

State Administration of Motor Carrier Requirements: Opportunities for Creative Partnerships

John J. Zogby, *InfoGroup, Inc.*

The purpose of this paper is to explore the effects of state administration of motor carrier requirements on the safe and efficient operation of heavy trucks. Because heavy trucks account for a significant number of highway deaths and injuries, the safety of such vehicles has been the subject of much research, legislation, and regulatory activity. The effects of recent research, legislation, and regulations on heavy truck safety will be examined, and some of the recommendations from these endeavors will be highlighted. The basic hypothesis is that the most effective solutions to the emerging safety problems with heavy trucks are found in policy initiatives rather than technology.

An underlying thesis is that effective administration of motor carrier safety programs, both public and private, requires an understanding of government regulatory policy and the motor carriage business. This thesis takes for granted that business and public administrators are well versed in the methodologies of their discipline. They should know at least some of the basics of such methods as management science, systems theory, budgeting, public policy analysis, operations research, and statistical analysis.

But the public administrator must also know some basics of the motor carriage business that they regulate, and the industry administrator should know the reasons for, and method of, motor carrier regulation. Administrators who do not learn them, or who ignore them, are vulnerable to snow jobs and technical jargon. And administrators can ill afford to have their management prerogatives pass down to technical specialists because of their own ignorance.

INTRODUCTION

Before the history of motor carrier legislation and regulation is presented, a review of some major items in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) (1) would be in order, since the author believes that this legislation offers the opportunities for the creative partnerships suggested in this paper. Section 2 of the act, the Declaration of Policy, lists the policy statements that provide the philosophic underpinnings of this major transportation legislation. The first two statements capture the essence of the overall mission of the act:

It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to

compete in the global economy, and will move people and goods in an energy efficient manner. . . .

The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation's preeminent position in international commerce. (1)

ISTEA has set the stage for a new era in transportation management. Environmental considerations alone have introduced a new set of managers in the policy and implementation phases. Additionally, the requirement for long-range development plans for states and metropolitan areas has changed the planning and decision structure, also introducing new players in the decision-making process. In this regard, ISTEA

- Establishes a National Highway System to focus federal resources on roads that are most important to interstate travel, that connect with other modes of transportation, and that are essential for intermodal commerce;
- Gives state and local governments more flexibility in determining their transportation needs and resolving their transportation problems;
- Mandates the use of enhanced planning and management systems to guide the state and local government in making choices; and
- Encourages, through funding, new technology such as intelligent vehicle-highway systems (IVHS).

In regard to motor carriers, ISTEA

- Reauthorizes and expands the Motor Carrier Safety Assistance Program (MCSAP),
- Recognizes uniform commercial vehicle registration and fuel tax reporting agreements,
- Requires driver training studies and standards, and
- Repeals the "bingo stamp" program.

Motor carriers will play a vital role in fulfilling the objective of this act. The contribution of the industry, in meeting the mission of ISTEA, will depend on the management of motor carriage issues and services by the industry and by federal and state government. This management must be coordinated and must understand the interconnection of economic, transportation system development, and motor carrier safety regulatory goals.

The trucking industry is composed of approximately 253,000 American firms and accounts for 78 percent of all freight transportation revenues in this country. It employs 7.6 million people and generates annual revenues in excess of \$257 billion. The public and the American economy depend heavily on truck transportation to provide the goods, services, and materials that move America (2).

Despite this, the number of highway crashes involving heavy trucks, as well as their size and increasing number in traffic, has prompted concern among public and industry officials alike. Even while acknowledging the vital services that the trucks provide, many members of the driving public perceive large trucks as menaces on the road. This perception is fueled by media reports such as a *Readers Digest* report titled "Killer Trucks" and *USA Today's* headline announcing "1 in 4 tractor-trailers rigged for disaster."

TRUCK CRASH EXPERIENCE

However, the reality is that from 1979 through 1989, the number of fatal crashes involving trucks remained fairly constant, deviating little from an average of 3,823 fatal crashes a year (see Figure 1). The fatal crash rate of combination vehicles decreased significantly, from 6.4 fatal crashes per 100 million mi of travel in 1979 to 3.8 in 1989. However, this rate is twice the 1.9 rate for passenger vehicles (see Figure 2) (3).

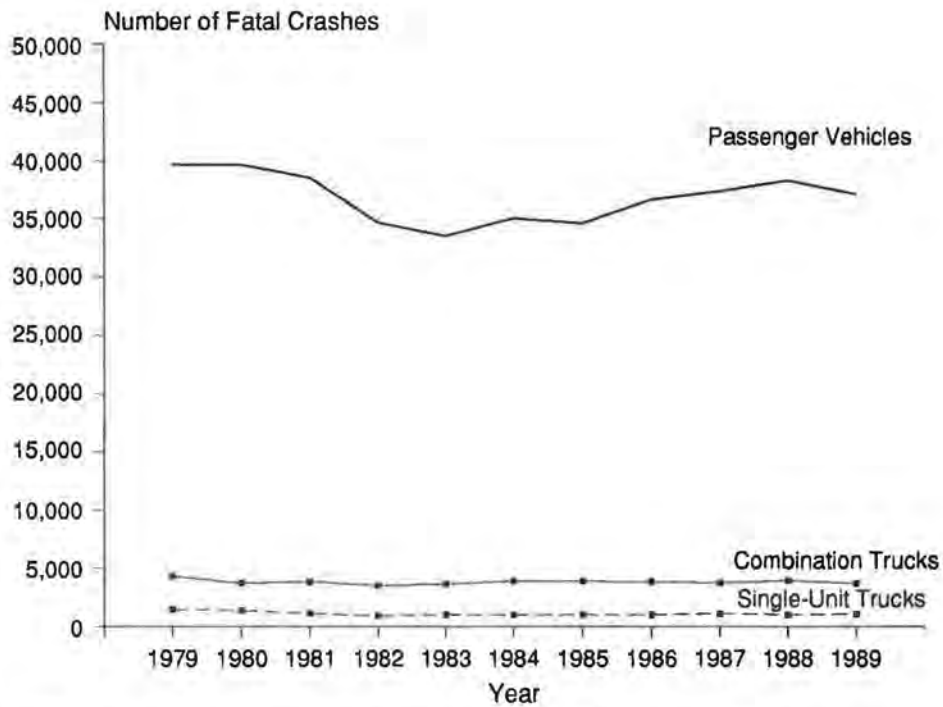


FIGURE 1 Fatal crashes by vehicle type and year, 1979 through 1989 (3).

