

- Miles Traveled by Selected Regulated Motor Carriers. Mitre Corp., McLean, VA, MTR-7081, Jan. 1976.
11. Empty/Loaded Truck Miles on Interstate Highways During 1976. Bureau of Economics, Interstate Commerce Commission, 1977.
  12. A.W. Todd. Impact, Knowledge, and Choice—One Company's Management of Inbound Transportation. Proc., Transportation Research Forum, Vol. 20, No. 1, Richard B. Cross Co., Oxford, IN, 1979.
  13. Motor Vehicle Facts and Figures, 1978. Motor Vehicle Manufacturers Association, Detroit, Dec. 1977.
  14. R.E. Knorr and M. Millar. Projections of Direct Energy Consumption by Modes: 1975-2000 Baseline. Argonne National Laboratory, Argonne, IL, ANL/CNSV-4, Aug. 1979.
  15. R.E. Knorr and K. Wilkie. An Analysis of a Coal Brokerage for a Midwest Site. Argonne National Laboratory, Argonne, IL, ANL/CNSV-TM-21, Oct. 1979.
  16. R.E. Knorr, S.J. Labelle, and M. Millar. Markets for New Transportation Technologies: Changing Energy Use Futures. Pergamon Press, Inc., New York, Oct. 1979.

## Consumer Reactions to the 1979 Gasoline Shortage

Jill L. Habermann (in conjunction with a presentation by Lois Jacobini)

The gasoline crisis of 1979 started on the West Coast of the United States nearly four months after the Iranian revolution in December 1978. The revolution precipitated the cutoff of approximately 500 000 bbl/day of crude oil normally destined for U. S. markets (500 000 bbl of crude oil represents approximately 10 million gal of gasoline). Reactions from every sector of the economy set in as the gasoline shortages spread.

To understand the underlying motivations for the reactions from consumers, industry, and government during the gasoline shortage, it is necessary to understand the relation of the average U.S. citizen to the automobile in psychological terms. Paul W. McCracken, who received the National Automobile Dealers Association's Freedom of Mobility Award in 1979, remarked that "a strategy for a national energy policy, which assumes automobiles must be abolished...will fail because it will fail to perceive the extent to which an automobile is for the common man not only the symbol, but an important source, of freedom." Right or wrong, decision makers in the United States tend to perpetuate this concept of the automobile as a symbol of freedom. Consequently, many decisions concerning gasoline were shortsighted and sought only to increase supplies. Short-term plans that perpetuate the use of the private automobile as the primary travel mode—for example, automobiles that are more fuel-efficient and gasohol to stretch fuel supplies—are more popular and pose fewer political and economic risks. The alternative, which is long-term planning, involves changes in life-styles, such as carpooling and using mass transit.

The issue at hand is not to evaluate the U.S. love affair with the automobile; rather, it is to evaluate the reactions to the 1979 shortage in relation to reactions to the 1973-1974 shortage and to speculate on future implications.

Richard J. Barnet, who wrote *The Lean Years: Politics in the Age of Scarcity*, calls for the development of a high degree of public participation, understanding, and decision making, which would lead to the development of a sense of stewardship. Stewardship is the concept that each one of us has the responsibility to inform ourselves and evaluate our past and current actions in order to plan for the future. This paper develops the thesis that the kind of information available to the U.S. public and the manner in which it was presented was a major factor in the types of consumer responses that occurred during the first six months of 1979. These reactions, in turn, motivated many government and industry decisions that did not necessarily accurately reflect needs.

Extrapolating Barnet's stewardship theory, I submit that the development of a national energy-awareness program is important to ensure rational, nondisruptive, long-term planning for energy conservation in the transportation sector. Some 50 percent of the petroleum imported by the United States is used to fuel personal motor vehicles. The

average citizen used 11.7 bbl of gasoline in 1979, compared to 2.8 in France, 1.8 in Italy, 2.8 in the United Kingdom, 3.2 in West Germany, and 1.9 in Japan. Faced with an inexorably diminishing world petroleum supply, the United States must divide up available sources among transportation, agriculture, residential, and industrial sectors. With cooperation, communication, and accountability at every level of society, the United States can conserve and reduce foreign oil imports. The transportation sector is potentially the flagship sector for assessing the U.S. commitment to energy-conservation awareness.

