

Chapter 2

Prevention and Enforcement

Prevention and Enforcement

Federal, State, and local governments share responsibility for the safe transport of hazardous materials and the prevention and control of accidents involving hazardous materials. The preeminent authority is the Federal Government, which issues regulations and sets standards governing identification and classification of hazardous materials, the design and performance of containers and equipment, and procedures for handling and transporting hazardous materials. Federal regulations also prescribe documentation of hazardous materials shipments and specify requirements for labels and placards. State prevention programs concentrate on inspection and enforcement within the framework of Federal regulations, although some States also issue regulations intended to supplement or strengthen Federal requirements, principally with respect to truck routing and notification of hazardous materials shipments. Local agencies are primarily concerned with emergency response, but they also play a role in prevention and enforcement by placing restrictions on routes and hours of hazardous materials transport and by requiring registration and permits for hazardous materials shippers and carriers operating within their jurisdictions.

In recent years, largely as a result of programs initiated and funded by the Department of Transportation (DOT), many States and local agencies have added to their regulatory authority and strengthened administrative, enforcement, and inspection procedures. They have also established or improved programs to train highway enforcement officers and to educate shippers and carriers about compliance with hazardous materials regulations.

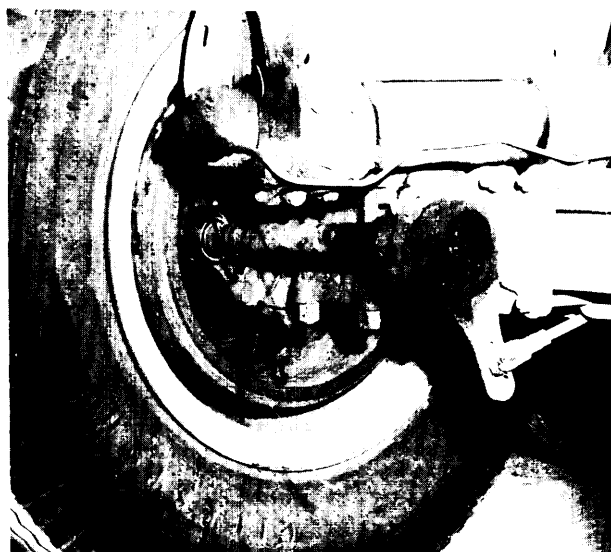


Photo credit: Research and Special Programs Administration, DOT

An accident waiting to happen—inadequate brake repair discovered during truck inspection.

This chapter reviews State and local prevention and enforcement programs that have evolved over the past 15 years and examines current State and local activities. It also discusses Federal agencies and policies affecting the capability and performance of State and local agencies. The principal sources of information for this chapter are reports filed by States participating in federally funded prevention and enforcement activities, proceedings of recent State and regional conferences on hazardous materials transportation, interviews with officials of Federal and State agencies, and an OTA workshop.

FEDERAL RESPONSIBILITIES

The Federal Government has broad and diverse authority over hazardous materials transportation. This authority is distributed among 12 different Federal agencies with regulatory or administrative responsibility for some aspect of prevention and en-

forcement (see table 2-1). The activities of DOT and the Nuclear Regulatory Commission (NRC) are of chief interest here since, to a large extent, they determine the context in which State and local agencies operate.

Table 2-1.-Federal Activities in Hazardous Materials Transportation

	Regulation of:				Planning	Recordkeeping	Inspection	Enforcement	Training	Emergency response
	Hazardous materials	Containers	Vehicles and vessels	Drivers						
DOT									X	
OHMT	X	X ^a				X	X	X		
FHWA			X			X	X	X		
BMCS			X	X ^a						
NHTSA			X							
FRA		X ^a	X			X	X	X		
FAA		X ^a	X			X	X	X		
USCG	X	X ^a	X			X	X	X	X	X
FEMA					X				X	X
EPA				X		X	X ^b	X	X	X ^c
NRC	X ^a	X						X	X	X ^c
DOE	X ^a	X				X ^d	X	X	X	X ^c
DOD	X			X		X	X	X		

^aThis category includes hazardous substances, hazardous waste and radioactive materials, and the tools for communication of those hazards such as shipping papers, placarding, and marking a package/container design.

^bEPA responds to accidents involving the release of products regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and oil spills in coastal and ocean water.

^cDepends on the type of radioactive material, severity of the accident, and the adequacy of State and local response programs.

^dIn cases of national security, DOD and DOE are not required to comply with DOT regulations provided they follow standards affording equal protection.

KEY: DOT—Department of Transportation; OHMT—Office of Hazardous Materials Transportation; FHWA—Federal Highway Administration; BMCS—Bureau of Motor Carrier Safety; NHTSA—National Highway Traffic Safety Administration; FRA—Federal Railroad Administration; FAA—Federal Aviation Administration; USCG—United States Coast Guard; EPA—Environmental Protection Agency; NRC—Nuclear Regulatory Commission; DOE—Department of Energy; DOD—Department of Defense.

SOURCE: Office of Technology Assessment.

Regulation of hazardous materials transportation by DOT is vested in five agencies: the Office of Hazardous Materials Transportation (OHMT), of the Research and Special Programs Administration, which is responsible for promulgating and enforcing regulations and coordinating the hazardous materials activities of DOT, and the four modal administrations charged with inspection and enforcement of hazardous materials transport by highway, rail, air, and water.

OHMT has general authority over all hazardous materials transportation regulation, except bulk shipment by ship or barge, which has been delegated to the U.S. Coast Guard. OHMT issues regulations designating and classifying hazardous materials, prescribing safety standards for containers, establishing requirements for labels and placards, and specifying handling, stowing, and other in-transit requirements for hazardous materials.¹ Another major OHMT activity has been administration of the State Hazardous Materials Enforcement Development Program, a cooperative program to strengthen State regulatory enforcement capabilities.

¹Regulations covering classification, shipping, packaging, and placarding of hazardous materials are contained in 49 CFR 171-177. Special routing requirements for hazardous materials, pursuant to the Hazardous Materials Transportation Act of 1974 (49 U.S.C. 1801-1811) have also been issued. OHMT also acts as DOT's liaison with the Environmental Protection Agency (EPA). EPA regulations for transporters of hazardous waste, issued under the authority of the Resource Conservation and Recovery Act, have been adopted by OHMT.

The Bureau of Motor Carrier Safety (BMCS) within the Federal Highway Administration (FHWA) is responsible for inspection and enforcement activities in highway transportation of hazardous materials and at depots and transshipment points.² BMCS, under its general authority to set motor carrier safety standards, also regulates vehicles used in transporting hazardous materials.³ In addition, BMCS administers the Motor Carrier Safety Assistance Program, which provides some financial assistance to States for enforcement of regulations governing hazardous materials transportation on public roads.⁴

The Federal Railroad Administration (FRA) enforces regulations pertaining to hazardous materials carried by rail or held in depots and freight yards.⁵ The Federal Aviation Administration has authority over shipments of hazardous materials on domestic and foreign carriers operating at U.S. airports and in airport cargo-handling areas.⁶ The Coast Guard carries out inspection and enforcement activities in port areas and on domestic and foreign ships and barges operating in the navigable waters of the United States.⁷ Responsibility for inspection

²49 CFR 177 and 49 CFR 1.48.

³49 CFR 350-399.

⁴MCSAP was created under the 1982 Surface Transportation Assistance Act (Public Law 97-424).

⁵49 CFR 174 and 49 CFR 1.46.

⁶49 CFR 175.

⁷49 CFR 176 and 49 CFR 1.46.

and enforcement of regulations pertaining to hazardous materials shipments that move by more than one mode of transportation is retained by OHMT.

Regulatory authority over transportation of radioactive materials is divided between DOT and NRC under a 1979 Memorandum of Understanding.⁷ Under this agreement, NRC sets standards for the design and performance of packages to carry fissile materials and radioactive materials that exceed Type A limits.* Currently NRC certifies all such packages and carries out the necessary inspections. NRC regulations also require that States be given advance notification of the transport of certain types of radioactive materials (including spent fuel)⁸ and provide for physical security measures to prevent deliberate acts to seize or damage shipments of strategic nuclear materials and spent fuel.⁹ Enforcement of these regulations is carried out by NRC regional offices.

DOT has regulatory authority over the design and performance of packages carrying nonfissile radio-

active materials and small quantities of fissile materials that do not exceed Type A limits. In addition, DOT governs the routing of radioactive materials designated as "Highway Route Controlled" for safety purposes.¹⁰

While OHMT exercises general regulatory responsibility for hazardous materials transportation, most day-to-day inspections and enforcement are carried out by the DOT modal administrations. These activities are often part of their overall programs to monitor compliance with other types of transportation and vehicle safety regulations.

The number of inspections and enforcement actions taken by DOT is small compared with the number of shippers, carriers, and container manufacturers throughout the country. In 1983, for instance, only 109 of the more than 20,000 container manufacturers were inspected by OHMT and FRA. The 1983 figures for shipping facilities are similarly low—5,000 of an estimated 104,000 were inspected.

The principal reason for the low number of inspections is the shortage of DOT personnel, especially those with training in hazardous materials enforcement. Table 2-2 shows the number of full- and

⁷44 F.R. 38690, July 2, 1979.

