# transportation energy contingency strategies

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part two
synopsis
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#### TRANSPORTATION ENERGY CONTINGENCY STRATEGIES

# PART TWO SYNOPSIS OF ACTIONS

#### SPONSORED BY:

## FEDERAL HIGHWAY ADMINISTRATION OFFICE OF HIGHWAY PLANNING

AND

URBAN MASS TRANSPORTATION ADMINISTRATION OFFICE OF PLANNING MANAGEMENT AND DEMONSTRATIONS

#### PREPARED BY:

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#### PART TWO

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## SYNOPSIS OF TRANSIT, PARATRANSIT, AND RIDESHARING ENERGY CONTINGENCY PLANNING ACTIONS

Several metropolitan areas, planning agencies, transit properties, and other public and private entities concerned with the provision of transportation services have already examined -- to differing degrees of completeness -- actions that might be warranted during a fuel emergency. Some of these efforts have been summarized by American Public Transit Association (APTA) in a document distributed to its member agencies titled "Approaches to Energy Contingency Planning" (September 1979) and by U.S. Department of Transportation (DOT) in a document entitled "Transportation Energy Contingency Planning: Local Experiences" (June 1979). The APTA document is primarily oriented to the transit operator while the DOT report gives a rather comprehensive listing of activities and actions that local entities (including the transit operator) might undertake in preparing an energy contingency plan. It provides excerpts from six previously developed metropolitan area emergency plans.\*

Since the time these reports were written and distributed, more has been learned about how prospective actions should be considered by agencies formulating contingency plans. More specifically, the usefulness and appropriateness of alternative contingency actions are best evaluated with respect, to varying conditions, including severity and duration of various fuel shortfalls, the lead time required for planning and implementation of various actions, the barriers to their timely adoption and implementation, and the

<sup>\*</sup>The six areas whose plans were excerpted are Memphis, Tenn., Seattle, Wash., Los Angeles, Calif., Washington, D.C., Dallas-Ft. Worth, Tex., and Minneapolis-St. Paul, Minn.

various actors who must participate in either the front-end planning or the actual implementation of the actions. For example, some activities which are appropriate as immediate conservation activities might be inappropriate to initiate in the middle of a shortage that is expected to last only a brief time. Other activities are appropriate in crisis conditions but require preparation in advance in order to be implemented during a crisis.

With these considerations in mind, the following section of this report presents a synopsis of those contingency actions designed to facilitate and make the best use of transit, paratransit, and ridesharing (TPR) services during a fuel emergency. These actions are grouped by types of lead actors and are keyed to four possible fuel supply conditions:

- a. Advance conservation
- b. Local, short-duration supply interruption, similar to the 1979 situation where lines at the pump were experienced in certain California cities, the Northeast, Washington, D.C., and a scattered number of other cities.
- c. Moderate shortfall (8 percent-12 percent) mid term (six months plus) on a national scale.
- d. Severe shortfall (12 percent-20 percent or more) on a national scale, one that presumably lasts longer than a few months.

Obviously, the actions categorized may not be applicable or relevant to all communities or uniformly suited to the particular lead agencies under which they are classified. It should also be stated beforehand that the list of items is not exhaustive; certainly a host of additional actions or variations on the ones mentioned here can be cited, some of them uniquely useful to individual states, regions, and localities. The point to be

stressed is that the package of contingency actions suited for one region will depend on that region's set of actors and the influence and expertise they have, the combination of resources available to be used, and the latitude allowed (or constrained) by institutional arrangements and agreements. Finally, the sense of urgency conveyed to the major actors by private citizens, interest groups, and the public-at-large will be a pivotal determinant of the kind of actions deemed technically and politically feasible and the pace at which such actions are adopted and implemented.

The need to account for unique circumstances in each community, however, does not obviate the need for a tool with which to gain an understanding of how arrangements for an emergency plan are best set in place, i.e., a tool that explains how state and local entities and planners can prepare emergency strategies that are politically and institutionally realistic as well as technically feasible. It is for this purpose that the following synopsis of actions is presented.

Since it is impossible to identify the exact title of the "actor" that will be assigned lead responsibility for planning and implementing various strategies in particular circumstances, the synopsis of actions is categorized by the following five generic titles:

- 1. The Transit Operator
- 2. Providers and Regulators of Auxiliary Mass Transportation Services
- 3. Ridesharing Service Coordinators and Promoters
- 4. Major Employers
- 5. Providers of Physical Infrastructure

#### SYNOPSIS OF ACTIONS

#### 1. ACTOR: THE TRANSIT OPERATOR

The term "transit operator" is considered here as encompassing organizations that oversee and/or directly operate conventional bus and rail mass transportation services. The operator should have four primary objectives in planning an energy contingency strategy:

- A. <u>Public Information</u> -- to provide adequate information to current and new riders regarding available capacity, operating conditions, routes and schedules.
- B. Fuel Efficiency -- to economize in the use of fuel.
- C. <u>Fuel Availability</u> -- to obtain sufficient fuel to sustain and expand levels of service.
- D. <u>Service Expansion</u> -- to accommodate increased demand.

The four objectives are tied together, since service expansion to accommodate additional ridership generally entails increased fuel requirements. At the same time, actions taken to conserve fuel may involve service changes and communicating these changes to the public may tax the public information capability of the transit operator.

In addition to pursuing these primary objectives, the operator must assist the community-at-large with a transition toward greater use of public transportation; establish communications with major employers who may now need new service; coordinate with other transportation service providers; and expand information programs on all public transportation services that exist in the region. In some cases transit authorities might assume a lead role in

such coordination activities. The actions described below, however, address the objectives and responsibilities of the transit provider concerning public information, fuel supplies, and service expansion.

#### A. Actions to Improve Public Information

Accommodating demand during an emergency requires that past riders be informed about changes in service that will affect them. New and potential riders must be informed about the services that are available to them and about methods of using the system. For these purposes, a comprehensive multi-media public information program should be prepared in advance and implemented at the onset of an emergency. Such a program should provide information on such things as:

- Types of services
- Location of routes and stops
- Schedules and schedule changes
- Fare information
- Location of information centers
- Underutilized services (time of day/route)
- How to use the system
- Auxiliary public transportation options (e.g. dial-a-ride services)
- Carpooling and ridesharing alternatives.

#### 1. Establish an Expanded Public Information Program

a. <u>Conservation phase</u>. In anticipation of rising prices and supply uncertainty, significantly upgrade and increase public infomation activity to inform potential riders of services (e.g., expand distribution of timetables on existing lines, etc.) and promote the concept of using transit.

- b. Local, three-week gasoline supply disruption -- The public information system is the most likely service to break down in this situation. exasperating the public which cannot even get a telephone answered. Prior planning is needed to assure the system's capacity to respond to the public's request for telephone information; special media efforts should be undertaken to disseminate information; accurate and useful information should be provided concerning actual operating conditions (e.g., so that riders will not be encouraged by the information system to wait for buses which have broken down). "Image" advertising promoting the concept of using transit is likely to be counterproductive if the crisis has already provided more riders than the system can handle. If capacity is available, however, (e.g., during off-peak hours), "image" advertising may usefully promote the concept of using transit during these hours. If supplementary services utilizing private buses or school buses are available, the transit system may be able to provide information concerning these services. Alternatively, it may be sensible for the transit provider to cooperate in a multi-service emergency information center rather than attempt to handle this work internally. If so, the multi-service center needs to be very well planned in advance.
- c. <u>Moderate Shortfall</u>. Same as (a) and (b), but consider adding marketing of off-peak capacity (if it is available). Also, develop feedback capacity to identify lines where peak spreading is most critically needed and contact key employers to encourage peak spreading through variable work hours.
- d. <u>Severe Shortfall</u>. Same as (c) above, but add resources to expand the system's internal feedback capacity and target employers for peak spreading efforts; explicitly plan these additional efforts in advance of a shortage.

#### 2. Establish Multi-Modal Telephone "Hot Line"

An important medium of public information during the emergency can be an adequately staffed regional public transportation telephone information service. Such a service should provide coordinated and integrated information on all regional public transportation systems as well as paratransit and ridesharing services. The service may or may not be operated by the transit operator, but the transit operator will have an obvious stake in the effectiveness of the service.

- a. Advance Conservation Phase. Planning for the "hot-line" service should be accomplished in this phase. This work may include preparation of instruction packets for phone operators and arrangements with the telephone company for special phone numbers and priority treatment during an emergency.
- b. Local Short Duration Supply Interruption. The emergency phone information system should be implemented.
- c. <u>Moderate Shortfall</u>. Same as above, expansion of the system may be necessary.
  - d. Severe Shortfall. Same as (c).

#### 3. Establish Emergency Media Program

An emergency media program should be prepared in advance and implemented when necessary. The program should use the print media, radio, and television. It should also involve preparation and dissemination of pamphlets, posters, etc.

(a) Advance Conservation Phase. Information material should be designed and planning should be done for production and distribution of these materials.