### REGIONAL DIFFERENCES

#### Quality of Information Flow

In any situation, one's reactions are usually based on two types of information: actual first-hand experience and information culled from a variety of second-hand sources. Most people consciously evaluate the information received from second-hand sources (i.e., television, newspapers, annual reports, and government documents) before taking action. When the gasoline lines started in California, most citizens were already aware of the correlation between the Iranian oil shutoff and scattered predictions of spot shortages nationwide. Nevertheless, there was little continuity in the information made public at first. The White House balked at giving the nation a realistic report, i.e., that gasoline was going to be expensive and in short supply. The White House was concerned that too much publicity would trigger the same panic buying, hoarding, and topping off that exacerbated gasoline shortages during the 1973-1974 oil embargo. Also, it was unwilling to take responsibility for the inevitable negative reactions to mandatory rationing and conservation plans.

The quality and consistency of the information flow represent the first step in establishing a sense of awareness in the consumer that leads to rational action, an evaluation of consequences, and a new awareness. The then DOE Secretary James Schlesinger announced on February 10, 1979, that the halt of Iranian oil exports was "prospectively more serious" than the oil embargo of 1973-1974. Then, four days later, the vice chairman of the Ford Motor Company, Phillip Caldwell, said that this gasoline crisis would not be as severe as the crisis caused by the 1973 cutoff because there were more gasoline stocks available and more fuel-efficient cars being manufactured. (The average automobile in 1979 got 16.4 miles/gal compared to the 1974 figure of 13.7 miles/gal.) U.S. Deputy Secretary of Energy John O'Leary warned on that same day that the current fuel pinch was but a foretaste of permanent shortages that could appear by 1981. The chairman of Exxon Corporation, C. C. Garvin, shortly thereafter

commented that the allocation system instituted by DOE was largely responsible for the gasoline shortage.

Other groups issued conflicting data as well. The U.S. Library of Congress issued a study on March 1, 1979, which concluded that the shortage in the United States was not related to foreign production shortages but to inventory mismanagement and market manipulation by the oil companies. Another study by the Office of Technology Assessment, an arm of the U.S. Congress, questioned the continued viability of the automobile as the primary method of personal transportation. Many different kinds of figures were used and manipulated by various groups, confusing the public and leading to widespread cynicism as to the credibility and motives of the federal government and of the oil companies.

### Action Groups

Faced with a myriad of conflicting data, consumers and industry were hard pressed to present a united plan of action to their respective subgroups. Sectionalism and polarized positions developed as each of the various groups assessed its gasoline needs in terms of the total supply available—understanding that its gains would be another group's loss.

Negative reactions set in as various groups fell into the pattern described by Harold Wakeley in his study on predicting consumer responses to gasoline shortages. Wakeley notes the division of these reactions into two types: (a) the reactance theory, which is the belief that a person will respond with hostility to a perceived loss of freedom of choice, and (b) the learned-helplessness theory, which is the belief that the ability to control future situations is based on a person's perception of how much control he or she had over a similar past situation. For example, after the initial shock and subsequent reactions to the gasoline shortage, special-interest groups began organizing to influence regulatory and legislative action and to take positive action in order to alleviate obvious setbacks, such as reduced availability and higher prices. One group, the gasoline retailers, organized into state associations and proposed a nationwide shutdown of service stations for four days to protest DOE's controls on gasoline prices. The U.S. Department of Justice sought a court order to prevent the shutdowns. Traveling salespeople launched a campaign to petition for special exemptions such as those received by doctors, farmers, and truck drivers. A group of service station operators, represented by the Independent Gasoline Marketers Council, sued DOE and sought to bar it from enforcing its stand-by gasoline-allocation plan, which they claimed discriminated against independent dealers. The dealers said DOE's regulation, which would bar the imposition of previously deferred price increases during emergencies, would cause economic hardships for the independents.

### Federal Responses

DOE had two mechanisms with which to handle the gasoline shortage. One was the federal stand-by gasoline-rationing plan, the regulations for which were not completed until January 1980, and the second was the gasoline-allocation program that was theoretically in place at the time the shortage began.

Development of the federal stand-by rationing plan was a long and arduous process that began in February 1979 with the White House calling for patriotic voluntary energy-conservation measures, such as increased use of carpooling and mass transit and strict observance of the 55-mph speed limit.

The call for voluntary measures prefaced the White House's request to Congress (February 26, 1979) to give the President stand-by authority to order four types of energy-conservation measures, depending on the state of emergency. These measures would close service stations on weekends or Sundays; order employees, including those of

state and local governments, to restrict commuter parking (to force the use of mass transit); ban the use of electricity for neon signs and other outdoor lighting (largely a symbolic gesture); and restrict the range of temperature settings for thermostats in public buildings.

