

CHAPTER 7

ENFORCEMENT OF TRUCK SIZE AND WEIGHT REGULATIONS

INTRODUCTION

Identifying implementation issues associated with changes to truck size and weight (TS&W) regulations cannot be accomplished without first investigating the enforcement and administration of the existing size and weight regulations. This chapter provides a current "snapshot" of State TS&W enforcement and permitting practices. Also presented is historical data on enforcement and permit practices, resource allocation, initiatives to improve the effectiveness and efficiency of the program, as well as the Motor Carrier Safety Assistance Program (MCSAP). Federal and State roles are also discussed.

EVOLUTION OF FEDERAL/STATE ENFORCEMENT PRACTICE

PRE-SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982

Federal size and weight regulation has evolved over time in response to changing National responsibilities, interests and needs, including the promotion of interstate commerce. A National highway system consisting of a network of "inter-regional" highways was envisioned as early as the 1921 Highway Act, and subsequently led to the designation of the Interstate System in 1956. Prior to the 1921 Act, individual States exercised sole responsibility for determining what roads were built and what improvements would be made with the Federal funds received under an apportionment formula. The 1956 Highway Act provided funding to the States from the newly created Highway Trust Fund financed by taxes on highway users under the "user pays" concept. With the exception of the Interstate System, States still decide what roads are improved and what improvements are made.

The Highway Act of 1956 also established the Federal involvement in weight regulation by enacting weight limits of 18,000 pounds for single axle, 32,000 pounds for tandem axle, and 73,280 pounds for gross vehicle weight (GVW) trucks and combination vehicles allowed on the new Interstate System. States which had weight limits in excess of the new Federal limits as of July 1, 1956 were given "grandfather rights." These "grandfather rights" were extended without any indication of a sunset date. The 1956 Federal weight limits remained in effect until the Federal-Aid Highway Act of 1974 when they were increased to the current limits of 20,000 pounds for a single axle, 34,000 pounds for tandem axle, and 80,000 pounds for GVW. States choosing to adopt the new 1974 weight limits were also required to adopt the new "bridge formula B." The provision of Federal-aid for highways carried with it a requirement that the States actively enforce both Federal and State weight limits.

Federal requirements for assurance of State enforcement of Federal weight limits evolved over time. Prior to 1974, the States typically sent a letter to the Federal Highway Administration (FHWA) each year stating that their laws were in compliance with the Federal laws. An annual statement (certification) of the Governor (or representative) was required starting in 1974. The Department of Transportation (DOT) adopted, through regulation, the requirement for an annual State Enforcement Plan (SEP). To assure full compliance with their certifications, the Surface Transportation Assistance Act (STAA) of 1978 authorized DOT to impose stricter requirements on the States. The annual SEP has become the measure of performance against which the certification is evaluated and compliance determined. A State which is deemed to be noncompliant may be penalized by withholding 10 percent of its Federal-aid highway funding.

Although States may be sanctioned for noncompliance with the enforcement requirement, funding of weight enforcement activities remained solely a State responsibility until 1992. State highway departments, as a rule, are authorized to construct and maintain the infrastructure, whereas State law enforcement departments are authorized and funded to enforce all laws, including TS&W. Consequently, the level of enforcement is, to a great extent, dependent on cooperation between two or more State agencies and a commitment of State resources for facilities and equipment (State highway or transportation department) and personnel (State law enforcement agency).

The 1979 General Accounting Office (GAO) report on State enforcement of weight limits cited a need for improvement of the State enforcement program administered by the FHWA. The report was critical of the DOT for failing to provide guidance and assistance to the States to improve programs. Other concerns raised by the GAO report included the States' expanded use of "grandfather" provisions for divisible loads, and the lack of uniformity in penalties, permit administration and enforcement among the States. The requirement of the annual SEP was one response by FHWA to the GAO report.

The 1981 Section 161 Report¹ by DOT to the Congress on TS&W noted that the Federal role and responsibility in the enforcement area was established by Congress in 1974 by requiring annual State certification. Evaluation of State enforcement and permit practices focused primarily on the use of an "apparent low level of activity" as the trigger for threatening sanctions in some States in the late 1970s. Measures cited in determining "low level of activity" were ratios of truck registrations to truck weighings, ratios of citations to weighings, and the number of scales per mile of Federal-aid highway. According to the 1981 Report, under these measures, 35 States were considered to be noncompliant or borderline and in need of some form of FHWA action.

POST-SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982

Prior to the STAA of 1982 the Federal interest in enforcement was primarily in assuring that maximum axle and gross vehicle weight limits applicable to Interstate Highways and "Bridge Formula B" were enforced. Subsequent to the passage of STAA of 1982, the Federal preemption of State laws governing certain length limits and legal vehicle combinations expanded the Federal interest in size and weight regulation to include uniformity in dimensions for the highway movement of freight. The States establish the limits on size and weight for vehicles and loads on highway systems other than the Interstate (where weight, width, length and configurations are largely governed by Federal law) and the National Network (NN) for large trucks (where size and configuration of vehicles are partly governed by Federal law). The Interstate and NN total approximately 200,000 miles (44,000 Interstate and approximately 155,000 Non-Interstate Federal-Aid Primary system) which amounts to 5 percent of total public highway mileage.²

The impact of STAA preemption was significant for many States. Although FHWA solicited State input through a notice in the Federal Register, many States felt they did not have an opportunity to review the non-Interstate routes designated for the STAA vehicles in advance and as a consequence many narrow, winding, mountainous routes with insufficient standards were included in the initial FHWA designation. Subsequently, FHWA revised the routes based on the State review and submissions. Further, State enforcement and administrative issues had not been addressed, creating confusion for both enforcement personnel and carriers. Since access beyond the "designated system" was determined by the States, regulations and procedures needed to be developed for a route review process and/or issuing permits.

Enforcement of restricted routes for the 1982 STAA vehicles required information (such as maps or signs) including what routes were restricted and the vehicle configurations not allowed. The enforcement of the limits on the "non-designated" system was incorporated within State size and weight enforcement programs. FHWA rules to resolve and standardize reasonable access for STAA vehicles became effective in 1991 and since then, virtually all problems regarding access for STAA vehicles have been resolved.

