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Identifying Fuel Conservation Priorities of Motor Carriers

by Richard Poist, Lawrence M. O'Connor** and Garland Chow**

INTRODUCTION

MUCH HAS BEEN SAID and written about the fact that the nation and its economic institutions are facing an energy crisis. With regard to the transportation industry, the severity of the crisis is such that the Transportation Research Board (TRB), which is affiliated with the National Academy of Sciences, has placed energy conservation and the development of alternative energy sources for transportation among the ten most critical issues in contemporary transportation.[1] Indeed a strong case can be made that the fuel crisis is the number one challenge confronting carriers today.

There are two broad, but basic, approaches to alleviating the fuel crisis. The first is what is known as the Supply-Oriented (or long-term) Approach. This approach says that, if you are going to alleviate the energy crisis, you must increase supplies of energy. This can be done, among other things, by locating and drilling additional oil wells and also by developing new energy sources. The Supply Approach is regarded as long-term because it can only be accomplished over 10, 20, 30 or more years.

A second approach is what is termed a Demand-Oriented (or short-term) Approach. This approach says that, if you are going to alleviate the energy crisis, you must **decrease** demand. In essence this means fuel conservation efforts and increased prices to discourage demand. In the short-run (i.e., next 1-10 years), this approach appears to be our best strategy for coping with fuel shortages.

The remainder of this paper deals with the Demand Approach and specifically the fuel conservation priorities of the trucking industry. Among the topics to be examined are the following:

a) Reasons for the recent emphasis on fuel conservation.
b) Potential areas for improving fuel efficiency.
c) Current carrier priorities with respect to fuel conservation.
d) Differences in conservation priorities based upon demographic variables.

**Associate Professor of Transportation, College of Business and Management, University of Maryland, College Park, Maryland.*

***Industrial General Manager, Cummins Mid-Atlantic, Inc., Baltimore, Maryland.*

EMPHASIS ON FUEL CONSERVATION

There are several reasons for trucking's current interest in fuel conservation. These include the following:

1) Projected shortages and lack of fuel availability.

Worldwide, what we are finding is that demand for oil is outstripping supply. This is occurring to such an extent that some geologists and energy experts are predicting we will run out of oil by the year 2015.[2]

In the short-run, of course, carriers are concerned with fuel availability. While supplies are currently adequate, a serious lack of availability ocurred in both the Winter of 1974 and the Spring of 1979. Such a situation is likely to occur again given an OPEC embargo or any other action leading to an oil shortfall.

2) Rapidly escalating fuel prices.

The day of a $1 a gallon diesel fuel is here. In 1973, prior to the Arab embargo, the retail price of diesel fuel was approximately 28 cents. Just in the short span from 1976 to 1980, the price increase has been phenomenal. For example, one study indicates retail diesel fuel costs have risen from 52.0 cents per gallon in January of 1976 to 105.2 cents in January of 1980, or an increase of 102 percent.[3]

The impact that this has had on carrier operating costs is substantial. In 1973, fuel costs as a percentage of total operating costs for motor carrier fleets was only about 3 percent.[4] Today this percentage generally exceeds 8 percent and is still climbing. For individual owner-operators and small fleet operators the percentage is usually considerably higher because of their inability to achieve cost economies through volume fuel purchases.

3) Transportation's (including truck-

ing's) almost total dependence on petroleum as a fuel source.

Today approximately 54 percent of the petroleum consumed in the United States is used by transportation. Even more significant is the fact that approximately 97 percent of transportation energy crisis is derived from petroleum sources.[5] What this means, essentially, is that transportation is "locked in" to petroleum for the foreseeable future. Therefore the need is obvious for carriers to make the most efficient use of the fuel they have.

FUEL IMPROVEMENT AREAS

Before current carrier strategies for fuel conservation could be assessed, it was necessary to identify potential areas and techniques for improving fuel efficiency. Based upon a search of academic and trade journals as well as other literature, an extensive list of 70 potential fuel-saving devices/techniques was developed. These devices were classified into the following categories or areas:

I. Aerodynamics
II. Rolling Resistance
III. Power Train
IV. Vehicle Maintenance
V. Driver Practices
VI. Operational Techniques[6]

These areas were thought to encompass the entire sphere of technological and operational fuel conservation devices/techniques currently available to the trucking industry. For purposes of the study, the categories were defined as follows:

I. **Aerodynamics**—includes all devices which reduce fuel consumption losses resulting from air resistance encountered by a moving vehicle (i.e., losses resulting from air or wind drag).