- (b) <u>Local Short Duration Supply Interruption</u>. Materials should be produced and disseminated if the duration of the crisis so warrants.
  - (c) Moderate Shortfall. Materials should be produced and disseminated.
  - (d) Severe Shortfall. Same as (c).

#### B. Actions to Improve Fuel Efficiency

The actions discussed in this category are oriented primarily toward increasing the fuel efficiency of the transit system. That is to say, these actions aim at increasing the passenger-miles of services provided per gallon of fuel consumed. Such actions could be used either to expand system capacity with constant fuel supplies, or to maintain overall system capacity with shrinking fuel supplies. Also, because of the dramatic increase in diesel fuel prices, it may be desirable to change operating practices even in the absence of a fuel shortage. Finally, it should be stressed that transit providers must be visibly committed to the most effective fuel conservation practices to justify the priority access to fuel supplies which they have been granted through DOE's Special Rule #9.

#### 1. Reduce Vehicle Stops

Vehicle fuel efficiency is improved by reducing the frequency of stops and starts for individual vehicles. Vehicle stop frequency can be reduced in several ways, some of which do not require elimination of any stops on a route. For example, some high volume routes lend themselves to double or triple heading, where two or more buses begin the run together. On some routes, "skip stopping" is possible, (i.e., alternate buses stop at alternate

- stops). Finally, if it is deemed feasible to eliminate or reduce service at some route stops, perhaps at certain times of the day, then express or limited stop service can be substituted for local service. These actions also tend to increase the intensity of use of both equipment and drivers (albeit at some expense to some users in terms of quality of service).
- (a) Advance Conservation Phase. During the period prior to the onset of an emergency, reductions in vehicle stop frequency will generally not be appropriate unless they are justified on grounds other than the energy emergency (economic or service quality reasons). At the same time, existing policies which may be outdated should be reviewed. The increase in the price of diesel fuel, if nothing else, may warrant such a review. In addition, planning and public hearings on contingency actions of this nature should occur during this phase if quick implementation of changes is to be feasible in the event of a shortage.
- (b) Local Short Duration Supply Interruption. It will generally be inappropriate to introduce vehicle stop reduction measures in this situation. Measures which do not eliminate route stops (such as skip-stopping and double heading) may make sense. In general, however, the difficulty of communicating changes to a large number of riders (many of whom are unfamiliar with public transportation) will argue against introducing new procedures in the middle of a crisis of short duration. State and federal requirements for public hearings and union requirements for orderly process on route changes will also discourage sudden changes in a brief crisis.
- (c) <u>Moderate Shortfall</u>. This situation may call for more dramatic stop reduction measures, including some which temporarily eliminate selected route stops (e.g., substituting express service, or eliminating some stops on

local routes). These steps will lead more to increased equipment utilization than to fuel conservation. A systematic and coherent approach to implementation of these changes will increase public understanding and reduce confusion.

(d) <u>Severe Shortfall</u>. This situation may call for even more severe stop reduction measures, primarily to increase equipment utilization.

#### 2. Reduce Deadheading

While unnecessary deadheading should be avoided even in normal times, the exigencies of a fuel emergency could justify certain measures to reduce deadheading that would not make sense under conventional circumstances. In general, deadheading may be reduced by relocating vehicle storage and maintenance sites; by downtown storage during the day of buses used at peak hours only; and by modifying existing routes (RUCUS\* programming techniques\* are useful for such scheduling).

- (a) Advance Conservation Phase. In addition to detailed contingency planning, deadhead reducing measures that are justified on economic or service grounds are generally appropriate in this phase. An imminent fuel supply crisis will call for a review of past operating procedures to examine adjustments that can contribute to fuel conservation and improved equipment utilization.
- (b) <u>Local Short Duration Supply Interruption</u>. Some deadhead reducing measures may be warranted at this point. Expensive changes, or those that are hard to reverse, however, probably will not be desirable.

<sup>\*&</sup>quot;RUCUS:" Acronym for <u>RUn CUtting</u> and <u>Scheduling</u>." See Roberts, Kenneth R., Mitre Corporation; "Vehicle Scheduling and Driver Run Cutting: RUCUS Package Overview," November 1973, prepared for UMTA.

- (c) <u>Moderate Shortfall</u>. Additional measures may be warranted, especially tentative changes in daytime vehicle storage locations.
- (d) <u>Severe Shortfall</u>. Extreme measures may be warranted. At this level of crisis, a full program of downtown bus relocation should be considered and efforts to accelerate the implementation of computerized run cutting and scheduling should be intensified. (It should be noted that bus routes which normally are not heavily patronized during off-peak hours may experience substantial increases in demand during the daytime hours, thus reducing the proportion of buses not in service during the day. These changes may affect the need for downtown vehicle storage facilities.)

#### 3. Reduce Vehicle Idling and Delay

A variety of measures can reduce the amount of fuel wasted in idling and delaying of vehicles. These measures range from improved driver and supervisor training, to improved passenger flow at terminals and on vehicles, to improved vehicular flow on streets. Many actions to reduce transit vehicle delay require the cooperation of authorities (such as local government or police) other than the transit operator.

- (a) Advance Conservation Phase. During this phase it will be necessary to lay the groundwork for implementation of delay-reducing actions. The reason is that many actions (e.g., increased use of transit passes by passengers; establishment of exclusive transit right-of-ways or priority signalization; and, implementation of new procedures for bus drivers and supervisory personnel) require considerable lead time before they can be implemented and require extensive coordination with other organizations.
- (b) <u>Local Short Duration Supply Interruption</u>. There may be actions which make sense as conservation programs but which have been precluded by

bureaucratic red tape. A local short duration crisis could provide the opportunity to implement such actions. However, unless these actions make sense over the long run, a short duration crisis may not be an appropriate time for their implementation either. One particularly useful step would be to reduce the idling of vehicle engines at terminals and stations.

- (c) <u>Moderate Shortfall</u>. Larger scale, more complex efforts to reduce delay will be appropriate, including traffic engineering measures that improve vehicular flow, such as exclusive lanes on streets and priority signalization.
- (d) <u>Severe Shortfall</u>. All measures to reduce idling and delay should be introduced, including the adjustment of signal systems, signing and other traffic control programs that can facilitate the flow of traffic, grant priority to public transportation vehicles and separate those vehicles from other types of roadway traffic. A pass program should also be implemented to reduce extended delays in fare collection at stops (if such a program is not already in effect).

#### 4. Transit Vehicle Hardware Modification.

Actions in this category aim at improving transit vehicle fuel efficiency by adjusting the physical characteristics of the vehicle: e.g., through augmented engine maintenance procedures, reduced operation of air conditioning, monitoring of tire inflation pressures, etc. While some of these measures may have the effect of reducing passenger comfort or increasing vehicle maintenance costs, fuel availability problems and high fuel prices may warrant their adoption.

(a) Advance Conservation Phase. Many fuel economy measures in this category may be justified simply by high fuel prices, regardless of the presence of a supply shortage. However, priority should be placed on

easily executed vehicle fuel efficiency measures (e.g., oil and tire pressure checks), and on the training and education of drivers and mechanics in energy conservation procedures.

- (b) <u>Local Short Duration Supply Interruption</u>. Actions in this phase should be limited to those which do not harm passenger comfort, so as to help hold permanently as many new riders as possible.
- (c) <u>Moderate Shortfall</u>. Several vehicle modification actions may be warranted during this phase. Actions that can be undertaken quickly, inexpensively, and with minimal effects on passenger comfort are prime candidates for consideration. Driver and mechanic training and education should be implemented in this phase if they have not been introduced already.
- (d) <u>Severe Shortfall</u>. More extreme actions may make sense, such as conversion of engines to alternate fuels (e.g., propane), the imposition of air-conditioning use restrictions, and removal of seats to increase vehicle capacity and reduce fleet requirements.

#### 5. Cut Back Service on Least Efficient Operations

Actions in this category involve reductions in or possible elimination of service provided on routes or route segments (or during time periods that are characterized by low fuel efficiency.) Since actions in this category involve a reduction in transit service at a time when people will need that service more than ever, service cutbacks will be justified only when the transit authority faces severe fuel availability problems, or when transit demand on more fuel efficient services is far outstripping transit capacity and satisfactory service by alternate suppliers (e.g., school buses, charter buses, taxis, vanpools, etc.) can be arranged. In general, service cutbacks

are a last resort emergency action. If such action is warranted, public hearings probably will have to be held.

- (a) Advance Conservation Phase. Some service cutbacks may be warranted on routes which cannot be justified on the basis of fuel efficiency or other benefits. Detailed contingency planning should be initiated, including the development of a mechanism for determining which services should be cut back during a shortage. Equally important, arrangements should be made where possible with labor unions and alternate service providers to allow for service substitution. Necessary public hearings should be held at this point.
- (b) <u>Local Short Duration Supply Interruption</u>. Generally, no service cutbacks will be warranted, but service cutback priorities should be clearly established if they have not been formulated previously.
- (c) <u>Moderate Shortfall</u>. Some cutbacks may be necessary due to demand and capacity problems. Turnback runs might be increased; express runs might be substituted for locals.
- (d) <u>Severe Shortfalls</u>. Additional cutbacks may be required. Where possible, services that have been cut should be operated by substitute suppliers.

