Session 4 Workshops on Strategies

Fuel Supply Strategies: A Local Perspective

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The first law of planning is "never plan the future from the present." This conference is a good example of adherence to this law. We are now and have been for the past year or so living in remarkable energy times. Remarkable in that no one would have predicted in 1973 that in 1983 world oil prices would fall to their present level. But the combination of a worldwide recession, conservation, efficient use of energy, and the absence of any major destabilizing political event in the Middle East has dramatically altered the world oil scene.

Spot market prices have fallen considerably and continue to fall. With the latest unenforceable benchmark price of $29 per barrel, the current world oil surplus has relegated energy contingency planning to a low priority on everyone's list, including transit systems'. Memories of long lines at gasoline stations, rapid growth of ridership on public transit, and uncertain energy supplies have faded as the day-to-day demands of operating a transit system have increased.

We now need to ask if it is necessary to have fuel supply security in 1983. There is sufficient diesel fuel available and prices have been dropping steadily. Perhaps we are returning to a pre-1973 world where there was never a question about either availability or security. Some analysts, on the other hand, foresee supply disruptions occurring in the mid- and late 1980s when lower prices will have fueled greater consumption and when the world economy is once again gaining strength.

We must never forget that fuel represents the lifeblood of a transit system and without it the buses will not run. Reliable access to adequate fuel supply is critical in order to provide safe, convenient, and dependable public transit service.

Many transit systems have weathered serious fuel supply emergencies during the last decade. During the first energy crisis of 1973-1974, transit managers worried about running short of fuel. During the second energy crisis in 1979, although supply was a problem, the price of fuel was a greater problem.

Transit systems received assistance through Special Rule No. 9, the U.S. Department of Energy (DOE) rule which provided transit systems with 100 percent of their requirements for surface mass transportation. In addition, some states tapped their state fuel allocation programs, so on the whole transit systems across the nation survived the 1979 crisis relatively unscathed. Some transit systems were hurt worse than others and some were not hurt at all.

The world is quite different now. Although the fuel supply is sufficient, there is little protection. On March 31, 1981, the DOE terminated its Special Rule No. 9. In addition, many state set-aside programs have been dismantled. Now in the event of a major disruption in fuel supply, whether because of an international crises, natural disaster, or manmade catastrophe, transit operators have no emergency fuel supply security other than reserve arrangements they have made themselves.

Faced with the absence of federal regulations and possible energy uncertainty, the Municipality of Metropolitan Seattle (Metro) made a policy decision to secure its own fuel reserve. In making this decision the agency went through a significant planning process. Key elements in the planning process included:

- Assessment of current fuel inventory--projection of future storage requirements;
- Determination of location for the fuel storage;
- Security issues;
- Quality control management;
- Environmental considerations; and
- Cost

The first consideration is fuel inventory and future fuel requirements. Most transit systems have limited fuel inventories with approximately 1 to 7 days' storage on hand at any given time. When planning for major long-term fuel storage, one rule of thumb is to maintain 3 months operating supply. With a 90-day supply, any initial emergency can be met and time is gained to plan for the handling of any prolonged disruptions. If any minimum storage is needed, 2 to 4 weeks supply should be adequate.

A second element is the determination of a location for fuel storage. Location questions are important because they can have a significant effect on cost and efficiency of delivery. Many transit systems have chosen to store emergency diesel fuel supplies at the bases in small additional underground storage. For some transit systems this arrangement is ideal because it provides for immediate access to fuel without major transportation con-

siderations. In addition, the environmental consequences of large above-ground storage are avoided.

Another method of storage is above ground at a centralized location. Seattle Metro chose this method because an existing tank farm was found and purchased. The suburban Detroit transit system has also selected this method of storage. The advantages are central control of facilities and the ability to buy in large volumes, hold, store, and draw down when appropriate. Disadvantages may be increased cost for transportation and environmental concerns related to water quality if the site is based on water. Air quality may also be a problem.

A third element is security. If the storage facility is centrally located and above ground, the issue of security is vital. The possibilities of tampering with equipment, vandalism, fire hazard, and possible theft or pilferage must be addressed.