II. **Rolling Resistance**—includes all techniques and devices which reduce fuel consumption losses associated with (a) pushing the tire over various road surfaces (i.e., overcoming road friction) and (b) flexing the tire sidewall and tread.

III. **Power Train**—includes all engine-related and drive train devices which cut back on the demand for horsepower and in turn reduce fuel consumption.

IV. **Vehicle Maintenance**—includes all the maintenance-related techniques that maintain vehicle fuel consumption characteristics at optimal levels.

V. **Driver Practices**—includes driver-related techniques which can be utilized to maximize the fuel saving potential of current technology equipment.

VI. **Operational Techniques**—includes the many operational techniques which may act to reduce fuel consumption.

Table 1 presents the individual fuel conservation devices/techniques associated with each of the above categories.

Before continuing this discussion, several qualifying remarks are in order. First, it should be noted that the placement of individual devices into categories was strictly judgmental and was not meant to represent a hard and final positioning. Likewise it should be recognized that, while the 70 techniques represented a listing which was both comprehensive and diversified, this listing should not be viewed as exhaustive. Finally, it should be noted that the techniques/devices offer only potential savings in fuel, not guaranteed savings under all operating conditions and vehicular configurations.

ASSESSMENT OF PRIORITIES

Conservation priorities were identified through a mail questionnaire sent to a sample of 1,000 motor carriers. The questionnaire was directed to the executive in charge of operations and/or maintenance for a given carrier. It was felt that these executives had the greatest expertise and knowledge relating to a carrier's experience with fuel-saving devices.

Specifically, the questionnaire asked respondents to evaluate each of the techniques/devices listed in Table 1 in terms of its current importance to the fuel conservation efforts of their firm. Importance was rated on a 0-3 scale with "no importance" established at "O" and progressing to "maximum importance" at "3." Based upon a composite of respondents' replies, it was possible to approximate the priority level assigned to each technique.

In addition, the questionnaire asked respondents to provide certain demographic data about themselves and their firm. Data collected about the firm included company size, fleet size, carrier type (i.e., for-hire vs. private), whether the firm uses specifications when purchasing its equipment, whether it buys used equipment or not, and commodity hauled. Demographics regarding respondents included age, education, and years in their present executive position (i.e., job tenure). The purpose of gathering this information was to analyze

TABLE 1

POTENTIAL FUEL CONSERVATION DEVICES/TECHNIQUES FOR MOTOR CARRIERS

Category I: Relating to Aerodynamics

* Cab-mounted air deflector
* Spoiler (mounted under front of vehicle)
* Belly pan
* Vortex stabilizer
* Nose cone
* Smooth-sided trailers
* Rounded front corners (trailers)
* Reduced frontal area (tractors)
* Inboard mounting of hang-on's (air cleaner; oil filter)

Category II: Relating to Rolling Resistance

* Radial tires
* Disc wheels
* Proper tire inflation
* Proper tire match
* Proper tire balance
* Proper vehicle alignment

Category III: Relating to Power Train (and Specifications)

* Engine derated in horsepower
* Engine governed at reduced RPM
* Engine retrofitted with turbo-charger
* Engine high torque version
* Road speed governor
* Tachograph
* Shutters
* Reduced air intake restriction
* Block heaters
* Fluorocarbon coating
* Fuel heater
* Battery heater
* Oil heater
* Reduced gears in transmission
* Rear axle—lowest numerical ratio possible
* Tag axle
* Fan clutch (any type of arrangement)
* Dieselization of equipment
* Electronic ignition
* Brushless alternator
* Air restriction gauge (vehicle mounted)

Category IV: Relating to Vehicle Maintenance

* PM schedule established and followed
* Tune up procedures and schedule
* Filter change interval
* Governor and fuel pressure settings checked
* Synthetic oil
* Synthetic gear lube
* Fuel additives
* Multigrade oils
* Supervised fueling practices
* Procedures to prevent manual and temperature (fuel) overfill
* Monitor fuel tanks for leaking

Category V: Relating to Driver Practices

* Driver training
* Driver motivation provided
* Adherence to posted speeds (55 MPH)
* Skip shifting
* Progressive shifting
* Idling time monitored and controlled
* Fuel island shutdown procedure

Category VI: Relating to Operations

* Control of actual road purchases of fuel
* Vehicle sized for maximum practical loads
* Utilization of size (straight trucks switched to tractor trailers)
* Twins, doubles, triples
* Freight loading (by stops)
* Dispatching
* Relay operations
* Routings
* Terminal location
* Elimination of empty backhaul
* Combo loading
* Containerization
* Piggyback
* Palletized loads by drop point
* Lightweight equipment

the relationships which might exist between demographic variables and technique importance.

