

3. Considerations in Transportation Energy Contingency Planning. TRB, Special Rept. 191, 1980.
4. Y. Sheffi and V. Prins. Dual Price System for Management of Gasoline Lines. TRB, Transportation Research Record 801, 1981, pp. 60-67.
5. Development of an Aggregate Model of Urbanized Area Travel Behavior: Final Report. U.S. Department of Transportation, Jan. 1979.
6. J. Horowitz. Modeling Travel Responses to Alternative Gasoline Allocation Plans. Presented at 60th Annual Meeting, TRB, 1981.
7. M. Ben-Akiva and T. Atherton. Transferability and Updating of Disaggregate Travel Demand Models. Presented at 60th Annual Meeting, TRB, 1981.
8. J.J. Louviere and others. Laboratory-Simulation Versus Revealed-Preference Methods for Estimating Travel Demand Models. TRB, Transportation Research Record 794, 1981, pp. 42-51.
9. 1977 Nationwide Personal Transportation Study: Report 3. FHWA, Dec. 1980.
10. R. Gorman. Household Characteristics and the Determinants of Travel Behavior. Presented at 60th Annual Meeting, TRB, 1981.
11. A. Politano. Exploring Social and Economic Effects of Measures to Reduce Motor Fuel Consumption. Presented at 60th Annual Meeting, TRB, 1981.
12. D. Hartgen and A. Neveu. The 1979 Energy Crisis: Who Conserved How Much? New York State Department of Transportation, Albany, Preliminary Res. Rept. 173, April 1980.
13. A.G. Hobeika and others. Impacts of Transportation Supply and Gasoline Shortages on Virginia Gas Tax Revenues: Volume II. Virginia Division of Motor Vehicles, Richmond, Aug. 1980.

Assessment of State Emergency Energy Conservation Planning

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Since the enactment of a federal law providing a framework for a coordinated national response to energy supply interruptions, there have been many developments that have tended to hinder this objective. The current oil glut and stabilizing prices, the lack of sufficient planning funds, and the redirection of federal regulatory policy are some of the factors that are affecting the progress of transportation emergency energy conservation planning. A survey was conducted by the New York State Department of Transportation to determine the status of state emergency conservation plans as required by the Emergency Energy Conservation Act of 1979 and to assess each state's plan development process with particular emphasis on the format of the plan, the extent of local plan coordination, impact assessments of specific measures, and measurement of specific implementation details. The results of this survey suggest several shortcomings of emergency conservation planning as conducted by state transportation and energy agencies throughout the country: lack of money for plan development and implementation, inadequate cost estimates of the plan, lack of good coordination with local plans, lack of evaluations regarding energy savings, and no assessment of economic impacts.

The possibility of energy supply interruptions has been a constant threat to oil-importing nations over the past few years. The past two "crises" (1973-1974 and summer 1979) evoke memories of long lines at gasoline stations, reduced travel mobility, and general frustration.

Prompted by these events, Congress in November 1979 enacted the Emergency Energy Conservation Act (EECA). One of its many purposes was to encourage the development of statewide plans to deal with energy shortages prior to their occurrence. The philosophy behind the EECA was to have in place state plans that could respond to a shortage in a rational, coherent manner--that is, to help maintain essential mobility, reduce gasoline lines, and prevent panic buying at service stations.

Several organizations, including the National Conference of State Legislatures, the National Governors' Association, and the U.S. Congress (1,2), have followed the progress of EECA plan development. These surveys primarily reviewed statewide efforts rather than evaluating the extensiveness of

the planning effort. In October 1980, the New York State Department of Transportation (NYSDOT) sent a questionnaire to all state energy offices and transportation departments throughout the country, not only to inquire about the status of these plans but also to learn what actions other states are including in their plans, to assess their planning processes, and to record their experiences so that energy planning in New York State may have the benefit of other work.

Although the responsibility for developing EECA plans has fallen on state energy offices, many state transportation departments have been actively involved in energy conservation, contingency, and long-range planning. Since we were interested in the extent of transportation department involvement in the EECA plan development process, the same survey was therefore distributed to all state transportation departments as well as energy offices. Responses to the survey numbered 27 from energy offices and 22 from transportation departments. Of these, 9 responses were received that were not entirely usable. Even though both types of responses were received from only 11 states, the transportation department responses provide insight into EECA planning for those states in which the energy offices did not respond.