*Fissile material is that containing one or more fissile radionuclides—Plutonium 238, Plutonium 239, Plutonium 241, Uranium 233, and Uranium 235. Neither natural nor depleted Uranium is fissile material. Type A quantity limits are defined in 10 CFR 71.4 and table A-1 thereto.

⁸10 CFR 71.97 and 73.37.

⁹10 CFR 73.

¹⁰49 CFR 177.825, Docket No. HM-164.

Table 2-2.— Hazardous Materials Transportation Inspectors

	1979	1980	1981	1982	1983
Inspectors (full-time):					
USCG	0	0	0	0	0
FAA	12	12	10	0	10
FHWA	9	9	9	0	8
FRA	19	24	25	23	33
OHMT	9	10	7	6	6
Totals	49	55	51	29	57
Inspectors (part-time):					
USCG	770	770	1,298	403	570
FAA	623	176	155	138	102
FHWA	152	161	153	149	144
FRA	61	64	129	129	158
OHMT	0	0	1	1	1
Totals	1,606	1,171	1,736	820	975
Total work years					
USCG	115.5	115.50	155.76	50.00	40.00
FAA	36.9	19.04	17.75	8.20	14.08
FHWA	47.0	49.25	47.25	40.20	25.28
FRA	28.2	33.60	34.65	33.00	46.40
OHMT	9.0	10.00	7.50	6.75	6.75
Totals	236.6	227.39	262.91	138.15	132.51

KEY: USCG—United States Coast Guard; FAA—Federal Aviation Administration; FHWA—Federal Highway Administration; FRA—Federal Railroad Administration; OH MT—Office of Hazardous Materials Transportation; and work year—equivalent to a full year of work by a single inspector.

SOURCE: Office of Technology Assessment; based on DOT Annual Reports.



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tions over the 5-year period. The total work-years of inspection and enforcement for all DOT agencies combined has also dropped—237 years in 1979 to 133 in 1983, a decline of almost half.

The number and frequency of hazardous materials shipments; the vast extent of roadways, waterways, and rail lines to be covered; and the variety of materials involved all dictate an inspection and enforcement program of much greater scope than Federal agencies presently offer. Based on the minimal number of inspections that have been carried out, the rate of noncompliance and safety violations is high. The Federal Government in recent years has begun helping the States to strengthen their inspection and enforcement capabilities, particularly for truck transport, since the number of trucks carrying hazardous materials constitutes the largest hazardous materials fleet in any mode. Truck safety inspections have also been a traditional function of State enforcement officers. In the early 1980s, the Federal rail inspection force was increased, and there has been a commensurate improvement in the rail safety record.

STATE ENFORCEMENT AND INSPECTION CAPABILITIES

The entry of State governments into the field of hazardous materials transportation safety began in earnest in the early 1970s. A series of episodes involving radioactive materials prompted States to call for more vigorous efforts to monitor and control the shipment of hazardous materials. Since it was apparent that the resources committed by the Federal Government to police shipments of radioactive material—much less other, more common, forms of hazardous materials—were inadequate, the States themselves began to seek ways to develop inspection and enforcement capabilities. The task was formidable since States then had virtually no organizational structure, legal authority, or personnel with specialized competence in the area of hazardous materials control.

Evolution of State Programs

In 1973, DOT and NRC's predecessor, the Atomic Energy Commission, undertook a program in cooperation with nine States to collect data on the amount and type of radioactive material originating in or passing through selected locations. This effort, known as the State Surveillance of Radioactive Materials Transportation Program (SSRMT), was directed at determining the magnitude of the problem posed by radioactive materials and the degree of regulatory noncompliance by shippers and carriers.

As expected, the SSRMT study found several inadequacies in data collection and recordkeeping; it

also pointed to important needs in the area of enforcement:

- Imposition of civil penalties and suspension of permits to use radioactive waste burial sites were needed to reduce violations in the disposal of radioactive material.
- Increased education of handlers and drivers was needed to heighten their safety awareness and to lessen their exposure to radiation.
- Enforcement by police cars equipped with radiation detectors (a program undertaken in Illinois) was found to be especially useful in identifying improperly placarded vehicles.
- Remote surveillance (for example, a geiger-counter mounted on a parked patrol car can detect gamma rays emitted by passing trucks or vehicles) could provide valuable data on shipping patterns and assist in determining the extent of compliance by shippers and carriers.
- Requiring appropriate placarding and shipping documents would provide emergency response personnel with better information in the event of a transportation accident.

In addition, SSRMT pointed out the need to strengthen State-level prevention and enforcement mechanisms for all types of hazardous materials. SSRMT findings thus helped form the basis for a much more substantial Federal program to aid in the development of State hazardous materials safety programs.

State Hazardous Materials Enforcement Development Program

Shortly after the SSRMT study was completed, responsibility for administering Federal-State cooperative programs was transferred to OHMT. Under OHMT, the programs were broadened to include all classes of hazardous materials, and emphasis shifted from data collection to regulatory enforcement, especially development of State organizations that could assume a greater share of inspection and enforcement functions.¹¹

In 1981, OHMT initiated a wide-ranging effort to increase State and local capabilities in managing the

transportation of hazardous materials. The State Hazardous Materials Enforcement Development Program (SHMED), designed to assist States in the enforcement of hazardous materials safety standards and regulations, primarily those pertaining to highway transportation, was a major component. SHMED had two objectives: decreasing the number of hazardous materials transportation accidents by strengthening State enforcement capabilities and promoting uniformity in State hazardous materials safety regulations and enforcement procedures. SHMED offered participating States contracts to conduct a three-phase program. The first phase, funded at a maximum of \$20,000 per State, concentrated on data gathering, passage of enabling legislation, and adoption of Federal regulations. The second phase had a funding limit of \$40,000 and required States to develop and implement an inspection program. In the third phase, with funding of up to \$60,000, States had to establish enforcement procedures.

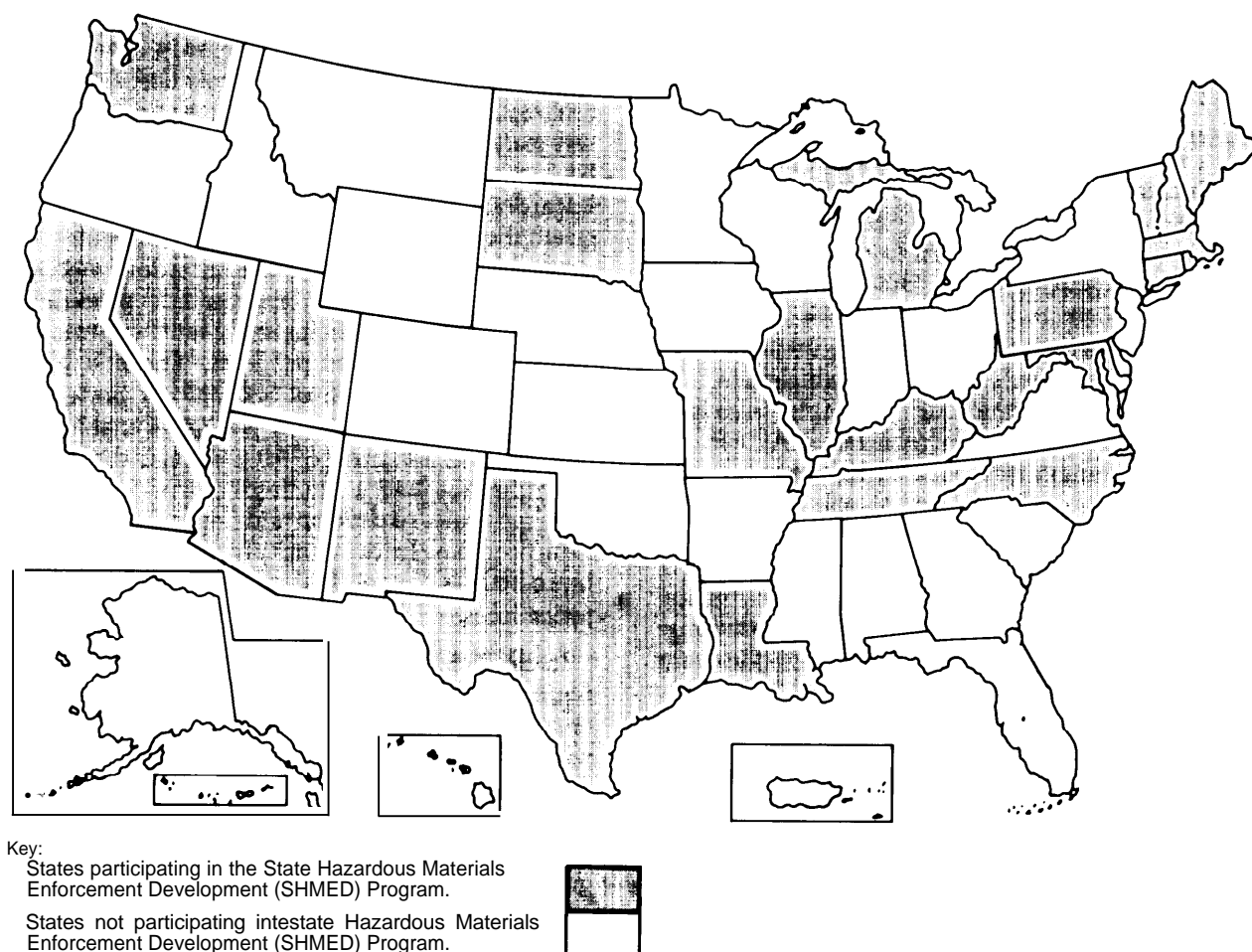
In all, 25 States have participated in SHMED (see figure 2-1). Compared to most Federal-State cooperative programs, SHMED is small. The 1984 budget was \$1.1 million, and overall expenditures through 1986, when the program expires, will amount to just over \$3 million. Nonetheless, it has had a significant influence in shaping State enforcement programs and in defining what constitutes an effective program. While some States, such as New Jersey, have established enforcement programs without SHMED support, the majority of existing State programs have had SHMED funding.

