Scenarios

Relationships were sought within each of the four primary market segments between the sociodemographic and trip behavior variables, identified previously in the description of the sample’s characteristics, and the decision to proceed with the trip given the various pricing and rationing alternatives. A series of Pearson product moment correlations were computed to test these relationships. The level of associations between the selected variables and the alternative strategies were weak. Strongest correlations were yielded by gross household income, which was positively related to the three pricing strategies in the visiting friends or relatives segment. However, even here the levels of association ranged only from .164 to .254.

The very low correlations which these tests revealed are consistent with the findings of other investigators. After a comprehensive review of the literature, O’Leary and Yu concluded that “except in a few cases, traditional socioeconomic and demographic variables have not been useful predictors to discriminate responses to questions dealing with attitudes and behavior about energy use and conservation.” The findings of the study reported here suggest their conclusion can be extended to include trip behavior variables also.

Potential Shifts to Alternate Transport Modes

Respondents were asked whether they would have made their trip by some other form of transportation if gasoline price increases or rationing made the trip by automobile nonfeasible. Responses differed in an expected direction (Table 4). Among pleasure vacationers, only 23% indicated they definitely would have found an alternate means of transport, but this proportion increased in the vacation/visiting and visiting friends or relatives segments. The proportion peaked in the business segment where 53% indicated their trip definitely would have proceeded.

TABLE 4
THE EXTENT TO WHICH RESPONDENTS IN EACH OF THE FOUR PRIMARY MARKET SEGMENTS WOULD BE PREPARED TO USE AN ALTERNATE FORM OF TRANSPORTATION IF IT WERE NONFEASIBLE TO MAKE THEIR PRESENT TRIP BY AUTOMOBILE

<table>
<thead>
<tr>
<th>Purpose of Trip</th>
<th>Pleasure Vacation</th>
<th>Visit Friends or Relatives</th>
<th>Business</th>
<th>Vacation/Visiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would not make the trip</td>
<td>58%</td>
<td>38%</td>
<td>36%</td>
<td>45%</td>
</tr>
<tr>
<td>Not sure</td>
<td>19</td>
<td>18</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Yes—fly</td>
<td>9</td>
<td>19</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Yes—some other form of transportation</td>
<td>14</td>
<td>25</td>
<td>28</td>
<td>17</td>
</tr>
</tbody>
</table>

These data appear to reinforce the observation that the automobile is an ingrained habit in American society. Respondents indicated that when faced with the alternatives of either no travel or traveling shorter distances, these were more preferable to a majority of them than shifting to an alternate travel mode. The mode of travel appears less likely to shift than the pattern of travel.

The decision of some in the pleasure vacation and
visiting/vacation segments not to make their trips by alternate form of transport may reflect the importance of en route vacation travel. If the flexibility offered by the automobile is removed, substantial benefits from the trip may be eliminated for some people.

However, the primary significance of these data may lie not in the finding that a majority of respondents in most segments would not make the trip, but rather in the relatively substantial minority who indicated they would seek other means to make the trip. This contrasts with the conclusions of Burke and Williams, who reported there was likely to be no shift to mass transportation when gasoline shortages arise: "Apparently, people will drop out of the market rather than switch to planes, trains and buses." Given the limited excess equipment capacity available in other transportation modes, such a large proportion could not be accommodated. It has been estimated that the airlines have existing surplus equipment capacity to absorb only between 2 and 5% of long-distance automobile travelers, while combined bus and rail spare capacity could absorb only 1%. Hence, it might reasonably be concluded that the determining factor in curtailing long-distance automobile travel, given severe gasoline price increases or rationing, will not be consumer unwillingness to shift modes, but rather the lack of available alternate mass transit to transport them.

CONCLUSIONS AND IMPLICATIONS

There are some limitations to the study which should be recognized when interpreting the data. First, the magnitude of reductions shown may not be fully realized because shorter trips may be substituted for the present trip which was the focus of this study. Similarly, respondents were asked to react to the scenarios under the assumption that they would use the same vehicle in which they were currently traveling. Some vehicle substitution may occur through respondents using smaller vehicles which would enable them to continue to make the same trip.

A second limitation, which again may have led to some exaggeration of the impact of rationing, resulted from offering respondents mutually independent pricing and rationing scenarios. Some respondents may not be constrained by rationing to the extent they indicated since they could take advantage of the white market and buy more gallons from that source. However, this gasoline is likely to cost an additional $1.60 per gallon and, given the relatively small proportion of respondents who indicated they would make their trip if a $1.25 price increase were imposed, this potential limitation seems likely to have only marginal impact.

There is some evidence which suggests that the sociodemographic profiles of visitors to highway welcome centers differ from those of all automobile travelers. However, a reasonably varied sociodemographic and trip behavior cross-section of the population was represented in this study. Further, biases in the distribution of these groups were not of primary concern since the focus was on exploring differences in reaction among market segments rather than on the distribution of those segments in the automobile population.

The state welcome centers were used for the study because it was considered imperative that respondents to the gasoline rationing and pricing scenarios react to the汽油 in a realistic context. It was recognized that it is more difficult to obtain valid and reliable answers when respondents are asked to project themselves into a future hypothetical situation than when they are requested to report on their past or current behavior.