STATUS AND DEVELOPMENT

The development of transportation plans for gasoline and diesel emergencies has been initiated in part by federal directives. The Federal Highway Administration and Urban Mass Transportation Administration encourage the preparation of energy contingency plans by the state transportation departments and the local metropolitan planning organizations (MPOs), and encourage each state highway agency to work cooperatively with state energy officials in preparing the transportation elements of emergency

energy conservation plans or EECA plans (3,4).

With the passage of the EECA in November 1979, Congress directed the establishment of a Federal Gasoline Rationing Plan and standby Federal Emergency Energy Conservation Plan. States are required to prepare and submit an emergency conservation plan to the U.S. Department of Energy (DOE) within 45 days of the establishment of a mandatory energy conservation target by the President. If a state does not submit a plan, or if a plan does not attain the target, a federal standby plan consisting of mandatory measures may be imposed on the state (5). So far, only voluntary gasoline reduction targets have been issued.

The requirements for state emergency energy conservation plans under the legislation are fairly broad. A plan must demonstrate the capability of meeting the target, equity, and consistency with state and federal law and must include appropriate public participation. State plans may contain measures suggested by the federal standby plan, coupled with other proven measures or measures uniquely appropriate to the state or local area.

Under the EECA, if a state failed to submit a plan to DOE within 45 days of a presidential declaration of an energy emergency, a federal standby plan would become operable in that state. Initially, eight transportation measures were considered as components of this plan:

1. Public information program,
2. Minimum fuel purchase restrictions,
3. Odd-even fuel purchase restrictions,
4. Employer-based commuter and travel measures,
5. Speed-limit enforcement,
6. Compressed work week,
7. Vehicle use sticker, and
8. Recreational watercraft restriction.

However, DOE has since withdrawn the measures that were proposed for inclusion in the federal plan--the compressed work week, vehicle use sticker, recreational watercraft restrictions, and one section of the employer-based commuter and travel measure--and is removing certain of the interim final measures--

the odd-even fuel purchase, the rest of the employer-based commuter and travel measure, and speed-limit enforcement--as well as the only nontransportation measure--the mandatory building temperature restrictions. The public information and minimum automobile fuel purchase measures remain in the federal plan as interim final rules (6).

Two other significant events have recently affected the original intent of energy emergency planning--to provide for a coordinated national response: decontrol of petroleum and the Reagan Administration's budget policies.

On January 28, 1981, President Reagan issued an executive order decontrolling crude oil and other petroleum products, effective immediately rather than September 30, 1981, the expected date for termination of federal controls. This order eliminated not only price controls on gasoline and diesel fuel but also allocation rules that assured transit systems of a guaranteed supply of petroleum products in the event of shortages. The latter aspect of this order is of particular concern to energy planners. Special Rule 9 of the Emergency Petroleum Allocation Act assured transit systems of 100 percent of their current requirements for diesel fuel. This was terminated March 31, 1981, along with the federal authorization of a state set-aside of middle distillates, which previously allocated 4 percent of the state supply based on local hardships, regional problems, and statewide priorities. This latter mechanism was relied on during the last shortage by public transportation operators that were unable to receive their full 100 percent requirements from their prime suppliers.

DOE made available to the states planning grants of up to \$29 000 for assistance in developing emergency energy conservation plans. The grants were the first installment of financial assistance provided to the states during the 1981 fiscal year for emergency planning. This money was to result in development of a management plan that described the steps the state would take to develop, maintain, and implement its fuel emergency plans. Phase 2 money could then be used to support full development of state EECA plans. However, at this time no funds

Table 1. Status of EECA plans according to state energy departments.

