

have to be administered by a local government agency other than the transit authority in order to avoid conflicts with 13c constraints. Under these arrangements, localities could stimulate the development of all types of DAR, SRT, and jitney services except those that compete with the services of a transit authority. User-side subsidies might be the most cost-effective and flexible means of providing public-sector financial support for new services.

4. Concentration of new service development on segments of the population that will be most affected by a fuel shortage (i.e., elderly, handicapped, poor persons, and clients of human service agencies).

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# Energy Contingency Planning for the U.S. School Transportation Industry, 1979-1980

*National School Transportation Association Energy Committee*

Barring some unforeseen solution to the world's current energy situation, such as the discovery of vast fossil-fuel deposits or the development of a cheap synthetic energy source, it appears clear that the United States will have to modify its transportation systems. A primary factor in such modification will be the sharply curtailed use of and dependence on the private automobile.

Based on the best information available today, the world's energy picture presents a problem of a very long-lasting nature. Whether the United States will adapt to this situation voluntarily or involuntarily remains to be seen, but it seems indisputable that implementing energy-conservation measures and maximizing the use of available transportation modalities are inevitable steps.

As the nation adjusts to these new transportation circumstances, it will be necessary for each locality to provide for the mobility of its citizens. The development of energy contingency plans is an essential first step in this direction.

The first obligation of the school transportation industry is the safe transportation of children to and from school and school activities. But, due to the shortage of fuel, school buses will be necessary for broader community service.

It is imperative to realize that planning for future transportation needs cannot be addressed in a compartmentalized fashion. It is assumed at the outset that comprehensive solutions—the only sort acceptable for such a pervasive problem—must involve many elements of society in general and the transportation community in particular. Therefore, only an approach that integrates all transportation providers can deal adequately with the problem.

## ENERGY CONTINGENCY PLANS

Energy contingency plans are designed to prepare for both immediate and long-range dependence on multipassenger vehicles, which should result in an overall petroleum saving. Most often, energy contingency planning addresses the need to increase the capacity of local bus transportation systems. At the same time, it prescribes methods of apportioning travel demand in a more uniform way and over a longer time period and encourages greater acceptance and use of taxis, vans, and informal multipassenger travel modes.

The chief elements in such planning are the process and the end product. The process describes the way in which plans are developed, identifies the participants, and assigns responsibilities. The product is a list of actions to be implemented. Moreover, energy contingency plans are generally keyed to levels of crisis and suggest which actions are most appropriate at given levels of fuel shortage.

In developing this document, the National School Transportation Association recognized that, although most communities have no transit systems and many have no rail or intercity bus systems, virtually all have school transportation systems. The existence of such systems means that school buses are available for use. Therefore, faced with increasingly scarce and expensive fuel, energy contingency planning that takes the presence of these vehicles into account can assure the community of the continued mobility of its population in order to maintain public welfare, support economic vitality, deliver public services, maintain the quality of life, and be prepared for emergencies.

The school bus operator may find that energy contingency planning presents additional opportunities. The curtailment of private automobile travel, whether as a matter of personal choice, economic necessity, or

government intervention, is likely to result in an increased demand for public transportation. This situation will provide the transit operator with a means to market the convenience of bus services to new passengers. It is probable that this will lead to the retention of that new ridership, if or when conditions ease.

Contingency planning can be expected to relieve the stress on the public of a crisis mentality and help to build support for bus service among local officials and citizens. Should such support materialize, there would be a residual opportunity for continued use of school transportation vehicles in an ancillary capacity to other transit systems long after the crisis—of whatever degree and duration—has waned. This would also bring the adult, nonschool population into immediate contact with the school transportation industry—a contact that would provide the opportunity to make the public aware of the skills of school bus operators and the safety, design, and maintenance of school buses.

As suggested above, energy contingency planning may become the cornerstone of an integrated transportation management system that links urban development and air quality into one comprehensive local transportation response.