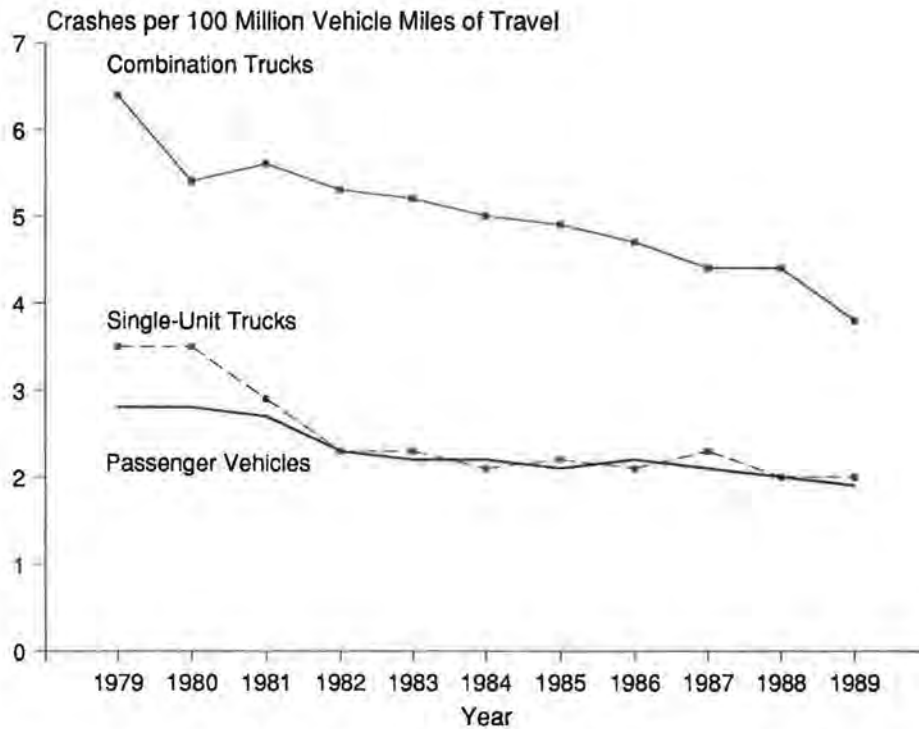


FIGURE 2 Fatal crash rates by vehicle type and year, 1979 through 1989 (3).

Medium and heavy trucks—that is, trucks with gross vehicle weight ratings over 10,000 lb—drove almost 150 billion mi in 1989, 7 percent of the 2.1 trillion mi driven by all vehicles. Trucks accounted for only 3 percent of the nation's vehicle fleet in 1989. On the basis of registered vehicles, combination trucks drove an average of 60,000 mi, straight trucks averaged 13,000 mi, and passenger vehicles averaged 11,000 mi. Of the 12 million vehicles involved in crashes of all severity, trucks made up 3 percent, or 349,000. For fatal crashes, however, 4,985 (8 percent) of the 60,870 vehicles involved were trucks. A total of 5,491 people lost their lives in truck crashes, but only 16 percent were truck occupants. Of the 124,000 people injured in truck crashes, only 26 percent were truck occupants (3).

The Congressional Office of Technology Assessment (OTA), in its study *Gearing Up for Safety: Motor Carrier Safety in a Competitive Environment* (4), made the same observation: that while annual fatalities in heavy truck crashes have remained constant over the past 10 years, four out of every five people killed in crashes involving tractor-trailers are occupants of the other vehicles.

The analysis of federal crash data in the study pointed to three significant findings. The first is that speed is a dominant factor in serious truck crashes. This finding implies a need to focus on speed limits as well as human factors and technologies related to controlling speed. Industry practice varies widely in this area. The study found that some large companies install speed governors set at about 55 mph on their fleets (at the time, the national speed limit), both to conserve fuel and to control the speed of the vehicle. The study also found that many truck drivers owned and used radar detectors and radar jamming devices for the sole purpose of avoiding detection when speeding. As a corollary, the study also found that a large number of truck drivers involved in crashes had prior records of speeding and other moving violations, as well as previous crashes. This finding is corroborated by information from NHTSA's *Summary of Medium and Heavy Truck Crashes in 1989* (3) (Table 1).

The second finding is the low level of driver training. The research showed that most drivers involved in crashes have never had any driver training. This finding indicates a need for specific attention to training programs with consideration for developing national guidelines and certification requirements for truck driver training programs. The study investigators also believe a key issue is on-the-road experience of prospective drivers. They recommend that the U.S. Department of Transportation (DOT) encourage carriers to develop apprentice programs that follow national guidelines.

The third finding in the truck crash data is the relationship of age of the vehicles involved in crashes. The age of the fleet has increased, and the expenditure on maintenance as a proportion of company income has remained flat. The study also found that 40 percent of heavy trucks involved in crashes are not subject to federal safety regulation.