Another key element is quality control management. Fuel stored must always meet the transit system's specifications. If leased storage is obtained, there can be problems with maintaining quality because occasionally comingling of the transit system's diesel fuel with other fuel may occur. It is important to specify segregated storage to ensure that the fuel will not be contaminated or altered in any significant way. In addition, roll-over of the fuel must be adequately monitored. Diesel fuel deteriorates over time and should be replaced or rolled over within a 12- to 24-month period.

Environmental considerations also must be addressed, particularly the issue of fuel spills. If the facility is water based, arrangements must be made to contain and disperse any spill. Specialized firms, which deal exclusively with the environmental consequences of oil spills, can be retained. Retention of such a firm is wise planning because it relieves the transit system of the responsibility of training and equipping its own crews to handle environmental problems.

Although air quality is not as much a problem with diesel fuel as with gasoline, if the facility is located in a nonindustrial area or does not meet state, federal, or local standards, considerable expense can be incurred in bringing the facility up to standard.

A final element is cost. Fuel storage can be obtained in three ways: by constructing a new facility, by purchasing an existing facility, or by leasing an existing facility. All of these methods are costly. According to our calculations, the greatest cost is incurred when constructing a new facility. Unless the transit system has more than adequate funding and a free hand for site acquisition and obtaining a permit, constructing a new facility is not only too costly, but also too time consuming.

Purchase of an existing facility is usually a matter of luck and location. In many cities there are no existing facilities available for sale and if there are they are too large or need too much rehabilitation. Occasionally, however, such facilities do appear on the market. Seattle Metro was able to acquire a facility that happened to be the right size in the right place and available at the right time. For the most part, purchase of an existing facility is only possible for a medium- or large-transit system. Costs include not only initial acquisition but retrofitting cost as well, so the final price may be a significant sum.

Leasing may be the preferred alternative for many systems, particularly small ones. Costs, however, can escalate in a relatively arbitrary fashion and quality control problems may occur. In addition, no equity is accrued with a leased facility.

I have briefly outlined a few of the major considerations related to acquisition of fuel storage. A detailed discussion of these elements is contained in the Emergency Fuel Reserve Storage Guidebook for Transit Managers (1).

On April 1, 1982, when Seattle Metro made a decision to purchase an existing 1.7 million gallon tank farm, the planning previously described had already been completed. The agency had been considering the possibility of purchasing fuel storage since the 1979 energy crisis. We were told by our supplier in May 1979 that he would no longer be able to deliver fuel. As a result an emergency 250,000-gallon emergency reserve was purchased and placed in privately owned storage.

At that time Metro's governing council initiated a feasibility study on the need for and cost of a permanent transit fuel reserve. This step marked Metro's formal entry into the search for additional fuel storage capacity that could be leased, purchased, or constructed.

We first considered purchasing available used tanks including government surplus. Information was gathered on comparative costs of various diesel storage options (above or below ground, centralized or decentralized). In the meantime, the agency signed a contract with Arco for its major fuel supply. Cost effectiveness analyses were prepared on the long-term fuel purchase savings that might accrue to the agency if a fuel reserve were acquired. A permanent reserve appeared to lower the risk of a fuel shortage and perhaps allow significant economies of scale in bulk fuel purchases. In spring 1981 Metro staff identified a tank farm property that had been placed on the market; this accelerated the search for a fuel reserve.

A fuel reserve study was completed in late 1981 under a consultant contract. New construction, leasing, and purchase of an existing facility were examined in this study. The consultant's analyses focused almost exclusively on site development issues, cost, and environmental requirements for obtaining a permit. Identification of the existing tank farm proved to be a catalyst and no other purchase option was ever seriously considered. New construction was definitely too costly. Leasing was examined but discarded because of little management control and no return on investment.

The preferred alternative--buying an existing tank farm--inspired considerable political and economic debate about cost and benefits compared to various lease options.

Internally, according to Metro's calculations, it was concluded that a better economic return on investment would accompany ownership. In April 1982 the Metro Council almost unanimously authorized purchase of the existing storage facility. The sale price was $2.5 million. Currently the tank farm is under renovation and is being retrofitted to meet Metro requirements.

Now that Metro has obtained fuel storage, other possibilities for its use have become evident. Metro currently uses 7.5 million gallons of diesel fuel per year. One option is to continually run fuel through the tank farm, bringing it in by barge lots and dispersing it by truck and trailer to the bases. Significant economies of scale are available to the agency if this course of action is pursued.