Motor Carrier Safety Assistance Program

When the SHMED program ends this year, Federal support of State multimodal hazardous materials enforcement capabilities will diminish, and there will be no programs specifically targeted to hazardous materials transportation by rail, water, and air. However, Federal funds for State inspection and regulatory enforcement on the highways will be available through the Motor Carrier Safety Assistance Program (MCSAP). Authorized under the Surface Transportation Assistance Act of 1982 (Public Law 97-424), MCSAP makes grants to States for "the development and implementation of programs for enforcement of Federal rules, regulations, stand-

¹¹Steve N. Solomon, *State Surveillance of Radioactive Materials Transportation: Final Report, NUREG-1015* (Washington, DC: U.S. Nuclear Regulatory Commission, Office of State Programs, 1984).

Figure 2-1.—States Participating in the State Hazardous Materials Enforcement Development Program



SOURCE: Office of Technology Assessment.

ards, and orders applicable to commercial motor vehicle safety and compatible State rules, regulations, standards, and orders.” MCSAP covers all aspects of truck safety, and the act specifically indicates that it may apply to enforcement of rules pertaining to vehicles used to transport hazardous commodities.

MCSAP is financed through the Highway Trust Fund under a 5-year authorization: \$10 million was authorized for fiscal year 1984, and \$10 million was to be added each year up to a maximum of \$50 million by fiscal year 1988. The Federal grants were to be matched by States on an 80:20 basis. To date, actual appropriations have been significantly lower.

Under MCSAP, States may apply for two types of grants. Development grants, available for a maximum of 3 years, provide funding for States needing

to establish or substantially modify an enforcement program. Implementation grants provide funding for States ready to initiate or continue established enforcement programs. To qualify for an implementation grant, a State must:

- agree to adopt and enforce the Federal Motor Carrier Safety Regulations (49 CFR Parts 390-399, including highway-related portions of the Federal Hazardous Materials Regulations) or compatible State rules;
- submit an enforcement and safety program plan and designate a lead agency for administering the plan;
- agree to devote adequate resources to administration of the program and enforcement of rules, regulations, standards, and orders; and

- have established statutory authority for right of entry into vehicles and facilities.

The MCSAP grant program, administered by the Bureau of Motor Carrier Safety or FHWA, is designed to improve State capabilities to enforce motor carrier safety regulations and to enable States to increase safety inspections of intrastate and interstate commercial vehicles. The development of an accurate database on compliance with safety regulations is a secondary goal of MCSAP, and funds may be used for data collection, storage, and analysis. The legislation also authorizes inspections (including hazardous materials inspections) of commercial vehicles in terminals and along highways. The projected total amount of development and imple-

mentation grants under MCSAP is more than \$14.6 million for 1985. Figure 2-2 shows the States participating in MCSAP.

State officials committed to expanding hazardous materials enforcement have expressed concern that MCSAP may give priority to general motor carrier safety programs and that hazardous materials enforcement activities—especially those for nonhighway modes—will be slighted. The State lead agencies for MCSAP are generally highway-oriented and often are not the lead agencies designated by the State for the SHMED program. However, at least one State, Indiana, which did not completely adopt 49 CFR until January 1985 and did not participate in the SHMED program, has used MCSAP funds

Figure 2-2.—States Participating in the Motor Carrier Safety Assistance Program, August 1985



SOURCE: Office of Technology Assessment.

to train and put into operation hazardous materials inspection teams. Since MCSAP funds are restricted to highway safety purposes, the broader question arises of how States are to develop or improve inspection, regulation, and enforcement for other modes of transportation, because no similar Federal programs exist for water, rail, or air. Although some State inspectors have been trained in rail safety regulations and enforcement procedures, they are not trained to carry out hazardous materials inspections. Particular concern has been expressed by States with high concentrations of non-highway hazardous materials shipments.

Commercial Vehicle Safety Alliance

In an initiative independent of the Federal Government, 26 States and the Canadian Provinces of Alberta and British Columbia formed the Commercial Vehicle Safety Alliance (CVSA) in 1980. Created under the leadership of California, Idaho, Oregon, and Washington, CVSA seeks to foster interstate cooperation in establishing uniform safety inspection standards for trucks. Under the terms of the Alliance, members agree to use identical inspection standards and out-of-service criteria and to honor the inspections of other jurisdictions. In this way, CVSA hopes to secure greater acceptance of motor carrier inspection programs by the trucking industry and to reduce delays caused by duplicative inspections of interstate truck shipments.

CVSA inspection standards and procedures have been developed in cooperation with BMCS and OHMT. The inspection process concentrates on the critical items (brakes, steering, tires, wheels, couplers, and suspension) most frequently identified as causes of truck accidents. In addition, the driver's qualifications and log book are checked. CVSA has recently added hazardous materials inspection standards and out-of-service criteria to its procedures. On passing inspection by a CVSA jurisdiction, the vehicle receives a decal valid for 3 months allowing it to travel through member States without further inspection unless a readily visible defect is detected. Reciprocity, uniformity, and consistency are the key concepts of the Alliance.

A CVSA associate membership program has recently been formed through which industry members serve in an advisory and nonvoting capacity to contribute their views, experience, and concerns. Since many of the States participating in CVSA are involved in SHMED and MCSAP as well, State agencies and personnel are developing a nationwide program of State-level hazardous materials transportation inspection and enforcement capability. The three organizations now hold joint national and regional meetings. CVSA sees its role as providing a link between Federal and State agencies responsible for motor carrier and hazardous materials inspection and enforcement.

CURRENT STATE ACTIVITIES

Building an effective inspection and enforcement capability at the State level has been a slow process. Ten years ago, few States had the requisite legal authority, organization, or personnel for conducting inspections of hazardous materials shippers and carriers, and enforcing safety rules and regulations. The Federal and State programs described above have helped to develop this capability, and most States now have organizations and programs in various stages of formation or operation. Generally, the process has involved the following steps:

- adopting enabling legislation and regulations,
- developing data collection mechanisms and information networks,

- establishing inspection and enforcement forces, and
- training inspectors.

Adopting Legislation and Regulations

A condition of State participation in MCSAP is that States wishing to participate must first pass legislation adopting Federal motor carrier safety regulations (49 CFR Parts 390-399) and those portions of Federal hazardous materials regulations pertaining to shipments on public highways (49 CFR Parts 171-173 and 177-178). As of August 1985, and sometimes only after lengthy legislative proceedings, all

but two States had adopted 49 CFR wholly or in part.

However, despite this strong Federal encouragement for uniform regulations and enforcement policies across all States, great variation from State to State remains, making familiarity with numerous State laws a burdensome necessity for interstate carriers, and development of nationally standardized training difficult. Some States exempt specific commodities, such as agricultural fertilizers; others exclude private carriers from regulation. In Illinois, hazardous materials regulations apply only to quantities that require placarding by Federal law; in South Dakota, shipments of flammable and combustible liquids are exempt.¹²

Data and Information Collection

An important first step for many States has been collecting data on hazardous materials shipments by truck and rail and on the degree of compliance with regulations. These data are used to clarify the nature and extent of the enforcement problem and to support legislative or regulatory actions that may be needed. (Because of the special importance of data collection, this aspect of State programs and the problems that States have encountered with it are treated in detail in chapter 4 of this report.)

Some States gather data on hazardous materials commodity flow by surveying drivers and inspecting trucks at weighing stations or checkpoints along major routes. Such surveys can be expensive and time-consuming, but can provide valuable data to guide enforcement efforts.

However, most States have concentrated on recording data on violations of hazardous materials regulations and do not yet have extensive data collection programs, relying instead on spot checks and reports of violations generated by enforcement agencies. For example, prior to expanding their enforcement programs, Texas and Illinois officials reported that they had no statistics on compliance, but that their experience indicated significant non-compliance by intrastate motor carriers. Massachusetts found that when data collection began under

the SHMED program, it was not uncommon to find at least one violation for every truck inspected.]¹³ States with more advanced enforcement programs are now using computerized data management systems to monitor the effectiveness of their efforts. Utah, Washington, Oregon, and Idaho have established management information systems that make use of data on truck accidents and truck traffic violations collected by the State and BMCS.