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An Investigation of Truck Size and Weight Limits, August 1981, Report of the Secretary of Transportation to the United States Congress.

Highway Statistics 1990, Table HM-43, FHWA-PL-91-003.

ADMINISTRATION OF THE FEDERAL/STATE VEHICLE WEIGHT ENFORCEMENT PROGRAM

The mission of the Federal vehicle weight enforcement program is to administer FHWA's size and weight enforcement efforts as well as to monitor State compliance with Federal requirements.³ As noted by FHWA "the need for truck weight enforcement must be balanced against other enforcement efforts including those for traffic law and criminal activity. The question is not, "are States enforcing truck weight laws, but rather how much enforcement is enough?" In that regard, it was noted by FHWA in 1991, that since the requirement of SEPs in 1979, the State enforcement of truck weight limits improved from a national perspective. FHWA cited the significant number of trucks which were weighed and the citations issued, as well as the increasing use of technology [primarily weigh-in-motion (WIM)] for weight enforcement, as indicators of improvement. Although significant problems continue to exist.

CURRENT LEVEL OF STATE PERMITTING AND ENFORCEMENT

Both Federal and State governments are involved in TS&W enforcement. Generally speaking, the Federal role and responsibility can be described as monitoring the status and performance of the Nation's highway system and responding to Congressional intent specified in law. The State role and responsibility can be described as implementing Federal and State policy through enforcement of the size and weight laws (Federal and State) in a judicious manner for the purpose of preserving the Federal and State infrastructure investments.

The Federal TS&W program is administered by the Office of Motor Carriers (OMC) within the FHWA. The States are grouped into nine regions and each region is responsible for coordinating, reviewing, and providing recommendations on acceptance of the annual SEPs and certifications of the States in their region. The requirement for annual certification of enforcement has been in effect since 1974 and for the SEP since 1979. The SEPs provide the baseline for evaluation of the certifications, which in turn provide FHWA with a means of evaluating trends and identifying potential issues associated with State enforcement and permitting.

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Stated in FHWA comments to the OIG's 1991 draft "Audit of the Vehicle Weight Program."

⁴ This is a question that continues to be evaluated, however, as evidenced by the FHWA ANPRM 93-28 "Certification of Size and Weight Enforcement".

The State certifications provide the data which are summarized and published by FHWA in the annual "Inventory of State Practices." The State data reviewed for this chapter are summarized in Appendices __ and __, and analyzed in the aggregate as well as on a State or regional basis in the chapter. These data provide insight into trends, areas of State commonality and differences, the impact of various techniques or types of enforcement, and other factors which might influence the level of effort. Data and information obtained through nine State visits is discussed later in this chapter and interspersed throughout the various sections.

Efforts to improve weight enforcement and permit programs, at both the Federal and State level, are ongoing. The FHWA review of annual certifications may lead to changes in State laws which are determined to be "inconsistent" with Federal law, or which may be considered too lenient. For example, the State of Washington increased its permit fees in 1995 to incorporate damage costs following an FHWA review.

Additionally, actions are occurring at the State level to reduce incentives for overweight truck operations. Many States are in the process of reviewing the adequacy of fines and permit fees for overweight vehicles. Some have increased fines and/or fees to recover more of the damage costs. However, at the present time fees and fines in the majority of States are too low to recover costs. Weight enforcement officers provide seminars or educational sessions for State legislators and judicial officers as part of outreach. Many States participate in the national Commercial Vehicle Information and Systems Networks (CVISN) effort as "pilot or prototype" States. The CVISN effort and technology deployment are discussed later in the chapter. States are also moving toward computerization of their permit programs and adopting regionally uniform permit regulations for non-divisible loads.

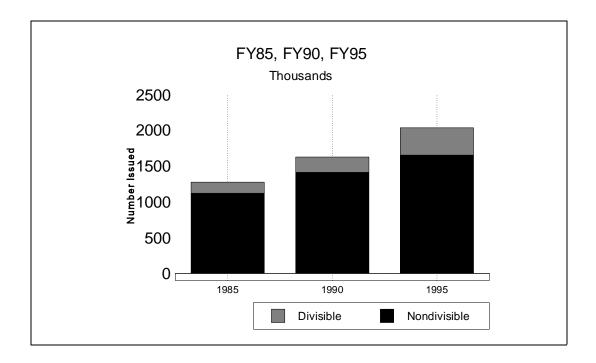
STATE PERMITTING OF TRUCK SIZE AND WEIGHT

State administration of TS&W regulations includes issuing permits for non-divisible and divisible loads that have been mandated by State legislatures or are protected by "grandfather rights." Prior to ISTEA there were 41 States which exercised Congressionally authorized "grandfather rights," with 34 issuing overweight permits for divisible loads.

PERMITS ISSUED

As Figure VII-1 shows, the most significant increase in overweight permitting has been in the number of divisible load permits issued. That number increased by 148 percent from FY 1985 through FY 1995 while nondivisible-load permits increased by 50 percent.

FIGURE VII-1
OVERWEIGHT PERMITS ISSUED BY STATES



The details of these trends are shown in Table VII-1. In the eleven-year period the total number of overweight permits issued annually (divisible and non-divisible) grew from 1.2 million in 1985 to 2.0 million in 1995, an increase of 60 percent.

Grandfathered gross weight and axle weight limits and overweight permits constitute "legally overweight" vehicles and result from Federal and State statutes allowing their use. From a cost recovery perspective the use of "multi-trip" permits is more problematic for at least two reasons: (1) they allow virtually unlimited operation of overweight vehicles on the highway system, and (2) fees for State permits (divisible and non-divisible) are often insufficient and unrelated to damage imposed and associated costs.

