Federal, State and Local Responses to 1979 Fuel Shortages

U.S. Department of Transportation

Office of the Secretary of Transportation

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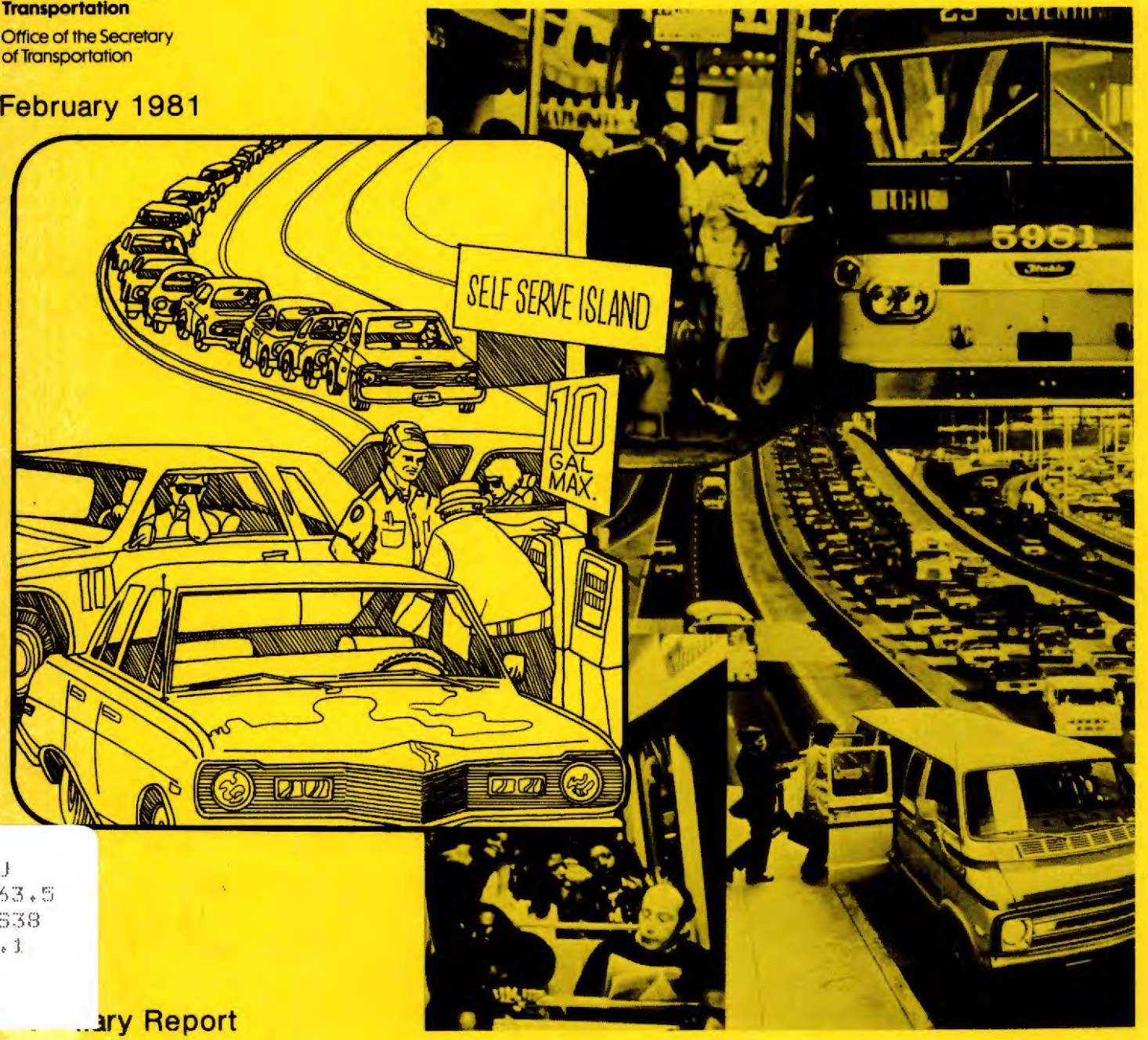

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Federal, State and Local Response to 1979 Fuel Shortages

Prepared for

U.S. DEPARTMENT OF TRANSPORTATION

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Washington, D.C. 20590

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Summary Report

Prepared by

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16. Abstract There are many lessons that can be learned from examining federal, state and local responses to the 1979 fuel shortages which can be applied to present and future energy contingency planning efforts to enhance their effectiveness. As part of a study performed for the Office of the Secretary, U.S. Department of Transportation, case studies were made of emergency transportation energy conservation actions implemented, or attempted, in Los Angeles, Dallas-Fort Worth, Minneapolis-St.Paul, Seattle, Rhode Island, and New York State. Information on responses to the fuel shortages for each case study area was obtained through on-site meetings with representatives of organizations having a strong interest in emergency transportation actions such as transit operators, metropolitan planning organizations, service station dealers, state highway and energy departments, ridesharing agencies, and others. Types of emergency transportation actions most commonly implemented or attempted by the case study areas were (1) expanded public information and marketing distribution systems, (2) emergency expansion of ridesharing (carpool and vanpool services), (3) rehabilitation and placing in service of standby reserve or "mothball" fleet buses, (4) implementation of odd-even and/or minimum (maximum) fuel purchase restrictions and (5) monitoring of transit ridership and shifting buses to the most heavily used routes. This report summarizes, and partially assesses, the major transportation energy contingency actions implemented, key implementation problems encountered, and actions planned but not implemented. Preliminary conclusions, recommendations, and implications for developing future transportation energy contingency plans are also presented. More detailed information on the individual case studies may be found in a separate volume.

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I. INTRODUCTION

PURPOSE AND SCOPE

Since the 1973-1974 Middle East Oil Embargo, numerous transportation energy contingency plans have been prepared and considerable effort has been expended in developing them. However, there has been comparatively less emphasis on examining what emergency energy conservation actions were actually implemented and how successful they were in maintaining mobility and economic vitality, or conserving energy.

This report complements existing knowledge of transportation energy contingency planning with more in-depth information on (1) the types of emergency conservation measures actually taken during the 1979 fuel shortages by various levels of government and their effectiveness and (2) some promising actions for an energy contingency and their implications for responding to future fuel shortages.

APPROACH

The severity and duration of both the 1973-1974 and 1979 fuel shortages tended to vary widely among states and localities within the country so it is difficult to generalize the response of state and local governments. In order to gain a more complete understanding of the many issues which arise in developing and/or implementing transportation energy contingency plans or actions - particularly those related to the timing of actions, institutional and organizational structures, financial barriers, staffing requirements, public response, etc. - it was decided to conduct a series of selected case studies. The project team made site visits to six areas for in-depth discussions with state and local government representatives. Whenever possible, concerned representatives of private sector interest groups (e.g., tourist industry, gasoline dealer associations, automobile clubs) were also contacted and invited to meetings.

The sites were selected jointly by the project team and by the U.S. Department of Transporation contracting officer's technical representative, in such a manner so as to ensure that they reflected a broad range of experience in dealing with the 1979 fuel shortages. Site visits were made to:

- Los Angeles, California;
- Seattle/King County, Washington;
- State of Rhode Island;
- State of New York;
- Dallas-Fort Worth Area; and
- Minneapolis-St. Paul, Minnesota.

Criteria for selecting these sites for case studies are summarized in Exhibit I-1.

Contacts were made at each of the above-mentioned sites and meetings arranged. An outline of potential discussion topics was prepared and distributed to organizations planning to attend the meeting prior to each actual site visit. Exhibit I-2 presents the outline of discussion topics.

BACKGROUND

Gasoline supply shortfalls have occurred during the 1973-1974 Middle East Oil Embargo and more recently with the disruption of Iranian oil supplies during the Spring and Summer of 1979. At the present time, despite the current high inventory of gasoline supplies, there is a growing concern that the United States is inadequately prepared to implement emergency energy conservation measures in response to a sudden cut-off of petroleum.[1] Growing instability in the Middle East, highlighted by the ongoing war between Iraq and Iran, has focused increased attention on the need for contingency plans to deal with potential disruptions in oil supplies.

The United States is both the largest oil producer and the largest oil consumer in the world. During 1978 the U.S. consumed 18.7 million barrels per day.[2] Due to conservation efforts, U.S. oil consumption as of November 1979 had declined to 17 million barrels per day.[3] Of this total, 55 percent was from domestic production. The remaining 45 percent was imported largely from member nations of the Organization of Petroleum Exporting Countries (OPEC) which accounts for 70 percent of all oil imports.[4] This dependence on OPEC makes the U.S. particularly vulnerable to sudden changes in the availability and price of oil as evidenced by the 1973-1974 Middle East Oil Embargo and the 1979 Iranian oil crisis.

The transportation sector, which includes the fuel needs of all vehicles that transport people and commodities, accounts for 53 percent of national petroleum consumption.[5] The residential, industrial, commercial and electric utility sectors are also significant users of petroleum products. Any major decrease in oil imports beyond that brought about by energy conservation measures would impact some or all of these economic sectors.

1/ U.S. Congress, Emergency Energy Conservation Programs: Department of Energy Oversight, Twenty-second Report by the Committee on Government Operations together with Additional Views, September 26, 1980.

2/ Hartgen, D. T., Neveu, A. J., et al., Changes in Travel in Response to the 1979 Energy Crisis, Preliminary Research Report 170, Planning Research Unit, New York State Department of Transportation, August, 1979.

3/&4/ Ibid.

5/ Oak Ridge National Laboratory, Transportation Energy Conservation Data Book: Edition 4, G. Kulp, et.al., September 1980.

EXHIBIT I-1

CRITERIA FOR SELECTING CASE STUDY SITES

	NEW YORK STATE	LOS ANGELES CA	DALLAS-FT. WORTH AREA, TX	MINNEAPOLIS-ST. PAUL MN	STATE OF RHODE ISLAND	SEATTLE/KING COUNTY WA
SEVERITY AND DURATION OF FUEL SHORTAGE	•	•			•	
CONTINGENCY PLAN IN EXISTENCE	•	•	•	•		•
HIGH TOURIST INDUSTRY IMPACT	•				•	
DEGREE OF RESPONSIVENESS TO REQUEST FOR PARTICIPATION	•	•	•	•	•	•

EXHIBIT I-2

POTENTIAL DISCUSSION TOPICS FOR CASE STUDIES

A. Brief description of the overall impact of 1979 fuel shortages on transportation and travel in specific area.

- Extent, scope and duration;
- Impacts on transportation and travel.

B. Key emergency transportation energy conservation actions or measures actually implemented prior to, during or after the 1979 fuel shortages.

- Specific measures;
- Were these measures part of an existing transportation energy contingency plan and if so, how was the decision made to make it part of the plan?;
- Institutional arrangements for implementing emergency transportation energy conservation actions i.e.; roles, powers and responsibilities of state and local government agencies; and
- Geographic application of these measures, i.e; city, suburban, regional, downtown only, statewide, etc.

C. Critical Implementation issues affecting specific transportation energy contingency actions implemented or proposed.

- Specific institutional, environmental, economic, legal, financial and social barriers encountered or expected;
- Possible suggestions or approaches for resolving these problems;
- Phasing or timing of transportation energy contingency plans or actions and their prioritization;
- Transferability to other areas/jurisdictions;
- Trade-off between voluntary vs. mandatory measures; and
- packaging or combining measures.

D. Assessment/Evaluation of reduction in energy use and other impacts.

- Quantitative or qualitative evaluations of the effectiveness of alternative transportation energy contingency actions;

- Availability of post fuel shortage studies or evaluations of the effectiveness of energy contingency actions; and

- Travel impacts stratified by trip purpose and impact groups; and

- Other impacts of transportation energy contingency actions including economic, social, environmental transportation and travel impacts.

E. Discussion of major lessons learned from past experiences with planning and implementing emergency energy conservation actions. To what extent have you modified your published transportation contingency plans?