State	Not Yet Begun or Just Starting	In Development				Submitted to DOE ^a
		Public Hearings	Task Force	Working Papers	Draft Form	
Alabama	X					
Arizona					X	
Arkansas					X	
California					X	
Delaware						
Florida						X
Hawaii				X		
Idaho	X					
Indiana	X					
Iowa						X
Kansas				X		
Louisiana	X					
Maryland						
Massachusetts						
Minnesota				X		
Missouri						X
Montana					X	
Nebraska						X
Nevada		X				
New Hampshire					X	
New Mexico					X	
North Carolina					X	
North Dakota				X		
Ohio					X	
South Carolina				X		
Tennessee					X	
Washington	X					

^aNone returned by DOE.

for phase 2 have been appropriated by Congress for FY 1981/82.

Other recent developments at DOE suggest that the focus on emergency energy planning has diminished (7). Technical assistance for developing emergency plans has not progressed. Initially, the regional offices of DOE were planning to conduct workshops for energy planners and to publish guidelines. However, the FY 1981 budget for these activities was rescinded and work was never completed on the planning guidelines.

Given these factors, it is incumbent on the states to take the initiative for planning for energy shortfalls. Although the current glut in the world oil market has diminished any urgency, it is likely that this surplus will subside and possibly leave many states ill-prepared.

Tables 1 and 2 give the status of EECA plans as indicated by state energy and transportation officials in the survey. As can be seen from these tables, the status of EECA planning has varied extensively from state to state. Four states--Florida, Iowa, Missouri, and Nebraska--have submitted their plans to DOE for review and approval. The majority of responses indicate that plans are circulating in draft form for comment within the

respective states. However, quite a few states either have not yet started or are just beginning the planning process since federal funding of up to \$29 000 has become available for this purpose.

Developing an EECA plan entails a great deal more effort than preparing a list of conservation measures to ensure an effective response to energy shortfalls. Basic steps to initiate this planning process include the designation of a lead organization, assurance of funding, and manpower availability.

The lead organization for development and coordination of the EECA plan is usually the state energy office. However, since the implementation of a plan might require the services of many other agencies, a cooperative effort is noted by many of the respondents to the survey.

The cost and manpower needed to develop a plan were concerns of every state that responded to the survey. Most states indicated that they did not have the resources available, exclusive of federal assistance, to develop a plan. Estimates of the costs ranged as low as \$25 000 to \$400 000. With receipt of federal funds, many states expect to proceed further in the development of their plans.

Table 2. Status of EECA plans according to state transportation departments.

State	Not Yet Begun or Just Starting	In Development				Submitted to DOE ^a
		Public Hearings	Task Force	Working Papers	Draft Form	
Alabama	X					
Alaska	X					
Arkansas				X		
California				X		
Connecticut					X	
Florida						X
Georgia	X					
Idaho						
Illinois	X					
Iowa					X	
Louisiana	X					
Maine	X					
Massachusetts				X		
Minnesota				X		
Nebraska						
New York					X	
Oregon					X	
South Carolina						
Texas	X					
Utah	X					
Wisconsin					X	
Wyoming	X					

^aNone returned by DOE.

Table 3. Measures for inclusion in state EECA plans according to state energy offices.

Action	AL	AZ	AR	CA	DE	FL	HI	ID	IN	IA	KS	LA	MD	MA	MN
Public information	X	X	X	X		X	X	X		X	X				X
Compressed work week		X	X	X		X	X	X		X	X				X
55-mph enforcement	X	X	X	X		X	X	X		X	X				X
Vehicle use sticker plan	X	X	X	X		X	X	X		X	X				X
Restriction on recreation vehicles	X	X													X
Employer commuter plan	X	X	X	X		X	X			X	X				X
Odd-even or minimum purchase	X	X	X	X		X	X	X		X					X
Permit standees on buses	X		X												
Use of spare buses	X		X				X								
Stockpiling of buses			X				X								
Use of school buses	X		X				X								
Nonwork bus travel			X				X								
Government employee plan	X	X	X			X	X	X		X					X
Staggered hours	X	X	X	X		X	X	X		X					X
Shared-ride taxi	X			X		X	X								
Parking fees			X	X		X	X			X					
Bicycle incentives	X	X		X			X	X							
Other		X		X		X	X			X					

FORMAT OF PLAN

Existing state and local contingency plans contain a sufficient base of suitable emergency measures that can be drawn on for inclusion in a state's EECA plan. Of course, further refining and screening of these measures are necessary to evaluate and select those measures that are most appropriate for that particular state and energy situation.