TABLE 1 Drivers Involved in Fatal Crashes by Prior Convictions and Involvements and Vehicle Type, 1989

Prior Conviction and Involvement	Truck Drivers (n = 4,904)		Car Drivers (n = 50,785)	
	Number	Percentage	Number	Percentage
Recorded accident	1,109	23	8,875	17
Recorded suspension	490	10	6,072	12
DWI conviction	92	2	2,279	4
Speeding conviction	1,711	35	12,235	25
Other conviction for harmful moving violation	1,120	23	8,786	17

NOTE: Drivers can appear in more than one conviction and involvement category.

SOURCE: NHTSA

FEDERAL AND STATE MOTOR CARRIER REGULATION

Motor carriage issues have been a concern of federal and state government for decades. State governments have been regulating motor vehicle dimensions since the early 1900s. Width restrictions were the most common form of state size regulation until the 1930s. In the 1930s states began regulating height and length dimensions. The Federal Aid Highway Act of 1956, which authorized financing and funding of the Interstate highway system, also introduced the first federal limits on truck size and weight (5). However, the federal government has been involved in motor carrier safety issues since 1935, when Congress enacted the Motor Carrier Act. The major purpose of the act was to preserve and foster efficient and economical highway movements in interstate commerce and to ensure the safety of operations of commercial vehicles. The act authorized the Interstate Commerce Commission (ICC) to issue regulations for certain motor carriers with respect to maximum hours of service, qualification of employees, and safety of operation and equipment. In 1936, under the authority of the Motor Carrier Act of 1935, the ICC promulgated the original Motor Carrier Safety Regulations (6).

The 1980s were particularly difficult for the trucking industry throughout the nation. The slowdown of the economy in the late 1970s and early 1980s reduced the demand for the movement of goods by truck; economic deregulation, required by the Motor Carrier Act of 1980, created a very different marketplace for motor carriers. Barriers to entry into the business and in selected markets were eliminated as a practical matter. Pricing was also deregulated. More than 25,000 carriers have entered the industry since deregulation, the vast majority of which are small truckload operators. The entry of so many new and small truckload operators created much excess capacity and made truckload rates highly competitive. Many trucking companies could not adapt to these changes and were forced out of business.

Many opponents of economic deregulation predicted that its effects would create a deteriorating safety climate. This projection was based on predicted financial pressures that would result in deferred maintenance of equipment and aging of equipment beyond accepted life-cycle schedules for repurchase. A motor carrier strapped for cash in an intensely competitive deregulated environment will consider alternatives to replacing equipment. An obvious alternative is to keep and operate equipment longer, in which case the equipment would need more maintenance. Most maintenance can be deferred except for those elements that literally prevent the vehicle from being driven. Maintenance, especially preventive maintenance, can do much to keep older equipment safely in use. The financial pressures brought on by deregulation, to a large degree, affect those carriers that can least afford the costs of new equipment or the associated maintenance costs of aging equipment. During this period government and industry were experiencing financial difficulties, and downsizing and cutbacks in programs were common. Government and industry officials alike claimed that trucking safety programs experienced the most severe cutbacks, especially in certain segments of the industry. At a time when the trucking industry was trying to adapt to the effects of a slow economy and deregulation, state governments, especially in the Midwest and Northeast, were faced with a deteriorating highway infrastructure that would require extensive infusions of dollars to reverse the deteriorating trend. The states in turn sought and enacted tax increases on highway users, in some cases placing a heavier burden on the trucking industry. These actions added to the adverse financial environment of certain segments of the industry.

The framers of the Motor Carrier Act of 1980 had foreseen some of these consequences and in Section 19 of the act required the Secretary of DOT and the Chairman of the ICC to "develop legislative or other recommendations to provide a more efficient and equitable system of state regulations for interstate motor carriers." In their report to Congress, *Section 19—Uniform State Regulations* (6), both federal agencies recommended more uniform and less cumbersome regulatory requirements of the motor carrier industry. In the area of safety the report encouraged states to adopt the Federal Motor Carrier Safety Regulations and apply them to all motor carriers by all levels of government. The report also offered recommendations for hazardous materials regulations and oversize and overweight permitting practices. The Motor Carrier Act

of 1980 and the Section 19 report were more concerned with economic relief and efficiencies, but they laid the groundwork for the safety initiatives in future legislative actions.

Although many studies on the impacts of deregulation have been undertaken, questions have lingered about the adequacy of existing federal safety policies and programs. In direct response to this growing concern, starting with the Motor Carrier Act of 1980 to the most recent Motor Carrier Act of 1991, Congress enacted 11 legislative initiatives with significant impact on government and industry in the area of motor carrier safety. These acts dramatically raised the degree and level of governmental involvement in commercial vehicle safety (see Table 2). They created a steadily growing demand for more and tighter inspection and enforcement of safety regulations for motor carrier equipment. Three are of special significance to the states.