F. Future direction and areas of emphasis in transportation energy contingency planning and implementation.

CAUSES AND EVENTS LEADING TO THE 1979 FUEL SHORTAGE

In the fourth quarter of 1978 growing unrest in Iran, OPEC's second largest producer, began to disrupt its oil production. From a peak of six million barrels per day in the third quarter of 1978 production fell more than 73 percent to slightly over one million barrels per day in the first quarter of 1979.[1] In the second quarter, Iranian oil production rose to close to about four million barrels per day.[2] Prior to the disruption of Iran's oil production, Exxon Oil Corporation was projecting total average oil imports to average nine million barrels per day.[3] This assumed that past production levels would be maintained and that 800,000 barrels per day or 14 percent of Iran's oil would be shipped to the U.S.[4] Based on a more realistic projection of 3.7 million barrels per day of Iranian production during 1979, Exxon estimated a shortfall of 600,000 barrels per day or about 3.1 percent.[5] This was more than could be compensated for by using current inventories. Although in the beginning of 1979 inventories of crude oil and products were 1.2 billion barrels, only 230 million of these were in usable form or readily available.[6] This is equivalent to only a twelve day supply. The remainder is normally allocated to working stock categories, i.e., being processed through refineries, in transit through refineries, in transit through pipelines, etc.

The crisis sparked by the disruption in Iranian oil supplies during the Spring and Summer of 1979 was aggravated by several other events. These are briefly discussed below:

- In March 1979, the Administration requested that U.S. oil companies not bid for oil in spot markets in order to minimize upward pressure on spot oil prices and also to reduce incentives for OPEC to raise prices.[7] This partially prevented the build-up of sufficient petroleum inventories;

- Domestic crude oil production continued to decline during the Spring and Summer of 1979;[8]

1/ Adelman, M. A., "The OPEC Game Heads They Win, Tails We Lose", Across the Board, January, 1980.

2/ Morgan Guaranty "Those Gas Lines - a Postmortem", Across the Board, January, 1980.

3/ Guly, G. A., The Energy Outlook 1979-1990, Proceedings of the Urban Transportation Energy Contingency Planning Seminar, Dallas-Ft. Worth, Technical Report Series No. 26, North Central Texas Council of Governments, November, 1979.

4/ - 6/ Ibid.

7/ Morgan Guaranty, op. cit.

8/ Ibid.

- Gasoline refining capacity was particularly tight as price-control constraints on refiners' profit margins reduced incentives for providing more production capacity. Therefore, low inventories of gasoline could not be replenished at a quick enough rate;

- Federal mandates to phase out lead additives which act as an octane booster in gasoline lowered effective gasoline production during the Iranian fuel crisis;

- Although other OPEC countries increased crude exports during the Iranian crisis, this was generally "heavier crudes". Heavier crudes yield less gasoline;

- The Administration's policy response to the low supply of heating oil stocks in the Spring of 1979 was to restrict gasoline production (and therefore driving) during the peak Summer driving season in order to build up adequate heating oil supplies for the Winter. On April 1, inventories of gasoline and distillates were 35 million barrels below the 1974-1978 average;[1/]

- The existing allocation and price-control systems increased gasoline demand. With price controls on gasoline, the price had only risen by a mere eleven cents (or from 67 cents to 78 cents) between the end of 1978 to May or June of 1979 when gasoline lines formed in California.[2/] With prices constrained and no gasoline rationing plan in effect, gasoline demand could not be controlled;

- Drivers responding to fear of gasoline shortages, first in California and later on the east coast, topped off their tanks. This behavior increased lines at gasoline pumps and strained overall supplies. For example, in Los Angeles average purchases declined from eight gallons to three.[3/] To add just five gallons to the tank of each car in this country, it requires twelve million barrels of gasoline. Although this amount is small relative to the more than 200 million barrels in refiner and wholesaler inventories, it still accounts for five percent of an average month's consumption.[4/] Of course, the fuel shortage wasn't equally distributed nationwide. However, given existing allocation rules for refiners, this incremental demand intensified gasoline lines in several areas;

1/ Guly, G. A. , op. cit.

2/ Morgan Guaranty, op. cit.

3/ Ibid.

4/ Ibid.

- Federal gasoline allocation regulations, as provided for in the 1973 Emergency Petroleum Allocation Act, created inefficiencies in the distribution of available gasoline supplies. Under authority of this Act, emergency gasoline supplies were set aside for state governments (3 percent of total supplies allocated to the state), farmers, police and the military. The remainder was then proportionally distributed to gasoline retailers according to their sales during the same month of the previous year. This state set aside was later changed from three to five percent in order to ease spot shortages. In addition, in order to compensate for population shifts, a five month base period from October 1978 to February 1979 was substituted in calculating gasoline allocations if the average base period amount was ten percent higher than the amount during the same month during the previous year. These policies may have compounded the shortfall in gasoline by less efficient allocation of available supplies. This was partially due to the inability to check if allocated set asides matched actual demands.

These events and circumstances all contributed to the serious impacts of the fuel shortages sparked by the disruption in Iranian oil supplies.

GOVERNMENT'S ROLES, POWERS AND RESPONSIBILITIES

Exhibit I-3 provides a brief overview of the roles, powers, and responsibilities of the various levels of government in planning for energy emergencies as outlined in federal legislation and other policy documents issued prior to, during and after, the 1979 fuel shortages. More details on specific documents may be found in the Technical Appendices. In order to evaluate government responses to the 1979 fuel shortages, it is useful to review the cited documents.

ORGANIZATION OF REPORT

This report is divided into two parts. The first presents an overview of federal, state and local responses to the 1979 fuel shortages. The second consists of technical appendices covering legislation on energy contingency planning and separate sections on each of the six case study areas.

The remainder of the overview part of the report is organized into three major sections, with this introduction serving as Section I.

Section II, Summary Assessment, summarizes the results of the case studies and covers major actions implemented, related implementation problems, and actions planned but not implemented.

Section III, Some Promising Actions for an Energy Contingency, discusses those measures that appear to have promising implementation potential for future fuel shortages.

Finally, Section IV, Implications for Responding to Future Fuel Shortages, examines the implications for local areas, states and the federal government of the study findings.

EXHIBIT I-3

OVERVIEW OF POLICY

(LEGISLATION, REGULATIONS, AND GUIDELINES)

POLICY DOCUMENT	GENERAL BACKGROUND, PURPOSE AND SCOPE	GOVERNMENT'S ROLES, POWERS AND RESPONSIBILITIES
Energy Policy and Conservation Act of 1975 (EPCA) PL 94-163 (S.622) December 22, 1975.	Key purpose was to foster overall energy conservation by: . granting authority to the President to impose rationing; . creating a strategic petroleum reserve; . increasing fossil fuel supplies through price incentives; . implementing conservation programs and regulating certain energy uses; . improving energy efficiency of motor vehicles and appliances; and . reducing petroleum and natural gas consumption by increasing the use of coal.	. Sec 201 required the President to submit to Congress a energy conservation contingency plan and a fuel rationing contingency plan to apply to all states. . Sec 202 prescribed that Energy Conservation Contingency Plans could not (1)impose rationing or any tax, tariff or user fee, (2)regulate petroleum prices and (3)allow for tax credits/deductions. . In March of 1979 Congress rejected all 3 energy conservation and contingency plans and a gasoline rationing plan submitted in accordance with sections 201,202. . In February 1980 the U.S. Department of Energy proposed a Standby Federal Emergency Energy Conservation Plan. In June 1980 a Standby Gasoline Rationing Plan was passed.
U.S. Department of Transportatioo, Transportation Energy Contingency Planning Memorandum to Field From UMTA and FHWA Administrators, March 29, 1979.	Highlighted the need for state and local government agencies to prepare emergency energy conservation plans for transportation.	. Promoted energy contingency planning among the states and the Metropolitan Planning Organizations (MPO's). . States were urged to consider the following issues/actions: (1) regulations to discourage travel, (2) encouragement of energy-efficent modes, (3) provision of public information and (4) interagency cooperation/coordination. . Local areas were urged to consider the following issues/actions: (1) maximum transit fleet utilization, (2) expansion of transit fleets through bus stockpiling, school buses and charter buses, (3) adding and funding new service, (4) provision of additional maintenance and personnel, (5) use of transit for non-work trips, (6) increased use of paratransit (ridesharing, taxicabs, subscription bus), (7) variable work hours, (8) transit fuel supplies and alternative fuels, (9) getting transit personnel to work, (10) information dissemination, (11) monitoring and interagency cooperation, (12) park and ride, (13) high occupancy vehicle lanes and (14) TSM actions.
Executive Order 12140 Delegation of Authorities Relating to Motor Gasoline End-User Allocation, May 29, 1979.	Gave all state governors the authority to implement queue management techniques.	State governors were authorized to impose the following measures to minimize gasoline lines whenever shortages are experienced and public safety or welfare is endangered: (1) regulation of gasoline service station hours, (2) institution of odd-even license plate gasoline purchase plans, and (3) minimum gasoline purchase requirements.

EXHIBIT I-3 (Continued)

POLICY DOCUMENT	GENERAL BACKGROUND, PURPOSE AND SCOPE	GOVERNMENT'S ROLES, POWERS AND RESPONSIBILITIES
U.S. Department of Transportation - Interim Notices and Regulations, June/ July, 1979.	Facilitate the implementation of emergency energy conservation measures by transit authorities.	. Allowed transit authorities to keep their old buses when they ordered new ones (reversed past policy) and encouraged the formation of reserve bus fleets. . Allowed the use of federal monies for rehabilitation of old buses rather than just for the purchase of new ones. . Provided Federal funds for the construction/ operation of fuel storage facilities.
Emergency Energy Conservation Act of 1979 (EECA) PL 96-102 (S.1030), November 5, 1979	Shortages during the Spring and Summer of 1979 and President Carter's commitment to the International Energy Program (IEP) to reduce petroleum consumption provided the impetus for this Act.	. Title I - Standby Motor Fuel Rationing - outlines a framework for developing/implementing a motor fuel rationing plan during severe energy supply disruptions or to satisfy U.S. internationsl energy obligations. . Title II - Emergency Energy Conservation - provides a means by which federal, state and local governments may establish emergency conservation measures for energy sources in short supply. Key provisions include: Sec. 211 This section allows the President to establish energy conservation targets for federal and state governments. Sec. 212 Requires state governors to submit emergency energy conservation plans to meet or exceed targets specified under Section 211 within 45 days of their publication. Possible measures may include: (1) voluntary measures, (2) measures authorized and enforced by state laws, (3) measures requested by the governor that are not inconsistent with federal and other laws and (4) measures contained in the Federal Conservation Plan established under Sec. 213. Sec. 213 Directs the President to prepare a Standby Federal Energy Conservation Plan for states which may be implemented, in all or in part, in each state which fails to meet conservation targets. Sec. 221 Allows state governors to request permission from the Secretary of the U.S. Department of Energy to set minimum fuel purchases provided that this doesn't violate state laws.

POLICY DOCUMENT	GENERAL BACKGROUND, PURPOSE AND SCOPE	GOVERNMENT'S ROLES, POWERS AND RESPONSIBILITIES
U.S. Department of Energy, Office of Conservation and Solar Energy, 10 CFR Part 477, Standby Federal Emergency Energy Conservation Plan, Interim Final Rulemaking and Notice of Proposed Rulemaking, February 7, 1980.	The Emergency Energy Conservation Act of 1979 (EECA) required that 90 days after enactment the U.S. Department of Energy prepare a Standby Federal Emergency Energy Conservation Plan.	Measures selected or proposed for inclusion in the Standby Federal Emergency Energy Conservation Plan were as follows: (1) public information, (2) minimum automobile fuel purchase restrictions, (3) odd-even license plate motor fuel purchase restrictions, (4) employer based commuter and travel measure (proposed), (5) speed limit enforcement measure, (6) compressed work week measure (proposed), (7) mandatory temperature restriction measure, (8) vehicle-use sticker measure (proposed) and (9) recreational watercraft restrictions measure (proposed and later withdrawn). In February 1981, the U.S. Department of Energy decided to retain only the consumer public information measure and the minimum gasoline purchase requirements.

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II. SUMMARY ASSESSMENT

There are many lessons that can be learned from examining the responses of the case study areas to the 1979 fuel shortages which can be applied to present and future energy contingency planning efforts to enhance their effectiveness. This chapter summarizes the major actions implemented, key implementation problems encountered, and actions planned but not implemented.

CASE STUDIES

Exhibits II-1 through II-6 provide a brief overview of the transportation energy contingency actions implemented in each of the case study areas and their estimated impacts.[1/] Key results of the individual case studies are highlighted in the following paragraphs.