Tables 3 and 4 give the measures that are or might be included in state EECA plans. Table 3 contains the responses of energy offices, and Table 4 contains the responses of transportation departments. In scanning these tables, one notes that many states relied on the federal standby plan elements, although not exclusively, as major components of their plans. All of the plans include some type of public information program. In some states, very extensive and costly programs are currently used for ongoing conservation activities. Examples include Florida's "Save It" campaign, estimated to cost \$500 000; Ohio intends to operate a 24-h public information program; and Arkansas will rely on the U.S. Department of Transportation (DOT) "Feather-foot" program.

Notably absent from the federal standby plan were transit measures. However, many states indicated that they would include at least one of the five transit choices in the survey: permitting standees on buses, spare bus use, stockpiling of buses, use of school buses, and promotion of transit for non-work travel.

The most unpopular measure was the restriction of recreational vehicles and boats. This proposed measure for the federal standby plan has since been dropped due to overwhelming public opposition.

COORDINATION WITH LOCAL PLANS

One particular aspect of EECA planning that led to the shift of responsibility from federal to state government was that differences exist between areas of the country with respect to their susceptibility to energy shortages, types of travel profiles, and ability to conserve. Just as likely to occur are regional, modal, and demographic differences within states. Thus, blanket state-level implementation of measures may not always be appropriate and in fact may prove detrimental. How the states deal with these possible intrastate differences will affect the effectiveness of the state plan.

Most states proposed to tackle this problem by integration of local contingency activities into the development and implementation of the state EECA plan. The majority of states indicated that local

plans are available and will be coordinated with the state plan. Coordination would occur via the regional planning commissions or MPOs in most states or with local participation on task forces or steering committees.

However, a survey by the General Accounting Office (GAO) concludes that regional contingency planning has progressed slowly due to lack of specific guidance, confusion about how these plans will interface with state EECA plans, and uncertainties about what actions the federal and state governments might implement.

The California Department of Transportation has developed guidelines for local plan coordination (9). The guidelines, called local energy emergency operation plans, specify the role of each level of government. The state provides assistance to the local areas in the form of workshops and other technical assistance. The cities and counties are required to identify the specific measures to be implemented within their jurisdiction. The MPOs and regional planning agencies allocate planning funds and provide technical assistance when requested. These guidelines also specify the roles and tasks for transportation providers and major employers.

While the California effort does serve as a catalyst for local plan coordination, other states rely on county coordinators or actually review the local plans for compatibility and integration. Regardless of the mechanism used, it is important that local plan coordination become an integral part of emergency energy planning. Overlapping responsibilities and distinct emergency planning activities initiated by different agencies have created a need for better definition of roles, responsibilities, and coordination prior to a shortage. How well a state responds to this need will determine its effectiveness in implementation of its emergency measures.

IMPLEMENTATION

General procedures for plan implementation as well as measure-specific details must be clear, prearranged, and agreed on by the actors involved. As mentioned previously, it is usually the energy office within each state that has been delegated the lead responsibility for administering and implementing emergency energy plans. Examination of the plans received showed that provisions were included for cooperation with other state agencies, especially transportation departments. For example, in Florida a memorandum of understanding between energy and transportation departments specifies their respective roles. Any EECA plan will require many agencies to implement, maintain, monitor, or enforce

MO	MT	NE	NV	NH	NM	NC	ND	OH	SC	TN	WA
X	X	X	X	X	X	X	X	X	X	X	X
	X				X	X	X				X
X	X	X	X	X	X	X	X	X	X	X	X
X		X	X	X	X	X	X		X	X	X
X	X		X	X	X	X	X	X	X	X	X
X	X	X		X			X	X	X	X	X
				X							
			X	X	X			X	X		
X	X	X	X	X	X	X	X	X	X	X	X
	X			X	X	X	X	X	X		X
X					X		X				X
X	X			X		X	X	X			
X			X				X				

Table 4. Measures for inclusion in state EECA plans according to state transportation departments.