This major gasoline-rationing plan was eventually scrapped, a victim of special-interest lobbying. The plan, as originally written, would be triggered by a severe energy-supply interruption. Owners of registered vehicles would have received gasoline-rationing checks every three months, which were redeemable for coupons. Coupons would then be redeemable for a certain number of gallons based on the type of vehicle to be used during those three months. Recipients of the coupons would be allowed to sell them on a white market. Essential services would receive as much fuel as needed, with farmers receiving top-priority allotments. A mechanism would allow each state to distribute coupons for hardship cases as needed. Congress would have 60 days to approve the plan, following a formal request for authority by the President. The cost to set up the approved rationing system was estimated at \$53.4 million for 1979 and the same for 1980. The plan is similar to the one proposed by former President Gerald Ford, except that the allotments in his plan were to be based on licensed drivers rather than on registered vehicles.

President Carter's gasoline plan was discussed in Congress for seven months and changed substantially three times before the U.S. Senate passed the measure. (The major change based allotments on statewide consumption of gasoline rather than on the number of registered vehicles; this favored rural states.) The U.S. House of Representatives, split by parochial interests, turned down the Senate's plan. It then proposed its own plan, which called for one driverless day per week per car and a \$5 minimum purchase for gasoline to prevent topping off.

The Senate then rejected the House version and passed its own measure suggesting that the President develop a federal plan and the governors develop their own state plans. The Senate's suggestion was eventually adopted by DOE with White House approval. The Senate proposal encourages states to draft energy-saving plans best suited to their regions and then to send them to Washington for federal approval. The President was authorized to draw up a national conservation plan, effective in the event of an emergency in a state that had no prepared or approved plan.

News articles did not herald this suggestion as the first acceptable federal stand-by gasoline-rationing plan. Most news articles carried headlines with negative connotations. No emphasis was placed on the fact that the Congress and DOE, with the approval of the White House, decided to share the responsibility of long-term energy-conservation planning with state and local governments through transportation modification. So, although the states experienced more responsible participation, the general public was still digesting contrary information and had no motivation to provide responsible input.

The U.S. General Accounting Office (GAO) called DOE's gasoline-allocation plan a chaotic program in need of overhaul. DOE has legislative authority granted by Congress (in 1973) to manage supply distribution when shortfalls drop below 20 percent. When the 1979 supply shortage developed, federal and state governments were not prepared to manage the supplies. The allocation system is supposed to allocate supply according to a historic base period. In other words, suppliers sell gasoline to purchasers based on the volume they bought in 1973. Essential purchasers receive a 100 percent allotment, and nonessential purchasers receive a fraction of their base-period volume. DOE was in charge of allocating supplies from the refiner to wholesalers to retail stations to bulk end-users. DOE failed, mainly because its program was five years old and the historic base-period volume statistics were inapplicable. The day-to-day operations were inadequately managed, and auditing enforcement and information-monitoring facilities did not exist in a usable form. DOE also lacked the ability to provide program

guidance to states to help them administer their set-aside programs. Lack of planning prior to the 1979 shortage meant that DOE was trying to create a viable program in the midst of the shortage—changes were made on an ad hoc basis with limited information.

In a report on gasoline allocation (April 1980), GAO recommends that the allocation program be revised. It emphasizes that there should exist distinct but complementary roles and responsibilities for government and industry and that unnecessary government regulation be avoided and industry be allowed to exercise its operational judgment within clearly defined and understood guidelines and regulations. Strong monitoring, compliance, and enforcement divisions are critical to the prevention of allocation abuses in the future. Instituting a rolling base period, instead of a historic base period, would provide a much more accurate reflection of supply and distribution patterns, thus enabling DOE to work more effectively with state and local governments.

#### State and Local Responses

State and local responses to regional shortages are examples of attempts to achieve a workable balance between alleviating short-term crisis-oriented problems and planning ahead to forestall similar, future supply disruptions.

The general public is aware of the different types of plans organized by state and local governments at the beginning of what seemed to be a shortage that would rival the one created by the 1973-1974 OPEC oil embargo. The plans included flag systems to denote gasoline supply status at specific stations, gasoline sales on an odd-even license-plate system, topping-off penalties, minimum- and maximum-purchase requirements, weekend closings, and so forth. The point is that state governments took the initiative to prevent panic buying and to spread supplies as evenly as possible throughout the course of one month's gasoline allocation.