Los Angeles, California

In late April and May, 1979, Los Angeles residents experienced a severe gasoline shortage and rising prices. This was accompanied by long gasoline lines and curtailed service station hours. Toward the end of May gas lines began to get shorter although prices continued to spiral. Exhibit II-1 shows the major transportation energy contingency actions implemented, or attempted, by the Southern California Rapid Transit District (SCRTD), the County of Los Angeles, the State of California and Commuter Transportation Services, Inc. (the local ridesharing agency) in response to the 1979 fuel shortages.

SCRTD, the major transit operator, had largely based its contingency plans on the potential availability of a large reserve bus fleet and the adoption of staggered work hours by a large number of major employers. Unfortunately, as the SCRTD's old buses broke down during the last few years without new buses to replace them, even older buses from the mothball fleet were used to replace them. Lacking the reserve bus fleet and unable to achieve timely implementation of staggered hours by major employers, SCRTD was ill-prepared to cope with the 1979 fuel shortages. Unable to expand transit services, SCRTD emphasized those actions which tended to increase patronage (and therefore load factors) on existing routes and improve overall bus fleet utilization. These are presented in Exhibit II-1. With the notable exception of successfully obtaining the return of 39 buses from Seattle and using them in line service or for operator training, SCRTD's efforts did not result in providing significantly more service to Los Angeles residents during the crisis period.

California implemented a statewide odd-even plan for gasoline with minimum and maximum purchase provisions on May 7. By May 21, only two weeks after this measure became effective, gas lines began to decrease.

1/ More detail on the individual case studies may be found in the second volume of this report which contains the technical appendices.

EXHIBIT II-1

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN LOS ANGELES, CALIFORNIA

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
Southern California Rapid Transit District (SCRTD)	. Transit Operating Agency	. Rehabilitation/Placing in service of old buses	. Used for operator training and to provide extra service on most heavily used routes. Limited number of buses available.
		. Expansion and decentralization of public information system	. Ads in local newspapers were successful in diverting potential transit users from calling the overtaxed telephone information system. . Phone information system lost many calls due to lack of personnel or equipment problems. Difficulties encountered in hiring and training switch board operators in a short time period. . Decentralization of information outlets and ticket offices required relatively long lead times.
		. Monitoring of service and schedules	. No buses shifted if it would disrupt existing service schedules.
		. Letter sent to large government and downtown private employers on the need for staggered hours to increase transit carrying capacity.	. A resolution supporting staggered hours was passed by the L.A. Chamber of Commerce. No information on the effectiveness of this action was available, however, without pre-planning it is unlikely that staggered hours could readily be implemented.
		. Met with private and school bus operators to discuss potential leasing/usage by SCRTD.	. Although no serious legal barriers, other problems made the potential use of schoolbuses unlikely except in severe emergencies. Problems included vehicle design constraints, coincidence of school hours with peak a.m. travel period, etc.
		. Internal SCRTD programs to conserve employee gasoline use.	. Guaranteed that employees arrived at work and minimized SCRTD employee use of gasoline.
		. Incurred additional overtime in the maintenance department and asked mechanics to defer vacations.	
County of Los Angeles Chief Administrative Officer	. Provided gasoline availability information and administered the odd-even plan.	. Operated Gasoline Hotline.	. Answered more than 4,000 calls per day with twenty-five phone lines during the worst days of the fuel shortage.
State of California	. State Odd-Even Gasoline Rationing Plan	. Motorists were allowed to buy gasoline on days determined by the last number on their license plate according to whether odd or even. Provisions for minimum and maximum gasoline purchase restrictions, special exemptions, and a color coded flag system for stations to signal motorists on gasoline availability were included.	. The crisis dissipated too quickly after this plan was put into effect for a formal evaluation of the effectiveness of this measure to be made.
Commuter Transportation Services, Inc. Commuter Computer, Inc. (Los Angeles)	. Local ridesharing agency provides matching services and advises employers on implementing carpool/vanpool programs.	. Spent additional financial resources on hiring more staff and responding to growth in demand for ridesharing assistance.	. Despite increased staff resources, the "turnaround time" between initial contact of the agency and receipt of the matchlist couldn't be reduced below 4 to 5 weeks. An analogous situation applied to employers requesting program assistance.

EXHIBIT II-1 (Cont'd)

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN LOS ANGELES, CALIFORNIA

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
Commuter Transportation Services, Inc. Commuter Computer, Inc. (Los Angeles)		. Maintains a data base on "potential" ridesharers that is periodically updated. (Partially supplied by large employers to comply with clean air requirements.	. Allows potential ridesharers to use the ridesharing agency as a "contingency" option.
			. In an evaluation of its own performance during the 1979 fuel shortage, Commuter Computer, Inc. made the following observations: - Significant mode shifts to carpooling occurred during the fuel shortage, however, most were informally based and not through match lists; and - Emergency users of ridesharing have significant potential for becoming long-term users.

EXHIBIT II-2

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN THE STATE OF RHODE ISLAND

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
State of Rhode Island	. Issuance of Executive Order implementing an odd-even minimum fuel purchase plan	. At first only a minimum fuel purchase plan was implemented. This was later modified to include an odd-even purchase requirement keyed to the last digit of vehicle license plates. A provision for the use of color coded flags to indicate fuel availability at stations was also included.	. It was generally observed that the minimum purchase provision alone wasn't very effective as it just encourged motorists to fill up more often. Adding the odd-even requirement reduced panic buying and the inventory of in-vehicle gasoline. There were problems in coordinating with surrounding states, particularly given Rhode Island's small size.
	. Operation of a Hotline by the Governor's Information Service	. This service provided information to the general public on gasoline availability and hours of operation on a station-by-station basis. Gasoline dealers called this information in on a toll-free number each day.	. This information system functioned very smoothly. This may be attributed to the high degree of dealer cooperation and the compact geography of Rhode Island.
Rhode Island Transit Authority	. Major Public Transit Operator in Rhode Island	. Operated at full capacity. A few select routes were added.	. There wasn't a significant expansion of overall transit capacity.

EXHIBIT II-3

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN THE TWIN CITIES AREA

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
Metropolitan Transit Commission (MTC)	. Major Transit Operating Agency	. Rehabilitation/Placing in service of standby fleet of old buses.	. Used largely to provide additional peak period service. Limited number of buses available
		. Route monitoring of bus loads.	. Used to allocate extra buses to overcrowded routes. The primary problem was the limited availability of buses.
		. Decentralized distribution of information and marketing materials.	. Enhanced and maintained MTC's capability to deliver information in an emergency.
SHARE-A-RIDE Program (part of MTC)	. Local Ridesharing Program oriented to multi-employer worksites	. Provided carpool matching and brokerage services according to normal operating procedures.	. Turnaround times (the time from initial application for a match until receipt of a matchlist) exceeded the one week to ten day standards established in 1978 due to higher demand. Brokerage phone calls, normally used as a follow-up mechanism to facilitate carpooling, also required a longer time frame due to Share-A-Ride's decision to place a higher priority on matching activities.
		. Vanpool matching and formation services tried to expand to meet the rise in demand.	. A shortage of vans severely constrained the capacity of vanpool services to carry more ridership. Van deliveries were not able to keep pace with demand due to (1) a shutdown of the van assembly plant for model changeover and (2) a May deadline for ordering new vans (vehicles ordered in May didn't arrive until September). Existing vanpools encountered difficulty in readily obtaining gasoline.
State of Minnesota	. Declaration of State of Emergency and Issuance of a Gasoline Minimum Purchase Plan	. At the end of March Governor Quie called for a voluntary 10 percent reduction in gasoline use over the summer . In mid-June the Director of the Minnesota Energy Agency appealed for a 20 percent reduction in gasoline usage (or 4 gallons per driver) for the rest of June through increased carpooling, more transit usage, trsvelling at the 55 mph speed limit, cutting discretionary travel, and keeping cars well tuned and driving efficiently.	. By June 21, MTC ridership was up by 5.6 percent and car counts on Route 35W down 2 percent. This was largely due to gasoline price increases, coupled with fuel shortages. . It is impossible to assess the effects of these requests for voluntary conservation.
		. The Governor issued an Order on June 28 which declared a State of Emergency and contained provisions for minimum fuel purchase requirements and dealer allocations to encourage stations to stay open weekends.	. This measure was passed too late for it to be effective since the shortages had already started to dissipate. There was considerable opposition to this action from the tourist industry and the general public.

EXHIBIT II-4

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN THE DALLAS-FORT WORTH AREA

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
State of Texas	. Issuance of an Odd-Even, Minimum/Maximum Gas Purchase Plan.	. On July 3 the Governor issued an Executive Order "Establishing Guidelines For Motor Vehicle End-User Allocation" which was applicable to the Dallas-Fort Worth Area. These guidelines contained provisions for: odd-even gasoline purchases keyed to license plates, minimum/maximum fuel purchases, posting of station hours and color coded flag systems to indicate gasoline availability. . Operation of Information Hotline.	. By the second week in July (when this measure became effective), gasoline supplies had already improved. By the third week in August fuel shortages had disappeared. The implementation of the gasoline plan appears to have contributed to the reduction of panic buying, tank topping and gasoline lines and indirectly to increased gasoline supplies through the reduction of in-vehicle inventories.
North Central Texas Council of Governments (NCTCOG) and Local Governments	. Dissemination of public information	. Many counties designated Local Energy Coordinators (LEC's) to keep informed and to facilitate communications between the North Central Texas Council of Governments and the local governments during energy emergencies.	LECs, already in place prior to the fuel shortages, fielded questions from area residents on energy-related problems and were very effective in keeping the general public and local governments informed.
	. Local Ridesharing Programs	. Existing carpool programs were maintained and expanded.	. Problems were encountered in handling the surge in demand; particularly in matching potential riders, answering phone calls and satisfying employer demand for ridesharing services.
Dallas Transit System (DTS) City Transit Service of Fort Worth (CITRAN)	. Transit Operating Agencies	. Prior to the 1979 fuel shortage legislation was passed permitting the use of school buses for general public transportation during emergencies.	. School buses were not used because of the relatively low severity of the supply shortfalls.
		. Additional fuel storage capacity was added prior to the 1979 fuel shortage.	. Extra fuel storage capacity may cushion transit operators from sudden price increases during fuel shortages. The U.S. Department of Energy's Special Rule 9 guaranteeing priority fuel allocation to transit in emergencies assures supply much more effectively than price.
		. Transit operators lengthened the time intervals between preventive maintenance to increase transit bus availability.	. Transit carrying capacity was increased.

EXHIBIT II-5

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN THE SEATTLE/KING COUNTY AREA

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
State of Washington	. The Washington State Energy Office prepared a Petroleum Shortage Contingency Plan	. The plan encouraged local area initiatives in dealing with fuel shortage problems.	. The plan failed to adequately consider the lack of and limitations on the powers of local governments. The State of Washington didn't implement any odd-even, minimum/maximum fuel purchase requirements
METRO Municipallty of Metropolitan Seattle	. Major Local Area Transit Operator	. Enhanced public information dissemination by inserting ads in newspapers with instructions for requesting transit information and increased the distribution of timetables from banks, libraries and shopping malls.	. Despite the considerable efforts made by METRO to enhance and maintain public information distribution, the telephone information system was heavily overloaded. Many callers received a busy signal or did not get information.
		. Through the use of its ongoing bus route monitoring system, METRO identified routes having the greatest demand and shifted high capacity articulated buses to these routes.	. Increased utilization of existing bus fleet capacity. This had a relatively limited impact as many of these buses were already on the most heavily patronized routes.
		. Rehabilitation and placing in service of reserve fleet buses.	. A limited number of reserve fleet buses were placed in service during the crisis.
Seattle/King County Commuter Pool, Inc.	. Local Area Ridesharing Agency	. A vanpool program was started in May. By the end of June 42 vans were in service.	. The timing of the start-up of the vanpool program limited its effectiveness during the fuel shortage period.
		. An attempt was made to increase carpool matching activities and encourage employers to implement variable work hours programs.	. Time constraints limited the effectiveness of efforts made to increase carpool matching and the use of variable work hours during the fuel shortage period.