The sample of carriers came from three sources including a random sample chosen from the **Executive and Ownership Report,** 1978 (published by The American Trucking Associations, Inc.), a random sample of the membership of the Private Carrier Conference of ATA, and a third group selected by cross alphabetizing the first two lists (to avoid duplication) with the membership listing of **The Directory of Fleet Maintenance Executives** (1977-1978).[7]

The sample selected included 200 from the Private Carrier Conference, 526 ATA Class I and II Motor Carriers, and 274 Fleet Maintenance Executives. (The Fleet Maintenance Executives sample segment included both private and for-hire carriers.) Unmailable addresses ultimately reduced this sample population to 956. Returns numbering 198 resulted in a response rate of approximately 21 percent. This return was considered respectable in view of the detail and number of questions asked of respondents as well as the fact that there was no follow-up mailing. Likewise the returns were regarded as adequate for measuring statistical relationships which might exist between technique importance and the demographic variables.

FINDINGS

Carrier Conservation Priorities

Table 2 indicates the average or mean importance ratings attached to the 70 conservation devices by respondents. These techniques/devices were placed into the following groupings based upon priority levels: "Great Importance," "Moderate Importance" and "Minimal Importance." The ten conservation devices/techniques perceived as most important (i.e., having highest mean ratings) were Proper tire inflation, PM schedule established and followed, Filter change interval, Proper tire match, Tune up procedures and schedule, Dieselization of equipment, Proper vehicle alignment, Adherence to posted speeds, Driver training, and Elimination of empty backhaul.

In contrast, perceived as least important were Synthetic oils, Fuel additives, Tag or lift axles, Nose cones, Oil heaters, Battery heaters, Fluorocarbon coating, Vortex stabilizers Spoilers, and Belly pans.

These findings as well as others indicated in Table 2 lead to several interesting observations. In general, the fuel conservation devices with "Great Importance" represent in-house, non-exotic devices available to every motor freight carrier in the country. Most of these devices represent legal obligations (e.g., Adherence to posted speeds), good maintenance practices or common sense operational techniques.

Likewise these techniques were generally better known and less sophisticated than a majority of the techniques evaluated. In contrast, the devices/techniques rated "Minimal" in importance represent items so specialized or so experimental that their benefits, or even widespread knowledge of their existence, are subject to doubt. It is also interesting to note that techniques or devices relating to Rolling Resistance (Category II) generally have the highest degree of perceived importance while those relating to Aerodynamics (Category I) have the lowest perceived importance. An apparent reason for this is the ease of implementing the Rolling Resistance devices in contrast to the extra cost of add-on equipment associated with the Aerodynamics category. The remaining conservation categories fell between these extremes, generally in relation to their costs and/or ease of implementation.

Demographic Relationships

Demographic information was gathered and analyzed to determine the potential relationships existing between demographic variables and technique importance. In other words, the analysis attempted to determine whether differences in perceived importance could be attributed to demographic differences. Using Chi-square analysis, comparisons were made between various classes or groupings within each demographic variable. The most relevant findings from this analysis are presented in the following paragraphs.

Overall results indicate that **Age of respondent, Job tenure of respondent, Specification of equipment, Purchase of used equipment, Carrier type,** and **Commodity hauled** did not differentiate between respondents and firms in terms of high vs. low technique importance. Analysis based upon these variables showed no discernible trends and relatively few statistically significant differences.