#### ROLE OF THE BUS OPERATOR

For bus operators, three categories of action are important. First, through the redeployment of resources and revisions in traditional concepts about the school bus enterprise, there are those actions that can be planned and implemented by the operator without outside assistance. Second, there are actions that involve the cooperation of other agencies. The third category includes actions, such as parking bans, staggered work hours, and governmental intervention, that do not directly involve the bus operator but will have an important impact on operations.

Energy contingency planning challenges the local community to adjust its transportation components so that the entire system performs at its maximum level of efficiency. This goal also challenges transportation providers to see themselves as parts of a total transportation team rather than isolated systems operating in a vacuum.

Consistent with this goal and the need for cooperation, bus operators may find themselves taking on several or all of the following specific task-oriented roles.

1. The bus operator is a service provider, managing the network to accommodate increased demand and attempting to attract those who travel on less-fuel-efficient modes. The school bus operator provides a specific transportation service. However, the operator—as a transportation professional—must also provide expertise and nonschool transportation services to enhance economic growth and to aid the community during periods of special need.

2. The bus operator needs to be a fuel conserver. A fuel-management plan is essential to maximum fuel economy standards and must deal with storage and supply issues.

3. In some cases, the bus operator may be a service coordinator, linking conventional school bus operations with those of other service providers in the area.

4. The bus operator has taken, and must continue to take, the responsibility of a planning catalyst. In this role, the operator alerts public agencies, other transportation providers, the local business community, and the general public to the seriousness of the local energy situation and suggests ways of coping with it.

#### ORIGINATING THE LOCAL PLAN

In 1973-1974, the country was shocked by the so-called oil crisis. After decades of apparently abundant fuel at what now are viewed as unrealistically low prices, most cities were unprepared to deal with the sudden and dramatic demand for mass transportation services in the wake of

soaring fuel prices. The oil embargo also was turning people away from the private automobile.

Based on that experience, many localities developed contingency plans for dealing with future supply and price problems. In many cases, those plans, which probably surfaced in the 1975 period, were updated in 1979. Should a community have no contingency plan, or one that has not been reevaluated for several years, it is time to originate such a plan or modify an existing one. The school bus operator should take a leading role in this process.

Chief elements of a local energy plan ought to include the following:

1. Analysis of current local energy situations and provisions for the continued monitoring of supply levels, storage provisions, and related factors;

2. Analysis of existing services, vehicles, and ridership, as well as factors affecting ridership;

3. Analysis of current capacity of all available fleets of multipassenger vehicles;

4. Projections of demand for transportation services that take into account both the magnitude of the demand and the location of such demand at various levels of a petroleum shortage (e.g., seasonal demand changes such as school vacations, holidays, and summer school closings);

5. Analysis of actions that may be taken to increase capacity, both with and without new capital investment;

6. Recommendation of operational actions to increase service;

7. Financial analysis of actions and newly proposed program changes;

8. Recommendation of support actions that involve personnel, planning, public information, marketing, and the interface of private and public entities;

9. Analysis of actions along a time line—those to be taken at once, those of an intermediate nature, and those that are long term;

10. Plan for fuel management that includes conservation measures within existing and projected operations, as well as provisions for additional fuel procurement and storage;

11. Analysis of actions that require public cooperation, such as staggered work hours, high-occupancy-vehicle lanes, ridesharing, vanpooling, park-and-ride lots, and prohibitions on students driving to school;

12. Implementation strategy that includes the designation of responsibilities for and timing of actions; and

13. Identification and procurement of funding needs and sources.

#### COMMUNITY ROLE IN PREPARING AND IMPLEMENTING THE PLAN

In a great majority of communities, the school bus operator or local transit operator working with the local MPO has been responsible for developing energy contingency plans. Routinely, the MPO has provided information by collecting and analyzing statistics for the operator. Local government and the business community have acted as consultants by offering comments and suggestions on the feasibility of various travel alternatives. By using this information, transit administrators and operators have been responsible for implementing transit improvements. Because most plans are heavily transit oriented, this puts the operator in the position of being a major resource. In those communities with no transit system, however, the school bus operator may also be the primary service provider. This situation means a new look must be taken at school bus use. The school bus operator must take the initiative in making the necessary contacts with and providing intelligent data to the proper local and state governmental bodies.