California has put in place a hazardous materials registration program and is currently establishing a computerized statewide database and information system, scheduled to be operational in mid-1986. The system consists of a profile of all carriers that currently carry hazardous materials or are likely to become involved in hazardous materials transportation in the State. The profile includes data on licensing, inspection records, citations, and spills. Monthly reports will list all carriers with a hazardous materials license due to expire in 90 days. The reports will be sent to the carrier and to the California Highway Patrol (CHP) along with a copy of each carrier's current profile. The database will also include a record of all highway hazardous materials incidents reported throughout the State. Monthly incident summaries will be issued by highway patrol subarea. The California system will have access to the information systems of BMCS and OHMT.¹⁴

State data collection capabilities will be further enhanced when an integrated Federal-State data network, known as SAFETYNET, is made operational by BMCS. SAFETYNET will tie together the present BMCS Motor Carrier Safety database with the OHMT Hazardous Material Information System and various computer-based State systems. The Motor Carrier Safety database now contains information on more than 200,000 interstate carriers and 25,000 hazardous materials shippers. It can report all of the known carriers domiciled in a region, rank them by the average number of driver and vehicle violations found per inspection, list the number of truck inspections each carrier has undergone, and give the date of the most recent safety audit. Once SAFETYNET is operating, BMCS and participating States should be able to:

- input driver-vehicle inspection data,

¹²U.S. Department of Transportation, Materials Transportation Bureau, "State Hazardous Materials Enforcement Development (SHMED) Program Workshop Proceedings," unpublished typescript, 1983, pp. 121 and 183.

¹³Ibid., p. 146.

¹⁴California Highway Patrol, "SHMED Program System Objectives and Scope," unpublished typescript, 1984, p. 3.

- . update and query inspection data,
- . update and query carrier census data,
- query safety management audit summary data,
- query accident report summary data,
- query inspection workload data, and
- generate system reports.¹⁵

A demonstration program involving four States—North Carolina, Colorado, Oregon, and Michigan—is in progress. The eventual goal is to include all States in SAFETYNET, but this may take 10 years or more to accomplish. Funding is to be provided in a variety of ways—through SHMED, MCSAP, other BMCS grants, and State-appropriated monies.

Inspection and Enforcement

In many States, hazardous materials inspection authority is divided among several agencies. Usually, the State highway patrol is charged with roadside inspections, and another agency, such as the Department of Transportation, has authority to conduct inspections of terminals. In addition, a specialized agency may be empowered to inspect carriers of radioactive materials. In an effort to centralize hazardous materials inspections, Maryland has designated the State Police as the only inspection force, with broad powers to stop and inspect vehicles carrying all classes of hazardous materials. Other States, Michigan and Massachusetts, for example, took a similar approach and established specialized units of the State highway patrol that are trained in and solely responsible for hazardous materials inspections.

Systematic, thorough, and consistent inspection procedures are important if the safety of hazardous materials transportation is to be improved. State inspectors who have received training connected with federal sponsored programs generally employ procedures that conform to Federal practice. OHMT has issued a series of inspection guidebooks that contain simplified, standard procedures. Developed with assistance from BMCS and CVSA, the guidebooks cover roadside procedures (stopping vehicles, exterior and interior inspection, putting a vehicle out of service, etc.) and terminal inspection procedures (warrantless entry, review and copying of documents, and seizure of a vehicle or its contents).

¹⁵Ibid., p. 2.



Photo credit: Research and Special Programs Administration, DOT

Inadequate blocking and bracing of containers for rail transportation can cause damage and spills.

A 1983 informal survey of States participating in SHMED¹⁶ identified the following as the most common violations found during roadside inspections:

- failure to display the correct placard,
- failure to block or brace hazardous materials containers,
- leaking discharge valves on cargo tanks,
- improperly described hazardous wastes,
- . inaccurate or missing shipping papers, and
- . excessive radiation levels in the cab of the truck.

Accurate placards and shipping papers are particularly important for the safety of first responders to hazardous materials emergencies, as they provide essential, basic information on the nature of the problems the responders face. State enforcement officials estimate that one-quarter to one-half of all hazardous materials vehicles have improper placards. *

¹⁶U.S. Department of Transportation, Research and Special Programs Administration, "Quarterly State Hazardous Materials Enforcement Development (SHMED) Program Progress Reports: 1984 -85," unpublished reports.

*Estimates received during the course of OTA research. State officials familiar with roadside truck inspections in at least 10 States were asked how many trucks had been found to be incorrectly placarded.

A Virginia Department of Transportation study found the rate to be at least one-third.¹⁷ Improper placarding means that the immediate source of information for first responders will frequently be faulty.

Enforcement policies affect violation rates, and violations are often treated differently from State to State and among different agencies in the same State. In about half of the States, inspectors have enforcement powers and can issue citations for violations. In the other half, inspectors can only report violations to a separate agency empowered to enforce regulations and assess penalties. Some States provide only for civil penalties; others give the enforcing agency the option of civil or criminal penalties depending on the severity of the violation and the violator's record. In some States, the policy is to issue written warnings to first offenders. Other States use more stringent measures; in Texas and Vermont, for instance, any violation of a hazardous materials regulation is automatically a criminal misdemeanor.

Fines for similar violations differ among the States. In South Dakota, where no penalties were specified by the State legislature when Federal regulations were adopted, all violations are automatically treated as petty misdemeanors. Texas has a \$200 limit on fines, while Illinois may impose fines of up to \$10,000 per day, per violation. Illinois has tried to ensure that similar offenses receive similar fines and has developed a rating system based on a matrix assigning a numerical value from one to five to such factors as the gravity of the violation, the degree of culpability, the history of prior offenses, and the ability to pay. A violator can be assessed up to 40 points, each representing a \$250 fine. The accused violator may appeal the fine before an administrative hearing officer who may reduce the penalty or set it aside.¹⁸

The need for a consistent State enforcement policy is apparent when violations are prosecuted by local city or county attorneys. Local prosecutors and

judges often are unfamiliar with hazardous materials regulations and may underestimate the seriousness of the offense or misunderstand the regulations. To improve local prosecution of violators, enforcement officers in some States provide local judges and prosecutors with regularly updated information on the regulations.

Enforcement officers report four problems commonly encountered in prosecuting hazardous materials violators. First, due to a lack of training or experience, officers often do not provide adequate documentation in the inspection report or have not followed correct procedures. As a result, many cases must be set aside or the charges reduced. Second, enforcement officers find that many judges and local prosecutors have difficulty understanding hazardous materials regulations and respond by dismissing cases or lowering penalties without cause. A third problem is in obtaining assistance from other agencies in preparing evidence for court proceedings. State agencies are sometimes unwilling to cooperate in testing hazardous materials or in providing other technical assistance. In some instances, State facilities may be willing to help, but they cannot provide certain kinds of tests or technical analysis, or they cannot do so in a timely manner.¹⁹ Fourth, State enforcement agencies complain that fines are too low to serve as a deterrent to noncompliance. Many carriers and shippers treat fines as a cost of doing business.²⁰

Training Inspectors

Training programs sponsored by the Federal Government have increased the number of State inspectors trained in hazardous materials, but there are still great disparities among the sizes of State inspection forces. California has a large, well-trained force as part of CHP. In 1983, the hazardous materials inspection unit consisted of 93 civilian commercial vehicle inspectors, 132 traffic officers who operated 40 platform scales and 9 other inspection facilities, 67 traffic officers trained and equipped for mobile road inspections, and 130 civilian motor carrier

¹⁷J.W. Schmidt and D.L. Price of Virginia Polytechnic Institute, *Hazardous Materials Transportation in Virginia* (Richmond, VA: Virginia Department of Transportation Safety, 1980), p. XIII.

¹⁸U.S. Department of Transportation, Materials Transportation Bureau, *Annual Report on Hazardous Materials Transportation, Calendar Year 1983* (Washington, DC: U.S. Government Printing Office, 1983), p. 126.

¹⁹Captain Richard Landis, in U.S. Congress, Office of Technology Assessment, "Transcript of Proceedings—OTA Workshop on State and Local Activities in Transportation of Hazardous Materials," unpublished typescript, Washington, DC, May 30, 1985.

²⁰U.S. Department of Transportation, *Annual Report*, op. cit., pp. 71-72.

specialists who performed off-highway and terminal inspections.²¹ Few other States have such extensive systems. Vermont, for example, has only part-time inspectors, and some States have no inspection force at all.

Inspecting vehicles for compliance with Federal and State hazardous materials regulations requires specialized training, knowledge, skill, and experience. Most States do not have the resources for an independent training program and send inspectors to the Transportation Safety Institute (TSI), a multi-modal training establishment supported by the Department of Transportation.

TSI offers instruction at its facility in Oklahoma City and at State-operated sites if requested; its courses are open to Federal, State, and local government employees and to private industry. Priority for enforcement courses has been given to trainees from States participating in SHMED.

In addition to courses on radioactive materials, TSI offers two inspection courses: one in hazardous materials compliance and enforcement and one in cargo tank compliance and enforcement. Both are organized into three phases: a self-study introduction that the student completes before attending class, a week of classroom instruction based on case studies, and a field exercise to be completed independently by the student once back on the job. In 1984, TSI trained more than 2,500 enforcement officers in courses offered at 29 locations.