EXHIBIT II-6

TRANSPORTATION ENERGY CONTINGENCY ACTIONS
IMPLEMENTED IN NEW YORK STATE

MAJOR ACTOR	ROLE	DESCRIPTION OF ACTION(S)	EVALUATION/ESTIMATION OF IMPACTS
New York State	. Issuance of Executive Order declaring a state of emergency and implementation of odd-even minimum purchase plan for gasoline.	. Specific provisions of the Executive Order required: - minimum gasoline purchases of at least one-half tank (later changed to dollar requirement for ease of administering) - station posting of hours and days of operation - use of color coded flags to indicate gasoline availability - gasoline dealers to be open at least one weekend day for a minimum of ten hours	. The odd-even minimum gasoline purchase plan spread the demand for gasoline in the New York City area and contributed to the reduction of lines at stations.
	. Allocation of gasoline supplies	. Release of fuel supply from the State emergency gasoline set-aside.	. Could not be evaluated
	. Dissemination of information on gasoline availability	. Operation of a gasoline hotline	. Provided callers with general information about gasoline availability and the odd-even plan. Unable to give detailed, location specific information.

Although discussions with local transportation planners suggest that the odd-even plan alleviated some of the panic-induced hoarding of fuel and thereby reduced gas lines, there are no specific data to verify this. The crisis dissipated too quickly for a formal evaluation of this measure to be made.

Commuter Transportation, Inc. (or Commuter Computer, Inc.) is the local ridesharing agency for the Los Angeles area. Despite the fact that additional staff and financial resources were committed to maintain and expand ridesharing activities during the fuel shortage, the surge in demand was such that average "turnaround time" (the time between the initial request for a match list and receipt of such list) was not reduced below the four to five weeks required prior to the fuel shortage. As a result, many potential ridesharers did not receive their match list in time to make use of it during the worst parts of the crisis. It is important to point out that Commuter Computer maintains an extensive data base for developing matches due to its use by a number of large employers as a means of satisfying Los Angeles' Clean Air quality requirements. For many of the people that normally would not be expected to rideshare, their inclusion in the data base provides them with a reasonable option in case of an emergency. This option is particularly attractive in view of the aforementioned difficulty in reducing match list turnaround time.

State of Rhode Island

The first signs of impending gasoline shortages in Rhode Island, consisting primarily of media reports on spot shortages in the neighboring states of Massachusetts and Connecticut, appeared towards the end of May. At this time, a strike by independent truckers curtailed fuel deliveries to gasoline dealers and led to lower inventories. These circumstances aggravated the fuel shortages brought about by the disruption in Iranian oil supplies. During June and July gasoline lines appeared at service stations throughout Rhode Island. At some stations, when gasoline was available, waiting times of forty-five minutes or more were reported.

The duration and severity of fuel shortages in Rhode Island during the summer of 1979 was considerably less than that which occurred in California. Rhode Island did not have an emergency transportation plan available prior to the fuel shortages. During interviews with representatives of private and public sector organizations involved with transportation activities, there was a strong consensus that voluntary cooperation and coordination among the various parties were more effective in coping with the fuel shortages than a formalized contingency plan would have been. Rhode Island's unique characteristics, particularly its small size and close lines of communication between the major actors involved in energy planning, may lend themselves to a somewhat less formalized approach to dealing with fuel shortages. This is particularly true when these shortages are of a less severe nature.

Exhibit II-2 highlights the major transportation energy contingency actions implemented. Although Rhode Island did not declare a state of emergency, it did issue an executive order mandating an odd-even minimum fuel purchase plan. Initially, only a minimum purchase requirement was included, however, this was subsequently amended by the addition of an odd-even purchase provision. It was felt that the minimum fuel purchase require-

ment alone was not very effective in reducing gasoline lines as it just encouraged motorists to fill up more frequently. When the odd-even provision was added, the plan tended to reduce panic buying of gasoline and the inventory of gasoline in "full tank" automobiles. A major problem for Rhode Island, given its particularly small size, was the inability to closely coordinate its odd-even minimum gasoline purchase plan with those of neighboring states. No statistical data on the effectiveness of the odd-even minimum purchase plan are available. The lack of such data may be at least partially due to the gradual increase in gasoline supplies which occurred soon after the plan was implemented.

What is not revealed in Exhibit II-2, is the extent of economic damage experienced by the Rhode Island tourist industry (e.g., hotels, tourist attractions, etc.) as a result of the fuel shortages. Tourism in Rhode Island is almost completely dependent on the automobile. Long gas lines, uncertain availability and rising prices concentrated in the Boston-Washington megalopolis greatly reduced tourist related travel. Unfortunately, there were no significant emergency measures implemented to reduce adverse economic impacts on the tourist industry and the overall Rhode Island economy stemming from the fuel shortages. This suggests a need for specific emergency transportation actions, such as increased emphasis on the use of intercity tourist buses, to maintain the economic vitality of this industry.

Minneapolis - St. Paul, Minnesota (Twin Cities Area)

Gasoline prices in the Twin Cities area started to increase rapidly in early March from 67.9 cents to 95.9 cents per gallon by the beginning of August, a jump of more than 41 percent. By June gasoline lines began to appear at various service stations, some requiring waits of up to one-half hour. An Emergency Executive Order declaring a State of Emergency was issued by Governor Quie on June 28. This order contained minimum gasoline purchase provisions as well as additional requirements for gasoline dealers to manage monthly fuel supplies. Before this measure really had a chance to be effective, lines ceased in early July as gasoline supplies became available at 97 cents per gallon.

Based on past experience with the 1973-1974 Middle East Oil Embargo and observing that a number of transit agencies were preparing energy contingency plans, the Metropolitan Transit Commission (MTC), in cooperation with other organizations concerned with local transportation in the Twin Cities area, initiated its planning effort in 1977. A regional transportation energy plan was developed based upon the general strategy of maximizing the use of transit buses and supplementing conventional service with paratransit and school buses. Although this plan was available prior to the 1979 fuel shortages, it was less effective than it could have been if more effort had been made to review, update and refine the specific emergency measures covered. Many of the measures identified in the plan were not implemented for a variety of reasons. These reasons included the short duration and severity of the fuel shortages, underestimates of the time frame required to implement many of the actions, insufficient pre-planning, and inadequate funds.

Exhibit II-3 presents the key transportation emergency conservation measures implemented or authorized by the MTC, the Share-A-Ride Program (major ridesharing program), and the State of Minnesota.

MTC made a major effort to place older buses from the standby reserve or "mothball" fleet in line service. In spite of time and funding constraints they were able to place 35 to 40 "mothball" fleet buses in service on the most heavily used routes by the end of 1979. Assuming a peak hour bus service of 800 or so buses in operation, this action increased bus capacity by only five percent. MTC also tried to decentralize its distribution system for bus transit schedules and information in order to satisfy the surge in inquiries. Nevertheless, both the number of phone calls lost and the time required to answer each information request increased. Although route monitoring in an on-going activity at MTC, the lack of extra bus capacity on any routes limited their ability to shift buses within the system.

Share-A-Ride during 1979 was primarily run as a ridesharing demonstration project to serve multi-employer sites. The limited number of sites served by the program placed some constraints on the demand for ridesharing services, although requests for assistance in forming carpools and vanpools grew rapidly during June and July. The most instructive observations may be made about the capabilities of the vanpool program to accommodate the surge in demand. Although service is provided through a third party arrangement with Vanpool Services, Inc. (a Chrysler Corporation subsidiary), Share-A-Ride was unable to obtain new vans fast enough to meet demand. This was largely due to the closing down of the van assembly plant for model changes and the need to order vehicles by a certain date in order to coincide with van production runs. In addition, securing sufficient gasoline to run existing van service was also a problem, particularly given their large fuel needs.

As signs of an impending fuel shortage and rising fuel prices began to appear at the end of April, Governor Quie began to request that state residents try to reduce fuel consumption. The worsening situation in July led the Governor to issue an Executive Order declaring a State of Emergency. This document contained minimum purchase restrictions on gasoline sales, required dealers to set aside fuel for weekends (provided they were normally open on weekends in 1978), and forced dealers to allocate their supplies so as to be able to operate with their monthly gasoline supplies (a maximum purchase restriction could be imposed by individual dealers if needed to satisfy this requirement). The fuel shortages started to rapidly disappear just around the time the Executive Order was issued so it was not really possible to evaluate its effectiveness. However, it should be noted that there was considerable opposition to the plan voiced by the tourist industry, as well as by the general public, both of which viewed it as undesirable government interference.

Dallas - Fort Worth Area, Texas

Gasoline supplies became tight in Texas at the end of May when many stations had exhausted their supplies of one or more lines of gasoline. Gasoline lines started to appear in the Dallas - Fort Worth area in mid-June, accompanied by heavy news media coverage of fuel shortages around the rest of the country. Service station dealers began to reduce their hours of operation and close on weekends. Despite the rise in gasoline prices (which rose about 14 percent between May and July) the longest gasoline lines appeared during the last part of June and the first week in July. The Governor introduced an odd-even gasoline purchase plan the second week in July. At this time the supply situation started to improve, panic buying and hoarding began to decrease, and gasoline lines started to disappear

although stations operated for reduced hours. By the latter part of August panic buying and "tank topping" all but stopped as the odd-even plan became more effective and gas supplies increased. With the increased availability of gasoline in the Dallas-Fort Worth area, the Governor decided to discontinue the odd-even plan on Labor Day.

In view of past experiences with the 1973-1974 Middle East Oil Embargo, the Steering Committee of the Metropolitan Planning Organization requested the North Central Texas Council of Governments (NCTCOG) to develop short-range plans to minimize the impacts of national energy contingencies on local ground transportation systems. The purpose of NCTCOG's plan is to preserve the economic vitality of the Dallas-Fort Worth area and to maintain local mobility, particularly work trips. Key recommendations in the Plan emphasized maintaining and expanding transit and carpool programs, the need for intergovernmental cooperation, possible use of school buses for emergency use, appointment of local energy coordinators (LEC's) in counties and cities, flexible work hour programs, drafting contingency agreements with other transportation providers (e.g., transit operators, taxicab companies, etc.) and preparing a regional park-and-ride and exclusive bus lane plan.

Despite the considerable impact the 1979 fuel shortages had in the Dallas - Fort Worth area, other than the odd-even minimum purchase gasoline restrictions mandated by the State of Texas, no specific regional transportation energy contingency actions were initiated during this period. This does not imply that local government agencies in the Dallas - Fort Worth area were not responsive to the problems generated by the gasoline shortages, but rather that to a large extent many of the programs outlined in the contingency plan were already in place and helped the area weather the shortages (e.g., enhanced carpool programs, local energy coordinator (LEC) system, additional bus fuel storage areas, and legislative changes permitting the use of school buses for public transportation under certain emergency conditions). In addition, there was a broad consensus that the problems faced in the Dallas - Fort Worth area were considerably less severe than those faced in various Northeastern states and California. These circumstances tended to limit the implementation of new emergency energy conservation actions.

Exhibit II-4 summarizes the transportation energy contingency actions implemented, or in place, in the Dallas - Fort Worth area. The Office of the Governor, State of Texas, issued an Executive Order on July 3 which established an odd-even minimum/maximum gasoline purchase plan. During the second week in July (when this measure became effective), gasoline supplies had already started to improve. By the third week in August signs of any fuel shortages had all but disappeared. Despite the gradual increase in gasoline supplies, it appears that the odd-even, minimum/maximum gasoline purchase requirements contributed to the reduction in panic buying, tank topping and gasoline lines. They may have also indirectly contributed to the increased availability of gasoline through the reduction of in-vehicle inventories of fuel.

NCTCOG, the organization that produced the transportation energy contingency plan in 1977, has no implementation powers or responsibilities.

It is strictly a regional planning organization. However, a number of elements in the energy contingency plan were implemented prior to the 1979 fuel shortages. These include the following actions:

- Texas state laws were changed to permit the use of school buses to provide general public transportation during emergencies, however, during the 1979 fuel shortages it was generally felt that the relatively low severity of emergency did not warrant use of this law -- particularly in view of the short term nature of the crisis and some potentially restrictive provisions attached to the law;

- Both the Dallas Transit Service (DTS) and the City Transit Service of Forth Worth (CITRAN) added fuel storage capacity. Local transit operators also changed their preventive maintenance program to increase transit system capacity;

- In order to enhance the dissemination of information and energy contingency actions, Local Energy Coordinators (LEC's) were appointed or elected by local governments to facilitate the flow of communication between NCTCOG and the local area governments. During the 1979 fuel crisis LEC's fielded questions from residents of their areas on a variety of energy related problems; and

- Existing ridesharing programs were maintained and expanded as outlined in the original contingency plan. These programs still experienced considerable difficulty in handling the surge in demand for their services.