The role of local government varies from cities where it has the major responsibility of assuring that most phases of the transportation planning are carried out to other communities where policy guidance is the sole function of government related to energy planning. Local governments

are also being called on by transit systems to support, coordinate, and accelerate transportation system management actions that are consistent with the regional plan and to seek and provide funding opportunities.

In general, the private sector has been asked by transit operators, local government, and planning agencies to facilitate carpooling and variable work hours among its employees and to provide transit service information. Just as this means a broader service and use for many school vehicles, it also requires that a wider range of governmental and community groups be involved in the planning process.

#### SCHOOL BUS OPERATOR ACTIONS

Plans routinely call for various classes of actions. One category sets forth those efforts that can be achieved by the bus operator with little or no outside assistance. The most common are summarized here.

##### Operations and Scheduling

1. Increase the number of buses available by retaining vehicles that are replaced by new purchases.
2. Rehabilitate older vehicle where feasible.
3. Set up emergency vehicle-use agreements with other operators (e.g., school buses, charter services, transit operations, and intercity and private commuter services).
4. Monitor daily demand to ensure that resources are allocated to be most effective.
5. Increase purchase and use of larger-capacity buses.
6. Initiate line-haul feeder services with other publicly sponsored services.
7. Develop reverse-commute runs in cooperation with isolated employers.
8. Develop park-and-ride or express services, possibly by using high school parking lots so that, as students are brought to school, workers are picked up for transport to employment sites.

##### Maintenance

1. Plan for increased employee training and the addition of new mechanics.
2. Contract for the loan of maintenance personnel from other vehicle operators.
3. Reschedule routine maintenance to nonpeak hours, which might require more than one maintenance shift or split shifts.
4. Recognize that increased service requires increased maintenance.

##### Personnel

1. Provide for emergency expansion of personnel (e.g., drivers, mechanics, dispatchers, and supervisors).
2. Maintain a list of satisfactory former drivers and mechanics for possible temporary reemployment.
3. Increase personnel recruitment, selection, and training.
4. Investigate ways to bring bus drivers, mechanics, and other employees to work, such as a special bus run for employees, during an extreme gasoline shortage.

##### Facilities

1. Determine current bus storage capacity and where additional space exists.
2. Accelerate programming of new buses and fuel storage facilities.
3. Establish alternative arrangements for midday parking of buses to avoid extra deadhead miles.

##### Fuel Management

1. Lease additional fuel storage space, such as vacant

service stations, and bulk tanks on farms and in-city locations.

2. Develop a list of operating actions to reduce fuel use.

3. Purchase bulk amounts of fuel on the open market as well as from regular suppliers.

##### Customer Information and Marketing

1. Develop a telephone information staff.
2. Develop and share information on other ridesharing and paratransit services with providers.
3. If the bus services are subject to changes, develop means of communicating with passengers via brochures, radio, television, newspapers, newsletters, and bulletins.

##### Planning

1. Determine where additional bus requirements will most likely occur during crises of varying severity and duration.

2. Identify appropriate park-and-ride locations that should include those to be used on a temporary emergency basis, as well as those to be used on a permanent basis such as schools, shopping centers, municipal parking lots, and post-secondary school campuses.

#### LOCAL GOVERNMENTAL ACTIONS

The following kinds of actions have been identified as appropriate to the roles of local government.