#### C. Actions to Improve Fuel Supply Availability

The actions discussed in this category are oriented primarily toward increasing the quantity and reliability of fuel supplies. It should be noted that operators who have bulk storage facilities may not need to consider the first action listed below unless DOE's Petroleum Allocation Regulations expire in 1981 or unless fuel prices rise so quickly that the strategy becomes desirable from a purely economic point of view. Operators who do not have

bulk storage facilities should consider this action immediately. Further, unless the timetable for elimination of the Petroleum Allocation Regulations is altered by further legislation, the second action listed below will become impossible after September, 1981. As of that date, an operator's fuel supplies will be determined by his willingness to pay the market price of fuel, not by his entitlement under the allocation program. Finally, there is a third action not described below which many operators who use diesel fuel could employ. This action would involve substituting Number 2 diesel fuel for Number 1 diesel fuel in bus operations.

#### 1. Build or Expand Fuel Storage

Building/expanding fuel storage is both a means of ensuring fuel availability during a supply interruption, and also a means of reducing average fuel costs during an emergency in which prices rise rapidly.

Additional fuel storage can be obtained by leasing, buying, or building a storage facility. (UMTA Section 3 capital funding is available for expanding fuel storage capacity.) The size, cost, and locational proximity of the facility are important considerations.

- (a) Advance Conservation Phase. Fuel storage must be built/expanded during this phase. If empty storage capacity is available at a time when a supply interruption appears imminent, bulk purchase of fuel on the open market may be warranted to build up fuel reserves. Further, if fuel prices are expected to rise, an investment in storage capacity could be self-liquidating in a relatively short period of time.
- (b) <u>Local Short Duration Supply Interruption</u>. Draw-down of stored fuel supplies may begin in this phase. However, the possibility of a worsening of the supply crisis may call for a measured draw-down of the

reserve supplies while other sources of emergency fuel supplies are pursued (e.g., Federal relief from allocation rules, state fuel "set-aside" supplies).

- (c) <u>Moderate Shortfall</u>. Reserve fuel supply draw-down will be necessary. Other emergency fuel supply sources should be pursued.
  - (d) Severe Shortfall. Same as (c) above.

#### 2. Secure Emergency Fuel Allocations

Under DOE's Petroleum Allocation Regulation it is possible for transit and paratransit operators who have bulk storage facilities to obtain special emergency supplies of fuel through DOE's Office of Hearings and Appeals, provided that they meet certain eligibility criteria and can afford to wait for a ruling. Both gasoline and diesel fuel users who have bulk storage facilities, however, can also request fuel from state set-asides. (During an emergency, each state may have control over the distribution of 4 percent of all diesel fuel supplies and 5 percent of all gasoline supplies in the state. This fuel may be distributed quickly to organizations and individuals who can demonstrate hardship or a public interest in their receipt of additional fuel supplies). Finally, certain transit or paratransit operators who use gasoline and who do not have bulk storage facilities can make arrangements to acquire fuel through other gasoline users who have these facilities and who are priority users under DOE's fuel allocation program (e.g., a school bus operator can purchase fuel from a taxicab company and vice versa).

(a) Advance Conservation Phase. Alternative emergency fuel supply sources should be explored during this phase. If possible, commitments should be obtained from state officials (via use of the state's set-aside) or other fuel users. Efforts to find alternative fuel sources that are unsuccessful during this phase should be further pursued after the fuel emergency occurs. Options that enhance vehicle fuel efficiency should be considered.

- (b) <u>Local Short Duration Supply Interruption</u>. Efforts described under(a) above should be continued.
- (c) <u>Moderate Shortfall</u>. If state set-aside fuel supplies cannot be obtained from the state set-aside or other fuel users in the region, the paratransit provider or transit authority should apply for federal relief.
  - (d) <u>Severe Shortfall</u>. Same as (c) above.

#### D. Actions to Expand System Capacity or Availability

Actions discussed in this category are oriented primarily to an emergency expansion in the number of seat-miles (or passenger space-miles) offered by a transit system per day. This increased capacity will be necessary during a fuel emergency because of increased peak demand for transit which is brought on by the inability of motorists to buy gasoline. A severe fuel supply crisis could cause an enormous percentage increase in transit demand.

Expansion of transit service may involve an expanded service area, new service to specific sites not previously served, and increased service frequency on existing routes. This service expansion should be undertaken only in areas of high demand so that the new service will be productive and fuel-efficient.

Increased service will, other things being equal, require increased funding. Some revenue should be realized from increased ridership. In addition, increased government funding from local, state, or federal sources may be forthcoming, but it may be slow in coming and only partially offset increased costs. To the extent that transit operators decide to fund expanded service by fare increases, the option of differential fares -- limiting increases to peak hour or premium services -- should be considered. Such

efforts should in many cases be attempted during the Advance Conservation Phase. At that time the public will be less transit dependent and sensitive, making fare increases more politically feasible. Also, fare increases prior to an emergency will serve to reduce ridership somewhat, providing some slack capacity which will be useful when the crisis hits. On the other hand, a conscious low fare policy can be an important conservation tool to encourage more transit use prior to a crisis. All these factors should be thoroughly considered in each locality and a strategy should be adopted <u>before</u> the onset of a crisis.

#### 1. Increase the Number of Vehicles Available

The number of vehicles available for operation at a given time is a basic determinant of overall transit capacity. The number of vehicles available during an emergency can be increased in a variety of ways:

- Old vehicles can be stockpiled and stored in operating condition instead of being sold when they are replaced by newly purchased vehicles. This may involve some rehabilitation of vehicles;
- Some maintenance operations which are not essential or which can be deferred without risk to public safety or fuel efficiency (e.g., cosmetic maintenance) can reduce the percent of the fleet that is down on a given day;
- The maintenance effort can be increased through more efficient and/or more resource-intensive maintenance procedures (e.g., expanded maintenance crews and facilities, larger parts inventories, contracted maintenance arrangements), thereby reducing vehicle "down-time";
  - Additional new or used buses can be purchased;

- The transit operator's vehicle fleet can be augmented by the use of supplemental vehicles such as school buses, church buses, charter buses, through special agreements negotiated in advance of the emergency.

Since additional vehicles are useless without additional people to drive and maintain them, plans must be developed for personnel augmentation as well. Possible actions in that regard include, among others:

- Develop and maintain a list of retired drivers and mechanics willing to work part- or full-time during an emergency;
- Explore the feasibility of temporarily contracting with other agencies or companies for additional driver and maintenance personnel during the emergency (e.g., private mechanics, private bus companies, school bus companies, etc.);
- Obtain modifications in collective bargaining agreements allowing for the temporary use of full- or part-time non-union workers during an emergency.

Different types and levels of actions will be appropriate to increase the number of vehicles available for various different stages or types of emergencies.

- (a) Advance Conservation Phase. Detailed contingency planning for expansion of the vehicle fleet and personnel necessary to operate and maintain the fleet should be accomplished before or during this phase. If plans call for stockpiling, rehabilitating, or purchasing vehicles and spare parts, then these actions should be implemented during this phase. If funding plans call for fare changes, this may be the appropriate time to pursue such changes.
- (b) <u>Local Short Duration Supply Interruption</u>. This type of crisis will call for relatively fast, undisruptive, and inexpensive fleet expansion actions, such as deferral of non-essential maintenance or shifting some

routine maintenance activities to nighttime work. Any back-up vehicles in storage should be used where appropriate. Measured use of overtime and reserve drivers may be desirable. Fare increases probably will be inappropriate, since the shortage is expected to be brief.

- (c) <u>Moderate Shortfall</u>. More substantial actions may be necessary, including efforts to increase the speed of essential vehicle maintenance, use of supplementary fleets (e.g., school buses and charter buses) and expansion of driver and maintenance staffs. Revenues from increased ridership may ease the need for additional government funding or fare increases, but the financial situation should be reviewed.
- (d) <u>Severe Shortfall</u>. Same as above, although more expensive long-range actions also may be appropriate. Such actions include the purchase of additional new buses, the hiring of new personnel for relatively permanent fleet expansion, and use of school, tour, and church buses for fleet or service augmentation.

#### 2. Increase Vehicle Capacity and Utilization

This includes measures to increase the number of passenger trips which can be served by a given number of vehicles, and includes measures which physically alter the vehicle (e.g., removing or rearranging seats on buses of transit vehicles to increase standing room) as well as measures to improve vehicle utilization (through use of HOV lanes, priority signalization, or increased use of express of skip-stop techniques). Actions which increase vehicle utilization have also mentioned in Section B, Actions to Improve Fuel Efficiency.