In contrast, the most significant findings occurred in relation to the **Firm size, Education of respondent and Fleet size** variables. Numerous statistically significant relationships as well as a number of trends were found between these variables and the level of technique importance. A brief summary of findings with respect to each variable is discussed below. An overall summary

TABLE 2

PERCEIVED IMPORTANCE OF FUEL CONSERVATION DEVICES/TECHNIQUES

Fuel Conservation Devices/Techniques (*,**)		Mean Importance Score	Degree of Importance
- Proper tire inflation (II, 2.65)	- Vehicles sized for maximum loads (VI, 2.38)	$\bar{x}$ of 2.00 and above	"Great"
- PM schedule established and followed (IV, 2.61)	- Proper tire balance (II, 2.26)		
- Filter change interval (IV, 2.50)	- Fan clutch (III, 2.20)		
- Proper tire match (II, 2.46)	- Governor and fuel pressure settings checked (IV, 2.20)		
- Tune up procedures and schedule (IV, 2.46)	- Engine governed at reduced RPM (III, 2.19)		
- Dieselization of equipment (III, 2.45)	- Engine high torque version (III, 2.16)		
- Proper vehicle alignment (II, 2.42)	- Driver motivation provided (V, 2.12)		
- Adherence to posted speeds (V, 2.42)	- Dispatching (VI, 2.12)		
- Driver training (V, 2.42)	- Routings (VI, 2.07)		
- Elimination of empty backhaul (VI, 2.39)	- Radial tires (II, 2.06		
- Engine derated in HP (III, 1.97)	- Supervised fueling practices (IV, 1.57)	$\bar{x}$ of 1.00 but less than 2.00	"Moderate'
- Control of actual road purchases (VI, 1.96)	- Reduced gears in transmission (III, 1.50)		
- Monitor fuel tanks for leaking (IV, 1.81)	- Terminal location (VI, 1.49)		
- Progressive shifting (V, 1.73)	- Multigrade oils (IV, 1.34)		
- Rear axle—lowest numerical ratio possible (III, 1.71)	- Utilization of size (III, 1.34)		
- Smooth sided trailers (I, 1.67)	- Rounded front corners (trailers) (I, 1.33)		
- Lightweight equipment (VI, 1.65)	- Reduced frontal area (tractors) (I, 1.30)		
- Freight loading (by stops) (VI, 1.63)	- Air restriction gauge (III, 1.29)		
- Road speed governor (III, 1.63)	- Engine retrofitted with turbocharger (III, 1.26)		
- Block heaters (III, 1.62)	- Brushless alternator (III, 1.25)		
- Idle time monitored (V, 1.62)	- Cab mounted air deflector (I, 1.22)		
- Combo loading (VI, 1.22)	- Palletized loads by drop point (VI, 1.10)	$\bar{x}$ of 1.00 but less than 2.00	"Moderate
- Shutters (III, 1.20)	- Reduced exhaust backpressure (III, 1.09)		
- Reduced air intake restriction (III, 1.18)	- Procedures to prevent overfill (IV, 1.09)		
- Fuel island shutdown procedure (V, 1.16)	- Disc wheels (II, 1.08)		
- Inboard mounting of hang-on's (I, 1.15)	- Twins, doubles, triples (VI, 1.00)		
- Tachograph (III, 1.14)			
- Relay operations (VI, .97)	- Tag axle (III, .58)	$\bar{x}$ of less than 1.00	"Minimal"
- Electronic ignition (III, .89)	- Nose cone (I, .49)		
- Fuel heater (III, .80)	- Oil heater (III, .45)		
- Skip shifting (V, .74)	- Battery heater (III, .40)		
- Containerization (VI, 72)	- Fluorocarbon coating (III, .32)		
- Piggyback (VI, .70)	- Vortex stabilizer (I, .26)		
- Synthetic gear lube (IV, .65)	- Spoiler—mounted under front of vehicle (I, .14)		
- Synthetic oil (IV, .61)	- Belly pan (I, .14)		
- Fuel additives (IV, .60)			

* First figure in parenthesis indicates the classification category of the device or technique (See Table 1).

** Second figure in parenthesis indicates the mean score for all respondents.

of results is presented in Table 3. Only techniques involving statistically significant differences are indicated.

Firm Size. Analysis based upon this variable yielded 23 statistically significant differences. In general, respondents from larger firms attached greater importance to fuel-saving devices than was true for respondents from small firms. For 18 of these techniques/devices, respondents from the largest firms (i.e., over $50 million) indicated higher perceived importance. Of the remaining 5 techniques (Driver training, Lightweight equipment, Containerization, Piggyback, and Palletized loads by drop point), respondents from the smallest companies (i.e., 0-$5 million) indicated higher perceived importance. In terms of overall conservation categories, it appears that the larger firms are placing emphasis on Aerodynamic and Power Train-related techniques for conserving fuel, while small carriers are placing greater emphasis on certain Operating Techniques.