1. Develop an overall energy plan for the municipality and region.
2. Mandate variable work hours for public employees.
3. Request (or where the power to do so exists, mandate) private employers to institute variable-work-hour programs and to encourage their employees to use buses and other multipassenger vehicles.
4. Develop emergency coordination networks among public agencies and private transportation providers to share supplies, vehicles, fuel, and personnel.
5. Expedite the implementation of the local transportation system management element, with special attention to the provision of preferential treatment for high-occupancy vehicles.
6. Assist in the development of additional park-and-ride locations.
7. Establish emergency transportation information centers and simplify the exchange of ridesharing information and the use of referral systems.

#### STATE AND FEDERAL ROLES

It is imperative that government at the state and federal levels advise and support appropriate aspects of the local energy contingency plan and planning efforts. Most plans will assume state and federal financial assistance. In addition, state and federal employers are expected to implement variable work schedules as well as to encourage the use of bus and ridesharing transportation modes.

The following are specific requests that can be made of appropriate state and federal agencies.

1. State departments of education and school boards should allow or approve added school bus use.
2. Such levels of government should develop an emergency procedure to marshal all publicly and privately owned transportation services during a crisis.
3. Appropriate agencies should establish contacts with fuel suppliers to ensure that adequate amounts of product are refined and available to the whole system.
4. DOE should assure bus operators that they will have the highest priority for diesel fuel and gasoline allocation.

## ROLE OF LOCAL BUSINESS

In general, the local business community is asked to cooperate by setting up variable work-hour schedules, disseminating information about bus services, encouraging their use, and facilitating the formation of ridesharing arrangements. Where feasible, business enterprises with large parking areas are asked to dedicate a portion of such space for park-and-ride use.

Depending on the resources and technology available to the school bus operator, transit operator, or local government, certain businesses—especially those of a highly technological type—may provide commuter services to maximize efficiency in coordinating the overall transportation system in return for the obvious public relations value. These operators may also provide planning and administrative personnel to assist in the design and execution of the plan. Moreover, business and industry may be sources of additional funding.

## ROLE OF LABOR

Where labor unions for school employees, workers, or drivers exist, energy contingency plans need to address labor issues that call for additional personnel. Constraints imposed by labor contracts and work rules incompatible with aspects of an energy contingency plan must be changed through consultation with involved unions. The importance of being able to hire part-time and contract personnel must be negotiated and resolved in advance with the appropriate unions.

## ROLE OF LOCAL PLANNERS

If the community has adopted a plan that does not currently involve the local school bus operator, this should be remedied. If no plan exists, one should be devised by the various responsible participants, especially in order to secure funding and fuel. It may be necessary for the school bus operator to encourage the formation of such a group with the support of the local governmental structure that encompasses all transportation modes. In any event, it seems clear that there can be no realistic, comprehensive transportation policy that does not involve the school bus operator as one of the primary planners and providers of services.

## OTHER CONSIDERATIONS

As with any business transaction, funding arrangements to implement local energy contingency plans will vary widely. Although many cities, counties, and states have crisis contingency funds, the local contingency planning committee will need to know the sources of money other than from bus fares.

Some identifiable sources of financial assistance include the following:

1. Transportation funds budgeted by the city, county, and state;
2. City, county, or state contingency funds;
3. Factory or agency-contracted rates of subsidies;
4. Passenger fares;
5. Revenue-sharing, welfare, social security, and other federal transportation funds for which the agency that contracts for bus service applies; and
6. UMTA funds.

If school buses are used for other purposes between the hours of 10:00 a.m. and 2:00 p.m., after school, and on weekends, then school officials need to know these schedules so that they can plan activities and athletic trips in advance. Businesses can have more flexible shopping times if needed, and community events can be planned within workable timetables. All of these ideas are to allow the same bus to make the maximum number of trips daily

that are reasonable and needed in the community. Special-education vehicles can be used by adult, as well as school, passengers through flexible scheduling.

Any vehicle that can carry many people to similar destinations or the same destination will save fuel. Deadheading and empty runs must be recognized as contrary to the goal of energy conservation.