For the most part, customers obeyed these mandatory rules. The success of the different types of imposed sale restrictions was due to the perception that a shortage did exist. But imposing mandatory restrictions, such as rationing, gasoline price decontrol, and economic penalties for downtown parking, can only be effective in the short run because the imposed rules do not educate the consumer as to how to plan and participate in long-term energy-conservation behavior.

Local transit operators have been successful in both contingency planning and in conservation-awareness development. They have developed societal goals, specific objectives, and performance indicators—all necessary components for a long-range conservation program.

The American Public Transit Association (APTA) emphasizes that predictable federal funding will allow public transit systems to formulate long-term plans with high energy-conservation savings. According to APTA, transit buses are up to 15 times more energy-efficient than automobiles, achieving 280 passenger-miles/gal compared to the 19 passenger-miles/gal achieved by the average commuter automobile. Transit riders saved 37 165 000 bbl of petroleum fuel in 1978. If funds can be guaranteed (\$50 billion will be needed over the next decade), intercity transit-system development is a solution that will both conserve energy and maintain the freedom of mobility so important to people in the United States.

Federal support of urban mass transit system improvements is growing. President Carter's plan sets aside \$2.41 billion for mass transit financing. These funds are essential, as pointed out by former U.S. Secretary of Transportation Brock Adams. He voiced skepticism that public transit could be a short-term or a long-term solution to cut down energy use unless adequately funded. He stated:

I'll get as many people out of cars and into mass transit as I can, but the most I can see doing is 15 to 20 percent, if all works well.... If we had a 10 percent shift of people (immediately) away from their automobiles, it would

swamp us—overload the public transportation system. Trains, planes, and buses all share only 15 percent of the travel between cities; the other 85 percent go by car.

Public-awareness programs that present clearly stated facts comparing the cost-effectiveness of public and private transportation help motivate consumers to consider making the work trip by public transit rather than by private automobile. An informed consumer is a rational consumer. An aware consumer is a consumer who will make decisive efforts to think in terms of long-range goals.

#### Priorities

Short-term goals cater to a crisis-oriented society and to special-interest groups. For example, production priorities set by U.S. refiners and by political considerations created the so-called heating oil and gasoline controversy that pitted the short-term political goals of the Carter administration against the various business and consumer interests affected by the menace of a summer gasoline shortage. DOE called for the oil industry to build up middle-distillate stocks, including diesel fuel and heating oil, from 114 million bbl in April 1979 to 240 million bbl by October 1979. Many industry representatives questioned the wisdom of reducing gasoline availability during the summer driving season to assure adequate heating supplies the following winter. The types of priorities set up by DOE and the White House demonstrate the importance that awareness of needs plays in determining both long-term national programs and short-term, special-interest programs.

Another example of a short-term goal taking priority is state and local efforts to acquire more diesel fuel as demanded by businesses in specific areas. Instead of considering the long-term issue, which is what increased diesel-fuel use will do to the air quality, the federal government sought to meet the demand from states for increased diesel fuel to alleviate the demand for gasoline. Promoting strict air pollution standards—a long-term beneficial social goal—would slow diesel-automobile development and make unavailable to the U.S. public an automobile that would have 25-30 percent greater fuel efficiency than a gasoline-powered car. Again, the priorities of the federal government showed a greater commitment to the short term than the long term.

The state and federal gasoline-allocation plans discussed earlier prioritize long-term considerations, as well as provide mechanisms to alleviate short-term supply shortages. DOE has been setting voluntary state gasoline-conservation targets for each quarter of 1980 to help achieve President Carter's goal of holding U.S. gasoline consumption in 1980 down to an average of 7 million bbl/day. This figure represents a 400 000-bbl/day or a 5.5 percent drop in average use in 1979. Including national targets for reduced fuel consumption within the state plans emphasizes for the public the importance of participating in a national conservation effort.

#### Industrial Sector

Gasoline is a petroleum product unlike most others in that its use is not restricted to either the industrial or consumer sector of the economy. Its use spreads across the entire spectrum of the U.S. economy. Its reduced availability in 1979 caused primary, secondary, and tertiary effects to ricochet throughout the economy—some negative and, surprisingly, some positive.

One sector hard hit was the automobile industry. U.S. manufacturers were not ready for the rapid market shift to smaller fuel-efficient automobiles. General Motors lost money on domestic sales. Ford Motor Company lost \$1 billion in 1979 in sales in North America and expects to lose another \$1 billion in 1980. American Motors Corporation, which recently went into partnership with Renault of France, was the only U.S. automobile company that showed a profit last year. One out of every four cars sold in the

United States is a foreign car (in California, the ratio is 2 to 1).