Dallas - Fort Worth was one of the first areas to develop a regional transportation energy contingency plan and has received broad recognition of its pioneering effort. Many of the recommendations made in the plan were implemented prior to the 1979 fuel shortages and have become part of an on-going effort to conserve transportation energy. In keeping with its organizational nature, the existence of NCTCOG's plan carries no requirements for implementation or funding. Without such a commitment from member governments, the NCTCOG contingency plan will not be as effective as it could be. This is particularly true in terms of providing resources to expand transit service and capacity and also to enhance the local ridesharing program's capability to serve a sudden increase in demand.

Seattle/King County, Washington

Seattle/King County travelers began to encounter long gas lines, curtailed hours at service stations on weekends and evenings, and rising gasoline prices around the middle of May. The crisis period was relatively short, lasting only a few months.

Based on past experience with the 1973-1974 Middle East Oil Embargo, the Metro Council requested that a transportation energy contingency plan be prepared to aid the Municipality of Metropolitan Seattle (METRO), which is the local transit operator, in responding to future fuel shortages. The

plan was divided into the following three sections:

- Primary Element I - consisted of strategies designed to increase the carrying capacity of the current transit system such as variable work hours, public information, use of school buses, etc.;

- Primary Element II - consisted of strategies designed to extend transit into areas not served by current transit and to increase usage of paratransit modes such as marketing multicenter transit systems, paratransit, etc.; and

- Alternate Plan - consisted of strategies for modifying transit operations and/or increasing fuel storage capacity when faced with cutbacks in diesel fuel.

Although this plan explicitly recognized the need for securing funding and more detailed pre-planning for many emergency energy conservation actions recommended, there was not a significant effort to follow through on this plan prior to the 1979 fuel shortages. During June 1979 METRO issued an updated Energy Crisis Contingency Plan (ECCP). This plan documented ongoing and planned actions to cope with severe motor gasoline shortfalls within a three day or 72 hour period.

Exhibit II-5 highlights the major emergency energy conservation actions implemented. The Washington State Energy Office's petroleum shortage contingency plan, in its initial phase, encouraged local initiatives in dealing with fuel shortage problems. Unfortunately, the plan did not adequately consider the lack of local government powers and its limitations. The State of Washington did not implement any odd-even minimum/maximum purchase restrictions.

METRO focused its efforts on three general contingency strategies: (1) enhanced public information distribution, (2) improved use of the existing fleet and (3) limited service expansion through rehabilitation of their reserve fleet. These actions are briefly described below:

- Enhanced Public Information Distribution

  The METRO telephone information system was heavily overloaded during the months of May, June and July 1979. Many callers received a busy signal or did not get information. METRO responded by inserting ads in newspapers with instructions for requesting transit information and asking people to avoid calling between 11 a.m. and 1 p.m. weekdays (the peak calling period). In addition, the distribution of timetables from banks, libraries and malls was increased.

- Improved Utilization of Existing Bus Fleet

  METRO regularly monitors ridership on its bus routes. METRO identified those routes having the greatest demand and shifted high capacity articulated buses to those routes with the highest growth in patronage.

- Rehabilitation of Reserve Fleet Buses

  At the beginning of 1979 METRO had 50 to 70 buses above the ten percent spare ratio in reserve status. These were generally old buses, some with as much as two million miles of travel. During the crisis period, a number of these buses were placed in service.

Seattle/King County Commuter Pool, Inc. the local area ridesharing organization, tried to increase matching activities to meet the surge in demand. Its vanpool program was just starting in May 1979 and therefore was of limited value to commuters during the fuel shortage. During June, however, 42 vans were placed in service. On July 11, Commuter Pool, in conjunction with local public officials, sent a letter to the largest businesses in the Seattle/King County area requesting that they (1) contact Commuter Pool for employee matching services, (2) encourage support for transit and (3) implement variable work hour programs. It is clear from the nature of the actions requested, that it would require a significant amount of time for businesses to respond in an effective manner and for Commuter Pool to provide matching services.

Since the crisis was relatively less severe than that which occurred in other areas, such as California and various Northeastern states, government actions were more limited. METRO, in cooperation with other local area organizations having an interest in transportation, is continuing to improve its capabilities to respond to future fuel shortages.

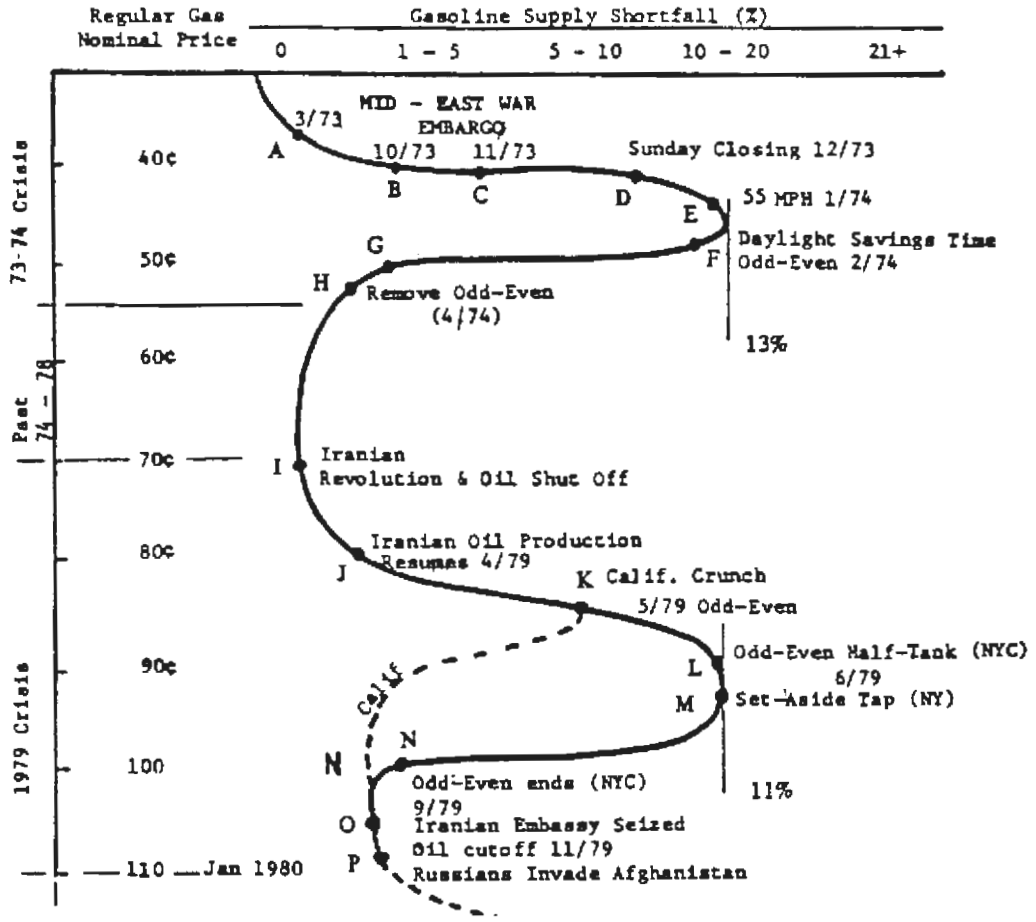
New York State

The appearance of spot fuel shortages in late April and early May in California and related media coverage foreshadowed the possibilities of fuel shortages in New York State. Exhibit II-7 presents the sequence of major events in New York State furing the 1979 fuel shortages and associated gasoline availability and price characteristics. In the New York City area gasoline dealers started to curtail hours, particularly on weekends and evenings. By June 11 long gas lines, some with waits as long as four hours, were increasingly apparent. Stations began to impose sales limits of 5 gallons or less. Queues were accentuated by motorists "topping-off tanks." Gasoline continued to be available at most upstate resort and rural areas although some upstate metropolitan areas reported reductions in gasoline supply, moderate gas lines and occasional weekend and evening gasoline station closings. New York City area residents responded to the fuel shortages by curtailing weekend and vacation travel. An independent truckers strike against high diesel fuel prices and Federal fuel allocation policies may have aggravated the crisis situation. The shortfall in gasoline supplies peaked during the last week in June and the first week in July. New York State implemented an odd-even half-tank minimum gasoline purchase plan in New York City and the surrounding nine county area in late June and released additional supplies from the New York State Set-Aside program. Gas lines eased by mid-July due to public efforts to conserve gasoline, the imposition of the odd-even minimum purchase plan in the New York City area and the fall-off in gasoline demand that accompanied rising prices. The fuel shortage lasted four months, from May through August.

The New York State Energy Act of 1976 created the New York State Energy Office and established the powers of its Commissioner during an energy emer-

EXHIBIT II-7

MAJOR EVENTS: 1973-1974 AND 1979 ENERGY CRISES



Source: Hartgen, D.T., Transportation Energy Contingencies: A Status Report on Public Response and Government Roles, Journal of Advanced Transportation, Vol. 14, No. 1, Spring, 1980, pp. 47-72.

gency. These powers allow the Commissioner to: (1) allocate available energy supplies among areas, users or persons, (2) impose restrictions on wasteful or inefficient energy uses, (3) waive state and local environmental protection requirements for 30 days -- with one extension of 30 more days, (4) allow the Governor to delegate additional emergency powers to the Commissioner and (5) allow the Commissioner to supersede the emergency powers normally vested in other agencies. These powers were used by Governor Carey to institute odd-even, half-tank sales restrictions in June 1979. Under the auspices of the New York State Energy Law of 1976, the New York State Energy Emergency Plan was prepared in February 1978. This plan established a 24-hour hotline to provide information on petroleum product availability and contains provisions for (1) allocating diesel and gasoline fuels, (2) establishing a state set-aside program if a Federal program is not in effect and (3) implementing an odd-even gasoline sales system.

Exhibit II-6 highlights the key actions implemented by New York State. In response to the growing presence of long gasoline lines and curtailed station hours in the New York City metropolitan area, New York State declared a state of emergency in June and instituted an odd-even minimum gasoline purchase plan in the New York City Metropolitan Region. Other provisions instituted with this plan required dealers to stay open at least one day during weekends and to post color coded flags indicating fuel availability. Because of its critical importance to travel, the New York State Thruway Authority was granted authority to determine minimum and maximum fuel purchase limits and also control gasoline station hours on the New York State Thruway. On September 6 all emergency restrictions were rescinded.

The odd-even minimum fuel purchase plan tended to spread the demand for fuel in the New York City Area and helped to reduce the length of lines. The impact of releasing the state set-aside supply of gasoline in July could not be assessed. The reduction in panic-induced buying was aided by the odd-even minimum purchase plan. The crisis peaked during the last week in June and the first week in July and then gradually tapered off.

The impact of severe local fuel shortages in the New York City metropolitan region on total statewide travel patterns highlights the critical importance of disseminating accurate and timely information on gasoline availability. Although severe fuel shortages were generally restricted to New York City and its nearby environs, there was a significant decline in recreational and vacation travel to many upstate resorts and a concomitant loss of revenues. The general media, including newspapers, television and radio outlets tended to encourage and reinforce traveler panic by focusing on horror stories and reporting incomplete information. As information reported by the media improved, travel to upstate areas began to recover. The telephone information hotline operated by New York State could only provide general information on gasoline availability in response to traveller inquiries. This suggests, perhaps, that the ability to gather and distribute accurate information on gasoline availability, at a fairly detailed level, may considerably minimize some of the negative impacts on recreational or vacation travel and related businesses.

The New York State experience also suggests that, in addition to curtailing discretionary travel, people tend to respond by purchasing more fuel efficient vehicles. The impact of this behavior on over-all gasoline consumption, at least for New York State as a whole, tended to outweigh many other efforts to conserve fuel -- including mode shifts to transit (except for the

New York City region).

MAJOR ACTIONS IMPLEMENTED AND RELATED IMPLEMENTATION PROBLEMS

The types of emergency transportation energy conservation actions most commonly implemented, or attempted, during the 1979 fuel shortages by the case study areas include:

- Expansion of public information and marketing distribution systems;
- Implementation of odd-even and/or minimum (maximum) fuel purchase restrictions;
- Rehabilitation and placing in service of standby reserve fleet or "mothball fleet" buses;
- Emergency expansion of ridesharing services (carpooling and vanpooling); and
- Monitoring of transit ridership and shifting buses to the most heavily used routes.