Nevertheless, the nature of the problem provided no alternatives to respondents' projecting themselves into a future situation. The conditions created by the standby plan would be unprecedented, making futile the extrapolation of projections based on past behavior. An effort was made to ameliorate this limitation by aligning the future scenarios as closely as possible to respondents' current behavior. This was facilitated by interviewing at state welcome centers respondents who were then currently involved in a trip. Respondents were asked "Would you still have made this trip in your present vehicle under the following conditions?" The seven scenarios described previously were then presented. By asking the respondents their reactions to the gasoline rationing and pricing scenarios in relation to their present trip, it was anticipated there would be high awareness of the cost implications of those scenarios for the present trip. At the same time, it seemed likely that the benefits of the trip would be prominent in respondents' minds so trade-offs could be made in a reasonably realistic framework. Hence, effective visualization of the scenarios and their impact was facilitated by the immediacy of respondents' current experiences.

This subject area is not peripheral to the life-styles of these travelers; rather, it is likely to be of central interest and concern. The reality of a major shortfall in gasoline supply was reinforced during the data collection period by publicity given to Congress' acceptance of the standby plan, the continuing crisis in the Middle East, and periodic presidential appeals. The immediacy and concern which the prospect of an emerging shortfall provokes gives added encouragement for believing responses were reasonably accurate.

Figures 3 through 6 show the various impacts of the seven scenarios in each of the four primary market segments. The figures emphasize the substantially greater impact of rationing. In the three nonbusiness segments (Figures 3, 4, and 6) it would take a price increase of $1.25 per gallon to achieve a comparable impact to that achieved when rationing is enforced at a level of 50 gallons per vehicle per month. In the business segment even this substantial increase in price would not reduce long-distance automobile traffic as much as the most liberal rationing level.

Implementing substantial price increases of the magnitude of $1.25 as an alternate to rationing is unlikely to be politically tenable. It would exacerbate societal inequities since price increases would be regressive, disproportionately affecting low and middle income groups. Rationing has been officially adopted as the supply control mechanism in the event of a gasoline shortfall, and this situation seems likely to survive any changes in the political balance of power.

The cost of implementing the standby rationing
plan will be between $2 and $4 billion and will take be-
tween 7 and 15 months to implement. Given these cost
and logistical factors, it is conceivable that if the level of
gasoline shortfall is sufficiently small, and the shortfall
is perceived to be a relatively short-term phenomenon,
then a price increase of somewhere between 25¢ and 75¢
per gallon may be viewed as more appropriate than ra-
tioning even though it would act regressively. Such a
price increase would be likely to cause a short-term
decrease in long-distance automobile travel which might
be sufficient to restore gasoline supply-demand equilib-
rium.

FIGURE 3
THE PROPORTION OF RESPONDENTS IN THE PLEASURE
VACATION MARKET SEGMENT INDICATING THEY WOULD
DEFINITELY MAKE THEIR PRESENT TRIP GIVEN
DIFFERENT PRICING AND RATIONING SCENARIOS

FIGURE 5
THE PROPORTION OF RESPONDENTS IN THE BUSINESS
MARKET SEGMENT INDICATING THEY WOULD DEFINITELY
MAKE THEIR PRESENT TRIP GIVEN DIFFERENT PRICING
AND RATIONING SCENARIOS

FIGURE 4
THE PROPORTION OF RESPONDENTS IN THE VISITING
FRIENDS AND RELATIVES MARKET SEGMENT INDICATING
THEY WOULD DEFINITELY MAKE THEIR PRESENT TRIP
GIVEN DIFFERENT PRICING AND RATIONING SCENARIOS

FIGURE 6
THE PROPORTION OF RESPONDENTS IN THE VACATION/VISITING MARKET SEGMENT INDICATING THEY WOULD
DEFINITELY MAKE THEIR PRESENT TRIP GIVEN
DIFFERENT PRICING AND RATIONING SCENARIOS
In each segment the major pricing impact comes at 75¢. However, although the 25¢ price level appears to have only a relatively small impact by reducing long-distance travel by some 20% in the three nonbusiness segments and 12% in the business segment, its potential impact on the travel industry is significant. For many small firms a decline in long-distance automobile business of 10-20% is likely to be the difference between profit and loss for the year.

The relative inelasticity of the business sector was expected and is in general accord with other studies reported in the literature. It may reflect some awareness that, if the standby plan is implemented, businesses will receive a priority allocation above the basic allowance. However, the inelasticity is only relative. In absolute terms the business segment demonstrates substantially reduced long-distance automobile travel in most scenarios, suggesting the potential substitutability of the telephone, telex, or letter.

The data suggested that the unavailability of gasoline at weekends in all segments would have a similar impact to increasing price by 75¢ per gallon (Figures 3, 4, 5, and 6). Hence, these two strategies may be reviewed as substitutable alternatives for reducing long-distance automobile travel.