A few States, notably California and Illinois, operate extensive training programs, staffed either with their own personnel or by instructors provided by TSI. CHP conducts a comprehensive State training program, during which uniformed CHP inspection officers attend a 20-week basic law enforcement training course on hazardous materials inspection procedures at the CHP Academy. Officers are then assigned to field commands where they receive 30 days of training from veteran CHP inspectors. In addition, officers receive periodic refresher training

throughout the year at their field headquarters and return to the Academy every 3 years for in-service training. CHP officers assigned exclusively to commercial enforcement duties at inspection and scale facilities and on mobile units are selected from veteran inspection officers. They attend an 80-hour commercial enforcement class at the Academy, with retraining every 2 years. Civilian inspectors assigned to CHP inspection duties must have at least 1 year of experience in the maintenance of heavy-duty commercial vehicles. They attend the 80-hour enforcement class at the Academy and receive additional in-service training every 2 or 3 years. CHP also provides training for other State agency personnel involved in hazardous materials management and for employees of the regulated industries. Two-day hazardous materials seminars are conducted as needed for these groups.²²

Private firms also offer hazardous materials training, and courses on inspection and enforcement are available from a wide variety of organizations. State officials indicate that the courses vary in content and suggest that the Federal Government or a national, professional group should develop a standardized curriculum and uniform training guidelines.

In recognition of the complexity of hazardous materials regulations, several States have set up programs to educate industry about compliance and enforcement procedures. Maryland, California, and Illinois work closely with the trucking industry, through State and local industry associations to promote voluntary compliance. Enforcement officials in Maryland hold informational meetings regularly with industry groups and ensure that new regulations or procedures are covered by the press. CHP conducts training for industry personnel to acquaint them with inspection requirements. Illinois postponed implementation of its enforcement program for 2 years to allow industry time to assimilate the regulations and move toward voluntary compliance.

²¹National Conference of State Legislators, *Hazardous Materials Transportation: A Legislator's Guide* (Denver, CO: 1984), p. 36.

²²U.S. Department of Transportation, "SHMED Program Workshop Proceedings," op. cit., p. 126.

CASE STUDIES: STATE PROFILES

No two State enforcement programs are alike. Some are large and well-financed; others have smaller resources and are tightly focused. The following short profiles of the programs in Illinois, Washington, and Maryland highlight some of the interesting accomplishments of State programs.

Illinois

Before 1977, Illinois had no central regulatory agency responsible for hazardous materials transportation and no State enforcement program. Once a study identified these deficiencies, the legislature authorized the Illinois Department of Transportation (IDOT) to regulate the transportation of hazardous materials on the highways and gave the State Police enforcement power. In 1979, the Illinois legislature adopted regulations that included 49 CFR Parts 171, 172, 173, 177, and 178 and Part 379 of the Bureau of Motor Carrier Safety Regulations. The Illinois regulations differed from their Federal counterparts in some important respects: Illinois set a higher threshold of applicability, exempting from regulation all hazardous materials that, under Federal regulations, do not require placarding. It also excluded certain agricultural products shipped between farms. By narrowing applicability, Illinois targeted bulk shipments—deemed the most important safety problem—for enforcement efforts.

Training of State Police officers was a key component in the enforcement program. Initially, 32 officers were trained in basic hazardous materials inspection and cargo tank inspection at TSI in Oklahoma City. As the State program developed, IDOT set up its own 3-week basic training program, supplemented by regularly scheduled refresher courses. Both the basic training and refresher courses focus on the regulations, procedures for conducting inspections, and methods of preparing a case for prosecution. During training, case studies are presented to demonstrate successful and unsuccessful techniques. Training also emphasizes use of standard equipment issued by on-the-road inspectors for de-

tection and recording of violations and for personal safety—items such as cameras; binoculars; vehicular-mounted detection and surveillance apparatus; explosive meters; and protective footwear, coveralls, and masks. IDOT attorneys and industry representatives participate in the training program to ensure that as many affected parties as possible are well informed.

In order to promote industry compliance, IDOT introduced the enforcement program slowly and deliberately. The first fines were levied 2½ years after regulations were adopted. This gave the regulated industries time to become familiar with the regulations and afforded inspectors a protracted training period. From 1979 to 1981, the Hazardous Materials Department of IDOT sent copies of the regulations with explanations to all State industries that were potential users or producers of hazardous materials. (The mailing list is kept current and used to inform industry of changes in regulations and enforcement.) The Department set up seminars and work sessions to discuss the regulations and procedures with such industry groups as the Illinois Trucking Association, the National Tank Truck Carriers, and the Tank Truck Manufacturers Association. In the meantime, State Police inspectors issued Notices of Apparent Violation to drivers and sent copies to the Hazardous Materials Department of IDOT. The Department notified the offending companies, explaining the regulations and apparent violation. After this period of education and training, the Department began sending frequent offenders letters warning that continued violations would mean fines up to \$10,000. The letter explained the fine system and appeal process.

During the first 3 years of inspection, the number of violations found by inspectors remained at approximately 2,400 annually, but the mix of violations changed. Minor violations, such as mistakes in paperwork or a torn placard, decreased, while major violations rose. IDOT attributes the decline in minor violations to the educational program for industry conducted by the State. IDOT concludes that

the rise in major violations found by inspectors was due to the in-service training the inspectors received and to the experience they gained on the job.²³

In a 1983 study, IDOT performed a Critical Safety Analysis of truck survey data to quantify the effects of its accident prevention program. It found that the chief problem was private, intrastate hazardous materials carriers. The analysis showed that, while private carriers accounted for one-third of the mileage traveled by all common carriers, they were involved in three-quarters of the hazardous materials accidents recorded throughout the State.²⁴

Washington

Washington's enforcement program exemplifies a State program that has been improved by a management information system. Officials of the Washington Utilities and Transportation Commission report that the most useful component of this system is the Critical Safety Management Breakdown Analysis. It utilizes two existing databases, the Computerized Accident System and the Carrier Profile System, to track carriers frequently involved in accidents or found to be in violation of regulations.

The Computerized Accident System includes all truck accident reports filed by enforcement agencies in the State. Hazardous materials involvement is noted on the field report, which is analyzed before it is entered into the computerized information system. Analysts make followup calls to carriers when the validity of the field report seems questionable. The followup checks have helped provide an accurate count of accidents involving hazardous materials. Based on their experience with the Computerized Accident System since 1975, State officials conclude that investigating officers do not always have sufficient training to evaluate accurately a situation that may involve hazardous materials. While investigators generally recognize blatant violations, they frequently miss less obvious incidents or make mistaken identifications. Between January and June 1983, statistical analysis identified 38 accidents involving hazardous materials, of which only 14 were recognized as such by the investigating officers. The remainder were identified through followup inves-

tigations. Washington State officials suspect that many hazardous materials spills are never reported, particularly those in which quantities are below placarding requirements. They suggest that obtaining an accurate picture of hazardous materials incidents requires careful analysis and followup of accident data from field reports.

The second database, the Carrier Profile System, is a computerized record of all violations, assembled by carrier. The system records the violation by date, time, and location and describes the action taken by State enforcement agencies. The database includes both hazardous materials violations and other forms of motor carrier safety violations.

The Critical Safety Management Breakdown Analysis integrates the two databases and identifies and keeps records on hazardous materials carriers that have frequent accidents or violations. State officials report that the system provides the quantifiable data necessary to evaluate the effectiveness of the hazardous materials enforcement and prevention programs.

Maryland

Maryland's hazardous materials enforcement program began in the early 1970s with a survey of the transportation of radioactive materials. The State expanded the program to cover all classes of hazardous materials in 1981. Inspections are conducted by specially trained State Police officers posted at points throughout the State, including several on Interstate routes. Inspections are performed daily on a random basis.

Maryland has developed a well-trained inspection force. The State has fully utilized TSI's outreach activities, sponsoring three courses with about 50 students enrolled in each. The first group of officers to be trained was drawn from select units of the State Police Truck Enforcement Division that patrols major interstate highways. After the officers had completed the course conducted by TSI on-site in Maryland and were ready for field work, they received 2 months of on-the-job training under the supervision of Federal hazardous materials inspectors from BMCS and OHMT. During this time, roadside inspections were performed, but only warnings, not citations, were issued. State officials used this grace period to contact the Maryland Motor Truck Asso-

²³ *Ibid.*, p. 126.

²⁴ *Ibid.*, p. 204.

ciation and major independent truckers to inform them of Maryland's hazardous materials regulations and enforcement program and to solicit voluntary compliance. Maryland officials feel the grace period enabled novice inspectors to gain experience and allowed hazardous materials carriers time to adjust to the new regulatory requirements.

As a matter of policy, Maryland regularly informs the trucking industry about regulations and enforcement practices. The State Police have developed a training program for commercial carriers, and officers hold frequent meetings with industry groups. Whenever an inspector cites a truck for a violation, the State Police department sends a copy of the traffic safety report to the Maryland Truck Association for forwarding to the truck company. In this way, the company is notified of the violation in time to take whatever corrective action may be needed on other trucks in their fleet.

Even though the number of violations has not declined appreciably, Maryland officials believe the en-

forcement program has been effective. During the second quarter of 1984, the State Police made 1,106 roadside inspections and issued 88 citations and 263 warnings. Officials note that the incidence of detected violations, about one for every three vehicles inspected, has remained essentially constant since enforcement began in 1982. They attribute the lack of decline, despite vigorous enforcement, to several factors. First, the inspection officers are increasingly skilled and sophisticated in their ability to detect violations. Second, fines assessed by the Maryland courts are low, and enforcement officials believe they have a minimal preventive value. Third, much of the hazardous materials traffic on Maryland highways is passing through and thus not easily influenced by State enforcement activities.²⁵

²⁵Maryland Department of Mental Health and Hygiene, *SHMED Quarterly Report, April-June 1984*, unpublished report filed with U.S. Department of Transportation, 1984.