DOT pushed the automobile industry to increase further the fuel efficiency of their products. The U.S. Environmental Protection Agency is requiring that each company's new fleet of automobiles averages 27.5 miles/gal by 1985. The goal was to cut daily national consumption of gasoline from 7.5 million bbl/day to 4.5-5 million bbl/day. The U.S. automobile industry is resisting this trend, according to Brock Adams, who noted that "the faster the mileage must rise, the earlier they (the automobile industry) will have to incur development costs."

William J. Abernathy of the Harvard Business School believes that the U.S. automobile industry is unprepared for the 1980s, which will mark an era of rapidly changing and innovative automobile technology. The companies operate on economies of scale that tend to discourage innovation. Innovation requires new production techniques that disrupt the mass-production techniques that cut costs for the U.S. automobile industry. Abernathy says that the companies have sought to perfect existing technologies and maintain mass production rather than promote innovation. The end result finds companies that cannot adapt to fast-changing technologies and are susceptible to economic hardship. New firms, such as Honda, are concentrating on developing new technologies and might eventually replace the older, more conservative, and slow-moving firms.

It is not that manufacturers are totally oblivious to trends; the U.S. automobile market is unpredictable. For example, in early 1979, Ford Motor Company was selling out of its 1979 models of the Mark V Lincoln Continental, its biggest luxury car. Then the gasoline lines started, and the trend reversed. Automobile makers offered customers rebates of up to \$1000 on slow-selling large cars rather than on small cars, as suggested by the White House, as an incentive to purchase the more fuel-efficient vehicles. U.S. consumers are willing to wait nine months for a Volkswagen Rabbit and pay substantial amounts over sticker prices to purchase diesel-fueled cars rather than take advantage of the rebates. U.S. manufacturers have not been able to provide the consumer with a product that he or she is interested in, thus creating a loss for the U.S. automobile industry and for the nation's economy in general.

The state of the art in innovative technology is as unpredictable as market trends. Detroit's main problem is maintaining an acceptable profit margin. For Detroit, the traditional money maker has always been the big automobile and its spare parts and accessories. According to John Z. DeLorean, who headed General Motors' Chevrolet Division in the early 1970s, the 1975-1979 top-of-the-line Cadillac Seville was just a luxury version of the inexpensive Chevrolet Nova. He also noted that a Chevrolet Caprice cost \$300-\$400 less to build than a Cadillac Coupe de Ville, but the Cadillac sells retail for \$3800 more. In other words, if the market for large, luxury models falls off, Detroit stands to lose a lot of money.

Small cars were never big money makers. What has been Detroit's reaction? Raise the price of the smaller cars—the Chevette's sticker price has risen 20 percent since 1978. But Detroit is still worried that it has not read the market correctly. It is worried that people might resign themselves to buying gasoline at \$2/gal and still dream of, and buy, a full-sized Cadillac.

In reading the market, Detroit has been cautious, or disbelieving, of the apparent trend toward smaller cars because of the experience in 1974. In 1974, most consumers continued to buy large, luxury automobiles, believing that the shortage was only an anomaly in the gasoline-distribution system. A misreading of the current market situation could result in severe economic hardships for the already financially strapped automobile industry.

Despite numerous problems, many people familiar with the ups and downs of the industry are optimistic about its future. The optimism stems from the fact that people in the United States will soon be replacing the 100 million automobiles they bought in the 1970s—thus giving U.S.

manufacturers a huge new market. Industry representatives believe that the automobile industry has already experienced its worst slump and is ready to spring forward. Both General Motors and Ford are expanding their overseas markets and, along with American Motors, are ready to produce the small cars that consumers want on a large scale. A world automobile is to be developed—an automobile that will be a standardized vehicle, with its major parts manufactured all over the world. It is expected that Japanese competitors will start production in the United States to avoid future U.S. import restrictions. Obligated to manufacture its automobiles with U.S. labor, the Japanese will lose their competitive pricing edge.

These different viewpoints as to the future of the U.S. automobile industry emphasize how difficult it is to predict the market behavior of the U.S. consumer. The bottom line for the industry is to produce fuel-efficient automobiles that appeal to the U.S. consumer, conserve energy, and produce profits.

The trucking industry suffered more immediate effects than did the automobile industry. Diesel fuel supplies became very tight, prices soared, and tempers flared. The truckers participated in hostile acts, such as blockading road access to southern Florida, participating in cross-country convoys, and blocking truck stops and fuel pumps.