Given the relative inelasticity of the business segment the travel industry may usefully try to convert the business traveler into a leisure-business traveler through promotional campaigns. This would represent a new primary market segment similar to the visiting/vacation segment used in the study reported here. Although this is worth exploring further, evidence provided by Woodside and Reid does not offer much encouragement. They concluded, “Business and leisure do not appear to readily mix in the travel market. . . . Some travelers show some propensity for fitting the business time into their leisure travel schedule, but few appear willing to do the opposite.”

The greater impact of rationing compared to price increases appears to contradict the findings of Williams and his colleagues, who reported, “The overall effects of rationing at 40 gallons per vehicle per month do not appear to be as great as those associated with fuel prices above $1.25 and beyond.” The same study also concluded, “Longer trips are severely curtailed when gasoline prices reach the $1.50 per gallon level.” The study reported here indicates that severe curtailment is not likely to occur until a price somewhat higher than this is reached. The relatively small impact of pricing suggests that many implicitly recognize that gasoline is still a bargain—and if the European experience is any indication, it will remain a bargain at $2.00 and more a gallon.

The relative inelasticity of price reported in this study supports the findings of Kouris, who used econometric and statistical techniques. He demonstrated the inelasticity of price in the European Economic Community countries following substantial price increases resulting from the 1973 oil crisis. He reported that in the E.E.C. area the 1973-74 crisis affected consumption for only 12 months. Since 1975 the level of consumption has become almost identical to that before the crisis.

Similarly, in their longitudinal study of 900 panel members Willenborg and Pitts concluded, “The price mechanism did not act as a deterrent to drivers, even in a period of unusually rapid and steady price increases. An extremely inelastic demand situation seems to have prevailed.” They found that although gasoline prices increased 45-50% between mid-1973 and mid-1974, these increases had negligible effect on the number of miles driven. After June 1974, prices of gasoline stabilized and consumers adapted to the new higher price levels.

The evidence in the study reported here appears to confirm that rationing is the more effective course of action to pursue if a severe cut in gasoline demand has to be enforced. The data reinforce the contention of previous researchers that policy-makers are not likely to be successful in reducing gasoline consumption by using the price mechanism, at least not through small or gradual increases.

This study indicated that if a major increase such as 75¢ per gallon is imposed an immediate reduction in demand would occur. However, other researchers have indicated that this reaction would probably be short-lived. Monroe recognized that consumers have an adaptation level, which implies that the important element in price perception is the relationship of the present price to its previous level. After a relatively short period of time, the 75¢ increase is likely to be perceived as the normal level of price and constitute the base from which new price increases will be evaluated. At that time, previous consumption patterns would be resumed as if nothing had happened. As Kouris noted, “In periods of sharp price increases people tend to realize that they can do with less car usage and endeavor to restrain consumption. This reaction, however, tends to be short-lived as past habits soon prevailed.”

These conclusions lead to some important policy implications. If a substantial tax is imposed upon gasoline it may raise considerable public revenue, but its success in reducing gasoline demand is likely to be short-term. The imposition of a gradually escalating tax or price increase, rather than a sudden one, is likely to have almost no impact on reducing gasoline consumption.

Although respondent reaction to the scenarios was severe, the situation is likely to improve over time. The present stock of automobiles is changing but still largely reflects the historically low price of energy. Higher gas prices and the provisions of the standby plan both provide economic incentives to shift to smaller cars. In the long term, consumer reaction to gasoline prices is fairly elastic as people shift from larger to smaller vehicles. Hence, the relative cost of travel will be lower and the distances that can be traveled with a given gasoline allocation will be higher. This suggests that those travel-related businesses which are able to survive any immediate traffic reduction which occurs when the standby plan is implemented should not be threatened further unless the initial rationing allowance is subsequently reduced.

The significance of the findings in this study lies in the relative magnitude of the impact of the various
scenarios on long-distance automobile travel. Destinations or attractions located far from population centers, which rely heavily on travelers arriving by automobile, are confronted with potentially disastrous situations if the standby plan is implemented. Places such as Lake Tahoe, the Monterey peninsula, and Las Vegas, where the majority of visitors arrive by car, will suffer considerably from any of the rationing scenarios explored in this study. This will be particularly true in areas which are now well served by airlines, buses, or trains. In contrast, resorts or attractions close to big cities will prosper as people are forced to substitute closer-to-home trips for long distance trips.

The potentially severe impact of even liberal rationing scenarios suggests that businesses in the travel industry should have a standby marketing and service delivery plan ready to implement at the time the federal government implements the standby rationing plan. Failure to act now and prepare this strategy will force the travel industry to react in a hasty, ad hoc, spontaneous fashion rather than enable them to respond by implementing a coordinated alternate plan. The standby plan injects a level of certainty into the future and travel businesses should respond to it at this time to lay the basis for their future survival.

Essential components of such a standby marketing plan would appear to include packaging trips; securing mass transit access to the destination or attraction; converting the business segment to a business-leisure segment; and focusing marketing efforts on target markets closer to the business, destination, or attraction.

3. This background material is adapted from the Federal Register, December 10, 1980 and from Hearings Before the Senate Sub-committee on Energy Regulation, January 28, 1980.
8. Somerset R. Waters, The Big Picture '79-80, p. 36.