TABLE 2 Major Laws Affecting Motor Carrier Safety

Law	Provisions
Motor Carrier Act of 1980	Directed DOT to establish levels of insurance for ICC-regulated truckers and private and intrastate carriers of hazardous materials.
Surface Transportation Assistance Act of 1982	Established MCSAP, directed DOT to designate routes for larger trucks, mandated that states allow 80,000-lb vehicles on the Interstate system, and increased the use tax on certain vehicles and the federal gasoline and diesel tax.
Bus Regulatory Reform Act of 1982	Directed DOT to establish minimum insurance levels for interstate for-hire bus operators.
Motor Carrier Safety Act of 1984	Directed DOT to revise the Federal Motor Carrier Safety Regulations, preempt state safety requirements affecting interstate commerce that are not compatible with federal regulations, and establish procedures for determining the safety fitness of carriers.
Commercial Motor Vehicle Safety Act of 1986	Directed DOT to establish federal standards for states to test and license truck and bus drivers, establish uniform penalties for drivers convicted of serious violations in a truck or bus, and establish an information system containing data on drivers.
Truck and Bus Safety and Regulatory Reform Act of 1988	Directed DOT to eliminate certain commercial zone exemptions from the federal safety regulations and conduct rule making on driver hours of service, on-board recording devices, emergency flares, brake maintenance and inspection, and biometric identification systems for CDL records.
Motor Carrier Safety Act of 1990	Directed DOT to publicize the names of motor carriers with unsafe procedures, prohibit carriers with unsatisfactory ratings from transporting hazardous materials or passengers, establish procedures to require a highway safety specialist to initiate an enforcement action during a carrier review or whenever a serious safety violation can be proven, and establish a system to ensure that states are imposing penalties on carriers failing to return reinspection certifications.
Sanitary Food Transportation Act of 1990	Required DOT in consultation with the U.S. Department of Health and Human Services, the Environmental Protection Agency, and the U.S. Department of Agriculture to issue regulations regarding the safe transportation of food, food additives, drugs, devices, and cosmetics in motor and rail vehicles, including tank trucks, rail tank cars, or cargo tanks that are also used to transport either refuse or other nonfood products that would make food products unsafe for humans.
Hazardous Materials Transportation Uniform Safety Act of 1990	Required DOT to additional regulations for the safe transportation of hazardous materials in interstate, intrastate, and foreign commerce. These regulations must address registration, highway routing, and safety permits.
Omnibus Transportation Employee Testing Act of 1991	Required DOT to establish regulations requiring intrastate and interstate drivers of private, for-hire, and government-owned heavy trucks and buses to be tested for alcohol and controlled substances.
Motor Carrier Act of 1991	Reauthorized and expanded the MCSAP, recognized uniform commercial vehicle registration and fuel tax reporting agreements, limited the operation of longer combination vehicles, required driver training studies and standards, amended the CDL requirements, and repealed the bingo stamp program.

Surface Transportation Assistance Act of 1982

The Surface Transportation Assistance Act (STAA) of 1982 established the MCSAP, which provided federal funds for state adoption and enforcement of motor carrier safety regulations, greatly expanding the existing federal inspection force. Before MCSAP, FHWA safety specialists conducted 36,000 motor carrier vehicle and driver inspections a year. During fiscal year 1991, state inspection officials conducted approximately 1.6 million safety inspections nationally (7).

The STAA also raised taxes and fees on carriers and allowed increased access for larger and heavier trucks. The increases in fees and taxes were required to provide funding to rehabilitate the aging infrastructure of Interstate and major arterial highways and bridges in the nation, but the costs to the industry further exacerbated the financial pressures of marginally profitable companies during a recessionary period, thereby encouraging more deferred maintenance and delayed replacement of aging equipment.

The concern for the safety performance of large trucks was heightened by the expanded use of double combination tractor-trailers on Interstates and designated state and local roads following the passage of the STAA of 1982. Since the completion of large segments of the Interstate system in the 1960s, major productivity gains were realized by the industry and were followed by increased truck traffic and gradual increases in average size and weight of trucks. Over time, substantial changes had taken place in the size, mix, and volume of trucks on such highways, prompting FHWA to sponsor research into large truck safety during the 1970s. Findings from these research projects were examined closely as part of the deliberation of more liberal truck size limits incorporated in the STAA of 1982.

Commercial Motor Vehicle Safety Act of 1986

The passage of the Commercial Motor Vehicle Safety Act (CMVSA) of 1986 placed a national emphasis on establishing a uniform national program to identify, qualify, and control commercial drivers. With financial help from FHWA, the American Association of Motor Vehicle Administrators, with the member jurisdictions, developed a valid and reliable set of knowledge and skill tests designed to examine and qualify commercial drivers. The Commercial Driver License Information System (CDLIS), a national telecommunications and data exchange system to track truck and bus drivers with respect to license administration, was also developed. To date more than 6 million drivers have been qualified to the CMVSA standard and possess a nationally recognized commercial driver license (CDL).

Motor Carrier Act of 1991

Title IV of ISTEA, the Motor Carrier Act of 1991, reauthorizes and expands MCSAP, recognizes uniform commercial vehicle registration and fuel tax reporting agreements, limits the operation of double and triple trailer combinations with a gross weight of more than 80,000 lb, requires driver training studies and standards, and repeals the state public utility requirements for documents (cards kept in the truck cab) indicating payment of entry fees. The cab cards are commonly referred to as the "bingo stamp" program.

The expansion of MCSAP under the act allows states to incorporate truck weight enforcement and controlled substance interdiction activities and enforce state traffic laws in conjunction with MCSAP roadside inspections. The uniformity provision calls for the states to join the International Registration Plan and the International Fuel Tax Agreement by 1996. It also directs FHWA to conduct a feasibility study for a national Commercial Vehicle Information System (CVIS), which will serve as a clearinghouse and depository of information pertaining to state registration and licensing of commercial motor vehicles and the safety fitness of the registrants of such vehicles. FHWA is directed to initiate rule making to establish minimum

training requirements for longer combination vehicles and propose rule making for entry-level training for all other operators of heavy trucks. Finally, it includes license disqualifications under the CMVSA to include violations of out-of-service orders by drivers.

FEDERAL, STATE, AND INDUSTRY MOTOR CARRIER PROGRAMS

Many government agencies at the federal and state levels are involved in motor carrier programs, for reasons as varied as the types of agencies. For the most part, Congress and state legislatures placed responsibility for these programs in the executive agency with the expertise and mandated responsibility at the time of the congressional or legislative action.