- a. Advanced Conservation Phase. Detailed contingency planning for increasing vehicle capacity and utilization should be accomplished before or during this phase. Plans for vehicle modification and increased utilization will generally involve long lead times; in some cases they should be implemented as part of a long-range conservation program. In cases where that seems premature, detailed plans should be prepared.
- b. Local Short Duration Supply Interruption. This type of crisis will call for relatively fast, undisruptive, and inexpensive actions, easily understood by relatively new transit patrons. This would tend to rule out most vehicle modification or service modification steps. If prior planning has been accomplished this may be an opportune time to introduce HOV lanes or traffic signal priority for transit.
- c. <u>Moderate Shortfall</u>. More substantial actions may be appropriate, including modifications to vehicles and service patterns, as well as changes in street utilization.
- d. <u>Severe Shortfall</u>. Same as above, although more extensive alterations may be appropriate.

#### 3. Establish Emergency Park-and-Ride Facilities

Transit service can be expanded, particularly in low density areas, by the establishment of park-and-ride lots along transit routes.

(a) Advance Conservation Phase. During this phase, detailed contingency planning for the emergency park-and-ride lot program should be accomplished, and the groundwork for system implementation should be laid.

This work will involve identification of the lots and establishment of arrangements for their use, as well as preparation of necessary public information and signing materials.

- (b) <u>Local Short Duration Supply Interruption</u>. This level of emergency will call for implementation of all or a portion of the park-and-ride system.
  - (c) Moderate Shortfall. Same as (b).
- (d) <u>Severe Shortfall</u>. Depending on the effects of the shortage, it may be appropriate to expand the park-and-ride lots as commuters find it increasingly difficult to drive to the lots or find spaces there. Steps might also be taken to make the park-and-ride system permanent.

#### 4. Support Efforts to Establish Alternate Work Hour Programs

Transit capacity during an emergency will be most strained during peak hours, when demand may far outstrip capacity. If major employers in major activity centers can be persuaded to implement staggered work hours and/or flexible work hours for employees, these programs will help to spread the demand peak and will maximize the use of available vehicle capacity. Transit operators should work with major employers and other local officials in establishing such programs.

- (a) Advance Conservation Phase. During this phase, planning for large scale alternative work hours programs should be carried out and, where possible, such programs should be implemented. Working relationships should be established with major employers and local officials.
- (b) <u>Local Short Duration Supply Interruption</u>. Additional alternate work hour programs should be implemented by employers, as transit peak hour capacity is strained.
  - (c) Moderate Shortfall. Expansion of above program.
  - (d) <u>Severe Shortfall</u>. Same as (c).

#### 2. ACTOR: PROVIDERS AND REGULATORS OF AUXILIARY MASS TRANSPORTATION SERVICES

Examples of the types of organizations and agencies included within this category are:

- Private Bus Companies (Charter, Tour, and Scheduled Buses)
- School Bus Operators
- Taxicab and Limousine Companies
- Rental Vehicle Agencies
- Social Service Agencies
- State Public Service Commissions
- State Departments of Education
- State Departments of Human Services
- Local and Regional Level Governments

Actors such as these are responsible for a large share of the public transportation of passengers in the U.S. Consequently, they should play an important role in responding to and planning for transportation energy emergencies.

Emergency actions by these actors should have two objectives: first, maintaining the essential services for which these actors are responsible; and second, expanding, improving, and diversifying those services rapidly in coordination with mass transit and private ridesharing actions to provide the most effective overall transportation system possible in a fuel-short environment.

The emergency actions discussed below are grouped into two closely related categories: those oriented toward removal of regulatory barriers, and those

oriented toward service expansion, improvement, and diversification. As noted, the list of actions discussed here is illustrative only. It is not meant to imply that all of these actions should necessarily be taken, or that there are not other actions which might be useful.

# A. Actions Aimed at Removing Legal & Institutional Barriers to Expanded or Improved Services

Public passenger transportation operations conducted by private and non-transit carriers are governed by a multitude of service, equipment, safety, insurance, and economic regulations administered principally by state and local levels of government. It is very important for responsible authorities to review these regulations in the light of the current energy and economic environment. Many substantive and procedural rules may merit streamlining, updating, or total elimination. Other rules should be changed or suspended temporarily, upon declaration of an emergency by a responsible authority.

In reviewing the effect that a fuel shortage may have on public transportation services, responsible authorities should keep four points in mind:

- There will be an overwhelming public need for new and expanded public transportation services of many types, and that need may arise very suddenly;
- It will be very important for public transportation services to be provided in a fuel-efficient and economic manner;
- 3. There will be a need for both creative and flexible responses to the crisis on the part of transportation service providers; and,
- 4. There will be a need for intermodal coordination, cooperation, and, in some cases, even substitution.

The items discussed below reflect these general considerations.

#### Remove Ridesharing Restrictions on Taxicabs

Many jurisdictions which regulate taxicabs have fare and service restrictions which prevent or discourage taxicabs from offering shared-ride service (i.e., combining trips of separate parties travelling in the same general direction). With appropriate rules regarding fare structure and service choice, such shared-ride services could allow passengers to enjoy less expensive service and allow cab operators to increase their income, while at the same time conserving fuel and preserving the right of those who wish to pay higher fares to obtain an exclusive ride. A variety of methods exist for implementing such systems, ranging from differential franchising to the use of zone fares and computer-aided dispatching. Shared-ride rules should provide for reasonable equity in the division of ride costs among sharing parties, and should provide a monetary incentive to both the taxi operator and the potential passenger to select a shared-ride service.

Finally, there are more extreme shared-ride measures which remove the option not to share (and the monetary incentive to share) from the passenger.

- (a) Advance Conservation Phase. Planning should be undertaken in this phase and, if possible, shared-ride services should be implemented as measures that make sense for long run conservation objectives and economic reasons.
- (b) <u>Local Short Duration Supply Interruption</u>. Regulatory change may be more feasible, politically and bureaucratically, during this phase than during the previous phase. If permanent regulations allowing shared riding cannot be obtained, temporary suspension of the provisions prohibiting shared riding may be feasible.
  - (c) Moderate Shortfall. Same as above. More emphasis on permanent

action. Consideration may be given to the "no option" form of shared ride, where the passenger has no choice.

(d) <u>Severe Shortfall</u>. Same as above. The "no option" form of service should be adopted.

## 2. Remove Regulations Restricting Use of School Buses for Other Transportation

In many jurisdictions, state and local laws or regulations prohibit the use of school buses for other than school and school-related purposes. Yet school buses represent a considerable standing capability to rapidly increase public transit capacity, assuming of course that ways can be found to accommodate their normal patrons, the school children. During the summer, or with changes in school hours, school buses could be used during peak travel periods. Otherwise, they could be used in the evening peak and the morning and noon off-peak periods. They could be operated under contract to mass transit operators, or to employers, or on their own according to a regional contingency plan that coordinates their operation with that of other modes and carriers.

- (a) Advance Conservation Phase. Extensive planning and prior arrangements will be necessary for school buses to be well utilized in a crisis. Changes in legal or regulatory provisions should also be attempted during this phase.
- (b) <u>Local Short Duration Supply Interruption</u>. If operational plans have been made, then temporary suspension of school bus restrictions may be obtained during this phase. However, it is likely that a short crisis will not warrant major use of school buses.

- (c) <u>Moderate Shortfall</u>. Restrictions should definitely be removed. A gubernatorial emergency declaration could facilitate the process.

  Modification of school hours may be considered.
- (d) <u>Severe Shortfall</u>. Same as above. Modification of school hours more likely.

## 3. Remove Restrictions Preventing Jitneys

Most jurisdictions have laws or regulations preventing the operation of taxicabs or other vehicles (e.g., station wagons, vans) along fixed or semi-fixed routes. These laws generally originated in the early days of automobile mass production, when early transit providers feared competition from the increasing number of jitneys. While there may be some circumstances, even during a fuel emergency, in which this shared-ride mode would be counterproductive, there will be numerous other instances where jitneys can play a useful role. They may, for example, provide feeder service to transit lines or shuttle service to or from transit termini. They may also be useful supplements along transit routes that are overcrowded.

- (a) Advance Conservation Phase. Planning should be done to ascertain where and what type of jitneys would be beneficial, both for long-term and ongoing conservation and for fuel supply emergencies of varying degrees. Effort should be made to obtain selective or complete removal of jitney restrictions where appropriate. Planning for public safety regulation of jitney providers (both drivers and vehicles) should be carried out.
- (b) <u>Local Short Duration Supply Interruption</u>. This level of crisis may provide an opportunity to break bureaucratic or political inertia retarding the progress of the steps outlined in (a).