Education. Analysis yielded 15 statistically significant differences. In general, respondents with more education indicated higher perceived importance. For 11 techniques, the college - educated group indicated greater importance. For the remaining 4 techniques (Reduced exhaust backpressure, Reduced air intake restriction, Skip shifting and Idle time monitored and controlled), the high school group indicated greater importance. With regard to overall categories, the college-educated group appeared to place more emphasis on Vehicle Maintenance devices in their conservation efforts whereas the high school group emphasized Driver Practices.

Fleet Size #1. In general, respondents from larger fleets attached greater importance to conservation techniques than did respondents from small fleets. Analysis yielded 16 statistically signifi-

TABLE 3

RELATIONSHIP OF DEVICE/TECHNIQUE IMPORTANCE TO SELECT DEMOGRAPHIC VARIABLES

Devices or Techniques/Classification Category	Company Size[a]	Education[b]	Fleet Size #1[c]	Fleet Size #2[d]
Cab mounted air deflector, I	.05	ns	.06	ns
Vortex stabilizer, I	.02	.09	ns	ns
Nose cone, I	ns	ns	.09	ns
Smooth sided trailers, I	.02	ns	.01	.09
Reduced frontal area (tractor), I	.03	ns	ns	ns
Inboard mounting of hang-on's (air cleaner, oil silter), I	.01	ns	ns	ns
Disc wheels, II	.05	ns	ns	ns
Proper tire inflation, II	ns	ns	.03	.02
Engine derated in horsepower, III	ns	ns	ns	.01
Engine governed at reduced RPM, III	ns	ns	ns	.01
Engine high torque version, III	.08	ns	ns	.01
Road speed governor, III	ns	ns	ns	.04
Shutters, III	ns	ns	.04	ns
Reduced exhaust backpressure, III	ns	.01	ns	ns
Reduced air intake restriction, III	.06	.01	.04	.06
Fluorocarbon coating, III	.03	ns	ns	ns
Battery Heater, III	ns	ns	.07	ns
Oil heater, III	ns	ns	.03	ns
Rear axle--lowest numerical ratio possible, III	.01	.01	.01	.06
Tag axle, III	ns	ns	.01	.03
Dieselization of equipment, III	ns	ns	.08	ns
Electronic ignition, III	.03	ns	ns	ns
Brushless alternator, III	ns	ns	.01	.06
Air restriction gauge—vehicle mounted, III	ns	ns	ns	.05
PM schedule established and followed, IV	.06	.04	ns	ns
Tune up procedures and schedule, IV	ns	.06	ns	ns
Governor and fuel pressure settings checked, IV	.05	ns	ns	ns
Synthetic oil, IV	ns	.01	ns	ns
Synthetic gear lube, IV	ns	.03	ns	ns
Multigrade oils, IV	ns	.02	ns	ns

Continued on next page

TABLE 3 (continued)

Devices or Techniques/Classification Category	Company Size[a]	Education[b]	Fleet Size #1[c]	Fleet Size #2[d]
Supervised fueling practices, IV	.07	ns	.04	ns
Procedures to prevent manual & temperature over fill, IV	ns	ns	ns	.09
Driver training, V	.03	ns	ns	ns
Adherence to posted speeds, V	ns	ns	ns	.02
Skip shifting, V	ns	.08	.08	ns
Progressive shifting, V	.04	ns	ns	ns
Idle time monitored and controlled, V	ns	.07	ns	ns
Control of actual road purchases, VI	ns	ns	ns	.07
Twins, doubles, triples, VI	.09	ns	.01	.01
Freight loading (by stops), VI	ns	.02	ns	ns
Dispatching, VI	ns	.01	ns	ns
Lightweight equipment, VI	.09	ns	ns	ns
Relay operations, VI	.08	ns	.05	ns
Routings, VI	ns	.01	ns	ns
Elimination of empty backhaul, VI	ns	.01	ns	ns
Combo loading, VI	.01	ns	ns	ns
Containerization, VI	.01	ns	ns	ns
Piggyback, VI	.09	ns	ns	ns
Palletized loads by drop point, VI	.01	ns	ns	ns

ns--Results found not statistically significant at .10 level or below.

.10 and BELOW--Results found to be statistically significant at indicated level using Chi-square analysis.

Roman numeral represents classification category.