State gasoline plans, implemented to help private consumers obtain adequate and consistent gasoline supplies, did not give truck drivers priority allotments. For independent truckers, especially, this was an economically disastrous situation.

Transient truckers were not accounted for when allocations were made to truck stops. Truckers carrying perishable goods were not given special status and suffered economic setbacks due to the lack of planning and to inflexible base-period allocation figures.

Agri-businesses consume the most gasoline and diesel fuel at harvest time, when the produce is shipped out. When allocations were cut to 80 or 90 percent, many firms found fuel supplies even more scarce because allocations were based on 1978's allocation level at harvest time, which did not coincide with the 1979 harvest period. (It is common to have harvest times that fluctuate yearly.) A DOE decision to give agricultural production activities priority in diesel allocations reduced the trucking industry's share of diesel fuel from 20 to 14 billion gal/year and forced the price to \$1.00/gal or more. The price represented a 41.4 percent increase since January 1979.

Trucking and union interests brought their complaints to the U.S. Interstate Commerce Commission (ICC) in early May 1979; they asked for the authority to pass through cost increases in a rapid and efficient manner. One month later, the trucking industry asked for priority in fuel allotments and a 120-day waiver of truck size and weight laws. The truckers received the surcharge they requested largely due to the perception that, without it, independent truckers would instigate a nationwide strike. Two months later, an ICC commissioner, Thomas Trantum, demanded an investigation into the use of surcharges that, he said, reaped windfall profits of about \$123 million for many general commodity carriers. According to Trantum, these carriers needed a surcharge of 3 or 3.7 percent to offset fuel price rises (ICC, Ex Parte 311, August 21, 1979). Some 40 percent of these carriers' shipments were truckload freight, which meant that the carriers received 1.5 percent more money than needed to offset the price hikes because the surcharge was applied to all truckload shipments. The ICC reduced the surcharge from 2.7 to 1.6 percent and was promptly sued on August 30, 1979, by the Central States Motor Freight Bureau and nine other major motor carrier rate bureaus in federal court to reverse the ICC's decision. The regulatory and legislative aspects of the trucking industry have many political ramifications that make it difficult to evaluate future alternatives.

One obvious solution to the truckers' problem is to increase fuel efficiency and fuel-conservation techniques. A 10 percent increase in fuel efficiency will result in an

annual fuel saving of 1 billion gal. To actually realize this saving is another problem. According to Thomas Dougherty, vice president and general manager of the International Harvester Company's North American Truck Operations, no major technological changes in truck design are expected. Rather, many small conservation initiatives will be taken that, when pooled, will provide substantial fuel savings. The problem here is that many truckers instituted fuel-conservation measures as early as 1973 and 1974. Most units are operating at fairly efficient levels. Another idea that complements increased fuel efficiency is increased freight per gallon. Federal gross weight limits have been increased to 80 000 lb. By lightening the rig and increasing the payload, fuel costs are lowered because the increased payload offsets the fuel costs. The corollary is minimizing empty or partially loaded miles, known as deadheading.

Truckers suffer from tight fuel supplies, makers of large automobiles are experiencing soft demand, motels on highways in out-of-the-way areas are accommodating fewer travelers, powerboats and campers are not selling due to uncertain fuel supplies, and vacation home developers have been affected by people who save gasoline for essential activities. Some sectors of the economy have been helped by the shortage. Sales are strong for small-automobile makers and sellers. Railroads are experiencing increased passenger use. Travelers are switching from automobiles to buses. Telephone companies are profiting by people who make contact by telephone rather than by travel. Resorts near cities and close to home are gaining in popularity. For every industry adversely affected by the shortage, there seems to be another that is benefiting.

Assuming assured supplies, the rising price of gasoline constitutes an economic problem in and of itself. Consumers who have to spend more of their fixed incomes on gasoline—an estimated \$18 billion more was spent in 1979 than in 1978—save less and buy fewer other goods. Unemployment rose in 1979 and layoffs and shorter work weeks were common. Many industries are coping with shortages and higher prices by thinking in the short term and curbing expansion and investment scenarios. The effect on the general economy is high unemployment, inflation, and soft real estate markets. Unless the United States commits itself to concentrated efforts at fuel conservation, economic recession is inevitable.