- (c) <u>Moderate Shortfall</u>. Same as (b). Also, a review should be made of routes where temporary suspension of anti-jitney rules might be made permanent in order to encourage more providers and more service.
  - (d) Severe Shortfall. Same as (c).
  - 4. Remove Barriers to Market Entry for Cabs, Private Bus Services, Jitneys

One of the most sensitive issues in attempting to allow private and auxiliary transit providers to respond to the need for expanded auxiliary transit capacity is the degree to which barriers to market entry should be relaxed. In many cities the number of taxicabs is limited by a "medallion" system. Most localities provide some degree of market protection to existing private bus companies on some routes. In other cases public transit authorities have exclusive rights to provide public transportation service and have the power to keep other providers out (there may also be pressure from labor to keep out other providers). Historically, jitney service has been prohibited in order to protect transit and cab markets. The energy situation is likely to require modification, or at least temporary relaxation of these prohibitions to market entry. Because the providers who are protected by these prohibitions can be expected to defend their economic interests, this issue is likely to be much more complex than the temporary relaxation of safety, comfort, or performance standards. A successful effort will require very careful planning and possibly packaging of modifications (including items of importance to existing providers, such as priority access to fuel for all providers, or emergency fare relief to cover increased fuel costs).

(a) Advance Conservation Phase. Careful planning and packaging of a strategy for dealing with market entry problems needs to be carried out.

Probably no early implementation actions will be feasible without the dramatic need created by a crisis.

- (b) <u>Local Short Duration Supply Interruption</u>. Efforts should be made to approximate strategies.
- (c) Moderate Shortfall. Same as (b) plus review, evaluation, and adjustment as needed.
  - (d) <u>Severe Shortfall</u>. Same as (c).

# B. Other Actions Aimed at Service Maintenace or Expansion

The removal of regulatory barriers discussed above will often be a necessary action to maintain and expand the transportation services that are provided during a fuel emergency by private and auxiliary carriers. In addition, at least two other types of actions will be generally necessary:

(1) securing fuel supplies and (2) effective planning and implementation of new services.

The actors who are in various ways responsible for the auxiliary transit services described in this section will have to undertake these actions during and prior to fuel supply emergencies.

# 1. Secure Fuel Supplies

The actions discussed in this category are applicable until the Department of Energy's Mandatory Petroleum Allocation Regulations expire in September 1981 (unless the timetable for elimination of the Petroleum Allocation Regulations is altered by further legislation). As of that date, an operator's fuel supplies will be determined by his willingness to pay the market price of fuel, not by his entitlement under the allocation program.

Building/expanding fuel storage is both a means of ensuring fuel availability during a supply interruption, and also a means of reducing average fuel costs during an emergency in which prices rise rapidly. Additional fuel storage can be obtained by leasing, buying, or building a storage facility. The size, cost, and locational proximity of the facility are important considerations. In addition, it is possible for transit and paratransit operators who have bulk storage facilities to obtain special emergency supplies of fuel through DOE, state energy offices or other providers of transportation services (though only under certain circumstances in the last case). Gasoline users who have bulk storage facilities can request additional fuel through DOE's Office of Hearings and Appeals, provided that they meet certain eligibility criteria and can afford to wait for a ruling. Both gasoline and diesel fuel users who have bulk storage facilities can request fuel from state set-asides. (During an emergency, each state may have control over the distribution of 4 percent of all diesel fuel supplies and 5 percent of all gasoline supplies in the state. This fuel may be distributed quickly to organizations and individuals who can demonstrate hardship or a public interest in their receipt of additional fuel supplies.) Finally, certain transit or paratransit operators who use gasoline and who do not have bulk storage facilities can make arrangements to acquire fuel through other gasoline users who have these facilities and who are priority users under DOE's fuel allocation program (e.g., a school bus company can purchase fuel through a taxicab company and vice versa).

(a) Advance Conservation Phase. Fuel storage should be built/expanded during this phase. If empty storage capacity is available at a time when a supply interruption appears imminent, bulk purchase of fuel on the open market

may be warranted to build up fuel reserves. Further, if fuel prices are expected to rise, a financial investment in storage capacity could be self-liquidating in a relatively short period of time.

In addition alternate fuel sources should be explored during this phase. If possible, commitments should be obtained from state officials (through use of the state's set-aside) or other fuel users. Efforts to find alternative fuel sources that are unsuccessful during this phase should be further pursued after the fuel emergency occurs.

- (b) Local Short Duration Supply Interruption. Draw-down of stored fuel supplies may begin in this phase. However, the possibility of a worsening of the supply crisis may call for a measured draw-down of the reserve supplies while other sources of emergency fuel supplies are pursued (e.g., state fuel "set-aside" supplies.)
- (c) <u>Moderate Shortfall</u>. If adequate fuel supplies cannot be obtained from the state set-aside or other fuel users in the region, the transit authority should apply for federal relief.
  - (d) Severe Shortfall. Same as (c) above.

# 2. Plan and Implement New Transporation Services

Private and auxiliary transit carriers can provide a variety of useful transportation services in a crisis. Their services could assume various forms -- express, subscription, street hail, demand-responsive and shuttle services -- and they could be used in a variety of ways -- neighborhood collector/feeder, express to activity centers, extra peak hour capacity parallel to transit, relatively inexpensive off-peak service, etc.

Realization of this potential will require considerable advance and ongoing planning by carriers, regulators, interested parties, and responsible

political and administrative officials. The will to implement services must be established and a realistic financial plan based upon fares, public financing, or a combination of the two, must be developed. Issues such as adequate incentive to private providers, fare levels consistent with consumer protection, and availability of funds must be considered and resolved.

- (a) Advance Conservation Phase. Detailed contingency planning must be attempted in this phase. All important parties must be involved at this stage and if possible, agreements among these parties should be obtained at this point. For example, public transit operators, labor unions, regulatory authorities, and potential funding organizations must all work together if useful services are to be implemented. In addition, major employers, shopping centers, and recreational areas will be relevant actors in an energy-short environment. Working relationships must be maintained even if detailed or official plans and agreements cannot be fully completed during this phase.
- (b) Local Short Duration Supply Interruption. The changes in the operational, economic, and political context during this phase may permit the efforts begun in phase (a) to be developed further and more successfully. Some new transportation services may actually be implemented in this phase, though a short crisis should probably be viewed mostly as an opportunity to win new patrons to existing programs.
  - (c) Moderate Shortfall. Extensive services should be implemented.
- (d) <u>Severe Shortfall</u>. Same as (c). Evaluation and modification of the services being provided should be undertaken.
  - 3. The Use of New Organizations to Organize Transportation Brokerage Services

Perhaps the most significant reason to proceed with a brokerage concept relates to human service transportation needs. Elderly and handicapped people

will experience a disproportionate disruption of their mobility during energy shortages. As public transportation options become overcrowded, the availability of specialized door-to-door services (e.g., taxis) and the use of crowded mass transportation services will diminish for the elderly and handicapped. The organization of a brokerage type operation that includes development of contractual relationships with private providers in advance of a shortage could be an important method of responding to the particular needs of the elderly and handicapped.

- (a) Advance Conservation Phase. Plan and implement the system.

  Maximum planning and pre-shortage implementation of the system will facilitate emergency responses. Contingency plans for expansion of the system during a shortage should also be developed.
- (b) <u>Local Short Duration Supply Interruption</u>. Evaluate the system and consider modifications. Since the shortage will be expected to be brief, modifications to the system probably should not be implemented at this time.
- (c) <u>Moderate Shortfall</u>. Same as (b), plus implement emergency service modifications.
  - (d) Severe Shortfall. Same as (c).

#### 3. ACTOR: RIDESHARING SERVICE COORDINATORS AND PROMOTERS

The actors referred to in this section are those public and private agencies or organizations that have official responsibility for coordinating and/or promoting ridesharing (i.e., carpools and vanpools) for work-related and other travel. Such actors will typically include one or more of the following:

- The State DOT or Highway Department
- The State DOE
- The MPOs
- The Governor's Office
- Public Corporations and Third Party Providers
- Local Governments
- Employers or Other Private Providers.
- Transit Operators.

In addition, ad hoc task forces and Federal agencies will often be important participants.

The role of these actors in a fuel emergency is a crucial one, for ridesharing offers the greatest potential for short-range fuel demand reduction. While mass transit may be more fuel efficient than ridesharing when load factors are reasonably high, the relatively small proportion of total trips serviced by mass transit, together with the cost of transit service and its physically limited ability to expand capacity quickly in response to sudden surges in demand, make increased reliance on ridesharing a necessity in a fuel crisis.

The actions described in this section are grouped into two areas: those that focus on employers, and those that focus directly on the individual commuter. Experience has shown that effective promotion and facilitation of ridesharing requires both types of actions.

## A. Actions Oriented Toward Employers

Since ridesharing requires clusters of trip origins and destinations, and since such clusters for the work trip occur at the work site, the employer is a logical focus for ridesharing promotion. Furthermore, recent experience indicates that efforts to promote increased ridesharing are most effective when they are focused on the employer (because of the employer's particular capability to promote the mode if he chooses to do so).