Federal Programs

The agencies involved at the federal level for the programs of concern are as follows:

- FHWA
 - Truck access issues;
 - Highway design and research;
 - Establishment and enforcement of motor carrier regulations, including driver and equipment maintenance requirements;
 - hazardous material regulation enforcement for motor carriers, shippers by highway, and cargo tank manufacturers;
 - Truck size and weight; and
 - Longer combination vehicle policy.
- NHTSA
 - Vehicle design standards,
 - Hazardous moving violations, and
 - Accident reporting and investigation.

And the Research and Special Programs Administration establishes regulations for transporting hazardous materials.

These agencies, all within DOT, are involved in varying levels of cooperation in administering their programs. In addition, the ICC is still involved in some regulatory activity, such as insurance requirements, but since 1967 the safety programs have been transferred to FHWA, in particular the Office of Motor Carriers.

FHWA has developed three national programs to ensure compliance with federal safety requirements. The Educational and Technical Assistance Program is designed to encourage carrier compliance with federal safety requirements by upgrading their knowledge and understanding of these requirements and to establish a safety rating for the carrier. Second, the Selective Compliance and Enforcement Program is targeted at carriers that receive an unsatisfactory or conditional safety rating as part of FHWA's safety fitness review. Education and enforcement actions may be applied on the basis of finding results. FHWA also does a compliance review on carriers about which they receive complaints. Third, the Commercial Accident Prevention and Evaluation Program assists motor carriers in identifying causal factors of crashes involving their vehicles for possible countermeasure initiatives (7).

To support these programs FHWA, with the cooperation of the states and the industry, developed an information system, the Motor Carrier Management Information System (MCMIS). Since the states and motor carriers provide much of the data for this system, FHWA maintains records available for state and motor carrier use in developing or evaluating their respective safety programs. Thus far the FHWA effort is resulting in a higher percentage of satisfactory safety ratings of carriers inspected.

State Programs

The experience of fragmentation of motor carrier programs at the state level is even more diverse than that at the federal level. The departments of transportation, police, motor vehicles, driver licensing, revenue, environmental resources, and the public utilities or service commissions all play a role. In addition, state legislatures and policy officials in the governors' offices are actively involved.

The major state motor carrier safety programs are cooperative programs with FHWA. These are MCSAP and the CDL program instigated by congressional action and administered by FHWA. As mentioned earlier, MCSAP dramatically increased the number of commercial vehicle safety inspections across the nation. Of the 1.6 million inspections performed by participating states in 1991, 146,000 included hazardous materials cargos and 27,000 were bus inspections. As a result of these inspections 497,000 vehicles (31 percent) and 126,000 drivers (8 percent) were placed out of service for critical violations. In addition, 9,500 safety and compliance reviews were conducted (8).

Corollary to the MCSAP, FHWA has trained more than 6,600 federal, state, and local law enforcement personnel in the detection of illegal use of drugs, or their transportation, during roadside inspections. The program is still in its infancy, but as of February 1993, more than 140 major drug seizures had occurred, resulting in the confiscation of drugs valued at more than \$310 million. ISTEA provides funds for the expansion of this program with MCSAP.

The 1986 CMVSA is the second major cooperative effort between FHWA and the states. The primary thrust of this act directed DOT to establish federal minimum standards for licensing, testing, qualifying, classifying, and monitoring commercial drivers. These standards would prohibit commercial drivers from possessing more than one commercial license, require that commercial drivers pass meaningful knowledge and driving tests (with special qualifications for hazardous materials drivers), establish minimum disqualification provisions, and provide that a driver found to have blood alcohol content of 0.04 percent or more would receive a 1-year license suspension for the first offense and permanent license revocation for subsequent offenses. The effective date for all states to be in compliance with the CDL provisions of the act was April 1, 1992. It is too early to assess the success of the safety impacts of the act, since the mandated sanctions implementation is scheduled for October 1, 1993. However, all states are in compliance with the license requirements, and early indications are very positive.

These two major programs, MCSAP and CDL, enhanced existing inspection and driver licensing programs in the states and more importantly forced uniformity among the states in standards and practice. However, in addition to these, states have been administering commercial vehicle safety programs since the early 1900s. Among these are periodic safety inspection programs, weight and size enforcement, safety education programs, safe transportation of hazardous materials, and highway improvements relating to commercial traffic.

Industry Programs

The organizationally fragmented governmental framework appears simple when compared with the diversity of the motor carrier industries. Generally, the industry is divided into four major groupings:

- For-hire trucking, which includes common and contract carriers, inter- and intrastate, and local and exempt carriers;
- Private trucking, such as manufacturers, food distributors, public utilities, construction, and mining;
- Intercity buses; and
- Others, such as government trucks, school buses, and urban buses.

This complexity is exacerbated by the diversity within each grouping. A carrier can own anywhere from one truck to many thousands.

Some large motor carriers have in-house training, driver and vehicle inspection, and maintenance programs to increase operating safety. Some have established a full-time safety position with duties to conduct on-the-road safety surveillance. An exemplary program over the years has been one developed by United Parcel Service (UPS). UPS made a corporate commitment to safety to achieve a highway safety record considerably above the industry average. Its comprehensive safety program includes driver qualifications, rigorous training, regular vehicle schedules, and stringent vehicle maintenance. Honor awards are given to employees for safe driving. Drivers are assigned to the same vehicle over long periods of time, thus improving their familiarity with the vehicle's driving performance. UPS also follows special maintenance practices and strict preventive maintenance inspection standards, which improve the reliability of their trucks and also extend vehicle service life. It is not uncommon for UPS drivers to achieve 25 or more years of crash-free driving (9).