TABLE VII-1 STATE PERMITTING OF OVERWEIGHT LOADS, FY85-FY95

Year	Divisible Trip	Divisible Multi-trip	Divisible Total	Nondivis. Trip	Nondivis. Multi-trip	Nondivis. Total	Total Permits
1985	62,810	90,832	153,642	1,072,776	46,451	1,119,227	1,272,869
1986	53,976	96,193	150,169	1,149,625	59,274	1,208,899	1,359,068
1987	51,824	102,759	154,583	1,136,649	67,132	1,203,781	1,358,364
1988	64,955	112,801	177,756	1,151,732	61,222	1,212,954	1,390,710
1989	67,194	136,267	203,463	1,205,394	76,687	1,282,081	1,485,544
1990	73,270	140,697	213,967	1,321,261	88,362	1,409,623	1,623,590
1991	163,228	160,914	324,142	1,259,176	66,848	1,326,024	1,650,166
1992	184,711	162,040	346,751	1,347,773	92,734	1,440,507	1,787,258
1993	160,847	166,865	327,712	1,325,802	104,870	1,430,672	1,758,384
1994	157,114	198,236	355,350	1,426,143	116,934	1,543,077	1,898,427
1995	169,013	211,502	380,515	1,543,270	106,746	1,650,016	2,030,531

Source: FHWA Annual Inventory of State Practices, Overweight Vehicles---Penalties and Permits, FY85-FY94; and FY95 Annual State Certifications

Table VII-2 compares data for 1983, 1989 and 1995 from the 40 States that issued divisible load permits. During that period of time, there was significant growth in the number of multi-trip permits, with the exception of two States. Trip permits offer more control and information on routes and mileage of operation for the issuing agency, whereas the multi-trip⁵ permits essentially allow unlimited operation with no accounting for mileage or routes for a greater length of time, generally a year.

Thirty-nine States and the District of Columbia issued divisible load permits in the period between 1983 and 1995 (see Table VII-2). Six States that issued divisible load permits in 1983 stopped issuing them by 1995 (Arizona, Hawaii, Illinois, Pennsylvania⁶, Tennessee, and Virginia).

⁵ This includes monthly, "blanket," and "annual" permits.

This was reversed in 1996 when Pennsylvania implemented legislation mandating permits for milk.

TABLE VII-2 DIVISIBLE LOAD PERMITS ISSUED BY STATES

STATE		SINGLE TRIP		MULTIPLE TRIP		
Alaska	0	0	16	0	43	0
Arizona	1,286	0	0	8	0	0
Colorado	0	5	0.00	0	85	3,002
Connecticut	(a)	0	0	(a)	1,844	1,986
Dist of Col	0	0	161	646	954	563
Florida	0	0	0	1,256	0	0
Georgia	0	12,835	54,253	0	202	1,376
Hawaii	43	5	0	194	85	0
Idaho	0	139	0	4,866	15,165	16,262
Illinois	169	399	0	0	0	0
Indiana	0	18,130	53,982	(b)	6,182	0
Iowa	0	0	0	0	132	191
Kansas	0	0	0	0	0	1,807
Kentucky	0	0	0	382	4,035	3,831
Louisiana	0	0	0	0	0	8,591
Massachusetts	0	0	0	8,211	14,942	12,972
Michigan	61	0	0	657	540	968
Minnesota	1,257	0	0	1,076	1,722	3,260
Montana	0	2,275	5,246	0	5,468	11,846
Nebraska	3,296	0	20,816	0	837	84
Nevada	8	15	48	917	229	2,599
New Hampshire	0	0	0	0	NA	0
New Mexico	0	0	0	0	0	225
New York	©	0	0	©	37,122	54,038
North Carolina	0	0	640	0	0	0
North Dakota	25,136	30,330	21,446	0	0	0
Ohio	767	0	0	0	1,912	31,124
Oklahoma	0	0	0	2,890	3,005	388
Oregon	0	0	23	9,253	4,286	27,342
Pennsylvania	81	342	0	0	0	0
Rhode Island	0	0	0	2,118	4,473	3,571
South Carolina	0	81	1,908	0	243	1,797
South Dakota	17,517	278	1,162	0	0	297
Tennessee	0	0	0	1,117	0	0
Texas	0	0	0	0	411	13,042
Utah	17,458	2,320	8,569	22,995	8,814	858
Vermont	0	0	0	455	1,949	2,246
Virginia	0	0	0	5,579	7,581	0
Washington	17,458	0	0	3,566	4,286	2,480
Wisconsin	0	0	0	397	2,231	4,339
Wyoming	168	40	743	0	0	417
TOTAL	68,113	67,194	169,013	74,231	128,778	211,502

⁽a) 78 total permits, not stratified (included as single trip in total) (b) 7476 Oversize/Overweight permits on Toll Road © 172 multiple trip permits, 788 single trip permits; not stratified as divisible or nondivisible (included as divisible in total) Source: FHWA Annual Inventory of State Practices, FY83 (Table 12), FY89; and Annual State Certifications (FY95)

PERMIT FEES

While the number of overweight permits issued has increased dramatically, the fees assessed for permits appear to have changed little, if at all. Permit fees are established in either State laws or regulations. Historically, they have not been set on an infrastructure cost occasioned basis. The fees are usually established to recover the costs to administer the permit programs, and in some States enforcement is cited as an administrative cost⁷.

In 1989, State permit fees for an 84,000 pound overweight vehicle ranged from \$6 to \$61.8 Although there has been little significant change to the 1989 fees, case studies conducted for this Study (see page VII-18) indicate that States are considering increases that would take into account damage costs; none are considering elimination of the "multi-trip" permit. Oregon periodically conducts a cost-allocation study; based on the results its legislature makes adjustments to the various truck fees, including permits. Oregon officials noted that their most recent study indicated an overpayment by the industry, and permit fees were therefore adjusted downward. Pennsylvania DOT will be initiating a study following a legislative audit of the motor carrier program that found "truck weight waiver fees do not appear to cover the cost of the damage caused by overweight trucks."