## COMPARISON WITH 1973-1974 OPEC OIL EMBARGO

### Variation of Consumer Responses

Everyone remembers the gasoline lines that appeared during the 1973-1974 oil embargo. Strategies developed at the time to cope with the crisis were short-term in scope and often implemented too late to be effective. As soon as the lines ended and supply increased, most people lost interest in fuel-conservation measures. Allocation plans were shelved. Many dealers returned to selling gasoline on a 24-h/day basis. Big-automobile sales rose. Conservation plans were left incomplete.

Some federal and state agencies had the foresight to begin evaluating the long-term implications of the shortages, namely that the United States was growing increasingly dependent on highly unstable sources of crude oil and making little effort to curb consumption, unlike most other industrial nations. State agencies developed contingency plans to forestall the side effects of similar shortages should they occur in the future. A major part of the planning went into attempts to disseminate information to targeted areas. The net effect in the beginning of 1979 was quick consumer response to the gasoline shortage—consumers went more readily to public transit than they did in 1973.

Increased ridership started in 1974 during the crisis, reversing a 28-year decline in public transit use. The problem came later when consumer responsiveness was not met by responsiveness from the public transportation sectors. Consumers then became disenchanted with

inadequate alternative travel modes.

The average motorist was better-prepared for the 1979 shortage than for the 1973-1974 embargo, both psychologically and sociologically. New subway lines in Washington, D.C., and Atlanta and a \$1-billion improvement program for the New York City transit system offered new alternatives to commuters. The improvement in automobile fuel efficiency since 1973 made the available gasoline go further. Preventive methods of conservation, such as carpooling and vanpooling, were implemented along with more strict enforcement of the 55-mph speed limit. This measure saved an estimated 200 000 bbl/day of oil. Strict compliance would save another 200 000 bbl/day.

Heightened consumer awareness in 1979 reduced the number of unnecessary trips in private automobiles, for example, for shopping and leisure activities. Businesses in these sectors were immediately affected; sales at shopping centers declined, and companies that were involved in the travel industry suffered. The economic impact on these industries was more severe in 1979 than in 1973-1974 because the 1979 shortage occurred during the peak summertime shopping and travel season. Even though 77 percent of the U.S. public believed that the oil companies hoarded gasoline, they accepted the fact that it was not available.

The 1973 crisis, on the other hand, took the nation by surprise. Most people had no recollection of a similar occurrence in their recent memory. By 1979, most people remembered 1973 and resigned themselves to the possibility of a gasoline shortage. Even considering this and all the factors described above, the 1979 situation was still marked by violence and the continued lack of a coordinated energy policy.

Consumers were still skeptical about the existence of the shortage because of the conflicting information they received. The fact that the shortage seemed to hit some areas of the country much harder than others seemed to reinforce this skepticism. Legislators, regulators, producers, and local government officials must help develop awareness programs that will provide consistent information to the consumer. Efforts have started, but they are not coordinated. Without coordination and some type of national program designed for different groups, efforts at informing the consumer will continue to fail.

### Lessons Learned—Federal Actions

Decision makers have since learned that the most important lesson in terms of future action by DOE and DOT is coordination of policy. In 1973, stop-gap measures were the most common approaches to alleviate shortages. In 1979, federal agencies were still promoting short-term policies at the expense of long-term considerations, as demonstrated by the ineffectiveness of DOE's allocation program.

After the 1979 shortage subsided, the White House, DOT, and DOE set aside more than \$16.5 billion of the July 15, 1979, energy plan for long-term conservation in the transportation sector. (The basic goal of the comprehensive energy program is to cut U.S. oil imports in half by 1990.) Conservation in the transportation sector would be promoted through programs, such as ridesharing, driver efficiency, federal-level participation in meeting the same conservation goals, energy-efficiency pledges (by corporations, state and local governments, unions, civic groups, and trade associations), and an energy-efficiency awards program to recognize those who make outstanding contributions to energy conservation. Drivers would be responsible for fuel efficiency through careful driving, coupled with the automobile industry's commitment to produce an acceptable fuel-efficient automobile. In these ways, fuel conservation in the United States would begin to be a participatory and coordinated effort.