MCSAP has become a highly visible safety initiative that has been positively received by a large segment of the industry. The American Trucking Associations, a national trade association of the larger carriers, has supported the MCSAP legislation. It has actively sought to improve compliance with regulations; shape the skill, knowledge, and attitudes of drivers; and ensure that vehicles are built and maintained for maximum safety. The industry was also actively involved in the formulation, draft, and support of the CMVSA of 1986. They participated with FHWA and the states in the development of the testing standards and the driver training programs relating to the CDL tests.

However, most carriers are operated by one or two people who own 1 to 10 trucks. These carriers do not have such safety programs as part of their routine operations. Certain segments of the industry have been strong and early advocates for congressional and DOT safety initiatives, since they participated in their formulation, but many carriers opposed these measures and remain in opposition to this day.

OPPORTUNITIES

The motor carrier safety environment has been enhanced over the past decade through the combined efforts of Congress, federal and state government agencies, and the motor carrier industry. Many of the initiatives implemented in this time frame are proving successful or are showing promise of success in reducing the frequency and severity of commercial vehicle crashes and incidents. Additional safety enhancement opportunities are identified in the OTA study (4) and a more recent effort by a TRB committee (10). Listed are opportunities identified in the TRB report for commercial vehicle safety:

- Initiate a comprehensive government and industry program to accelerate the introduction of safety technology into the new truck fleet system. Safety enhancements such as improved truck stopping distances, improved stability, increased conspicuity, reduced underride potential, improved crashworthiness, and occupant protection in cab area should be considered.
- Assess critically the relative effectiveness of the various enforcement activities for motor carriers. The assessment should address the relative roles of federal, state, and local governments in conjunction with the industry. This information should be used to develop guidelines to ensure the most effective use of human and financial resources in improving motor carrier safety.
- Develop reliable and cost-effective methods to detect, and remove from operation, drivers who are impaired by drug or alcohol use or excess fatigue.
- Review and upgrade design practices for highway facilities to ensure sufficient consideration is given to commercial vehicles, such as the use of vehicles with longer wheelbase designs for turning, more roadside rest areas, installation of mandatory truck stops at the crest of steep grades with historically high crash frequency, reduced speed limits and arrestor beds on these types of grades, and signing at locations that present operational difficulty for large commercial vehicles.

- Develop a means to better identify chronic motor carrier violators and bring them to the attention of both public and private sector groups for corrective action. The Safetynet and CDL information systems provide an excellent tool for this effort.
- Develop effective economic disincentives to eliminate advantages currently associated with “illegal” operation. Such disincentives could include fines, penalties, and other sanctions that outweigh any economic gain of the illegal operation.
- Develop innovative programs, in conjunction with the preceding items, to identify and improve commercial drivers who have specific problems with driving performance and specify target improvement activities. Although the new CDL addresses commercial driver qualifications, it does not address any improvement efforts targeted at commercial drivers.
- Evaluate the CDL program. It is the largest national effort to date aimed at controlling a major group of drivers. The federal and state governments and the industry have committed large resources to this effort. A careful evaluation is warranted to ascertain what benefits have been obtained. In addition, if proven beneficial this program should be the model for all categories of driver licensing programs.
- Assist the trucking industry to establish and implement standard training through driver school certification using FHWA’s Proposed Minimum Standards for Training Tractor-Trailer Drivers.
- Expand drug testing efforts already under way to ultimately implement a mandatory random drug testing program.
- Develop a multiyear plan for hazardous materials transportation that cuts across the responsibilities of all federal and state agencies involved in their movement, packaging, placarding, inspection, and enforcement.
- Develop and implement a coordinated national strategic management system for motor carriage, which includes goods movement and safety.

Opportunities in research are well-defined in TRB’s *Special Report 229 (11)*. The report suggests five areas of research concerning large truck safety. The study cites the growth in the number and size of trucks expected in the traffic stream as the industry continues to take advantage of the increased size allowances of the STAA of 1982 and projected growth rates of combination truck traffic. [The Highway Performance Monitoring System data project an annual growth rate of 3.3 percent over the next decade for combination vehicles, well above the 2.3 percent average annual growth projected for traffic of all types.]

The study suggests a more concentrated effort in the following five areas:

1. *Performance capabilities of commercial drivers.* Because of the severity of crashes between large trucks and cars and the delays caused by truck crashes on congested roads, research to ensure the high performance of truck drivers is a major priority.
2. *Highway design for large trucks.* The choice of design vehicle is critical to many geometric design guidelines used by highway engineers, such as sight distance requirements for passing and stopping and provision of adequate turning radii at curves, intersections, and ramps to prevent vehicles from encroaching on opposing traffic lanes or running off the road.
3. *Evaluation of major truck safety programs.* In addition to the evaluation of the CDL as mentioned earlier, the study recommends the evaluation of MCSAP and the safety review program.
4. *Police capabilities to detect truck safety violations.* Truck safety violations, such as driving with poorly maintained or misadjusted brakes or driving overweight, have the potential to create a far greater hazard in a truck than in a passenger car because of the adverse effects of the greater size and weight of the truck in the event of a crash. Research is needed to determine what combination of enforcement strategies and technology will maximize police capabilities to deter and remove unsafe trucks from the highways.
5. *Truck safety data.* Existing truck safety data are inadequate to determine the magnitude and trends of truck safety problems and to guide actions to reduce crash losses. Several efforts under way, most notably the Center for National Truck Statistics of the University of Michigan Transportation Research Institute, FHWA’s MCMIS data base, and the minimum truck crash

data elements to be included in state accident record systems that were recommended by the National Governors' Association, can help sort through the costs and benefits of alternative technologies and determine where they can be most effectively deployed.