Minnesota and Washington have set permit fees that better reflect infrastructure damage. Minnesota revised its permit fees in 1993 to include damage cost per mile based on pavement wear for axle groups on an Equivalent Single Axle (ESAL) basis. ¹⁰ The cost assessed to a particular axle group increases for a given load as axles are added to the group. Pavement costs per ESAL are based on unit costs/ESAL for typical pavements. Bridge costs are not specifically accounted for in this fee, such costs were felt to be covered by registration and other taxes paid. ¹¹

Table VII-3 provides the cost factors that are based on weight and axle group within a defined axle spacing under the Minnesota formula. The maximum weights for which an overweight permit is available are: (1) 12,000 pounds for a two-axle group; (2) 18,000 pounds for a three-axle group; and (3) 22,000 pounds for a four-or more axle group. The permit fee is a combination of the base single trip fee plus the damage cost fee of *xx* cents per mile.

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Confirmed in case study interviews and comments to docket 93-28.

Source: FHWA "Inventory of State Practices"

^{9 &}quot;Performance Audit Report of the Department of Transportation," Commonwealth of Pennsylvania Legislative Budget and Finance Committee, 1996.

The formula is (AFxUC)xD+ADMIN where AF= Axle Group Factor, UC=Unit Cost, D= Distance increment, and ADMIN=minimum administrative fee. The cost factors adopted by Minnesota were based on a methodology developed by a Minnesota DOT research engineer.

Comments to Docket 93-28, Minnesota Department of Transportation, FHWA Docket 93-28-17, March 14, 1994

TABLE VII-3 MINNESOTA OVERWEIGHT AXLE GROUP COST FACTORS (\$ per mile) SINGLE TRIP PERMITS

Number of Pounds	2 Axles at 8 ft. Or less	3 Axles at 9 ft. Or less	4 Axles at 14 ft. Or less
0 - 2,000 lbs.	0.12	0.05	0.04
2,001 - 4,000 lbs.	0.14	0.06	0.05
4,001 - 6,000 lbs.	0.18	0.07	0.06
6,001 - 8,000 lbs.	0.21	0.09	0.07
8,001 - 10,000 lbs.	0.26	0.1	0.08
10,001 - 12,000 lbs.	0.3	0.12	0.09
12,001 - 14,000 lbs.	Not permitted	0.14	0.11
14,001 - 16,000 lbs.	Not permitted	0.17	0.12
16,001 - 18,000 lbs.	Not permitted	0.19	0.15
18,001 - 20,000 lbs.	Not permitted	Not permitted	0.16
20,001 - 22,000 lbs.	Not permitted	Not permitted	0.2

Washington State passed legislation in 1995 that increased the per mile overweight permit fees for nondivisible loads to reflect damage cost as well as administrative costs. Washington's action was in response to FHWA findings of inconsistencies in their law and a concern that the fees were insufficient. Washington has a two-tiered fee structure; in addition to a "flat fee" there is a per mile fee. Prior to the 1995 changes, the per mile fee was capped at \$2.80 for 80,000 pounds or more overweight. The current fee increases from \$2.82 per mile for 80,000 pounds to \$4.25 per mile for 100,000 pounds plus \$.50 per mile for each additional 5,000 pounds.

The FHWA Highway Cost Allocation (HCA) Study provides information on the overall cost recovery by States as well as by the Federal government. While several States are attempting to establish permit fees that recover damage to highways, the vast majority of States presently have permit fees that are insufficient and well below a realistic cost recovery level. Follow-up work on the HCA Study will provide the States with data and methodology to use in designing permit fees or developing their own HCA Study.

STATE ENFORCEMENT OF TRUCK SIZE AND WEIGHT REGULATIONS

The identification of possible State enforcement issues associated with changes to TS&W limits is dependent on understanding current practices and challenges. The baseline was established through reviewing previous studies, research, enforcement statistics, and personal interviews with the enforcement and permitting officials in nine States.

Development of the "snapshot" of State enforcement included review of the FY 1995 State Certifications of Size and Weight Enforcement and the FY 1995 SEPs submitted to the OMC. The information and data obtained from these documents pertained to enforcement strategy, State funding (budget) for the enforcement program, truck weighings and citations issued, offloading, and number of permits issued for FY95. Inconsistencies in State interpretations of the FHWA guidelines often result from changes in personnel at the State level. When this occurs, FHWA often provides on-site training on preparation of the certifications and SEPs.

The role and importance of State enforcement in the management and control of State and Federal weight limits has been underscored in past studies.¹² The degree of compliance depends on numerous variables, many of which are beyond the control of State program administrators and enforcement officials, such as funding and State legislative mandates.

It is difficult to obtain accurate information on the degree of noncompliance with weight limits. Over the past 15 years FHWA review of the effectiveness of enforcement programs has primarily focused on changes in numbers from year to year. For example, number of trucks weighed, number of citations issued, and violation rates are tracked. Quantifying the degree of noncompliance with weight limits at the State and National level continues to be an unresolved issue for FHWA.¹³

While adequate fines and penalties are important elements in an effective program, judicial support is critical and beyond the control of State enforcement officials. The problem of judicial support was evaluated in a 1985 FHWA study. The report, "Administrative Adjudication of Overweight Violations," suggested alternative approaches and expanded use of the Minnesota Relevant Evidence model. Relevant evidence is discussed later in this chapter.

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A previous study by Clayton, Nix, and Fepke noted that: (1) violation rates are an indication only of enforcement "ability to issue or impose sanctions" on those vehicles which are stopped and weighed, useful for comparison of one State to another in a given year but limited as a conclusive measure of effectiveness, and (2) that the number of citations issued as a percentage of the total truck population using the highways in a given State would likely be very small, probably minuscule. They also note that a minimum "measure of effectiveness" for enforcement is the perceived assurance of apprehension and penalties or sanctions that are severe enough to have a deterrent effect.

Clayton, Nix, and Fepke in *Enforcement and Overweight Trucking*, presented at the Canadian Transportation Research Forum in June 1992 discuss the difficulty of measuring the "real" picture of overweight trucking and emphasize that regardless of this difficulty, without weight enforcement of limits the legal operators would be economically disadvantaged, road costs would be excessive and there would be no incentive for operators to control loading.