[a]Compares the importance ratings of respondents from carrier firms with annual gross revenues of $0-5 million vs. $6-50 million vs. over $50 million.

[b]Compares the importance ratings of high school graduates vs. college graduates.

[c]Compares the importance ratings of carriers with Power Units over 10,000 pounds gross vehicle weight of 0-60 units vs. 61-200 units vs. over 200 units.

[d]Compares the importance ratings of carriers with 0-50 trailers vs. 51-250 trailers vs. over 250 trailers.

cant differences. For 14 techniques, respondents from the largest fleets (over 200 Power Units) indicated higher importance. Of the remaining 2 statistically significant differences, one (Nose cones) was indicated as more important by respondents from medium size fleets (61-200 Units) while the other (Shutters) was perceived as more important by small fleets (0-60 Units). In terms of overall conservation categories, respondents from the largest fleets attached greater importance to Power Train devices.

Fleet Size #2. Analysis based upon this variable yielded similar results to those obtained for Fleet Size #1. Statistically significant differences were found with regard to 15 techniques. In all cases respondents from the largest fleets (over 250 trailers) indicated greater perceived importance. The Power Train Category accounted for most of the significant differences.

CONCLUDING REMARKS

The study findings have implications for both carrier management and equipment suppliers. Carrier managers should find the results meaningful for several reasons. First, the fact that conservation techniques have been identified and classified should enhance carrier awareness of the many and varied options available to improve fuel efficiency.[8]

Secondly, the results should prove valuable to carrier managers as a benchmark for comparing their conservation priorities with the composite priorities for other carrier fleets. Some obvious questions can be asked. For example, are they making use of the most important techniques? If not, why? Similarly, many additional comparisons can be made.

Equipment suppliers can also benefit from the study results. More effective sales and promotional programs can be designed on the basis of information about the relative importance of particular techniques/devices as well as demographic preferences. For example, by knowing that larger fleets attach greater importance to Power Train-related techniques, specially tailored sales and advertising messages can be directed to these fleets.

Before concluding this report, it should be stressed that active support and encouragement of the "Supply-Side Approach" is also required if a lasting solution to the energy crisis is to be found. Even though the trucking industry appears to be doing an admirable job in terms of improving fuel economy, conservation efforts can only go so far.[9] In the long-run the industry must also support the development of new fuels and power sources. Alternatives presently under consideration include synthetic fuels and electrically or battery-powered vehicles. Only by supporting **both** Demand and Supply-Oriented Approaches to the fuel crisis can energy self-sufficiency realistically be achieved.

FOOTNOTES

1 "The Ten Most Critical Issues in Transportation," **Research Review** (American Trucking Associations, Inc.), January 15, 1979, p. 2.

2 Peter Nulty, "When We'll Start Running Out of Oil," **Fortune**, October, 1977.

3 "A Special Report on Transportation Developments," **Research Review** (American Trucking Associations, Inc.), February 15, 1980, p. 2.

4 For example, see **Transport Topics**, May 7, 1978, p. 18.

5 D. B. Shonka, A. S. Loebl and P. D. Patterson, **Transportation Energy Conservation Data Book: Edition 2**, (Oak Ridge, Tenn.: Oak Ridge National Laboratory, 1977), pp. 155-175.

6 This classification was first suggested in **How to Save Truck Fuel** (Washington, D.C.: The Voluntary Truck and Bus Fuel Economy Program is a joint industry-government effort involving commercial trucks of more than 10,000 lbs. gross vehicle weight.

7 None of the groups from which the sample population was developed either requested participation or provided knowing assistance in the formulation, implementation or findings of this survey. These groups were chosen primarily because of the diversity of their memberships, geographic dispersion, and recognized competence and authority in the field of fleet maintenance and operations.

8 According to some estimates, fuel savings of 10-35% are possible by utilizing a wide range of techniques. Power Train modifications alone can potentially result in savings of 1 to 4.5 cents per mile. For a truck traveling 100,000 miles, this translates into a savings of $1,000 to $4,500. (Source: American Trucking Association, Inc., Washington, D.C.).

9 For example, see "Voluntary Truck, Bus Fuel-Saving Said To Total 3.4 Billion Gallons," **Traffic World**, January 21, 1980, p. 67 and "GAO Hails Voluntary Fuel Economy Program of Industry," **Transport Topics**, March 24, 1980, p. 1.