STATE AND LOCAL ACCIDENT PREVENTION ACTIVITIES

While State agencies undertake most enforcement and inspection tasks for hazardous materials, local government agencies are concerned primarily with emergency response and public safety in the event of transportation accidents and spills. Both State and local governments have authority over accident prevention measures and protection of public safety, including: restriction of the routes that hazardous materials shippers may use or hours when shipments are permitted; requirements for licensing, registration, or permits; advance notification or other special procedures; and escorts for hazardous materials movements. Because compliance with these requirements involves expenditures of time and money by industry, considerable controversy often arises when such requirements are imposed.

Two factors limit the nature and extent of State and local government involvement in hazardous materials accident prevention. First is a general lack of the expertise and resources, especially among local agencies, necessary to carry out effective inspection and enforcement. Second, the Federal Government is authorized to preempt certain State and local

laws and ordinances. While these factors tend to narrow the available range of State and local actions, they do not preclude the enactment of a variety of requirements. The following discussion presents an overview of Federal preemption powers for hazardous materials transportation and the types of requirements that have been instituted by State and local jurisdictions.

Preemption

Section 112 (a) of the Hazardous Materials Transportation Act (HMTA) states that, "any requirement of a state or political subdivision thereof, which is inconsistent with any requirement set forth in this title, or in a regulation issued under this title, is preempted."²⁶ DOT has established procedures allowing States, localities, affected parties, and DOT itself to seek administrative rulings as to whether a State or local requirement is inconsistent.²⁷ DOT's administrative process is meant to serve as an alter-

²⁶49 U.S.C. 1811 (a).

²⁷49 CFR 107.203 to 107.211.

native to litigation; however, the process is only advisory in nature and does not preclude judicial interpretations of a State or local requirement. Independent of DOT procedures, a Federal court may be asked to decide whether a State or local requirement is inconsistent and therefore preempted under the HMTA or invalid under the Commerce Clause of the U.S. Constitution.

HMTA also allows DOT to waive preemption of inconsistent State or local requirements where they afford equal or greater levels of protection to the public than do the Federal requirements and do not unreasonably burden commerce.²⁸ Procedures regarding the submission and review of waiver applications have also been promulgated.²⁹

Sixteen inconsistency rulings have been issued by DOT.³⁰ Generally, the types of requirements found to be inconsistent are those pertaining to areas already subject to Federal regulation, such as definitions of hazardous materials, vehicle placarding, packaging or container requirements, insurance requirements, and shipping papers. Consistent requirements are those falling within the scope of local traffic regulations, such as separation distances between vehicles, use of headlights, vehicle inspections at loading/unloading areas, and requirements for immediate notification of accidents.

Licensing, Registration, and Permits

Licensing, registration, and permit requirements vary widely at the State and local level, causing difficulties for enforcement officers and industry. For example, 26 States require that transport companies carrying hazardous wastes register with the State and pay a fee. Fees imposed range from \$25 up to \$500 and may be good for only one trip or for as long as a year. Four States require special training or certification for drivers of hazardous waste vehicles. (See table 2-3 for a summary of varying State requirements.)

²⁸Section II(2)(b) of the Hazardous Materials Transportation Act (HMTA), 49 USC 1811(b). The Senate Committee Report (No. 93-1192, 93d Cong., 2d sess., Sept. 30, 1974) that accompanied the Senate HMTA bill indicated that this provision should be used in certain exceptional circumstances necessitating immediate action at the State or local level.

²⁹49 CFR 107.215 to 107.225.

³⁰See 43 F.R. 16954; 44 F.R. 75565; 45 F.R. 71881; 46 F.R. 18917; 47 F.R. 18457; 47 F.R. 1231; 47 F.R. 51991; 48 F.R. 760; 49 F.R. 46632; and 50 F.R. 20871.

In other States, an ordinary driver's license is all that is required for drivers of any truck. In addition, local jurisdictions may require hazardous materials carriers operating within their boundaries to purchase separate permits or registrations. Some communities use this income to finance emergency response activities; others treat it as general revenue.

These State and local requirements typically apply to trucks. Many trucking company officials believe that continued adoption of special requirements by different States impedes interstate commerce and have taken legal action. For example, a 1983 New Hampshire law imposing license fee requirements on vehicles transporting hazardous materials was challenged in court by State and national representatives of the trucking industry. Although the district court found that the law violated the Commerce Clause and was preempted by the Hazardous Materials Transportation Act, the law was upheld when the decision was reversed on appeal.³¹ Proliferation of State requirements can pose hardships for interstate carriers. One transporter noted that, in order to ensure that his driver was completely prepared to transport a load of hazardous waste from Georgia to Wisconsin, he had to telephone every State along the route, sometimes calling as many as four or five agencies within a State, before he was fully apprised of all the requirements.³²

DOT has issued a number of inconsistency rulings regarding State and local permit requirements. Even though there are no explicit Federal permit or registration requirements, DOT found the requirements to be inconsistent with HMTA as they caused delays, resulted in diversions of shipments, or required transporters to provide information that differed from Federal shipping paper requirements.³³ With respect to fees, DOT decided in one case that a Vermont requirement that imposed a \$1,000 fee per shipment of certain radioactive materials was inconsistent because it was applied in a discriminatory manner (e.g., only to certain radioactive materials), diverted shipments into other jurisdictions, and

³¹*New Hampshire Motor Transport Association, et al. v. Flynn, et al.*, Opinion of the U.S. Court of Appeals for the First Circuit, Dec. 26, 1984.

³²Reported at the May 1985 OTA workshop.

³³See, for example, Inconsistency Rulings 8, 10, 11, 12, 13, 14, and 15, 49 F.R. 46637-46667, Nov. 27, 1984.

Table 2-3.—States With Proposed or Existing Hazardous Wastes Transportation Fee or Registration Requirements, 1985

State	Requirements							
	Company registration	Company fee	Years covered	Vehicle registration	Vehicle fee	Vehicle inspection	Driver training/certification/registration	Industry spill equipment and bonds required
Alabama	Yes	None	3 yrs					
Arizona	No							
Arkansas	Yes	\$100	5 yrs					
(Department of Pollution)								
(Arkansas Transportation Commission)		\$50						
California	Yes	\$50				First 10 at \$50 each/exempt ...	24 hrs ^a certified by State	
Colorado	No							
Connecticut	Yes	\$350		Each vehicle		Inspect and certify	Certification required	Yes
Delaware	Yes	No		Authorizing letter				
Florida	No							
Georgia		\$25 trip permit ^{a b}						
Idaho	Yes	\$25 trip permit						
Illinois	Yes	No		Trailers only				
Indiana	Yes ^c	\$100 ^d		\$10 each				
Iowa	No							
Kansas	Yes	\$250 annually						
Kentucky	Yes	\$250 ^e annually						
Louisiana	Yes, company must be registered with Federal EPA	No						
Maine	Yes	\$100		Yes	\$50 each		Yes \$50	\$50,000 surety bond
Maryland	Yes	No		Yes	\$50 each		Yes \$20	\$10,000 surety bond
Massachusetts	Yes ^f	\$100		Yes	\$200 each			
Michigan	Yes ^g	\$500		Yes	\$200 each			
Minnesota	Yes	No						
Mississippi	No							
Missouri	Yes				\$20 per vehicle			

Table 2-3.—States With Proposed or Existing Hazardous Wastes Transportation Fee or Registration Requirements, 1985 (Continued)

State	Requirements							
	Company registration	Company fee	Years covered	Vehicle registration	Vehicle fee	Vehicle inspection	Driver training/ certification/ registration	Industry spill equipment and bonds required
M	No							
Nebraska	No							
Nevada	No							
New Hampshire								
New Jersey				Yes ^h	\$50			
New Mexico				Yes	\$50 ⁱ			
New York	No	\$5,000 ^j						
North Carolina	No							
North Dakota	Yes	No						
Ohio	Yes	\$25			\$3 each			
Oklahoma	Yes	No						
Pennsylvania	Yes	\$200 annually						Yes \$60,000 collateral bond or letter of credit
Rhode Island	Yes	No		Yes	\$25	Yes		
South Carolina	Yes	No						
South Dakota	No							
Tennessee	Yes	\$285 annually						
Texas	Yes	\$25						
Utah	No							
Vermont	Yes	No		Yes/ ractor and trailer	\$10 each			
Virginia	Yes	No	10 yrs					
Washington	No							
West Virginia	No							
Wisconsin	Yes ^k	No						
W	No							
District of Columbia	No							

^aFor rules only.

^bState requires notification before entering or leaving State.

^cFor liquid industrial waste only.

^dIncludes registration of one vehicle.

^eHazardous materials.

^fFile monthly report on hazardous waste movement.

^gThe words "Hazardous Waste Hauling Vehicle," "co-

^hAnnual report required.

ⁱ\$50 for first 20 vehicles, \$5 each thereafter.

^j\$5,000 to purchase exempt letter.

^kRequires names and EPA number of disposal sites.