- 1. Distribute and Promote Information and Instruction Kit to Employers
  Information, instructions, and other tools that are useful in setting up
  ridesharing programs within companies and work sites should be developed,
  disseminated, and promoted among all large employers within a region or
  jurisdiction. The package could include manual ride matching techniques and
  instructions for obtaining computer-aided matching assistance from local or
  state agencies. It could also include a list of local employers (and
  contacts) with successful ridesharing programs and suggestions on ways to
  promote ridesharing within a company or work site.
- (a) Advance Conservation Phase. The package should be developed and prepared in advance of the crisis. Whether and in what way the package should be distributed at this phase is a matter to consider. If a crisis is imminent, it makes sense to distribute such a package immediately. In normal times, however, employers will tend to pay much less attention to this kind of

promotional effort than they would after a crisis occurs itself. On the other hand, ridesharing makes sense as an ongoing conservation measure, not necessarily dependent on emergencies. To help develop and refine the package, consideration might be given to starting a pilot program during this phase that focuses on a few interested employers.

- (b) <u>Local Short Duration Supply Interruption</u>. The package should be widely distributed immediately at the outset of such a crisis. If it has already been distributed, consideration should be given to redistribution. Promotion of the package should also take place.
  - (c) Moderate Shortfall. Same as (b).
  - (d) Severe Shortfall. Same as (b).

## 2. Identify and Recruit Lead Employers

Major employers who have successful company ridesharing programs in the area could be identified and recruited to help promote ridesharing among other companies. Individuals responsible for developing and running ridesharing programs in the lead companies together with appropriate government officials, could provide assistance to other companies interested in developing programs of their own.

(a) Advance Conservation Phase. Lead employers should be identified in this phase. Attempts should be made to recruit them to help other employers get started in ridesharing. The effort should be organized in this phase for immediate implementation where appropriate as a long-term conservation action. Working relationships should be established and groundwork should be laid for implementation of the effort immediately after a crisis has occurred.

- (b) <u>Local Short Duration Supply Interruption</u>. Where efforts to find and recruit lead employers have not been successful in (a), they should be attempted again, for the crisis will improve their chances of success. Once lead employers have been recruited, promotion and assistance efforts should begin as soon as possible in this phase.
- (c) Moderate Shortfall. Same as (b). Expansion of the program may be warranted. As the crisis becomes more severe, the focus may have to shift from promotion of employer-based ridesharing to accommodation of demand from numerous employers for ideas and assistance in implementing programs.
- (d) <u>Severe Shortfall</u>. Same as (c). Emphasis may be further shifted to coordinating efforts by groups or clusters of employers. In a severe crisis, increased emphasis may have to be placed on mass transit modes (such as subscription bus) and on obtaining an adequate supply of vans or buses. Government officials should help company officials, transit officials, and other relevant groups work together.

## 3. Mandate Employer-Based Ridesharing Programs

A more severe type of action focusing on employers would involve enactment -- by states or other levels of government -- of mandatory energy conservation laws requiring all large employers to develop and implement programs to encourage and facilitate employee ridesharing. Such laws could take different approaches. One would require employers to take certain specific actions, such as reducing the number of available employee on-site parking spaces, providing employee ride-matching services, and/or instituting company-sponsored vanpools. Another more flexible approach would require employers to choose and implement a certain minimum number of actions from a list of alternative programs. A third approach would establish a mandatory

"commuter efficiency standard," under which employers would have to take steps to ensure that a certain percentage of all employee commutation travel is by energy-efficient modes (e.g., transit, vanpool, carpool). Using this approach the employer would have complete freedom to choose a method for achieving the standard. Standards might vary by population or employment density or other criteria.

Mandatory programs such as these may be viewed as extreme measures, suitable for severe situations only. Nevertheless, it may be appropriate to have such laws available on a stand-by basis, both to spur interest and concern among large employers, and to maximize preparedness for a crisis.

From another perspective, a carefully designed program could be cost-beneficial and might not require excessive hardship on anybody's part. Indeed, certain kinds of mandatory programs may be most effective as ongoing conservation measures.

- (a) Advance Conservation Phase. Mandatory programs are complex because they involve difficult legal, political, equity, and administrative issues. They should be designed carefully, with input from those who will administer and enforce them as well as from the employers who will be affected by them. The design process will take time, which argues strongly for advance design and planning work before a crisis occurs. Furthermore, if they are well designed, mandatory programs might also make sense as long-term conservation programs. In many instances, however, political realities will prevent their implementation except in a crisis.
- (b) <u>Local Short Duration Supply Interruption</u>. Mandatory programs are not appropriate for implementation during a short-term crisis unless they make sense as long-term conservation reasons. However, the atmosphere created by

such a crisis may spur development of such programs (for stand-by status) and may encourage a more positive and participatory approach by employers and program administrators.

- (c) <u>Moderate Shortfall</u>. Same as (b). Implementation may be appropriate if the mechanism is available.
- (d) <u>Severe Shortfall</u>. Implementation of mandatory programs may become more feasible in a severe crisis, and certainly the need for employer action to facilitate ridesharing will be acute in such a crisis. However, the effectiveness of a mandatory program may be reduced in a severe crisis, because most employers may already be doing all they can to facilitate ridesharing.

# B. Actions Oriented Directly Toward Individual Commuters

While employer-based actions will be particularly effective where employers are committed to the concept, these actions nevertheless are indirect in their approach, since the ultimate target is the individual commuter. It is therefore appropriate and necessary for the actors discussed in this section to also consider actions that are directly oriented toward the individual commuter. Such actions attempt to educate commuters regarding ridesharing and also facilitate ridesharing (in some cases by making single occupant vehicle travel more onerous).

# 1. Augment Capacity of Regional Commuter Matching Systems

Many metropolitan areas have computerized matching programs which offer commuters assistance in finding ridesharing partners. During a fuel emergency, such programs will probably be taxed beyond their capacity as a result of burgeoning demand for matching services. Areas which have such

programs, therefore, should develop contingency plans to deal with rapidly increasing demand. Areas that do not yet have such programs should consider instituting them during or before a fuel emergency.

- (a) Advance Conservation Phase. Detailed contingency planning should be carried out, including identification of reserve personnel, facilities, and funds.
- (b) Local Short Duration Supply Interruption. This type of crisis can greatly stimulate the demand for commuter matching services. Consequently, contingency plans should be immediately implemented to meet the demand. The availability of the matching system should be widely publicized. Many commuters who convert to a ridesharing mode in a crisis may stay with that mode permanently, thereby helping long-term conservation.
- (c) Moderate Shortfall. Same as (b), although more temporary personnel may be needed to provide matching assistance.
  - (d) Severe Shortfall. Same as (c).
  - 2. Establish System of Park-and-Ride Lots for Ridesharing and Paratransit

In coordination with the establishment of park-and-ride lots for mass transit, a system of park-and-ride lots could be established during an emergency for ridesharing and other paratransit type operations. Lots would facilitate the formation of carpools and vanpools and would facilitate the operation of third party and multi-company vanpools, shared-ride taxi service and subscription modes.

(a) Advance Conservation Phase. Detailed contingency planning should occur, including agreements with property owners, coordination with mass transit, and some preparation of publicity and informational materials.

- (b) <u>Local Short Duration Supply Interruption</u>. While implementation may or may not be appropriate in a short crisis, planning efforts (as described above) should continue and may be facilitated by the onset of a fuel emergency.
  - (c) Moderate Shortfall. The system should be implemented.
  - (d) Severe Shortfall. Same as (c).
  - 3. Establish Priority Fuel Availability for High Occupancy Vehicles (HOV)

Though formal guidelines have not yet been issued by DOE on this subject, state governments theoretically can use "priority at the pump" procedures and/or the state emergency set-aside to give priority treatment to vanpools and other high occupancy modes. In addition, employers who provide vans to employees for vanpools may provide fuel to these vehicles through company controlled bulk storage facilities. States and localities should explore opportunities for instituting/expanding both of these approaches.

- (a) Advance Conservation Phase. Various methods of priority fuel availability treatment should be explored and considered (e.g. reserved pump islands or special hours at service stations). If the program that is selected requires registration of bona fide vanpools, it may be useful (both as a contingency measure and as a vanpool promotional device) to begin registering vans before the onset of the crisis. Special cards or stickers to identify the vans might also be issued. Such registration would have to be regularly updated.
- (b) Local Short Duration Supply Interruption. If the fuel priority system has been designed, it may be appropriate to implement it at this point. If the system is not ready for implementation, planning efforts should intensify.
  - (c) Moderate Shortfall. The priority system should be implemented.