The National Energy Conservation Program was unveiled on April 29, 1980. This is the first attempt to present a coordinated federal agency program and is aimed at participatory conservation efforts. The program seeks to

increase public awareness of the need to conserve energy. Public- and private-sector employers will be asked to achieve 20 percent employee participation in ridesharing, or a 20 percent increase in participation (known as the 20/20 program). DOT has established a National Ridesharing Information Center under the program with a ridesharing network and workshops around the country to teach employees how to promote ridesharing. Through the Driver Efficiency Conservation Awareness Training program, DOT will provide driver-efficiency teach-ins for 3000 representatives of public and private employers and offer general public-service advertising to inform the public about gasoline-saving techniques. The Interagency Conservation Action Group (ICAG) is a cabinet-level task force encouraged by the White House. It has representatives from DOE, DOT, and the U.S. Departments of Housing and Urban Development, Agriculture, and Commerce, who are responsible for formulating energy-conservation outreach groups. These groups will ask the advice of government, business, labor, civic groups, and associations to promote energy conservation in the transportation, agricultural, and residential sectors. If this plan is managed efficiently and well promoted, it will successfully begin to instill in the U.S. public a sense of stewardship—the ability to take the responsibility for reducing the wasteful use of gasoline.

## FUTURE IMPLICATIONS

### Understanding the Problems

According to the National Transportation Policy Study Commission's final report on National Transportation Policies Through the Year 2000, critical uncertainties exist concerning the future capability of the United States to achieve energy conservation and develop alternative fuel sources. The commission asks the following questions:

1. How can future transportation systems provide energy-efficient movement of people and freight in a balanced system at the lowest social and economic costs?
2. How can transportation demand be reduced to conserve energy without seriously impairing mobility?
3. What strategies may be employed to conserve existing transportation energy sources? and
4. How many new transportation technologies or alternative sources of fuel can be developed to maximize the efficiency of new systems and provide adequate fuel supplies?

Another question needs to be asked, "How do you get the private consumer and the commercial consumer to develop long-range planning capabilities?" According to the policy study commission, a future-oriented energy-conservation policy for transportation needs must take into account changing value systems and changing economic factors. The only comment the commission makes on energy conservation is that "free energy markets should provide the proper incentives to producers and carriers to use fuel-efficient vehicles and practices. Retain fuel-efficiency standards until such free energy markets can be achieved."

The issue of whether to abolish price controls on gasoline is a major question with no clear answer. On August 16, 1979, Schlesinger admitted that the U.S. government cannot determine supply allocations under a system of price controls better than a free-market system can. Binding price controls tend to exacerbate shortage situations when

consumer demand for gasoline exceeds the supply available at the maximum-allowable price. The available supplies, which cannot meet the demand, must then be allocated by a government allocation system that has proved to be very inefficient, inflexible, and inequitable, thus compounding supply problems.

Price controls have also affected the production and supply of unleaded gasoline. Limits on refiners' return on investment for refinery improvements needed to produce larger quantities of unleaded gasoline have discouraged production. The price-control structure could result in future shortages of unleaded gasoline.

### Creative Courses of Action

Allowing the development of free energy markets in anticipation that higher prices will reduce consumer demand can only be considered a part of the solution to the problem of reducing gasoline demand. Gasoline and diesel-fuel demand can be price-inelastic at times. A study by the Congressional Office of Technology Assessment showed that a 15 percent increase in the price of gasoline yielded only a 3 percent reduction in vehicle miles traveled.

Serious long-term conservation planning should concentrate on reducing gasoline demand permanently. Demand should not only be reduced artificially by economic restrictions to alleviate a particular shortage situation. A national energy-conservation awareness program should be developed to provide consistently accurate information in a simple manner in order to guide the consumer toward an eventual reassessment of value systems that prioritize the use of the private automobile. The National Energy Conservation Program is a good start.

The program should be expanded to include educational seminars and information on a higher level than simply training individuals in fuel-efficiency techniques. Through creative use of ICAG, major participants could provide input—for example, federal, state, and local agencies; multijurisdictional agencies; trade associations; labor unions; educational institutions; banks; oil companies; and Congress. Issues to address would include government policies, regulation and finance, public transportation, transport technology, intergovernmental relations, and economic development and land use.

The information program would have to be developed with enough built-in flexibility so that it would appeal to a variety of groups—from high school groups to company employees enrolled in energy-conservation programs.

The ICAG is an excellent way of providing a forum for gathering pertinent data, especially from DOE and the oil companies. The information ideally should be disseminated by representatives from the private sector, in conjunction with federal support or support from institutions such as the Transportation Research Board. The program's biggest obstacle would be establishing credibility for its information.

It is the responsibility of every citizen, especially those knowledgeable in energy conservation and transportation planning, to promote gasoline conservation as a way of life.

The National Energy Act orders that petroleum imports be reduced by 6 million gal/day by 1985. If transportation use accounts for 50 percent of total petroleum use in the United States, then significant changes must be made in transportation systems in the next decade. Development of a national energy-conservation awareness program could significantly alter transportation modes in the United States by the year 2000.