Action	AL	AK	AR	CA	CT	FL	GA	ID	IL	IA	LA	ME	MA	MN	NE	NY	OR	SC	TX	UT	WI	WY	
Public information			X	X	X	X			X	X		X	X	X		X	X					X	X
Compressed work week			X	X		X			X	X		X		X		X	X					X	X
55-mph enforcement			X	X		X			X	X		X	X	X		X	X					X	X
Vehicle use sticker plan			X			X			X	X			X	X			X					X	
Restriction on recreational vehicles			X									X		X			X						
Employer commuter plan			X	X		X				X		X	X	X		X	X					X	X
Odd-even or minimum purchase			X	X	X	X				X		X		X		X	X					X	X
Permit standees on buses			X		X	X								X		X	X						
Use of spare buses				X	X	X			X							X	X						
Stockpiling of buses			X	X	X	X										X	X					X	
Use of school buses			X	X	X				X			X											X
Nonwork bus travel			X	X		X			X							X	X						
Government employee plan				X		X			X			X	X	X		X	X						X
Staggered hours			X	X		X			X	X		X	X	X			X					X	X
Shared-ride taxi			X	X		X			X			X	X			X							
Parking fees				X						X							X						X
Bicycle incentives				X		X			X			X					X						X
Other				X					X	X			X			X	X						X

Table 5. Possible monitoring and measuring techniques for energy emergencies.

Key Emergency Variable	Monitoring Technique	Measuring Technique
Fuel availability	Oil company data Weekly reports by city and county energy coordinators	Anticipated gasoline delivery data demonstrate that an area will experience a reduction in gasoline supplies during any month that is at least 5% below expected demand Variations in number, type, amount, and location of hardship requests for state fuel set-aside program
Gasoline lines	Local-area survey conducted by city/county energy coordinator or MPO	At least 50 percent of all retail gasoline stations in an area experienced a significant gasoline line at least once during 75 percent of days included in a recent sample period of at least 4 days; at least 50 percent of all retail outlets in an area sold gasoline for 5.5 h/day or less during at least 75 percent of days included in a recent sample period of at least 4 days ^a
Violence at gasoline stations	Weekly police department report	No. of reported incidents
Automobile and truck traffic volumes and patterns	Weekly report by operators of key transportation facilities (e.g., bridges, tunnels, thruway, parkway)	Changes in daily and weekend vehicle traffic
Automobile occupancy	Same as above; special survey or spot counts by MPOs	Changes in peak, off-peak, and weekend automobile occupancies
Public transit ridership	Daily monitoring of individual routes by transit operators; weekly summary of ridership changes reported to state by telephone	Changes in transit ridership and in peak-hour load factors
Public- and private-sector perception of emergency, actions taken, and compliance	Weekly telephone surveys of households in affected areas; monitor state and local area hotline requests for information; reports from private interest groups (e.g., automobile clubs); media reports and surveys	Quantitative and qualitative judgments of public perceptions and actions taken
Changes in fuel price	Monthly or weekly metropolitan area fuel price surveys of retail gasoline stations	Rate and/or amount of increase or decrease for a specified area
Fleet turnover		Rate of new-car purchases and amount of fuel savings from change in average fleet fuel efficiency

^aMonitoring and measuring techniques presented in the Department of Energy Interim Decision and Order on the District of Columbia petition for special fuel allocations during an emergency period, January 2, 1980.

various aspects of a plan. This involvement will require actions that are both costly and timely. Similar agreements will allow their roles to be defined when a shortage actually occurs.

Of course, the provision of new funds or the shifting of funds from other programs--federal or state--to implement emergency measures is an important issue. Almost half the states responding were either uncertain of the implementation costs or did not answer this question, even though their plans were already in draft form. Nearly every state appears to rely on federal or state funds not yet available to implement its plans. If a shortage occurred, most states would probably not be in a position to immediately implement many of their proposed measures.

Cost is a variable that can change according to the severity of a shortage. The Missouri Division of Energy estimated the implementation costs of its plan as anywhere from \$1000 to \$2.6 million for the first year. The Illinois DOT estimated the cost of its plan at a minimum of \$9.7 million, \$7 million for its carless sticker plan alone. To refine this

estimation, the plan needs to define at what level of shortage certain measures will be added or intensified. Trigger mechanisms can play an important role.