As noted earlier, perhaps the most important and difficult question to be answered by FHWA, prior to defining measures of effectiveness, is what is a reasonable level of enforcement given the uniqueness of each State's laws and available resources.

ANNUAL WEIGHT CERTIFICATIONS AND STATE ENFORCEMENT PLANS

Federal regulations detail the requirements for submittal of annual SEPs and certification of enforcement. ¹⁴ The certification must contain either the signature of the Governor or his official designee. The requirements specify the data and supplemental information which is required including a statement of enforcement of the ISTEA length and weight freeze (see Appendix ___).

Failure to comply with the conditions, or provide the information required, may result in a withholding of Federal-aid highway funds. FHWA utilizes an incremental administrative procedure that gives States the opportunity to resolve discrepancies or problems and avoid sanction. Sanction proceedings may be initiated for one or more of the following reasons: (1) a State fails to submit the required certification (10 percent of highway funds); (2) FHWA determination of inadequate size and weight enforcement on the Federal-aid system following review of the annual certification and SEP (10 percent of highway funds); and (3) FHWA determines there is an inconsistency between State and Federal weight limits for the Interstate 15 (100 percent of NHS funds) (see Appendix ___). The frequency of use over the 16 year period summarized in Appendix ___, for each of the three reasons, is summarized in Table VII-4.

TABLE VII-4

FHWA REVIEW OF STATE ANNUAL SIZE AND WEIGHT CERTIFICATION

CONDITIONAL APPROVALS 1978-1994

Number of States Receiving Conditional Approvals= 23

Reason Cited for Conditional Rating	Frequency of Use	Number of States
Inadequate Enforcement	15	11
Conflict in Laws	22	12
Inconsistency with Federal weight limits on Interstate	10	6

¹⁴ Part 657 of Title 23 CFR.

¹⁵ 23 U.S.C. Section 127.

Since 1978, several States have received conditional approval of their annual certifications and SEPs; some frequently. Through 1995, conditional acceptance of certifications has occurred on forty occasions with sanctions threatened. Seven of the forty cases resulted in letters being sent to the Governor on the impending sanction. In fact, all conflicts were resolved and sanctions were not imposed. Appendix __ shows that in two (1979 and 1980) of the seven cases inadequate enforcement was given as a reason for the proposed sanction. As this illustrates, FHWA and the States make every effort to resolve conflicts administratively and through cooperative arrangements.

WEIGHT ENFORCEMENT

The FHWA's OMC extracts data from the annual certifications, which is then compiled into tables for the annual Inventory of State Practices on Overweight Permitting. Historic data from the past inventories and the certifications indicates a significant growth in enforcement activities from 1978 through 1985.

State size and weight enforcement, nationwide, has increased in the last 10 years, even with the additional demands on the States for safety inspections under the MCSAP. The increasing number of trucks operating in interstate commerce and the increased use of WIM technology for screening trucks is reflected in the increased number of vehicle weighings. In 1985, the States weighed 105.2 million trucks (including 7.9 million on WIM) on all types of scales (fixed, portable, semi-portable) with only four states using WIM. In 1995, the total number of trucks weighed (including 57.9 million on WIM) increased to 169.6 million with 28 States using WIM in some capacity. The increase in the number of vehicle weighings continued through 1993. A decrease occurred in 1994 and 1995 which reflects the inoperable condition of equipment (WIM or scales) in some States, as well as weather factors and personnel constraints.

During the same time period (1985 to 1995) the total number of overweight (axle, gross, and bridge formula) citations issued decreased slightly from 664,000 in 1985 to 655,000 in 1995 while the number of trucks weighed (excluding WIM) increased by 14.3 million. As the violation rates shown in Table VII-5 indicate, the percent of trucks weighed that are cited for weight violations is very small and deviates little over time.

In addition to citations, the requirement for an overweight vehicle either to off-load or shift the load until legal can be a strong incentive to comply. Off-loading and load shifting requirements are effective immediately, and the inconvenience and/or added cost which the violator incurs may contribute to increasing compliance. After decreasing from 1985 through 1991, off-loading and load shifting as enforcement tools appear to be increasing in use. The use of off-loading may be based on several factors including mandatory off-load parameters established by State legislatures, departmental guidelines or policy, prosecutor guidelines, or officer discretion.

TABLE VII-5 STATE WEIGHT ENFORCEMENT FY85-FY95

Year	Weighed (incl WIM) (000)	Weighed (excl WIM) (000)	Weight Citations	Violation Rate	Off Loaded	Load Shift Required
1985	105,234	97,330	664,033	0.007	106,618	371,104
1986	113,269	102,504	650,728	0.006	81,716	395,184
1987	117,900	104,452	671,259	0.006	85,949	432,598
1988	130,188	111,532	700,928	0.006	89,033	453,841
1989	146,950	124,687	692,673	0.006	79,309	438,584
1990	149,187	126,076	667,463	0.005	76,769	425,298
1991	150,428	116,759	663,204	0.006	85,935	396,913
1992	160,536	113,563	677,976	0.006	60,142	380,249
1993	162,615	111,889	653,492	0.006	76,611	451,643
1994	161,066	108,124	642,616	0.006	82,491	447,396
1995	169,568	111,620	654,903	0.006	105,948	472,614

Table VII-6 indicates that when the total number of trucks weighed is disaggregated by scale type, the distribution from 1985 through 1995 clearly indicates the significant influence of WIM as a screening tool on scale house efficiency. Enforcement strategies from year to year appear fairly constant, with the bulk of weighing occurring at fixed facilities. In 1995, only five States, four in the Northeast and Alabama, did not use fixed scales as part of their enforcement strategy.

TABLE VII-6
TRUCKS WEIGHED BY SCALE TYPE, FY85 THROUGH FY95 (000's)

Year	Fixed	Se mi-Portable	Portable	WIM	Total
1985	94,685	1,152	1,494	7,903	105,234
1986	100,010	1,238	1,257	10,764	113,269
1987	101,801	1,444	1,206	13,449	117,900
1988	108,881	1,439	1,212	18,656	130,188
1989	122,188	1,312	1,187	22,263	146,950
1990	123,748	1,175	1,153	23,111	149,187
1991	114,271	1,233	1,255	33,669	150,428
1992	111,016	1,229	1,318	46,973	160,536
1993	109,347	1,238	1,304	50,726	162,615
1994	105,679	1,183	1,262	52,942	161,066
1995	109,275	1,107	1,237	57,948	169,568

Many of the measures of compliance (number of weighings, number of citations issued) are more input measures than output measures and offer limited information on the extent of illegal overweight activity in the State, and no information on legal overweight activity.