The expected benefits from these opportunities can be optimized only by creating partnerships between the government agencies administering and regulating motor carrier programs and the segments of the affected industry groups.

CREATIVE PARTNERSHIPS

ISTEA provides an excellent opportunity for developing partnerships between federal and state governments and the motor carrier industry. A cooperative government and industry venture can provide oversight to the existing and emerging development, implementation, and evaluation of safety programs. OTA concluded in its report that addressing motor carrier safety issues successfully requires a comprehensive strategic approach (4). OTA found that the division of responsibility for different facets of roadway, vehicle, and driver issues among multiple agencies hampers problem solving. OTA also concluded in its study that DOT agencies need to coordinate in collecting and analyzing data, conducting research programs, and developing regulatory proposals. The OTA study considered government agencies only. Industry must be included as an equal participating partner. The coordination with motor carriers and government is becoming increasingly important in the light of emerging large truck issues and technology to address these issues.

Yet there still exists an uneasy alliance between government agencies and the trucking industry in addressing managerial and technical initiatives. This was shown in the federal DOT endeavors toward uniformity in registration and fuel tax, especially in the area of weight-distance taxing mechanisms, and in the early phases of the Heavy Vehicle Electronic License Plate (HELP) program. Some of the barriers to a more cooperative working environment have been broached by the various working groups and Motor Carrier Advisory Boards that came into existence since the Motor Carrier Act of 1980. This is especially true regarding the industry and government in the case of the HELP program, and between federal agencies on certain issues, commercial vehicle operations (CVO) in particular. But institutional barriers still exist in federal and state governments and within the various industry groups. These issues must be resolved if significant enhancements to motor carrier safety are to be attained.

One initiative that may overcome these barriers is the IVHS technology being developed. A major functional area of IVHS technology is CVO. Commercial vehicles are using automatic vehicle location, tracking, and two-way communications; routing algorithms for dispatch; and in-vehicle text and map displays. These technologies can expedite deliveries, improve operational efficiency, and increase safety. Both industry and government acknowledge that the goals of the CVO can be met only with public-private partnerships.

These CVO goals are transparent state borders and electronic commercial driver and vehicle inspections. Transparent state borders refer to an electronic network that would allow commercial vehicles to travel from one state to another as smoothly and as easily as passenger cars. Compliance with registration, licensing, and permits would be verified electronically. Mileage could be reported to the states automatically. Electronic commercial driver and vehicle safety inspections would be used to verify electronically information such as a vehicle's Commercial Vehicle Safety Alliance (CVSA) inspection decal and a driver's CDL. Achieving these goals will require the resolution of many issues in technology, human factors, and standardization. However, the most fundamental issues to be resolved are institutional (12).

FHWA is addressing this obstacle by funding a CVO Institutional Issues Study. FHWA will help participating states (several states are grouping together and pooling their funding and resources) to establish a multiagency working group to identify and study how CVO technology can be implemented. A major task in this study is to "identify the types of institutional (organizational, legislative, regulatory or administrative) issues that would impede or prevent the application of IVHS technology and what institutional changes would need to be made to

resolve these issues." The Midwest Transportation Center through Iowa State University has developed a detailed work plan for such an effort for use in Iowa. This study addresses CVO implementation, but its design is readily adaptable to motor carrier safety issues in general.

The institutional issues become acutely important with the imminent international flow of commerce fostered by the North American Free Trade Agreement (NAFTA). NAFTA affirms the commitment of Canada, Mexico, and the United States to promote employment and economic growth in each country through the expansion of trade and investment opportunities in the area of free trade. NAFTA eliminates all tariffs on goods originating in the three North American countries in order to enhance the competitiveness of Canadian, Mexican, and U.S. firms in global markets. The objectives of the agreement must be compatible with provisions that protect the environment of North America. Of particular interest to this paper are the provisions removing land transportation barriers between the NAFTA countries and for the establishment of compatible technical and safety standards for land transport.

Six years after NAFTA goes into effect, each of the three countries will allow cross-border access to its entire territory to trucking firms from the other two. Consistent with their commitment to enhance safety, the NAFTA partners will endeavor to make compatible, over a 6-year period, their standards-related measures with respect to motor carrier operation, including

- Vehicles, plus equipment such as tires and brakes, weights and dimensions, maintenance and repair, and certain aspects of emission levels;
- Nonmedical testing and licensing of truck drivers;
- Medical standards for truck drivers;
- Standards relating to the transportation of dangerous goods; and
- Road signs and supervision of motor carrier safety compliance.

NAFTA includes a review process for the effects of liberalization in the land transportation sector. Five years after the agreement is in effect a committee of government officials of the three countries will review any specific problems or unanticipated effects of the agreement on each country's motor carrier industry. The results of these consultations will be forwarded to the NAFTA Trade Commission for appropriate action. The review process of NAFTA includes government officials from the three countries and provides the framework for creative partnerships between and among agencies and motor carriers for all North America.

Government officials and safety experts have long sought ways to achieve a responsible balance between ensuring highway safety and facilitating the flow of commerce. Partnerships, between and among government and motor carriers, that will address institutional barriers to accomplishing mutually agreed objectives can provide that needed balance. In an effective partnership, each party involved must receive a recognizable gain. If this gain exists and is recognized, the next most important factor is the commitment of high-level officials of the organizations involved to set goals and ensure that the agreed-upon program objectives are met. This statement sounds simplistic, especially in the light of the complexity of the issues and the fragmentation of government and industry organizations involved. It is based on the assumption that carriers, large and small, are generally interested in safety. But they will measure investments in safety innovation, whether in new equipment or driver safety programs, against tangible economic rewards. Government agencies must keep this in mind when enacting, developing, and enforcing safety regulations.