## IMPLEMENTING THE CONTINGENCY PLAN

Each area should determine its own needs and shortfall problems and be ready to act when the shortage is at the 15 or 20 percent level. This means that the groundwork with local suppliers, schools, city, state, and county should be ready and in place.

Further, it would be helpful to begin now to effect even small changes in each locality. Such changes might include a limitation on the use of student-owned cars, the establishment of park-and-ride lots, and the use of school buses to accommodate revised factory work schedules. In fact, pilot operations would help prepare the community and the transportation providers to cope with the changes. The less sudden the "shock", the more smoothly the community can accept and work with long-range energy plans.

The media can be key factors in helping the community develop an awareness of the need for transportation changes and encourage the public to cooperate. For example, the media could highlight the amount of fuel saved through the maximum use of school buses.

The energy shortfall is a long-range national problem. Therefore, school staff and pupils should be involved in analyzing local problems and developing solutions. Research and experience show that persons who are involved in the development of solutions work diligently to make them succeed.

Although future energy shortfalls may not seriously affect a given area as much as another, it is likely that no location will be immune. Regardless of current situations, the time to prepare for an energy shortfall is now.

## ACKNOWLEDGMENT

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## Can the Intercity Transportation System Accommodate the Demand During an Energy Shortage?

Gibson W. Fairman

What is an energy shortage? In this paper, it is defined as a short-term emergency interruption of the supply of transportation fuel similar to that created during the 1973-1974 oil embargo by OPEC. Such a short-term shortage is characterized by its suddenness, its severity (percentage of supplies cut off), the curtailment of normal travel, and the likelihood of government intervention (fuel allocation, rationing, etc.), as well as its adverse long-term economic and social impacts.

Individual efforts by private citizens and government-initiated programs to reduce travel would be aimed primarily at the automobile and light-truck user. Together, they account for more than 88 percent of the total person miles of travel in the United States and consume about 63 percent of all petroleum used for transportation, or nearly 33 percent of all petroleum consumed in the United States. (All data in this report are for 1977.) The other forms of passenger transportation consume an additional 6.3 percent of the petroleum used for transportation. Freight movement by truck, rail, water, pipeline, and air accounts for the remaining 3 percent of transportation fuel use. Transportation used 53.7 percent of the total U.S. petroleum consumed (1-3).

Petroleum accounts for approximately 49 percent of the total U.S. energy resource. Nearly 48 percent of the petroleum consumed in the United States is imported. A sudden one-third reduction in oil imports could mean a 16 percent reduction in fuel available for transportation. Similarly, a two-thirds cutoff of imported oil could result in a 32 percent reduction. These percentages are based on the

assumption that available oil would be distributed in proportion to past consumption patterns. Undoubtedly, reallocation would deviate from past trends but to what extent is beyond the scope of this paper.

Aside from the uncertainties of emergency shortages, we are also faced with the long-term problem of diminishing world oil supplies. Responses to the long-term problem call for different and more deliberate actions than those we would take in an emergency. Nevertheless, consideration of the long-range implications should be a factor in evaluating potential short-range solutions.

Before attempting to determine the amount of excess capacity that may exist in the public intercity modes, it would be useful to summarize the basic assumptions of this paper. All data are for 1977. Intercity trips by automobile and truck are defined as one-way trips of 100 miles or more and 50 miles or more. Automobile and light-truck travel data are taken from the 1977 U.S. Census of Transportation for one-way trips of more than 100 miles. A light truck is a pickup or van. Additional automobile and truck travel to account for trips of 50 miles or more was determined from output from the California Statewide Travel Model (trip-length frequency distribution). Reductions in available fuel are applied across the board, except for total decreases in intercity travel that are applied to automobile and truck travel only—i.e., the modal shift is from automobile and truck to the three public modes (bus, rail, and air). No change in existing (1977) oil distribution patterns is assumed as a result of reductions, except as noted above. Automobile and truck occupancy for total travel is 2.2