In general, there are three commercial vehicle enforcement functions which are performed during roadside and scale house inspections. These are credentials verification, vehicle size and weight enforcement, and driver/vehicle safety inspections.

A State's choice of enforcement strategies is dependent on many factors, including traffic patterns, resources, geography, and environment. Key factors influencing the choice between fixed facilities or mobile enforcement, as well as the advantages/disadvantages of each strategy, are noted in Table VII-7. The key physical elements of a fixed facility are stationary scales, space and lighting for safe inspections, voice and data communications, shelter, controlled highway and inspection facility signage, acceleration or deceleration lanes, washroom facilities, and use of technology such as WIM, Automated Vehicle Identification (AVI), and cameras.

Table VII-7 provides a summary of factors influencing the weight enforcement strategy a State might select. Generally, most States include all of the strategies, in varying degrees with mobile and portable scale teams patrolling on by-pass routes.¹⁶

TABLE VII-7
SELECTION CONSIDERATIONS FOR WEIGHT ENFORCEMENT STRATEGIES

Criteria	Fixed Facility	Mobile/portable + Weigh-in-Motion
Volumes of trucks weighed	700-800 per shift (2500 per day)	3-5 per hour
Facility and technology used	Best for space and technology use	Adequate to limited
Cost to construct ¹	Range from \$1.7 million to over \$5 million ²	Cost of land, equipment and signage (\$300,000 or more)
Staffing requirements ¹	24 hours (2) days a week operation: minimum staffing of 17	8 hours operation: minimum of 2 enforcement/inspectors ³
Flexibility	Limited	Very flexible
Security and Safety for Officer, Driver and Vehicle	Excellent	Poor
Deterrence/Visibility	High for Specific System (primarily Interstate vehicles)	Low visibility, High deterrence for local traffic and weigh station avoidance

Source: "Enhancing the Effectiveness of Commercial Motor Vehicle Inspections." Governor's Commission on Economy and Efficiency in State Government. November 1990. Montpelier, Vermont

^{2 \$1.7} million to construct St.Croix, Minnesota facility on I-94 in 1987; \$2.4 million for Woodburn, Oregon on I-5 in 1986; \$5.3 million (Arizona share) for joint port-of-entry at St.George, Utah on I-15 in 1990. Vermont Agency of Transportation

Operation limited to daylight hours, weather is a serious consideration

As noted in annual SEPs submitted to FHWA.

Although the weight enforcement program has improved from a National perspective, there is need for continued improvement, both in Federal administration and oversight as well as State enforcement and administration. While positive steps have been taken at both levels, much remains to be done to correct outstanding issues in enforcement.

WEIGHT ENFORCEMENT AND MOTOR CARRIER SAFETY ASSISTANCE PROGRAM

Weight enforcement and MCSAP inspections are not mutually exclusive. The integration of weight enforcement with safety inspections without reducing the effectiveness of either program is an important issue. Therefore, it is essential to determining the current level of enforcement that data from both motor carrier programs administered by OMC and enforced by the States be included, that is certification of weight enforcement and MCSAP. Consequently, the data reviewed included resources dedicated by the States, weight and safety inspections performed (trucks weighed, citations issued, type of enforcement, weight enforcement personnel, trucks inspected, and vehicles placed out-of-service). The inclusion of the MCSAP inspection data is essential to providing a complete picture of State enforcement at weigh facilities, whether fixed or portable strategies are employed.

Currently the States provide the bulk of funding for enforcement of motor carrier related regulations. There is no Federal funding available for the weight enforcement program, except for those vehicles weighed incidental to MCSAP inspections. The States annually commit resources of approximately \$281 million to enforce State and Federal weight laws and meet their SEP goals (see Appendix ___). In FY95 the Federal and State MCSAP and State TS&W enforcement expenditures totaled \$342 million, with 82 percent of this total from State funds as Table VII-8 shows. The Federal funding under MCSAP was \$49 million in FY95, distributed among the 51 States (and territories) under an 80/20 match, this represents a decrease of 12 percent (\$7 million) from FY1994.

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MCSAP funding to the States has been primarily for roadside inspections of vehicles. The FHWA/OMC inspectors continue to conduct the bulk of Compliance Reviews (CR) of registered carriers, although the States are being encouraged to perform CR audits to reduce the number of unrated carriers.

TABLE VII-8 FUNDING OF STATE MOTOR CARRIER ENFORCEMENT

Expenditures and Personnel for Enforcement of Weight and Motor Carrier Safety Assistance Programs, FY1995				
	Expenditur	es_	Personnel	
MCSAP Basic Grant \$ 61,267,000		1,069		
Federal (80%)	\$ 49,028,0	00		
State (20%)*	\$ 12,239,0	00		
Weight Enforcement State (100%)	\$ 280,706,0	000	6,061	
TOTAL	\$ 341,973	,000	7,130	

^{*}The 20 percent represents only the required State match for MCSAP funds and not the total expenditure by the States for safety enforcement. All States were doing safety enforcement long before MCSAP and continue to place an emphasis on safety enforcement in such areas as speed limits, brake checks, vehicle equipment checks, and driver licensing checks.

In general, the numerical measures of enforcement (including expenditures) of size and weight laws and Federal safety regulations in the years since the STAA of 1982 have increased as Table VII-9 illustrates. It is apparent that some States support more comprehensive programs than others.