SOURCE: American Trucking Association survey provided by Charles Mayer, Tri-State Motor Transit Co.

the response team funded by the fee requirement replicated Federal emergency response programs.³⁴

The trucking industry has made Congress aware of its concerns, and BMCS has begun, at congressional request, a 5-year program that will lead to greater uniformity in some areas. BMCS is surveying State motor carrier laws to determine those that are more or less stringent than Federal requirements in the areas of driver qualifications and training, hours of service, and equipment maintenance. When completed, the survey will be reviewed by a panel convened by the Secretary of Transportation, and if warranted, DOT will consider rulemaking to preempt State laws that do not ensure greater safety than their Federal counterparts.

However, many State and local enforcement officers as well as industry representatives feel strongly that national, uniform standards should be established in areas related to hazardous materials as well. Carrier associations and insurance industry representatives have voiced strong support for a national hazardous materials driver's license requiring special training.

In addition, this Federal review will leave untouched problems of varying State and local special permits and registration fees. The transport industry views these requirements primarily as State and local funding devices for enforcement or emergency response activities. Carriers find them annoyingly inconsistent and financially burdensome. Preemption by the Federal Government may not be the only appropriate way to achieve uniformity of requirements—a goal that many see as the most important need in hazardous materials regulation. National guidelines for permits and registrations could provide uniformity, and consensus building would ensure at least some measure of agreement between concerned public and private sector groups.

Notification

Notification requirements are used by State and local governments, and by transportation facilities (e.g., bridge and tunnel authorities) to obtain information on shipments of hazardous materials into or through their jurisdictions. The data are used for

inventory purposes, to arrange escorts, for emergency response planning, and in support of enforcement activities. Figure 2-3 indicates which States have enacted notification laws and the types of hazardous materials covered.

Knowing which hazardous materials are present or pass through a community is important to many State and local agencies. However, the use of notification provisions may not be the most efficient or effective method of data collection available (chapter 4 discusses data collection in more detail). Recent studies conducted for DOT indicate that notification requirements targeted at a limited number of extremely hazardous substances (e.g., high-level nuclear waste) have provided useful information. However, most local governments do not have the resources or the expertise to implement and enforce requirements that encompass a broader range of hazardous materials.³⁵ In addition, transporters are concerned that a multiplicity of State and local notification regulations would create scheduling difficulties and substantial increases in paperwork.

At the Federal level, the U.S. Coast Guard and NRC have established notification requirements. The Coast Guard requires all vessels carrying certain dangerous cargo to notify appropriate port authorities up to 24 hours in advance before entering or leaving U.S. ports and waterways.³⁶ Dangerous cargo includes Class A explosives, oxidizing materials or blasting agents, large quantities of radioactive material or certain fissile radioactive material, and bulk shipments of other specified materials.³⁷ The NRC regulation requires licensees to notify States in advance regarding shipments of certain radioactive materials.³⁸ Recognizing the difficulties faced by carriers confronted with varying State notification rules, DOT has taken the position that this is an area warranting uniform national requirements. DOT has not issued Federal guidelines. It has, however, preempted a number of non-Federal requirements, either because they differed from the NRC

³⁴Department of Transportation Inconsistency Ruling 15, 49 F.R. 46660, Nov. 27, 1984.

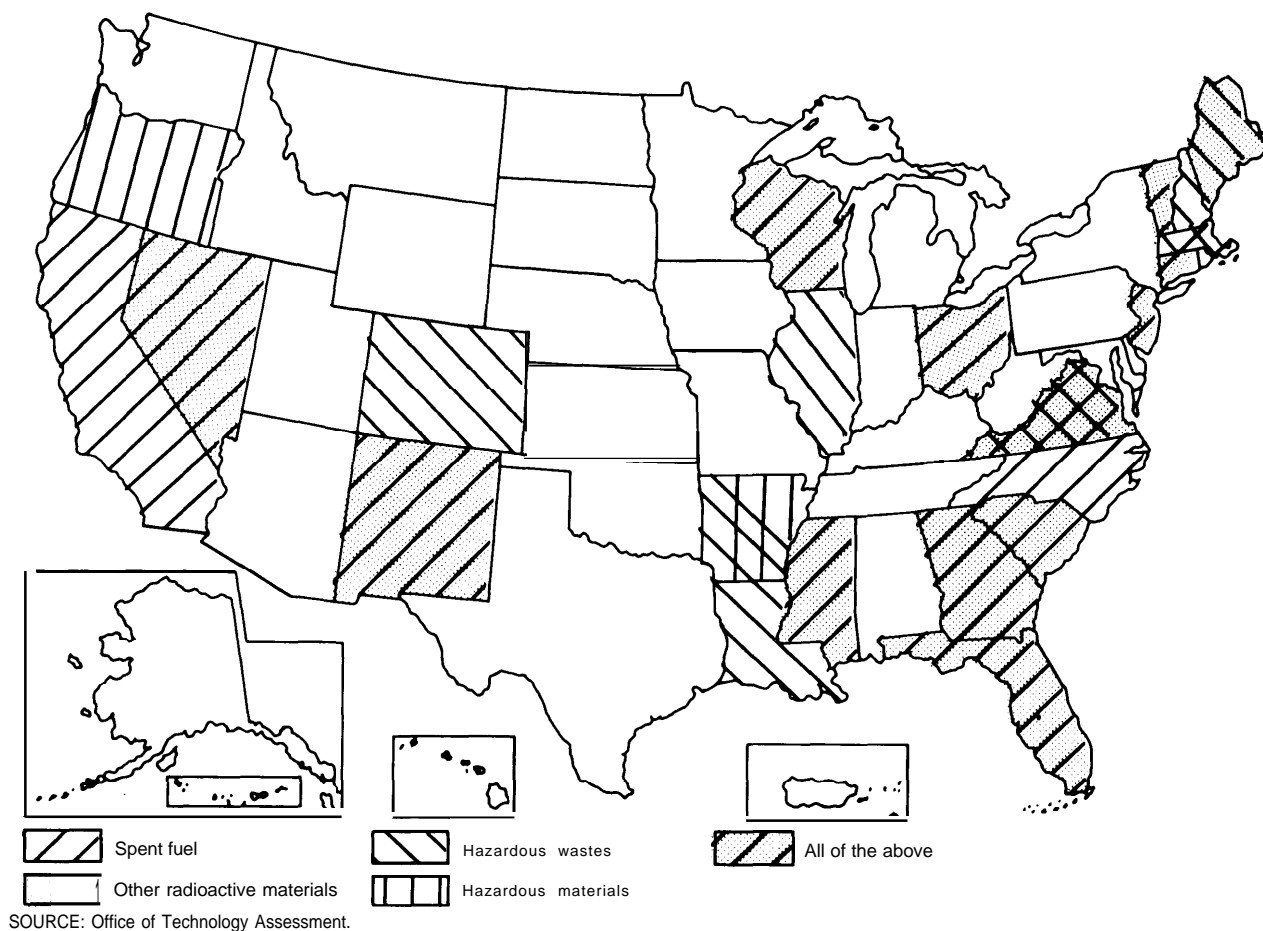
³⁵See Battelle Memorial Research Laboratories, Battelle Human Affairs Research Center, *Assessment of State and Local Notification Requirements for Transportation of Radioactive and Other Hazardous Materials* (Columbus, OH: Jan. 11, 1985).

³⁶33 CFR 160.211 and 160.213. Additional requirements for vessels on voyages of 24 hours or more and vessels bound for the Great Lakes are specified in 33 CFR 160.20 and 160.209.

³⁷33 CFR 160.203 and 46 CFR 153 (table).

³⁸10 CFR 71.97.

Figure 2-3.—States With Hazardous Materials Notification Requirements by Type of Material, 1985



regulation or had the potential to cause transportation delays or traffic diversions.³⁹

Routing

Routing is an important tool for local governments to use in preventing or reducing the consequences of hazardous materials accidents, and increasing numbers of cities, counties, and townships are adopting ordinances requiring hazardous materials carriers to use designated routes. Careful routing decisions mean that hazardous materials shipments are restricted to the safest routes, often interstate highways and beltways, thus reducing the overall risk of an accident as well as risks on local streets and highways. In addition, routing is a low-cost preven-

³⁹See for example IR-16, 50 F.R. 20871, May 20, 1985. DOT has adopted the NRC notification requirements.

tion measure that local police can enforce without additional equipment or training. On the other hand, routing requirements may lengthen and complicate trips for truckers, and sometimes bring local governments into conflict with each other or with Federal regulations protecting interstate commerce.

The only Federal requirement pertaining to routing of nonradioactive hazardous materials is general:⁴⁰

Unless there is no practicable alternative, a motor vehicle which contains hazardous materials must be operated over routes which do not go through or near heavi, populated areas, places where crowds are assembled, tunnels, narrow streets, or alleys.

⁴⁰49 CFR 397.9(a).

This provision is contained in the Federal Motor Carrier Safety Regulations. DOT has published guidelines to assist communities in designating routes for transporting hazardous materials.⁴¹ The guidelines include procedures for analyzing risks associated with the transportation of hazardous materials on alternative routes within a jurisdiction, and emphasize the importance of involving a broad spectrum of community and industry members in the decisionmaking process. (A 1983 demonstration program in Portland, Oregon, described on pp. 34-35, successfully tested the guidelines.)