A trigger mechanism can be an event or an action that signals the need for implementing or disengaging certain measures. Most states are using a numerical percentage of fuel shortages as well as a qualitative indicator to move through response phases. To fully understand emergency conditions, data on fuel availability should be considered together with information on travel demand changes, public perception of the shortage, and other important indicators. Table 5 suggests a range of key energy emergency variables that could be monitored and measured at the statewide and local-area levels (10).

On the national level, numerical indicators of projected fuel shortages will initiate the process set up by EECA--that is, the issuance of mandatory fuel reduction targets that trigger implementation of state emergency energy conservation plans or the federal standby plan.

Table 6. Compliance with federal gasoline consumption targets: 1980.

State	Gallons (000s)		Difference Between Consumption and Target (%)	Difference Between 1980 and 1979 Con- sumption (%)
	Consumption	Target		
Alabama	1 962 046	2 023 268	-3.0	-6.3
Alaska	201 373	188 082	+7.1	-2.5
Arizona	1 328 722	1 374 846	-3.3	-6.0
Arkansas	1 178 800	1 225 409	-3.8	-7.2
California	10 992 050	11 324 244	-2.9	-3.3
Colorado	1 503 288	1 525 537	-1.5	-3.4
Connecticut	1 327 582	1 312 612	+1.1	-3.3
Delaware	293 851	285 542	+2.9	-4.1
D.C.	171 451	197 051	-13.0	-15.7
Florida	4 810 520	4 727 816	+1.7	-1.9
Georgia	2 874 923	2 884 955	-0.3	-4.9
Hawaii	354 529	312 488	+13.5	+6.6
Idaho	488 333	536 626	-9.0	-9.4
Illinois	4 816 780	5 178 087	-7.0	-7.1
Indiana	2 686 146	2 813 475	-4.5	-7.2
Iowa	1 561 192	1 633 340	-4.4	-9.2
Kansas	1 310 568	1 390 549	-5.8	-6.8
Kentucky	1 755 397	1 798 091	-2.4	-6.0
Louisiana	2 081 328	2 028 165	+2.6	-3.6
Maine	517 014	532 509	-2.9	-4.6
Maryland	1 941 209	1 865 491	+4.1	-0.5
Massachusetts	2 301 675	2 254 034	+2.1	-4.6
Michigan	4 274 036	4 547 529	-6.0	-10.1
Minnesota	2 045 270	2 145 552	-4.7	-7.9
Mississippi	1 194 845	1 221 127	-2.2	-7.5
Missouri	2 602 627	2 686 115	-3.1	-6.6
Montana	459 950	491 197	-6.4	-7.9
Nebraska	816 426	875 403	-6.7	-10.0
Nevada	500 286	510 594	-2.0	-0.1
New Hampshire	413 214	427 935	-3.9	-5.2
New Jersey	3 260 992	3 200 617	+1.9	-3.9
New Mexico	746 655	787 160	-5.1	-5.9
New York	5 672 549	5 614 538	+1.0	-4.7
North Carolina	2 932 274	3 006 470	-2.5	-6.3
North Dakota	407 250	431 445	-5.6	-8.2
Ohio	4 982 574	5 025 549	-0.8	-7.0
Oklahoma	1 845 259	1 862 067	-0.9	-2.8
Oregon	1 330 612	1 363 613	-2.4	-3.8
Pennsylvania	4 700 328	4 720 187	-0.4	-6.8
Rhode Island	381 826	375 618	+1.6	-3.3
South Carolina	1 554 787	1 601 891	-2.9	-6.2
South Dakota	423 517	460 279	-8.0	-10.3
Tennessee	2 417 939	2 440 716	-0.9	-4.4
Texas	8 106 499	8 311 174	-2.5	-6.9
Utah	734 992	736 217	-0.2	+0.6
Vermont	238 842	247 599	-3.5	-8.5
Virginia	2 599 199	2 633 762	-1.3	-5.1
Washington	1 882 513	1 962 400	-4.1	-5.7
West Virginia	845 242	840 486	+0.5	-4.9
Wisconsin	2 177 363	2 260 026	-3.7	-7.4
Wyoming	373 723	389 916	-4.2	-2.1
Total	106 378 366	108 515 417	-2.0	-5.5