- (d) <u>Severe Shortfall</u>. The priority system should be implemented, reviewed, and updated.
- 4. Establish Roadway Toll Policies to Encourage High Occupancy Vehicles
  Tolls on bridges and highways can be reduced for carpools, vanpools, and
  other HOVs (and/or increased for single occupant vehicles) to encourage
  ridesharing. Time-of-day differentials may also be used.
- (a) Advance Conservation Phase. Planning should be done in this phase, and toll reductions for HOVs might be implemented where financially feasible and appropriate as a long-term conservation action. If increased tolls for single occupant vehicles are sought, consideration should be given to whether such increases will be more or less politically feasible before or after the onset of a fuel crisis.
- (b) <u>Local Short Duration Supply Interruption</u>. Toll policies probably should not be changed just for a short crisis, unless the changes also make sense in the long term.
- (c) <u>Moderate Shortfall</u>. Implementation of emergency toll policies may be appropriate.
- (d) <u>Severe Shortfall</u>. Implementation of emergency toll policies probably will be appropriate at this point. Expansion of toll facilities to additional roadways may be warranted by an extreme need for conservation. On the other hand, the effectiveness of toll policy changes may be reduced by the fact that the price or availability of fuel already may be forcing as many people as possible to share rides.
- 5. <u>Use HOV Exclusive Use Lanes and Other Physical Impediments & Incentives</u>
  Physically separating lanes and roadways and permitting their use only by
  high occupancy vehicles during peak hours can significantly encourage the use
  of ridesharing and transit. Such physical separation improves the service

quality of the high occupancy modes. However, taking existing roadway capacity for exclusive HOV use (as opposed to building additional new exclusive capacity) is very unpopular and therefore difficult politically. There may be serious safety problems in some cases as well, and the number of roads that can be altered may also be severely limited by cost or capacity considerations.

- (a) Advance Conservation Phase. Exclusive HOV roadways can be effective only when the alternative general roadways are congested (or will be made congested by the HOV lanes). Also, the most politically feasible way to provide exclusive HOV roadway -- by addition of new capacity -- is a major capital investment action not appropriate as an emergency contingency response. For these reasons, HOV lanes may be most effective as long-term conservation actions, not as emergency contingency actions. To the degree that the HOV lanes do make sense as emergency actions (e.g., to increase transit capacity and fuel efficiency), they do require considerable advance planning, coordination between agencies, and other preparations, all of which should start before the onset of a crisis.
- (b) <u>Local Short Duration Supply Interruption</u>. Such a crisis can provide a change in public awareness which may make HOV roadway actions for long-term conservation more feasible.
- (c) Moderate Shortfall. If HOV lanes are ever to be used as an emergency response action it will probably during this type of crisis. A greater crisis would probably eliminate much of the congestion that gives HOV lanes their reasons for being. A shorter crisis would not warrant major physical changes.
- (d) <u>Severe Shortfall</u>. As noted, HOV lanes may have relatively less effect in a severe crisis due to lack of congestion.

## 6. <u>Institute Legalized Hitchhiking</u>

This refers to programs which set up and promote hitchhiking systems using identification cards/destination signs, possibly in conjunction with reduced tolls or exclusive HOV lane type incentives for high occupancy vehicles. While hitchhiking is not feasible for some types of travel, it does represent a way to increase auto occupancy and fuel efficiency for many trips. Such a system can be set up relatively quickly and inexpensively.

- (a) Advance Conservation Phase. Planning and preparation for an emergency hitchhiking program should be considered. The program could also be implemented in this phase as an ongoing conservation measure.
- (b) <u>Local Short Duration Supply Interruption</u>. This may well be an appropriate time for implementation and promotion.
  - (c) Moderate Shortfall. Same as (b).
  - (d) <u>Severe Shortfall</u>. Same as (b).

# 7. Institute Parking Restrictions or Taxation and HOV Incentives

Restrictions on the total number of parking spaces available, increases in parking charges (at certain times of the day, possibly), and/or provision of preferential parking spaces to high occupancy vehicles at major activity centers can help induce use of transit and ridesharing modes. Such measures are generally extremely unpopular, however, and may have harmful economic impacts at commercial activity centers. In the case of government owned or administered parking spaces (e.g., municipal lots, on-street parking), such restrictions often may be introduced administratively. In the case of private lots, mandatory action generally will require legislation.

(a) Advance Conservation Phase. Institution of parking measures requires planning and analysis, which should be begun in this phase. If

parking actions are implemented in this phase as a long-term conservation measure, they may be most cost-effective if applied only during peak morning hours, thereby encouraging high occupancy vehicle commuter travel while minimizing impact on retail and commercial establishments.

- (b) <u>Local Short Duration Supply Interruption</u>. Same as (a). Such a crisis may or may not change the political climate and make parking restrictions more feasible.
- (c) <u>Moderate Shortfall</u>. Parking actions may be appropriate if there is increased potential for transit or ridesharing use.
- (d) <u>Severe Shortfall</u>. In a severe crisis, it is likely that there will be very little unused transit or even ridesharing capacity for commuter travel. Parking actions, if appropriate at all, therefore might have to focus more on off-peak hours, when some excess public transit or ridesharing capacity may still exist.

#### 8. Establish Government Operated Third Party Vanpool Program

State or local government agencies may consider establishing, promoting, and operating (directly or by contract) third party vanpool programs. In third party systems, the van is owned by an organization or agency independent of the employer or employee; the owner takes care of administrative functions including insurance and possibly ride-matching. Employees (who may be from one or more companies at a common work site) operate the van, with the passengers paying a fare which covers all operating costs. The approach could conceivably be extended to smaller vehicles as well, such as station wagons and sedans. Government involvement can often reduce or eliminate regulatory problems and other obstacles faced by private third party systems.

- (a) Advance Conservation Phase. The program may make sense as a self-supporting permanent conservation measure. It may be appropriate to begin a pilot project in this phase and to purchase a reserve fleet of vans as a contingency.
- (b) <u>Local Short Duration Supply Interruption</u>. If a system is ready to go or a pilot project is already operating, such a crisis can stimulate its operation and success.
- (c) <u>Moderate Shortfall</u>. The program definitely should be implemented at this time. If the program is already running, expansion may be appropriate if additional vans can be obtained.

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## 4. ACTOR: MAJOR EMPLOYERS

Major employers -- that is, those companies, agencies, and other institutions who employ large numbers of people at single work sites -- are in a unique position to promote the use and development of transit, paratransit, and ridesharing for the journey to work. The actions briefly discussed in this section illustrate only some of the things which major employers should consider doing in preparation for, or in response to, a fuel supply emergency. Some of the actions described here will make sense even in the absence of an acute crisis as long-term conservation actions. Many of the actions described here will not only help society by promoting fuel conservation, but will also help employees and employers themselves during a shortage by facilitating job access, improving morale, improving productivity, or reducing costs (e.g., travel costs and parking lot expansion). Five general types of actions are identifed below, but they are not meant to be exhaustive. One major area of actions not included in this section are those that save transportation fuel by reducing the amount of work-related travel (e.g., substitution of telecommunications for travel, satellite work centers, increased work at home options, etc.). These options should also be considered by those employers that could implement such strategies.

# A. <u>Information</u>, <u>Education</u>, <u>Organization</u>

Employers can establish a basis for increased promotion and utilization of high occupancy modes by gathering information, educating employees, and working cooperatively with other employers. Some specific actions which might be undertaken include:

- Survey employees to determine where potential exists for high occupancy vehicle commuting;
- Set up a "Commuting Information Office," with transit schedules and maps, park-and-ride lot locations, carpool matching board, and publicity on special services and incentives;
- Use company newsletter, house organ, personal letter, etc. to provide information on carpooling programs and assist people who are seeking or offering rides;
- Organize with other nearby employers to identify special needs, and implement mutually beneficial services.

Actions such as the above will be useful during a fuel emergency. However, they are also worthwhile in normal times, as a response to rising fuel prices, parking space problems, or plant relocations.

- 1. Advance Conservation Phase. Many actions of this type should be planned (or even implemented) during this phase, particularly if a fuel crisis is imminent. Advance discussions with service providers will broaden the options available during the crisis.
- 2. Local Short Duration Supply Interruption. Actions such as those described should be implemented wherever possible. Communication efforts will need to be expanded as more employees seek information and assistance. For a short-term crisis, employers should probably focus on expanding existing initiatives rather than creating new initiatives. Commuter behavioral change in response to a short-term crisis may continue after the immediate crisis subsides, to the benefit of all.
- 3. <u>Moderate Shortfall</u>. The actions described above should be pursued. Additional actions may be appropriate to broaden the options available to employees.

4. Severe Shortfall. Same as (3).

## B. Actions to Promote Use of Carpools

The high occupancy mode with the greatest potential for large and rapid expansion in a fuel emergency is the carpool. Employers are particularly able to facilitate such expansion. Some illustrative specific actions include:

- Implement and promote a carpool program among employees (personal communications from high-ranking company officials will be particularly helpful);
- Provide preferential parking or other parking-related incentives for carpools;
- Acquire carpool matching software to do in-house matching;
- Allow company fleet vehicles to be taken home by employees who will
  use them as carpool vehicles carrying three or more employees to work.
   Carpool related actions such as the above may be appropriate as follows,
   during a fuel emergency.
- 1. Advance Conservation Phase. Actions to promote carpooling may make sense in this phase for a variety of reasons, largely economic, which do not relate specifically to energy emergencies. Furthermore, it may be appropriate to begin planning for emergency response actions in this phase.
- 2. Local Short Duration Supply Interruption. Emergency carpool actions should be implemented. Existing programs can be expected to experience increased demand.
  - 3. Moderate Shortfall. Same as (2).
- 4. <u>Severe Shortfall</u>. Same as (2). As the crisis becomes more severe, transit and auxiliary transit capacity will be totally filled, vans

may be hard to obtain, and carpools may be the only available method of increasing average vehicle occupancy for the work trip.