On the other hand, government requires the cooperation of the motor carrier industry to effectively meet its regulatory mandates. The past decade has witnessed an era of shrinking resources in the nation and in the world. Productivity is a key term in many areas, and commercial trucking is no exception. Improving productivity from the standpoint of both government agencies and the trucking industry is impossible without a recognition of the interconnection of the industry's financial performance and government regulation in the areas of economics, registration and licensing, taxation, and safety.

The motor carrier industry servicing North America has four major points of contact with the governments of the states and provinces: vehicle registration and driver licensing, highway

use taxation, safety, and economic regulation. In the United States, the Motor Carrier Act of 1980 effectively eliminated economic regulation and ISTEA is mandating administrative uniformity of existing state economic regulation as it affects interstate commerce. ISTEA provides for uniformity in registration and fuel tax collection. An important provision in ISTEA that can have far-reaching effects on safety management is for a feasibility study for the CVIS, described earlier. Information from CVIS, if links are provided, can be integrated with information from Safetynet and MCMIS. The implications for administrative efficiency and safety are enormous. The ability to identify illegal operation for registration and taxation can result in more equitable distribution of highway cost responsibility. By linking safety to these systems the safety enforcement capabilities would be greatly enhanced. If the CVIS becomes a reality (FHWA must report on its feasibility by January 1, 1995), it, in conjunction with information from CDLIS, Safetynet, and MCMIS, would provide an integrated decision support system for a strategic partnership between industry segments and government for motor carrier safety management.

Achieving the safety benefits suggested in this paper would require the implementation of policy initiatives by federal, state, and local governments that would establish long-term partnerships. Such partnerships would involve mid-level, and some top management, representation of government and industry organizations. These partnerships would then be responsible for setting goals for functional agencies in government and industry and would require progress reporting systems on the strategic objectives implemented to achieve established goals.

The implementing agencies would develop the strategic objectives, cooperatively, with the use of information technology of shared data bases, hardware, and software devices. The implementing agencies would report back to the strategic management partnership on their progress, successes and failures, and suggested adjustments to goals or objectives. This process suggests a highly integrated environment of management and technology, without which the benefits hoped for by government and industry in meeting the goals of ISTEA and the economic competitiveness of the nation will not be optimized.

Motor carrier safety regulation is protective regulatory policy. In the case of protective regulatory policy, it is usually the lowest organizational units of Congress and the executive branch that address the full range of issues both internally and with each other. However, when dealing with broad questions such as creation or alteration of regulatory powers, virtually no final decisions are made at these levels. Inevitably the issues are taken to higher organizational levels for continued discussion and resolution. This escalation of issues does not automatically mean final decisions will be reached. In fact, many regulatory issues are debated over and over in much the same terms for many years. But often resolution does not occur and conflicts continue (13).

Policy initiatives, such as the CVO initiative, should allow much of the regulatory conflict resolution to partnerships. Doing so could achieve a higher-level optimization toward meeting objectives of the mission of both government and industry. The author suggests neither that government abandon its mandated regulatory responsibilities to the industry, nor that the regulatory agency become "captive" to the industry to the extent that there is self-regulation with governmental blessing, but instead that government and industry work cooperatively toward mutually agreed goals that are developed in trust and concert with each other's established mission.

It is a sad fact of bureaucratic life that it is often easier to achieve cooperation between jurisdictions than it is to achieve the same degree of cooperation among the various agencies within a jurisdiction or department. The fragmentation in the motor carrier industry suggests that this is probably also true in this sector. To get these two groups together in a truly effective partnership may sound impossible or, at best, naive. However, the potential productivity and safety gains demand that this concept be investigated fully and that these obstacles be overcome as necessary. The development process of these systems and their implementation and use will go far in removing or bypassing these obstacles as jurisdictions and industry focus on mutually established goals.

REFERENCES

1. Pub. L. 102-240, *Intermodal Surface Transportation Efficiency Act of 1991* (ISTEA), 105 Stat. 1914.
2. American Trucking Associations. *Statement on the Motor Carrier Safety Assistance Program Reauthorization Act of 1991*. Senate Surface Transportation Subcommittee, March 13, 1991.
3. *Summary of Medium and Heavy Truck Crashes in 1989*. DOT-HS-807-739. NHTSA, U.S. Department of Transportation, July 1991.
4. *Gearing Up for Safety: Motor Carrier Safety in a Competitive Environment*. Office of Technology Assessment, U.S. Congress, Sept. 1988.
5. *Special Report 223: Providing Access for Large Trucks*. TRB, National Research Council, Washington, D.C., 1989.
6. U.S. Department of Transportation and Interstate Commerce Commission. *Section 19—Uniform State Regulations, Motor Carrier Act of 1980*. 97th Cong., 2nd sess., 1982.
7. *Motor Carrier Activities of the Federal Highway Administration*. FHWA, U.S. Department of Transportation, May 1992.
8. *Accomplishments and Effectiveness Annual Report*. Office of Motor Carriers, FHWA, U.S. Department of Transportation, May 1992.
9. *Moving America: New Directions, New Opportunities 1990*. U.S. Department of Transportation.
10. *Transportation Research Circular 375: Strategic Highway Safety Plan*. TRB, National Research Council, Washington, D.C., 1991.
11. *Special Report 229: Safety Research for a Changing Highway Environment*. TRB, National Research Council, Washington, D.C., 1990.
12. *Commercial Vehicle Operation Institutional Issues Study Briefing Material*. FHWA, U.S. Department of Transportation, Sept. 1991.
13. Ripley, R. B., and G. A. Franklin. *Congress the Bureaucracy and Public Policy*, 4th ed. Dorsey Press, Chicago, Ill., 1987.