TABLE VII-9
COMPARISON OF STATE MOTOR CARRIER ENFORCEMENT ACTIVITY
(000's)

	FY85	FY95
Trucks Weighed (excl. WIM)	97,330	111,620
Trucks Inspected (MCSAP)	372	1,799
TOTAL	97,702	113,419

One problem for weight enforcement at fixed facilities is "scale avoidance." Over the years it has been assumed that the only reason trucks avoid scales is because they are overweight. While this may have been the case in the early 1980s, it is probably less important in the 1990s. With forty-nine States and the District of Columbia participating in MCSAP, and an increasing emphasis on safety inspections, many trucks circumvent the scale houses to avoid a roadside inspection rather than to avoid being weighed. Therefore, mobile safety enforcement (as with weight enforcement) is part of a comprehensive safety enforcement program.

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Cited as a problem by the GAO in "Excessive Truck Weight: An Expensive Burden We Can No Longer Support" in 1979 and the Florida DOT study, "Weigh Station Evasion by Trucks", 1994.

SAFETY ENFORCEMENT

In the 1982 Motor Carrier Safety Act, Congress created an Office of Motor Carrier Safety and established a Federal grant program for State enforcement of the Federal Motor Carrier Safety Regulations (FMCSRs), the MCSAP in STAA of 1982. Due to a significant increase in the number of commercial vehicles operating in interstate commerce, the resources of the FHWA's Bureau of Motor Carrier Safety (BMCS) program were insufficient to meet the enforcement demands of carrier audits and field safety inspections.¹⁹

MCSAP participation continues to be a voluntary commitment by States that accept a "basic" grant²⁰ to enforce the FMCSRs and conduct safety inspections. In FY84, the first year of the program, there were only 17 States participating, by FY 1995 this number had increased to 49 States and the District of Columbia. Only South Dakota remains outside MCSAP.²¹

As in the weight enforcement program, States that are determined by FHWA to have laws or regulations inconsistent or incompatible with Federal laws and regulations are subject to sanctions, in this case the withholding of up to 50 percent of their "basic" grant. As in the weight enforcement program, the majority of States facing MCSAP sanctions implement the necessary changes and avoid loss of funding.²²

Until 1992 enforcement activities funded under MCSAP were limited to operations directly related to safety inspections, which did not include weight enforcement. Partially in recognition of the reality that enforcement of weight and safety regulations occur simultaneously or in conjunction with one another, ISTEA expanded the "flexibility" of States to use MCSAP funds for weight enforcement under certain conditions.

A comprehensive State commercial motor vehicle (CMV) enforcement program includes both weight and safety elements, and improvements to one should also serve to improve the other. Additional information on what the States are currently doing in their enforcement programs is useful in developing the base case on enforcement. An example of a State comprehensive weight enforcement and safety inspection plan was developed by Michigan DOT and State Police in 1992 and is included in Appendix __.

Prior to 1982 Federal BMCS inspectors coordinated field inspections with State weight enforcement personnel, since the Federal inspectors had no legal authority to stop vehicles.

²⁰ Since 1982, the MCSAP funding programs have increased beyond the "basic" grant to include a supplemental grant program. Supplemental program areas include: (1) Traffic Enforcement, (2) Hazardous Materials Training, (3) Drug Interdiction (DIAP), (4) Research & Development; and (5) Uniformity. Supplemental grants are not contingent on State participation in MCSAP, thus South Dakota is eligible for funding.

South Dakota, by choice, does not participate in MCSAP as far as receiving funding under the "basic" grant. The State has adopted the FMCSRs and does enforce and perform safety inspections with 100% State funding.

An exception occurred in FY95 when sanctions were imposed on two States, Maine and Pennsylvania, and 50 percent of the "basic" grant was withheld.

CASE STUDIES

Interviews and meetings with State size and weight enforcement and permit officials were conducted in nine States to obtain direct input and supplement information on file in the OMC. The selection of States was determined in consultation with the OMC which oversees both the size and weight program and MCSAP. The selection of States for interviews provided regional coverage for the six regions defined in the CTS&W Study:²³ Northeast, Southeast, South Central, Midwest, West, and California.

The criteria used included LCVs operating in State, States with no LCVs allowed, States with ports, high truck traffic corridors, use of Intelligent Transportation Systems-Commercial Vehicle Operations (ITS-CVO) in program, ranked in top 10 States for number of trucks weighed or weight citations issued, States using fixed facilities, and States with no fixed facilities for weighing. Table VII-10 provides descriptive information on the weight programs for each of the nine States.

TABLE VII-10
OVERVIEW OF CASE STUDY STATES

	OVERVIEW OF CASE STUDY STATES						
State	Region/1	Enforcement Agency	Enforcement Type	Grandfather Rights	LCVs Operate	Relevant Evidence Law/2	
AZ	West	Dept. of Public Safety	Portable	No	Yes, by permit	Yes/ 3	
CA	California	California Highway Patrol	Fixed, Portable	No	No	No	
GA	Southeast	Georgia DOT	Fixed, Portable	Yes	No	No/4	
MD	Northeast	Md State Police Md Trans Auth	Fixed, Portable	Yes	No	No	
MA	Northeast	Ma State Police	Portable, Mobile Units	Yes	Yes, by permit	No	
MN	Midwest	Mn State Patrol	Fixed POE, Portable	Yes	No	Yes	
NH	Northeast	Dept. Of Safety	Portable	Yes	No	No	
OR	West	Oregon DOT	Fixed POE, Portable	Yes	Yes,	No	
PA	Northeast	Pa State Police Pa DOT	Fixed, Portable	Yes	No	No	

¹ Regions: NE=CT,DE,DC,ME,MD,MA,NH,NJ,NY,PA,RI,VT,VA,WV; SE=AL,AR,FL,GA,LA,MS,NC,SC,TN, MW=IL,IN,IA,KY,MI,MN,MO,OH,WI; W=AK,AZ,CO,HI,ID,KS,MT,NE,NV,NM,ND,OK,OR,SD,TX,UT,WA,WY

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² See discussion on Page VII-23 describing Administrative Adjudication.

³ Arizona enforcement may use weight slips as basis for tickets on GVW violations without weighing trucks on scales

⁴ Georgia's fines for overweight violations are treated as administrative penalties and collected through an administrative adjudication process which could be an alternative for collection of fines.