FUEL TARGETS

The President is empowered to impose mandatory gasoline conservation targets for each state on a finding of an imminent shortage. The state would be required to meet these targets, which are the product of gasoline use during a three-year period. Currently, DOE has established voluntary targets as a way to encourage states to conserve and to facilitate the EECA planning process. A state is in compliance with the target if its cumulative consumption is within 2 percent/year of the target. At the time of this report, 39 states, including the District of Columbia, are meeting the targets for 1980, and only 6 states--Alaska, Hawaii, Delaware, Louisiana, Massachusetts, and Maryland--are above the allowable percentage error of 2 percent.

While it should be understood that the present voluntary targets may well be quite different from any mandatory target, they do serve a useful purpose. The target program familiarizes the states

with the procedures used by DOE and also emphasizes the urgency of energy conservation. However, these targets have come under fire. In testimony before a congressional subcommittee (2), it has been suggested that the national quarterly targets were higher than the national gasoline consumption projected by DOE.

An analysis of Table 6 shows another side of the coin. In a comparison of 1980 and 1979 state gasoline consumption, all but Hawaii and Utah have reduced their consumption. This suggests that most states can meet the targets but are consuming considerably less gasoline compared with the same period in the previous year. The targets are within reach, but they represent a real savings. The total state consumption was 5.5 percent less in 1980 than in 1979 and met the target by 2 percent.

BENEFITS OF PLAN

Basically, there are four responses to energy emergencies, the first three of which reduce fuel consumption without loss of mobility:

1. Public response--Consumers will make changes in travel patterns to replace lost mobility implied by a shortage even if government takes no action. For example, by switching to transit, carpooling, and organizing trips better, consumers can maintain mobility while reducing vehicle travel and thus fuel consumption.

2. Government actions--Government agencies can implement measures in cooperation with private business to help maintain mobility by providing new or expanded services or by helping consumers to use existing services and other measures to maintain order, to reduce negative economic impacts, and to distribute negative impacts equitably.

3. Improvements in fleet fuel efficiency--The improvements in average automobile fuel efficiency as new cars are purchased and older cars are retired over the years continue to preserve mobility with less fuel. Vehicle miles of travel are constrained by the shortage level and the fuel efficiency of the fleet.

4. Reduction in mobility--Reduction in mobility is the amount of reduction in fuel use to be made up by reducing mobility. Mobility is defined as the ability of a person to travel for different purposes by whatever mode and circumstance he or she would choose.

How effective the first three responses are to a fuel shortage will determine the extent of reductions in mobility necessary to balance supply and demand of fuel. Since the businesses and residents of a state face potential hardships and losses, assessing the impacts of each measure, individually and in total, is an essential component of emergency energy planning. Specifically, each measure should be evaluated for expected energy savings and for social and economic impacts.

The survey asked questions concerning the extent of such an assessment by the states. More than half the states that responded did not determine the amount of energy to be saved, expressed as a percentage of annual state gasoline use, due to their EECA plan. Typical answers were that it varied, it depended on the severity of the shortage, or it would save as much as necessary. Very few of the plans examined contained an analysis of the energy savings expected.

The other area that the plans do not generally address involves economic impacts such as (a) loss of income from fuel price increases, (b) economic value of lost mobility, (c) losses due to waiting in

gasoline lines, (d) revenue losses to government (fuel taxes and tolls), and (e) losses to travel and recreation industries.

Such an assessment in advance of a shortage can minimize opposition by those directly affected and can help identify those steps that can relieve some of the hardships created by the emergency measures.

SUMMARY AND CONCLUSIONS

While emergency energy conservation planning is certainly not progressing uniformly throughout the country, the survey noted that a considerable amount of activity is (or at least was) under way. The conflict in the Persian Gulf region, the escalation of prices by the Organization of Petroleum Exporting Countries, and the DOE Emergency Planning Grants have served as the impetus for further planning. However, as conditions change in the demand, supply, and price of fuel, the plans need to be refined to ensure their responsiveness.