The Metro experience demonstrated that even during an oil supply glut a public sector commitment to long-term planning for emergency fuel supply can be developed. Purchasing a fuel reserve on the scale of the one purchased by Metro may well be beyond the capacity of most average size transit systems.

Nevertheless, transit systems should note that regardless of their fuel storage requirements reserve storage can be tailor-made to suit their needs.

None of us know what the future holds. We may have a secure fuel supply far into the next decade; on the other hand, we may not. Prudent behavior would indicate a serious look at fuel storage requirements. At Seattle Metro, we not only assessed our needs for fuel storage, but took action. Even in this time of glut, we are glad we did.

REFERENCE

1. Emergency Fuel Reserve Storage Planning: A Guide for Transit Managers. Municipality of Metropolitan Seattle, Seattle, Wash., Jan. 1983.

How Consumers Cope With Transportation Emergencies: The New York and New Jersey Experiences

Joanna M. Brunso

During the last decade the United States faced two energy supply interruptions, both of which were followed by rapidly rising gasoline prices. Although the gasoline shortage was unevenly distributed in both the 1973-1974 and 1979 crises, most parts of the United States were affected to some degree. The New York City area was particularly hard hit in 1979 primarily because of the reliance on foreign imported oil during the crisis. In the 1979 crisis gasoline consumption dropped by 11 percent in the summer (1,2) and traffic dropped by 10 percent. Transit ridership in the New York City urban area increased substantially as consumers faced a shortage of fuel and turned to other modes of transportation to avoid gasoline lines at service stations and to preserve as much mobility as possible.

In the aftermath of the two crises, studies and analyses have been published; energy contingency plans have been prepared, and in some cases, adopted; and rules and regulations have been passed and repealed. A great deal is known about what transit can do in an emergency and for how long (3,4). We know how to establish ridesharing services at various levels of sophistication and in various jurisdictions (5,6). Also we are beginning to understand how consumers respond initially, and over time, to gasoline shortages and rapid increases in gasoline prices (1,7).

The experience of the two oil shortages led Congress to enact the Emergency Energy Conservation Act of 1979 which encouraged the development of statewide plans to deal with future energy shortages. This act was followed by U.S. Department of Transportation (DOT) regulations which directed metropolitan planning organizations (MPOs) to include among their activities contingency plans in the event of disruptions of energy supplies. An assessment of state plans by the New York State Department of Transportation (NYSDOT) (8) and a similar study of urban-area plans by the federal government (9) revealed that these plans were deficient in several respects. Among the deficiencies were the lack of a regional scope that includes all modes, the lack of agreements and coordination concerning the commitment and cooperation of various jurisdictions, the lack of commitment of local funds to implement each aspect of the plans, and the lack of identification of barriers and agreements for the removal of these barriers during a crisis.

In the light of these findings it is instructive to study the ways in which urban areas cope when mobility becomes limited. The strike of two commuter rail lines in New York City and suburban New York and New Jersey is an illustration of a limited emergency. At the time this paper was written, two rail lines were striking concerning work rules, but all bus lines, subways, and PATH lines continued to operate. A third-party vanpool operator, Metropool, was operating in Westchester County and the New Jersey Department of Transportation (NJDOT) was operating an active ridesharing office.

Because there was a 3-month advance warning of the intent to strike, both the Metropolitan Transportation Authority (MTA) and New Jersey Transit were able to develop contingency plans. These plans involved essentially seven components of several possible suggested strategies (Table 1). Detailed information about the seven components of the contingency plans was obtained from telephone interviews with the following persons: Lona Mayer, Supervisor, Transportation Systems Management and Research, Port Authority of New York and New Jersey; Douglas Reilly, Special Projects Manager, Office of Ridesharing, New Jersey Department of Transportation; James Redeker, Manager of Evaluation and Analysis, New Jersey Transit; and Arthur Perfall, Public Relations Officer, Metropolitan Transportation Authority. The seven components include:

1. Flexible work hours (informal, varies with employers),
2. Rail station-based carpool program (New Jersey only),
3. Additional service of existing transit,
4. Refurbish old buses not yet auctioned off,
5. Charter additional buses,
6. Establish additional remote park-and-ride lots, and
7. Public information.