These actions are discussed in more detail in the following paragraphs.

Expansion of Public Information and Marketing Distribution Systems

Each of the case study areas made an effort to maintain and expand their capability to deliver timely and accurate travel information to the general public. State governments generally confined their efforts to operating hotlines to inform motorists about gasoline availability and to answer questions relating to fuel purchase restrictions. A common problem encountered was the failure of state-operated hotlines to provide detailed information on the availability of gasoline along specific routes and destinations.

Transit agencies tried to enhance their capability to disseminate travel information (e.g., schedules, maps, trip-routing services, etc.) and market fare payment options (monthly and weekly passes) through the use of decentralized distribution centers. These centers were generally shopping areas, mobile units, banks and employer outlets. For many transit operators decentralization was the only option available. Phone information centers operated twenty-four hours per day in many instances and yet capacity constraints resulted in high percentages of lost calls and long waits. Key reasons behind these capacity constraints were: (1) phone operator productivity, as measured by calls handled per employee hour, declined due to the influx of calls from unfamiliar users of transit systems, (2) phone system capacity limitations, and (3) shortages of qualified operators, compounded by the need for long training periods for new hirees.

Implementation of Odd-Even And/Or Minimum (Maximum) Fuel Purchase Restrictions

Five out of the six case study areas implemented some type of odd-even and/or minimum (maximum) fuel purchase requirements. The lone exception, Seattle, did not do so because of the low severity of fuel shortages and

because the State of Washington,which had the power to implement an odd-even gasoline purchase plan,felt that local areas should take the initiative in coping with fuel shortages.[1/] In most cases by the time the decision was made to implement odd-even and/or minimum (maximum) purchase requirements, the crisis had peaked and gasoline became more available. A key impact of these requirements is the reduction in panic-induced hoarding of gasoline supplies. In many cases, compliance with odd-even and/or minimum purchase restrictions was difficult to monitor and enforce. The opposition of various major public interest groups, i.e., the tourist industry, gasoline dealers, and the general public in many areas tended to delay the timely implementation of these types of actions.

Rehabilitation and Placing In Service Of Standby Reserve Fleet or "Mothball" Fleet Buses

All of the transit operators covered in the case studies placed heavy emphasis on expanding transit carrying capacity in their contingency plans through the rehabilitation and placing in service of standby reserve or "mothball" fleets of old buses. Some transit operators, such as the Southern California Rapid Transit District in Los Angeles, the Metropolitan Transit Commission in Minneapolis, and the Seattle Metro, succeeded, although relatively small numbers of additional buses were placed into service under this measure. This type of emergency action is important, however, because it enables motorists who are unable to obtain gasoline to maintain their mobility, at least partially.

The primary constraint in implementing this measure is the need for the transit operator to have a considerable inventory of easily repairable buses and spare parts so as to provide a significant increase in carrying capacity. Other problems related to implementing this measure are as follows:

- Rehabilitation of buses may require huge expenses for the transit agency, particularly for labor (overtime) and parts -- at a time when transit agency budgets are constrained by rising diesel fuel costs and other expenses;

- The schedule for placing standby buses in service will largely be a function of available manpower, equipment resources, and the extent of repairs needed -- leading to long lead times; and

- Rehabilitated buses may not be capable of being placed in certain types of service operations (e.g., freeway operations) because of poorer levels of performance.

Emergency Expansion of Ridesharing Services

In the case study areas local ridesharing organizations were only partially successful in providing expanded services in response to the sudden surge in demand for carpool and vanpool matching, although they all were able to accommodate at least some of this new demand. A major role of

1/ In the State of Washington, during 1979, the occurrence of fuel shortages was a fairly localized phenomenon, being limited primarily to the Seattle area. This was also true in the Northeast and California.

most ridesharing organizations is to provide matchlists of potential carpoolers (or vanpoolers) to applicants requesting such assistance. Long turnaround times (the time from match application to receipt of matchlist) limited the capability of ridesharing organizations to respond in a timely manner. Despite attempts to increase staff, the basic time required to enter information into the local ridesharing organization's data base and the sheer magnitude of the increase in applications from individuals and employers made it difficult to maintain, much less reduce, turnaround time. For fuel shortages that are of a short term nature, this can be a critical factor in determining whether ridesharing can be an effective emergency energy conservation measure.

For ridesharing organizations that promote and/or provide vans for vanpooling, there were two critical problems in responding to increased demand during the 1979 fuel shortages. The first was the problem of obtaining timely delivery of vans. Orders for vans required long lead times due to production plant closings for model changeovers, the need to place orders in advance, and the general supply/demand for new vans. The second problem in expanding vanpool services related to the difficulty in obtaining gasoline. Employer-based vanpools had difficulty in obtaining gasoline for their fleets. The difficulty was lessened by fuel storage capabilities and a sufficient inventory of gasoline. In addition, in most areas there was no mechanism in place to grant vanpools priority at gasoline pumps.1/

Monitoring of Transit Ridership and Shifting of Buses to Most Heavily Patronized Routes

All of the transit agencies encountered during the site visits monitor patronage. Some transit systems, such as Seattle Metro, were able to allocate high capacity articulated buses to routes having the greatest growth in patronage. Many operators cited problems associated with changing transit schedules and the allocation of vehicles/drivers to routes due to the need to hold public hearings, union labor contract agreements, and technical scheduling complexities. Transit management, at all properties visited, claimed to operate at almost maximum load capacity during peak travel periods and therefore, had little or no flexibility to shift vehicles between routes.

ACTIONS PLANNED BUT NOT IMPLEMENTED

A review of several pre-1979 fuel shortage transportation energy contingency plans from case study sites as well as other areas, shows that there were a number of actions commonly planned but never implemented. One of the most frequently mentioned emergency actions is the adoption of variable work hour programs or alternative work schedules. Flexible and staggered hour schedules are the most common variations found in transportation energy contingency plans, however, compressed work weeks are occasionally cited. Transit operators often look upon these techniques to smooth peak period demand and increase the volume of passengers carried during the shoulder periods.2/ Unfortunately, without extensive preparation of plans by major employers prior to an energy emergency and considerable coordination with the transit operating agency, the time required to plan and implement most alternative work schedules would probably make implementation questionable in all but the longest and most severe fuel shortage conditions.

1/ DOE Special Rule 9 which guaranteed fuel allocations to transit was later extended to vanpools.

2/ "Shoulder periods" are those intervals of time immediately before and after the peak travel periods when considerable excess capacity is available on most transit systems.

Another class of actions frequently mentioned in transportation energy contingency plans, but almost never implemented, may be categorized as transit system operating changes. These include such measures as changing local bus services to express or skip-stop operations, removing seats to increase standing room, adjusting bus schedules, reducing the number of stops, adding turnbacks, etc. These actions generally involve fine tuning of the transit system. In many cases transit systems may not be able to implement these types of actions unless detailed pre-plans are available prior to the crisis.

There are many other types of actions such as increasing the use of differential pricing on transit during the peak and off-peak periods, increased use of paratransit, and others which have been mentioned but rarely, if ever, used.

COMPARATIVE ANALYSIS OF CASE STUDY AREA RESPONSES

In order to facilitate comparison of the responses of case study areas to the 1979 fuel shortages, the results have been summarized in Exhibit II-8. Since these comparisions are primarily qualitative and judgemental in nature, the actual case study areas have not been identified. In general, for the four transportation contingency actions shown, there were no examples of high overall program effectiveness. In addition, it may be observed that efforts to expand ridesharing and disseminate travel information appeared to be relatively more successful than efforts to expand transit system capacity.

EXHIBIT II-8

COMPARISON OF SELECTED RESPONSES OF CASE STUDY AREAS TO THE 1979 FUEL SHORTAGES

TRANSPORTATION AND TRANSIT INFORMATION DISSEMINATION

KEY CHARACTERISTICS	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6
Severity of Shortage	Severe	Severe	Low-Medium	Low-Medium	Low-Medium	Severe
Program Commitment	High	High	High	High	High	High
Overall Effectiveness	Medium	Medium-High	Medium	Medium-High	Low-Medium	Low-Medium

EMERGENCY EXPANSION OF RIDESHARING

KEY CHARACTERISTICS	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6
Severity of Shortage	Severe	Severe	Low-Medium	Low-Medium	Low-Medium	Severe
Program Commitment	High	Low	High	High	Low	Low
Overall Effectiveness	Medium-High	Low	Medium	Medium	Low	Low

REHABILITATION AND PLACING IN SERVICE OF RESERVE FLEET BUSES

KEY CHARACTERISTICS	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6
Severity of Shortage	Severe	Severe	Low-Medium	Low-Medium	Low-Medium	Severe
Program Commitment	Medium	Low	High	Low	Medium	Low
Overall Effectiveness	Low	Low	Low	Low	Low	Low

MONITORING OF TRANSIT RIDERSHIP AND SHIFTING OF BUSES TO MOST HEAVILY USED ROUTES

KEY CHARACTERISTICS	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6
Severity of Shortage	Severe	Severe	Low-Medium	Low-Medium	Low--Medium	Severe
Program Commitment	Low-Medium	Low	Low-Medium	Low	High	Low
Overall Effectiveness	Low	Low	Low	Low	Medium	Low

III. SOME PROMISING ACTIONS FOR AN ENERGY CONTINGENCY

This section identifies some promising emergency transportation energy conservation actions and discusses related planning and implementation issues. Based on the actual experiences of state and local governments in coping with fuel shortages, and also on published research related to transportation energy contingency planning, some promising actions have been identified. They include:

- Reserve Transit Bus Fleet;
- Reserve School Bus Fleet;
- Variable Work Hours Program;
- Carpooling Program Expansion;
- Transportation and Transit Information Dissemination;
- Local Energy Emergency Coordinator Program;
- Gasoline Sales/Service Monitoring; and
- Gasoline Sales Purchase Requirements.

These actions are discussed in the following paragraphs.

RESERVE TRANSIT BUS FLEET

In planning for energy shortages, transit operators and Metropolitan Planning Organizations (MPO's) placed considerable emphasis on expanding transit system capacity through rehabilitation and placing in service of reserve or "mothball" fleets of old buses. Although some transit operators were partially successful in this effort during the 1979 fuel shortages (e.g., Southern California Rapid Transit District in Los Angeles, METRO in Seattle and Metropolitan Transit Commission in Minneapolis-St.Paul), a relatively small number of buses were placed in actual line-haul service during this period. If more buses were available in reserve transit fleets, and if they were maintained in operable or near-operable condition, then transit operators would have considerably more capability to accommodate sudden surges in demand and expand transit service during emergencies.

Past Limitations of Reserve Transit Bus Fleets

In recent years transit bus sales have barely kept pace with the need to replace existing fleets and accommodate normal ridership growth. This may largely be attributable to the limited bus construction capabilities of the two remaining manufacturers and extensive federal requirements and procedures for purchasing new buses.[1/] Transit systems desiring to purchase new buses encounter waits as long as 18 to 24 months.[2/]

Transit operators that were able to assemble a reserve bus fleet encountered numerous obstacles. Many lacked sufficient maintenance and storage facilities to accommodate a large number of buses. Several older buses were badly deteriorated and required considerable rehabilitation before they could be placed in line-haul service. In addition, before 1981, the Urban Mass Transportation Administration (UMTA) discouraged the formulation of reserve bus fleets by requiring operators receiving government grants to sell buses being replaced and use the proceeds to help offset the costs of new buses. The combination of these factors limited the availability and effectiveness of reserve bus fleets during past fuel shortages.

Planning Considerations

UMTA is currently in the process of preparing policy guidelines for bus replacement, fleet expansion and reserve fleets. These guidelines will constitute a comprehensive bus policy.

UMTA recently revised its policy on transit bus stockpiling to permit transit operators to retain buses in a reserve fleet whenever (1) an old bus is replaced by a new one or (2) a bus is no longer needed to provide regular service due to cutbacks.[3/] Buses stored under this policy may be used during energy emergencies, as short-term replacements for buses being rehabilitated or to supplement regular transit equipment if local conditions change unexpectedly. This policy allows normal operating costs incidental to the storage of the buses, preparation for storage, and if needed, return to active service to be considered eligible expenses for operating assistance under Section 5 of the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1604).