A number of localities, including Columbus, Denver, and Boston, have established routing restrictions based on the Federal Motor Carrier Safety provision.⁴² The types of regulations enacted by these jurisdictions include restricting the use of certain roads, prohibiting transportation and delivery during rush hours, and specifying operating requirements. However, reaching a regional consensus is frequently difficult, even when a broad spectrum of the community is consulted. Often, for example, after a community routing risk assessment has been completed, hazardous materials carriers are diverted from central city routes onto surrounding roadways—usually Interstate highways—that traverse less populated areas. However, since many suburban communities do not have the specialized hazardous materials response teams of their urban neighbors, they feel particularly vulnerable to increased hazardous materials traffic and resist agreeing to such routing requirements. In 1985, in the Cincinnati region, suburban townships opposed the city's attempts to divert through shipments from city roads onto outlying highways.

⁴¹E.J. Barber and L.K. Hildebrand, et al., *Guidelines for Applying Criteria to Designate Routes for Transporting Hazardous Materials—Implementation Package*, FHWA-1-80-20 (Washington, DC: U.S. Department of Transportation, 1980).

⁴²See for example, Columbus *Codes*, 1959, chapter 2551; article IV of chapter 22 of the *Denver Municipal Code*; and 46 F.R. 18921, Mar. 26, 1981, for a description of Boston's regulations.

The trucking industry has also opposed some local routing ordinances, claiming that they interfere with interstate commerce and are inconsistent with HMTA. Boston's regulations restricting the use of city streets for hazardous materials transportation were challenged by the American Trucking Associations, both in Federal court and through DOT's inconsistency ruling process.⁴³ After a lengthy administrative review process, DOT decided that it could not reach a conclusion, because even though the routing restrictions enhanced public safety, consultation with affected jurisdictions had been limited as the requirements were developed.⁴⁴ A final decision by the court had not been reached by late 1985.⁴⁵

Highway routing of radioactive materials is addressed specifically in a 1981 DOT rulemaking, docket HM-164.⁴⁶ The DOT regulations were established in response to severe restrictions that had been placed on the transportation of radioactive materials by local jurisdictions, most notably New York City, making some through shipments impossible. HM-164 requires carriers to follow "preferred routes" (routes designated by States or Interstate highways where State alternates have not been named), prepare and file route plans, provide specialized training related to radioactive materials and emergency response, and comply with appropriate NRC security requirements. DOT has also developed guidelines for route selection for shipments of radioactive materials.⁴⁷

⁴³See 46 F. R. 18918, Mar. 26, 1981.

⁴⁴F.R. 18457, Apr. 29, 1982. DOT also cited some concern about the validity of the data used for Boston's risk determination but concluded that further refinement of the data would not have had a substantial effect on the outcome.

⁴⁵12 Environmental Law Reporter 20,789 (D. Mass. 1981).

⁴⁶46 F.R. 5298, Jan. 19, 1981.

⁴⁷U.S. Department of Transportation, Research and Special Programs Administration, Materials Transportation Bureau, *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials*, DOT/RSPA/MTB-84/22 (Washington, DC: U.S. Government Printing Office, June 1984 (originally published in June 1981)).

FINDINGS

Continued support is needed for State multimodal hazardous materials enforcement activities. The SHMED program, which ends in 1986, has had

a significant influence in shaping State enforcement programs despite relatively low funding levels. Although MCSAP will continue to fund State enforce-

The Portland Demonstration Project

In 1983, DOT contracted with Portland, Oregon, to demonstrate and test the newly promulgated Federal policy on highway routing of hazardous materials shipments and, in particular, the FHWA's guidelines. The demonstration, conducted by the Portland Office of Emergency Management (POEM) in cooperation with the six surrounding counties, was the first attempt by jurisdictions in the Portland region (and one of the first anywhere in the country) to carry out a systematic analysis and comparison of alternative routes for hazardous materials movements.

Two assumptions underlay the demonstration. The first was that hazardous materials transportation was regional in nature and that routing decisions would be made with the safety of the entire region in mind. The second was that there would be at least one reasonable route that would permit shipment of hazardous commodities in conformance with Federal safety regulations. Following procedures set forth in FHWA guidelines, the study was conducted in four steps.

The first step was formation of a technical advisory committee consisting of officials from local governments and emergency service agencies in the city and six surrounding counties, representatives of local business associations and local industry, and Federal and State officials. The committee also included a number of special technical experts, including traffic engineers, enforcement personnel, and hazardous materials specialists. The committee helped in the development of the study plan, locating sources of hazardous materials, and identifying and analyzing routes.

The second step focused on locating hazardous materials terminals and their access roads and identifying the types of hazardous materials movements supported. With the cooperation of the local law enforcement, the major terminals shipping or receiving hazardous materials were surveyed to identify the types of hazardous materials handled and the access routes most commonly used. Data were collected by means of questionnaires followed up by phone calls. The survey results indicated that most vehicles had no patchwork route going into accept or pickup zones and that, in many cases, their selection was inconsistent with later study findings as to the best routes.

Information on through shipments was gathered by sampling shipping papers at three weigh stations on

Interstate 5 and on 100-mile trucks were found to make up the majority of shipments, representing 55 percent of all hazardous materials shipped. It was also found that the types of hazardous materials shipped through the region were different from those shipped within the region. Through shipments including a higher percentage of explosives, explosives, poisons, and acids. This information was important in evaluating the risks involved in shifting through shipments onto a newly opened freeway running through the Portland suburbs. Because the survey provided information on hazardous materials flow that was not previously available in the Portland region, it also proved to be valuable to fire departments and hazardous materials response teams in developing emergency response plans.

The third step involved identifying alternative routes. For this purpose, hazardous materials shipments were classified into three kinds of trips: local deliveries, shipments to industrial areas, and through shipments. Since all local routes within the metropolitan area were used for local deliveries (such as deliveries to gas stations), the POEM staff and the advisory committee considered that routes for local trips could not be shortened and eliminated them from further study. They also agreed to limit classes of hazardous materials to those requiring regulation, and limited the list to certain hazardous commodities: explosives, poisons, flammable acids, and hazardous materials shipped at high volumes.

In the fourth step, lists of alternate routes were compared to determine which were the safest. The routes were divided into segments, and each segment was evaluated according to the following criteria:

- accident rates and probabilities;
- population exposure, in terms of the number of people living immediately adjacent to a route and those living within one-quarter mile on either side;
- population risk, expressed as the product of accident probability and population exposure;
- emergency response availability, measured in terms of response time, availability, and availability of water or other extinguishing agents; and
- roadway characteristics, such as lane and shoulder widths, lane changes required to stay on route, and grade and railroad crossings to be traversed.

Although most of the criteria were quantifiable, many decisions required the professional judgment of

*City of Portland, Oregon, Office of Emergency Management, *Hazardous Materials Shipping Analysis and Evaluation* (U.S. Department of Transportation, 1983), p. 1.

the staff and the advisory committee. Consensus on the safest route was reached in all but one case, a reroute around a tunnel. The final decision in that case was made by the fire marshal of the emergency response jurisdiction, subject to acceptance by other fire departments along the alternate route. In general, the alternate route analysis indicated that interstate freeways were preferable because they had the lowest accident rates and probabilities of all the routes considered.

As a result of the demonstration, the Portland City Council, in cooperation with the State Highway Department and Oregon Transportation Commission, enacted ordinances banning hazardous materials shipments from one tunnel and two grade-level rail cross-

ings. The tunnel had been used frequently by trucks carrying petroleum products from the principal distribution center in the Portland area to the northwestern parts of the State, and fire officials determined that the tunnel posed an unacceptably high risk. To compensate for any additional risks posed by the rerouting decisions, the City of Portland and three adjoining counties revised their mutual-aid agreements to assure that the affected counties would have access to the city's specialized fire-fighting equipment. POEM officials notified local industries, shippers, and carriers about the restrictions and the recommended alternate routes. It is expected that most truckers will comply; additional liability will accompany an accident off the recommended routes.

ment programs, States are concerned that priority will be given to general motor carrier safety programs and that hazardous materials enforcement—especially for nonhighway modes—will be slighted.

Penalties for regulatory violations, including failure to report hazardous materials incidents, should be consistent across governmental and jurisdictional levels and sufficiently large to discourage future infractions. An effective enforcement program requires that legislatures, enforcement agencies, and courts be aware of the death, injury, property damage, and environmental harm that could result from accidental release of hazardous materials and set penalties accordingly.

State and local enforcement personnel need additional training and current information on hazardous materials regulations for all modes of transportation. Methods used by the Federal Government to deliver this information to State and local officials need to be improved and strengthened. Programs to educate shippers and carriers on safety measures and regulatory compliance need strengthening as well.

National standards establishing uniform State hazardous materials requirements and regulations would simplify and improve compliance by shippers and carriers, and State and local enforcement

activities. State, regional, and local agency concerns as well as those of industry should be considered in formulating standards. The areas where uniformity is most needed are:

- Licensing to ensure that drivers and others handling hazardous materials are qualified and have been properly trained. Some form of national truck driver's license is favored by many State, local, and industry officials.
- Permit or registration requirements to obtain information and collect fees in a coordinated manner that does not unduly burden transporters.
- Shipment notification systems that provide useful information for localities without unduly burdening carriers.

Development of local routing restrictions should be based on interjurisdictional consultation and the use of explicit safety criteria. Although it is likely that the development of a routing scheme that enhances overall safety will be a difficult process for some regions, the Portland experience demonstrates that it is possible. In those instances where hazardous materials shipments are routed around cities through suburban communities, it may be necessary to establish a regional emergency response system.