## C. Actions to Promote Use of Vanpools

Vanpools can be a very effective mechanism for conserving gasoline consumed in commuter travel. Employers are in the best position to promote vanpool use by purchasing vans, organizing ride-matching programs, providing preferential parking for vanpools, and allowing employees who drive eight or more commuters to work to utilize the vans for personal travel on weekends. Such programs cost the employer little if anything, because passengers pay a monthly fare which covers costs of the system, and the Federal Government allows tax credits for 10 percent of the purchase price of vans so used. companies have succeeded in reducing employee vehicle-miles of travel to and from work by up to 35 percent,\* and have reduced their parking space requirements through the promotion of such vanpool programs. Cost-effective vanpools are most feasible where clusters of eight or more employees live some distance from the work site. In some cases, fuel efficient company-provided automobiles may be appropriate to form "van" - pools of four persons. Companies that do not wish to run their own vanpool programs can have such programs provided by so-called third party operators.

1. Advance Conservation Phase. Promotion of vanpools should be started in this phase for economic or long-term conservation reasons. In addition, because of the lead time required, contingency planning to institute such a program when a fuel shortage occurs should be done at this point.

<sup>\*</sup>The TVA program in Knoxville reports 50%, but this may be a unique case.

- 2. Local Short Duration Supply Interruption. Contingency plans should be implemented. Existing programs should be prepared to handle new demand, but in a short-term crisis, newly interested individuals will have to be accommodated in existing vanpools (where seats are available) or in carpools. It may be possible to "capture" the new interest by temporarily using company pool cars until vans can be delivered.
  - 3. Moderate Shortfall. Same as (2).
  - 4. Severe Shortfall. Same as (3).

# D. Actions to Promote Use of Transit and Paratransit

Employers may promote the use of transit and paratransit by employees for their trip to work in many ways, including the following:

- Distribute (sell) transit passes and participate in transit pass or commuter ticket payroll deduction programs if these programs are offered by local transit operators and agencies;
- Provide partial or full subsidies for transit passes;
- Initiate shuttle services to nearby transit stops or stations, using company vehicles;
- Organize charter or subscription services for groups of employees,
   using local private bus or taxi companies, or company owned buses
   driven by employees;
- Cooperate with transit and auxiliary transit providers in staggering work hours or establishing flexitime programs.

Many other possibilities exist. Employers should contact local transportation providers for recommendations.

- 1. Advance Conservation Phase. Transit and paratransit promotion efforts should be begun in this phase as ongoing conservation measures. Otherwise, contingency planning should be carried out in coordination with local transit officials and arrangements should be made to assure service availability under contingency conditions.
- 2. Local Short Duration Supply Interruption. All initiatives ready to go should obviously be implemented. To the extent that advance preparations have not been made, the primary action is likely to be improved information to employees. New services will be difficult to organize without extensive planning.
- 3. <u>Moderate Shortfall</u>. Measures should be implemented. If transit capacity is badly overcrowded in the area, peak shifting measures should be considered (e.g., 4-day work week, flexitime, staggered work hours)\* either in-house or in coordination with other nearby companies. In addition, new initiatives which might not be justified in (2) above, may make sense in a context of continuous shortfall.
  - 4. Severe Shortfall. Same as (3).

# E. Incentives and Disincentives

Employers are often in a position to simultaneously apply incentives to use high occupancy modes and disincentives to single occupant auto usage.

Such actions can be very effective. Examples include:

<sup>\*</sup>The selection of one of these options will depend upon local circumstances, including the degree of shortfall being experienced in a locality, the degree of transit dependency in that locality, and the suitability of these options to particular employers.

- Reduce the number of employee parking spaces, and/or increase parking fees;
- Offer ridesharing and transit-riding employees the dollar value of the parking subsidy provided to single-occupant commuters, or impose a fixed per day parking charge on all <u>vehicles</u> entering the work site, then return the proceeds of the charge to each <u>employee</u> equally regardless of mode of access;
- (In areas served by transit) offer employees the choice of a parking space or a subsidized transit pass.

Some measures such as these could be perceived by employees as punitive and therefore they may be difficult to implement. Nevertheless, in some situations they may be the most effective type of action an employer can take. In addition, it should be possible to package incentives in a positive way (e.g., as new benefits) rather than taking away old benefits.

- 1. Advance Conservation Phase. In general, actions such as these will not be most beneficial during this phase unless an employer wants to make a very strong commitment to ongoing conservation.
- 2. Local Short Duration Supply Interruption. Such a crisis may permit the imposition of disincentive type measures. On the other hand, employees who drive alone may be perceived as having enough trouble getting to work, without their employers adding to their woes. The crisis itself will generate such strong incentives to seek other means of getting to work that incentives are likely to be meaningless in such a context.
- 3. <u>Moderate Shortfall</u>. Same as (2), but the need for conservation, and hence justification for strong action, will be greater. In particular,

actions perceived as rewarding beneficial actions such as ridesharing should be implemented.

4. <u>Severe Shortfall</u>. Same as (3). However, as the crisis grows more severe, those who have any alternative to commuting alone may exercise that alternative, thus reducing the effectiveness of incentive/disincentive measures.

#### 5. ACTOR: PROVIDERS OF PHYSICAL INFRASTRUCTURE

The actors referred to in this section are those public agencies or organizations that have official responsibility for providing and managing physical infrastructure such as streets, highways, traffic signals, and park-and-ride lots. Such actors will typically include one or more of the following:

- the State DOT or highway department
- the city and town governments
- the county and other regional agency
- transit providers or ridesharing organizers.

The role of these agencies in fuel emergencies is important, particularly in providing support for other energy conservation and contingency initiatives. The provision of adequate park-and-ride facilities and adquate public information can be an effective element of TPR strategies. Priority treatment for high occupancy vehicles by provision of special lanes, by priority treatment at traffic signals at ramps and other congested locations, and by special priority in enforcing parking and other regulations can be essential to the success of TPR initiatives. However, such actions may be beyond the control of the agency specifically charged with the responsibility to provide a TPR service. Thus, the support role played by this actor will be difficult, because while it is important, it is not likely to be an activity of high priority within the agency. Indeed, the agency is unlikely to receive praise if the support role is played well, while it will receive the anger of

that segment of the public which is displeased with the success of the HOV lane, priority traffic signal, etc. For this reason, very determined efforts will be required to elevate the status and priority of these activities in the relevant agencies.

# A. Provide for Ample Park-and-Ride Locations and Adequate Public Information for Their Use

This can be carried out either by public purchase and construction, by part-time leasing of existing church and shopping center parking lots, or by a combination of the two.

- (1) Advance Conservation Phase. It is highly desirable that planning and implementation activities be carried out during this phase in order to develop an excess supply of park-and-ride capacity which can be made available during emergencies. Insurance implications may be among the most serious problems to resolve.
- (2) Local Short Duration Supply Interruption. Available excess capacity should be publicized; conversely, over-subscribed capacity should not be publicized. Free media publicity is likely to be available because of the emergency. (However, this may not always be the case.) It may be possible to achieve breakthroughs on new park-and-ride locations because of the emergency condition. Identification and establishment of new park-and-ride locations may not be possible in time to be useful for this crisis, but should be pursued for longer run purposes.
- (3) Moderate Shortfall. Same as (2) but a much greater emphasis will likely be required to identify new capacity, as capacity developed during (1) is likely to fill. It may also become necessary to set priorities among transit and carpool users who are competing for a limited number of spaces in

some locations. The development of auxiliary transit feeder service to some of the park-and-ride locations may begin to make sense.

- (4) <u>Severe Shortfall</u>. Same as (3) above, except that the pressure for additional lots will be greater.
  - B. Provide for Priority Enforcement of Parking and Other Regulations; Institute HOV Lanes to Expedite HOV Traffic Flow

These improvement opportunities are generally already identified in most regions because of TSM activities which have been required by federal transportation planning programs. Consequently, the primary issue will be implementation of what has been planned, although some new planning may be in order to give a higher priority to these type activities.

- (1) Advance Conservation Phase. These initiatives take considerable time to implement but they should be implemented as soon as possible, both as conservation measures (to encourage ridesharing in the absence of an energy supply disruption) and in order to promote preparedness for a contingency situation.
- (2) Local Short Duration Supply Interruption. Where funding or institutional obstacles have prevented implementation during phase (1), an emergency may serve to expedite implementation. In an energy disruption, however, traffic densities may be reduced sufficiently so that the importance or impact of such actions will be diminished during the crisis. On the other hand, the only opportunity to get action may be during the crisis.
- (3) <u>Moderate Shortfall</u>. Same as (2), but with additional initiatives likely to emerge as both useful and feasible.
  - (4) Severe Shortfall. Same as (3).

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