1/ Taylor, G. F., "Capacity of Urban Transit Systems to Respond to Energy Constraints, "in Transportation Research Board Special Report 191, Considerations in Transportation Energy Contingency Planning, 1980, pp. 43-48.

2/ Ibid., p. 43.

3/ Federal Register, Vol. 46, No. 12, Department of Transportation 49 CFR Part 639, Emergency Stockpiling of Buses, Final Rule, January 19, 1981, pp. 5480-5481.

Although this rule on bus stockpiling will encourage formation of reserve bus transit fleets, there are a number of other factors that must be dealt with before reserve bus fleets become a feasible strategy for expanding transit service and capacity during fuel shortages. These include: accumulation of enough buses for the reserve fleet, construction of support facilities for maintenance, storage and rehabilitation of old buses to a reasonable performance standard; contingency funds for placing these buses in service; and procedures for allocating buses to existing routes and/or expanding services.

RESERVE SCHOOL BUS FLEET

The inability of public transit systems to accommodate sudden surges in ridership and the lack of alternative travel options in areas where transit is not available have focused increased interest in the possible use of school buses to provide general public transportation during emergencies. The large number of school buses and their broad geographical distribution are likely to enhance the effectiveness of this option as an emergency energy conservation measure. There are 391,000 school buses in the United States (156,000 of them are privately owned and 253,000 are publicly owned) as compared to only 54,000 city or county transit buses.[1/] In addition, school buses are available almost everywhere whereas transit buses operate in only 900 localities -- primarily urban areas.[2/] By using school buses to provide general public transportation during fuel shortages, transit systems may rapidly and significantly expand their carrying capacity while avoiding additional investment in purchasing new buses or rehabilitating old ones. Moreover, many areas not served by transit but having a school bus district, would be able to provide their citizens with a transit alternative to using their automobiles. The large number of school buses and their widespread availability would aid local areas in maintaining travel mobility and encouraging fuel-efficient travel.

There are precedents for using school buses to provide public transportation during fuel shortages and natural disasters. One situation in Dade County, Florida involved changes in school hours due to a fuel shortage.[3/] Others in Boston, Massachusetts and Wilkes Barre, Pennsylvania included changes in school hours as a result of natural disasters. In all these cases, school children were never mixed with adults on the same bus.[4/]

1/ Shannon, Jr., T.A., "Will your school buses rescue us from the energy crisis?" The American School Board Journal, November, 1980, pp. 21-22.

2/ Ibid.

3/ Carlson, C. and McShane, M.P., "Potential Roles For Auxiliary-Paratransit Services in an Energy Shortage," in Transportation Research Board Special Report 191, Considerations in Transportation Energy Contingency Planning, 1980, pp. 48-59.

4/ Ibid.

Opposition to using school buses to provide general public transportation has, along with the existence of institutional and legal barriers, limited the use of this strategy during fuel shortages. However, the potential advantages of using school buses are forcing opponents of this policy to reexamine and reevaluate their position. Some problems associated with expanded use of school buses during fuel shortages are summarized below:

- Legal Barriers[1/] - Only 17 states currently allow school buses to be used for non-school activities. Thirteen states absolutely prohibit any use of school buses other than transporting students to and from school or school activities. There are, however, 21 states that allow school buses to be used by specific groups (e.g., senior citizens, retarded children) for non-school activities. Several states, such as Colorado, New York, Oregon, and Texas are working to make state laws on school buses use more flexible. In most states, Governors have the power to commandeer all forms of public transportation during an emergency. In addition to changes in state legislation, there are a number of other regulatory barriers which have to be considered. Federal and state licensing authorities may have to accelerate their normal operating procedures for granting authority to introduce new fixed route bus services. School buses may also require exemption from the U.S. Department of Transportation's 504 regulations requiring transit services supported by Federal funds to be accessible to the handicapped.

- Cost and Funding Issues - School bus operating costs may vary from normal transit bus operating costs. It is unclear how fares would be set for transit services provided by school buses. If fares are set below break-even levels in order to be compatible with existing transit fares, subsidies would be needed. Insurance costs for school buses used to provide general transit service are likely to be higher unless some arrangements can be made.

- School Bus Availability - During the school year, the morning peak period for school transportation often overlaps that for transit. In the afternoon, the extent of overlap tends to be slightly less. In order to make school buses available for general transit service, school hours may have to be modified. Such changes may be opposed by school teachers and families whose normal routines may be disrupted (e.g., working parents).

- School Bus Design Constraints - A school bus typically has a narrow aisle and a single door. On routes where frequent stops are required at points where heavy boarding and alighting occurs, it may not be possible to use school buses without incurring considerable travel delays. School buses may differ in durability from current transit vehicles and exhibit more maintenance problems when used to provide line-haul transit service.

1/ Shannon, Jr., op. cit., p. 22.

- Labor Considerations - Section 13(c) agreements may pose an obstacle to the use of school buses for general transit service. Without union approval, transit authorities may not be able to contract for use of school bus vehicles and drivers. Moreover, if transit authorities succeed in contracting for such services, 13(c) protection may have to be provided to school bus employees as part of the arrangement. Contingency contracts will have to be prepared in advance in order to minimize implementation delays.

Despite these problems, available evidence suggests that through careful pre-planning and elimination of legal and institutional barriers, school buses may be used to provide general transit service during severe fuel shortages.

VARIABLE WORK HOURS PROGRAM

Variable work hours programs or alternative work schedules generally include all variations of the typical work schedule, i.e. a workday from 8:00 or 9:00 a.m. to 5:00 p.m., for 7 or 8 hours a day, 5 days a week. Alternative work schedules offering the greatest potential for emergency conservation of gasoline include flexitime, staggered hours and compressed work weeks.

Types of Alternative Work Schedules

Flexitime allows employees to select and vary their work start and stop times within certain limits agreed upon by the employer and employee. Core time requirements (times when all employees must be present) are generally imposed. Employees work the contracted number of hours in a specified time period, usually a day, week or month.

Staggered hours are somewhat more restrictive than flexitime in that subgroups of employees start and end work at variable times fixed by the employer or employee. Once schedules are agreed upon, they remain unchanged and employees are required to work a fixed number of hours per day.

Compressed work weeks imply rescheduling the normal work week such that there are fewer working days per week but with longer working hours per day. The most common variation involves working four days at ten hours per day.

Possible Transportation Impacts of Emergency Implementation of Alternative Work Schedules

A major impact of flexitime and staggered work schedules is that they allow commuters to travel outside of normal peak travel periods. This is likely to facilitate increased use of existing transit capacity during the "shoulder periods." 1/ Flexitime also allows employees more schedule flexibility in forming or joining carpools and vanpools. Implementation of flexitime and staggered work hours is often opposed because many fear that it would encourage current transit riders and carpoolers to shift to less fuel efficient single occupant vehicles -- a travel option made significantly more attractive to flexitime and staggered work hour

1/ "Shoulder periods" are those intervals of time immediately before and after the peak travel periods when considerable excess capacity is available on most transit systems.

program participants by the possibility of avoiding peak period travel congestion. The lack of readily available gasoline during fuel shortages, accompanied by rapidly rising prices, suggests that any shift to single-occupant vehicles would be minimal.

In addition to shifting participating commuters trips outside the normal peak travel periods, compressed work schedules would reduce the total number of work trips. Although there is the possibility that non-work travel may increase, particularly if the extra day(s) off result in a longer weekend, the lack of readily available gasoline and rising prices are likely to discourage such travel. The major impacts would be the reduction in gasoline used for work trips and increased utilization of transit during non-peak travel periods.

Planning Considerations

Many Metropolitan Planning Organizations (MPO's) and transit authorities have encouraged implementation of variable work hours, particularly flexitime and staggered hours, as a key element in emergency energy conservation plans. The failure to implement alternative work schedules during the 1973-1974 Middle East Oil Embargo and the more recent 1979 fuel shortages may be attributed largely to the lack of detailed pre-planning prior to fuel shortages and implementation time constraints. In order to make alternative work schedules a more feasible option during energy emergencies, a number of critical planning steps must be undertaken prior to the appearance of a fuel shortage. These include (1) encouraging employers and employees (and unions) to prepare plans and make voluntary commitments to adopt alternative work schedules during emergencies and (2) having the transit operator prepare adjusted transit schedules to accommodate changes in work schedules.

Emergency implementation of compressed work week schedules entails resolving far more barriers than either flexitime or staggered work hours. These include Federal and state laws relating to maximum workday length and overtime pay (e.g., Walsh-Healy Act, Fair Labor Standards Act, Federal Pay Act and State Protective Laws), potential union and employer opposition, potential disruptive impacts on employee life style, etc.). Although implementation of compressed work weeks during fuel shortages may result in significant gasoline savings, it is unlikely to be used except in the more severe shortages and only if legal and institutional barriers are eased. Even then, participation would have to be limited to certain industries and/or occupations (i.e., it is unlikely that such enterprises as hospitals, agricultural, or other vital industries would participate).

CARPOOLING PROGRAM EXPANSION

The ability to increase carpooling during fuel shortages is particularly attractive because it is generally more available to a larger number of persons than transit and it also serves many markets that may not be currently served by transit (e.g., suburban employees, shopping centers, etc.). The extent of carpooling that occurs during a fuel shortage will be influenced by the availability and price of gasoline, duration of the shortage, availability of travel options and the existence and performance of both ridesharing agency and employer carpool-matching programs. It is this last factor that offers the greatest opportunity for local areas to increase the level of carpooling beyond that which would normally occur under emergency conditions through informal matching.

In order to expand carpool-matching activities during short-term fuel shortages to accommodate the surge in demand, the capability of preparing and distributing matchlists in a short time frame is a critical factor for both ridesharing agencies as well as employer programs. Turnaround time, the time between the initial request for a matchlist and its receipt, is a useful indicator of carpool-matching program performance in an emergency. During the 1979 fuel shortages, many ridesharing agencies were unable to reduce, or even maintain, normal turnaround times despite increases in staff and other resources. The failure to decrease turnaround time limited the overall effectiveness of ridesharing program efforts to increase carpool-matching under emergency conditions.

Preparation of matching data bases, prior to the onset of an emergency, by ridesharing agencies and employers offers significant potential for reducing carpool-matchlist turnaround times and overall ridesharing program performance during emergencies. Data on persons potentially interested in carpooling under emergency conditions would be collected in advance of any crisis. Such information should be periodically updated and kept in a file separate from persons who are currently seeking to carpool. In the event of a fuel shortage or other emergency, ridesharing programs would minimize the time spent in adding new requests for matchlists into their data base as much of this information would already be on file. This could, particularly in the case of large computer data bases, help reduce matchlist turnaround times. Providing staff and other resources are sufficient, ridesharing programs would be in a better position to expand their services.

TRANSPORTATION AND TRANSIT INFORMATION DISSEMINATION

In order to ensure the efficient use of transportation facilities during emergencies and also to avoid undesirable panic-induced travel behavior arising from insufficient or poor information on gasoline availability, increased emphasis must be focused on the dissemination of transportation and transit information. Experience gained during the 1979 fuel shortages suggests that many local transit operators and government agencies encountered considerable difficulty in coping with the rapid growth in requests for information as well as in providing the specific information requested. The implementation of effective public information programs entails a commitment of time and resources (e.g., telephone line capacity, accurate real-time information sources, trained staff, etc.) far in excess of that normally available.

Availability of Sufficient Information

For many motorists, information on gasoline availability thru various hot lines, particularly the location of stations having gasoline and their hours of operation, was a critical factor in determining whether to make certain trips or purchase additional gasoline. In retrospect, it appears that much of the reported decline in recreational and tourist based travel may be attributed to a lack of reliable information on gasoline availability. A number of tourist and recreational centers that had gasoline available suffered loss of business because potential travellers couldn't obtain adequate information. In many cases these travel centers resorted to their own efforts to inform prospective visitors through newspaper ads or radio announcements.

In order to improve the overall effectiveness of gasoline hot lines, it would be desirable for hot line information services to coordinate with each other and also tie into a gasoline station monitoring system. Possible ways of monitoring gasoline availability at stations may include periodic phone surveys, police checks, or other methods. Requests for specific types of gasoline availability information during past shortages may be used to plan the gasoline station monitoring system.