Some of the more specific shortcomings of emergency planning to date include the following:

1. Lack of money for plan development and implementation,
2. Inadequate cost estimates of measures,
3. Lack of good coordination with local plans,
4. Lack of evaluations regarding energy savings due to the plans, and
5. No assessment of economic impacts of the measures.

The current redirection of federal policy appears to be toward reliance on an unregulated market to ensure an orderly adjustment to any future interruption in energy supply. States cannot rely on the Federal Gasoline Rationing Plan, the federal standby plan, or EECA regulations for the next shortage. Funding for developing state plans or implementing

them may not be forthcoming. Thus, the onus is on the state to ensure that appropriate measures are evaluated and included in its planning efforts.

REFERENCES

1. State EECA Planning Status Summary of State Responses. National Governors' Assn., Washington, DC, June 2, 1980.
2. Emergency Energy Conservation Programs: Department of Energy Oversight. Committee on Government Operations, U.S. Congress, 22nd Rept., Sept. 26, 1980.
3. T.M. Downs and R.H. McManus. Action Energy Contingency Plans. U.S. Department of Transportation, Memorandum, March 29, 1979.
4. Statement of FHWA Policy on Energy Conservation. FHWA, Notice 55204, March 21, 1980.
5. U.S. Department of Energy. Standby Federal Emergency Energy Conservation Plan. Federal Register, Feb. 7, 1980.
6. U.S. Department of Energy. Federal Register, Feb. 23, 1981.
7. The Department of Energy's Reorganization of Energy Contingency Planning Holds Promise--But Questions Remain. U.S. General Accounting Office, EMD 81-57, March 4, 1981.
8. Transportation Contingency Plans for Future Gas Shortages Will Not Meet Commuter Needs. U.S. General Accounting Office, CED-81-79, July 1, 1981.
9. Local Energy Emergency Operation Plan Guidelines. California Department of Transportation, Sacramento, Aug. 11, 1980.
10. R. Bixby, A. Reno, and T. Corsi. New York State Transportation Energy Contingency Planning. New York State Department of Transportation, Albany, Preliminary Res. Rept. 196, Jan. 1981.

Efficacy of Urban-Area Transportation Contingency Plans: A Study of Completed Plans

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As of October 1981, approximately 93 percent of all urban areas had begun transportation energy contingency plans and 37 percent of all urban areas had completed them. An exploratory study of a sample of completed plans was undertaken in order to understand their ability to be implemented and to suggest improvements that would increase the efficacy of those plans not yet completed. The study relied on the Federal Highway Administration's field resources to collect completed plans. A total of 20 completed plans were studied by the headquarter's staff of the Federal Highway Administration and the Urban Mass Transportation Administration. The sample was chosen randomly, and the population of the corresponding cities ranged from 25 000 to 1 180 000, covering all regions of the country. The summer 1979 energy shortage showed that some plans were implemented well and others were not. Based on these experiences, four elements of completed plans were examined: scope, organization, timing, and efficacy of measures. As a result of the study, it was possible to identify those aspects of a plan that could make it more implementable and effective. The plan would (a) cover an entire urbanized area and all modes, (b) include intergovernmental and interagency agreements concerning responsibility for implementation, (c) identify preimplementation tasks and a mechanism to phase in tasks, and (d) contain provisions to evaluate the potential and appropriateness of a measure and its attendant barriers. It is hoped that these observations will help local areas to improve the quality of transportation energy contingency plans.

On January 28, 1981, President Reagan removed price and allocation controls on U.S. crude oil and refined petroleum products by issuing Executive Order 12287. By eliminating restrictive price and allocation controls, the President sought to encourage conservation of energy through the increase of domestic oil prices.

Consistent with the President's direction, the U.S. Department of Energy (DOE) issued its latest National Energy Policy Plan (1). The policy plan relies on (a) market forces, (b) growth in the Strategic Petroleum Reserve, (c) dual-fuel capability for manufacturers and utilities, (d) increased domestic output, and (e) international coordination in order to ensure emergency preparedness on a national level. These actions will reduce the pressure on local areas to take drastic actions in the event of future energy emergencies. In order to assist local areas to help themselves, a reexami-