More Productive Use of Transportation Services

Confronted by a sudden fuel shortage, commuters and other travellers often adjust by changing their normal travel patterns -- particularly their travel mode, route, and other trip characteristics (e.g., number, type, length and timing of trips). More fuel-efficient modes, particularly transit and ridesharing, are likely to attract large numbers of motorists who formerly drove single-occupant vehicles. Telephone calls to transit operators for service and fare information may be expected to soar. A similar situation is likely to occur for ridesharing programs with respect to requests for carpool matchlists. Most requests will be from people who are not familiar with the transit system or how ridesharing works. During the 1979 fuel shortages, ridesharing programs and transit agencies encountered great difficulty in providing information on a timely basis. Problems associated with limitations in phone line capacity and the lack of trained information operators were compounded by the difficulty of providing travel information to persons totally unfamiliar with the system. Many transit and ridesharing programs noted a decrease in the productivity of the operators in answering requests for information. This may primarily be attributed to the need to spend more time per telephone inquiry on calls from persons not familiar with the transportation system.

Transit operators and ridesharing programs may be able to improve their capability to disseminate information through preparing contingency plans to decentralize information services, provide extra phone line capacity and use newspapers, television, radio, and other media to supplement their existing information centers. To some extent, many of these strategies were tried during the 1979 fuel shortages; however, the lack of pre-planning, time constraints, and the short duration of the shortages limited their effectiveness. The ability to provide potential travellers with information may be the single most critical response that transit operators and ridesharing programs can undertake during fuel shortages.

LOCAL ENERGY EMERGENCY COORDINATOR PROGRAM

The concept of a Local Energy Coordinator (LEC) originated in the transportation energy contingency plan prepared by the North Central Texas Council of Governments in 1977.[1/] The original intent, as outlined in the contingency plan, was to use LEC's to keep counties and cities in the Dallas-Fort Worth region informed and to facilitate the flow of communication between the regional planning agency and the local area governments during energy emergencies. Their

1/ North Central Texas Council of Governments, A Metropolitan Transportation Plan for National Energy Contingencies, Arlington, Texas, 1977.

role has since been expanded to cover energy conservation in addition to contingency planning activities. Each local government designated an LEC from their staff or elected officials to serve as a point of contact for the city or county in receiving information on energy conservation and contingency developments at the Federal and state levels through the North Central Texas Council of Governments.

Instituting a Local Energy Coordinator program can be an effective way for Metropolitan Planning Organizations (MPO's) to disseminate and receive information from member representatives during emergencies. It may also aid in planning and coordinating energy contingency activities. The decentralized nature of this program will enable it to be responsive to specific community needs while allowing the MPO to focus attention on issues that have the greatest importance to the region. In order for a Local Energy Coordinator program to be effective, LEC's must be designated prior to the advent of an energy emergency and be familiar with the contingency planning process. They would actively function only during emergencies.

GASOLINE SALES/SERVICE MONITORING

The design and development of gasoline use and conservation monitoring information systems for early detection of fuel shortages, real-time monitoring of shortages, and evaluation of emergency energy conservation actions, is vitally needed at all levels of government. These gasoline use and conservation monitoring information systems may play a key role in triggering or phasing in specific government and private sector responses to fuel shortages. This need was clearly demonstrated during the 1979 fuel shortages by the failure of many states to implement gasoline sales purchase restrictions (e.g., odd/even/minimum (maximum) purchase plans) at times when the fuel shortages had reached their most critical stages. These plans were often implemented when fuel supplies were already starting to improve.

In order to ensure that emergency conservation actions are implemented in a timely manner, gasoline sales/service monitoring programs should be developed. Although states currently collect monthly gasoline consumption data for the Federal Highway Administration based on state tax receipts, it may be useful to develop procedures to prepare and disseminate this information on a weekly or perhaps daily basis. In addition, it would be helpful to disaggregate such data on a regional or metropolitan area basis. This would allow more fine tuning of emergency energy conservation strategies to the specific needs of local areas. For example, during the 1979 fuel shortages, gasoline sales purchase restrictions were applied only to selected areas of Texas and New York State as opposed to the entire states.

GASOLINE SALES PURCHASE REQUIREMENTS

Gasoline sales purchase requirements generally involve implementation of one or more gas line (queue) management plans. The purpose of these plans is to prevent, eliminate, or reduce lines of vehicles waiting to purchase gasoline and to minimize tank-topping. The most common gasoline sales purchase requirements used during the 1979 fuel shortages consisted of two parts: (1) a minimum (maximum) purchase plan, and (2) an odd/even plan which allows motorists to purchase gasoline on either odd or even days of the month according to the last digit on their license plate. The minimum purchase plan is primarily

designed to eliminate tank-topping by imposing a penalty on any driver who purchases less than the required amount. The odd/even plan attempts to reduce gasoline lines by reducing by one half the number of vehicles eligible to purchase gasoline on a single day. The power to impose gasoline sales purchase requirements generally resides with state governments.

Interviews with various local government transportation planners and officials suggest that many felt that gasoline sales purchase requirements were very effective in managing gasoline lines during the 1979 fuel shortages. The primary problem cited was the inability to time the implementation of the measure to coincide with the period when gas lines were the greatest. In many cases, opposition from many special interests such as the tourist and recreational industry as well as the general public made many public officials reluctant to implement odd/even or minimum (maximum) fuel purchase plans. This often resulted in the implementation of these plans at a time when gasoline supplies were becoming more available and the crisis stage of the fuel shortage had already passed. Another problem often cited related to the difficulty of enforcing these plans. It should be noted that some analysts feel that both the odd/even and minimum (maximum) fuel purchase plans are minimally effective in reducing queue lengths; however, they do concede that they serve to reduce transient tank-topping and restore public confidence in the government that is "trying to do something" about the situation.[1/] In February 1981 the U.S. Department of Energy deleted the odd/even fuel purchase measure from the Standby Federal Emergency Energy Conservation Plan while retaining the minimum purchase provision. This action may make it more difficult to implement effective gasoline purchase requirements during future fuel shortages.

At the present time, it is unclear what the likely impact of gasoline price decontrol and the discontinuation of gasoline allocation procedures will be during future fuel shortages -- particularly if a more flexible gasoline pricing system will automatically eliminate long lines. Under current legislation, the U.S. Department of Energy still retains the right to reimpose gasoline allocations and price control measures in the event of a shortage. Nevertheless, it is the consensus of a large number of local transportation planners and officials, that gasoline sales purchase requirements were effective strategies during the 1979 fuel shortages. More effort should be focused on trying to develop better methods for deciding at what stage of a fuel shortage these gasoline sales purchase requirements should be implemented. One possibility would be to tie the decision to implement this strategy with a real-time gasoline sales monitoring system.

1/ Sheffi, Y. and Prins, V., A Dual Price System For Gasoline Lines Management, Paper submitted for presentation at the 60th Transportation Research Board Annual Meeting, Washington, D.C., January, 1981, p. 9.

IV. IMPLICATIONS FOR RESPONDING TO FUTURE FUEL SHORTAGES

Increased federal, state and local government efforts to encourage and improve transportation energy contingency planning are likely to enhance our capability to respond effectively to future fuel shortages. This section presents general conclusions of this study and suggests some possible federal actions that would facilitate the implementation of promising transportation energy contingency measures.

CONCLUSIONS

Transportation energy contingency plans prepared prior to the 1979 fuel shortages may generally be characterized as follows:

- They tended to contain similar emergency energy conservation actions and fail to adequately reflect the characteristics of the area for which they have been prepared;
- A wide range of energy conservation actions were covered, but not in sufficient depth to insure implementation;
- Their underlying purpose or rationale was not really to provide an actual plan but rather to focus increased attention on the need for energy conservation, promote capital expenditures, etc. Largely developed in response to experience with the 1973-1974 Middle East Oil Embargo, they were typically not updated once completed; and
- Their degree of comprehensiveness varied significantly according to the type of organization (transit operating agency, metropolitan planning organization, state energy office, other) responsible for preparing the plan.

Despite the large number of contingency planning efforts and accompanying rhetoric that had occurred prior to the 1979 fuel shortages, the implementation of odd-even and/or minimum (maximum) fuel purchase restrictions seems to have been the singularly most effective government action in reducing panic-induced hoarding and gasoline lines. In most of the case studies, however, the implementation of this action occurred when the severity of the fuel shortage was approaching its peak, or had peaked, and gasoline supplies were becoming more available. Therefore, it is difficult to determine how effective this measure was.

The results of the case studies suggest that in developing transportation energy contingency plans more emphasis should be placed on:

- Preparing more comprehensive plans that cover a broad range of transportation and travel activities, including tourist and recreational travel, intra-suburban travel, and other types often neglected or accorded low priority in many of the plans reviewed. This effort is likely to be encouraged by the growing trend of designating Metropolitan Planning Organizations (MPO's) as the focal points of comprehensive transportation energy contingency planning activities;

- Establishing institutional roles and organizational planning for preparing and implementing emergency energy conservation plans, or portions thereof. More specifically, the question of who is responsible and for what must be clearly determined. Also, the question of who is responsible for integrating the parts into a coherent whole must be answered.

- Detailed pre-planning of specific actions and more effort at issue resolution are needed such that implementation can be done quickly and smoothly in a shortage (e.g., on-line data base for expanding emergency ridesharing such as used by Commuter Computer, Inc. in Los Angeles, assigned responsibility areas for organizations and individuals);

- Budgeting funds to be used only in the event of an emergency to pay for expenses associated with energy contingency measures. For transit and ridesharing agencies, the impact of rising fuel prices and the need to hire additional staff or incur extra overtime costs must be taken into account;

- Updating contingency plans regularly, on a periodic basis, to ensure that they remain responsive to changing situations; and

- Design and development of gasoline use monitoring and information systems for early detection and real-time monitoring of shortages -- particularly for triggering actions.

POSSIBLE FEDERAL GOVERNMENT RESPONSES

As part of its statuatory responsibilities under the Emergency Energy Conservation Act of 1979 (EECA), the U.S. Department of Energy is encouraging states to prepare transportation energy contingency plans in order to achieve gasoline conservation targets in the event of a fuel shortage. The U.S. Department of Transportation has encouraged Metropolitan Planning Organizations (MPO's) to develop contingency plans as part of their Unified Work Programs. In addition, several transit operators and ridesharing programs have also started to prepare contingency plans. Despite these efforts, there are still considerable opportunities for the Federal government to ensure that the promising energy contingency actions are successfully implemented if a fuel shortage occurs. Possible Federal government actions are discussed in the following paragraphs.

Research and Development

Although past experience with fuel shortages has provided decision-makers and planners with considerable information on contingency planning, there are still areas which require futher investigation. These include:

- determining whether and how much gasoline sales purchase requirements are effective in reducing lines and tank-topping;
- assessing how an emergency variable work hours program would effect transit operations, particularly schedules, services, and operating costs; and
- evaluating how school buses would perform under normal transit operating conditions and developing procedures for placing school buses in line-haul services.

There are many other areas in which the Federal government can provide research and development assistance.

Funding

Almost all public transit operators and local ridesharing agencies operate on fairly tight operating budgets. Funding for contingency planning efforts is a luxury that few can, or are willing to, undertake. Contingency actions which require local transit operators and ridesharing agencies to incur significant expenses, such as developing a reserve bus fleet, or starting a computerized data base for advanced carpool matching before a fuel shortage, may require the Federal government to assist once in covering these costs.

Regulatory Actions

Certain energy contingency actions may be precluded or limited by current Federal regulations. Attempts to implement variable work hours programs, particularily compressed work weeks, may not be permitted under current labor laws. The Federal government may wish to review current legislation on work hours and make it more flexible under emergency conditions.

Policy Actions

The Federal government should continue to emphasize policies which foster increased consideration of energy conservation and contingency planning by state and local area governments. Particular emphasis should be placed on coordinating federal agency activities and providing incentives for states and local areas to undertake contingency planning activities.

In addition to encouraging general contingency planning efforts by state and local governments, specific policies should be developed to encourage promising contingency actions. The current Urban Mass Transportation Administration's effort to develop a comprehensive bus policy covering procurement, rehabilitation and stockpiling of transit buses, can help make the use of reserve transit bus fleets a much more effective option for dealing with future shortages. Other contingency actions may benefit from similar programs.

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