The regions defined in the TS&W study are not the FHWA regions; however, the nine States selected represented six of the nine FHWA regions and five of the six TS&W study regions.

The case studies provided an opportunity to receive information directly from field enforcement and permit officials in the States on how the programs are operating. Key points of discussion that evolved from the case studies are noted below, and additional points are discussed in Appendix ___.

PERMIT OPERATIONS

Refusing to Issue a Permit

In the case study States, issuance of overweight permits is generally not an automated process. Although States screen applications for accuracy and compliance with minimum requirements, such as insurance, most do not check or consider carrier safety records or safety ratings issued by FHWA. A State's law may allow for the permit official to refuse to issue a permit, however it is unlikely that a permit will be refused for a poor safety record or rating. For example, Georgia law specifies that "For just cause, including, but not limited to, repeated and consistent past violations, . . . an official of the department designated . . . may refuse to issue or may cancel, suspend, or revoke the permit of an applicant or permittee." Since many of the permits issued are multi-trip or annual, screening would primarily be limited to the single-trip permit applicant without an automated system.

Vehicle Certifications for Weight versus Overweight Permits

In two of the case study States a certification appears to serve as a permit to operate over the GVW on State highways for certain vehicles. The certification is to verify that the vehicle does not exceed the truck manufacturer's GVW rating. The certification process in one State requires a visual inspection of the truck by an enforcement officer, whereas in the other State a clerk only verifies paperwork to see that it is in order. In both States the certification is a one-time requirement, as long as the owner remains the same.

Permitting of International Containers

Permitting of international containers is generally limited to those States that have marine ports, either coastal or on the Great Lakes. In the case study States, the GVW limits that are allowed for the container permits range from 80,000 pounds in Georgia to 105,500 pounds in Oregon. Table VII-11 summarizes the information on container permits for the nine case study States. The data that is collected by the States on the permits is limited as most are multi-trip (annual) permits and not vehicle specific.

With the exception of Minnesota and Oregon.

TABLE VII-11 CONTAINER PERMITTING IN CASE STUDY STATES

STATE	Permit Available Y/N Type:Trip/Annual	Permit Fee	Maximum GVW and Single/Tandem Axle Weight Limits	Conditions/Comments
Arizona	Not Available	NA	NA	NA
California	Yes Annual Permits	Yes \$90 per vehicle	95,000 lbs.	Ports of Los Angeles and Long Beach, within specified distance of ports. Are vehicle and route specific. Oakland has its own permit program for the Port.
Georgia	Yes Trip and Annual Permits	Yes \$20 trip \$100 per vehicle	Trip: 100,000 lbs.; 22,000/40,680 lbs. Annual: to 80,000 lbs.; 20,340 per axle	Issue approximately 300 per day, second largest generator of permits.
Maryland	Yes Annual Permits	No Fee	90,000 lbs. 22,400/40,000 lbs.	To/From Port of Baltimore, route restrictions, not vehicle specific.
Massachusetts	Not Available	NA	NA	NA
Minnesota	Yes Trip Permits	Yes Base fee \$15, plus damage assessment fee	No maximum GVW 46,000 lbs. tandem 60,000 lbs. tridem 80,000 lbs. quad	Available only since 1994, issued less than 50
New Hampshire	Not Available	NA	NA	NA
Oregon	Yes	Yes	105,500 lbs. 21,000/42,000 lbs.	
Pennsylvania	Yes Annual Permits	Yes based on number of truck-tractors*	90,000 lbs. 21,000/42,000 lbs.	Issued approximately, 3,200, routes restricted

^{*\$100} for 15 or fewer truck-tractors; \$150 for 16 to 50 truck-tractors; \$250 for 51 to 100 truck-tractors; \$350 for 101 to 150 truck-tractors; and \$400 for more than 150 truck-tractors.

ENFORCEMENT OPERATIONS

Weigh Facilities and Equipment

Problems of inoperable or obsolete equipment, repair or maintenance work not completed expeditiously, and inconsistency between States and regions are common issues cited by FHWA in the review of the Annual State Certifications and confirmed in some of the case study States. States that are subjected to harsh winter weather conditions and have a very limited number of fixed weigh facilities, as with three of the case study States, contend with the problem of locating plowed roadside inspection areas for safely weighing trucks.

Roadside inspection facilities are often insufficient to provide a safe environment for the officer and vehicle being weighed, and limit the number of vehicles that can be safely stopped for weighing. The Minnesota State Patrol operates under written guidelines for enforcement in the selection of appropriate inspection areas for weight enforcement. Other State enforcement agencies may also consider implementing guidelines.²⁵

Grandfather Rights and Nonuniformity Between States

Nonuniformity in weight limits and permits as the result of grandfather rights in contiguous States is an issue raised by enforcement in many of the case study States. The impact of different limits or exceptions in neighboring States often results in the addition of new permits or exceptions with each legislative session, resulting in the "ratcheting effect." The nonuniformity created by constant changes in limits and exceptions suggests that a uniform standard, whether Federal or regional, may be desirable. Uniformity, in this context, could be a means of "leveling the playing field" between States and the industries in those States. For instance, weight permits for milk in New York was cited by Pennsylvania officials as one reason legislation was passed for new overweight blanket permits for milk and steel coils, in 1995. In late 1995, the Pennsylvania permit law led to inquiries from the Maryland industry about pursuing a similar law.²⁶ This is an example of the process of "ratcheting" weight limits upward over time because of competitive pressure from neighboring States.

Complex Regulations Should be Avoided

State field enforcement personnel and officials interviewed during the case study process generally believed that complex regulations should be avoided.²⁷ National standards, particularly those that require field enforcement in the States, should be developed in full consultation with State enforcement officers. Regulations must be easily comprehended by enforcement personnel as well as by those expected to comply. Often the education of industry occurs when a ticket is written and the State enforcement officer must explain the law to the driver. A regulation that requires specialized equipment or facilities and technical expertise will be difficult to enforce.

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The 1996 death of an Indiana State inspector and the truck driver of the vehicle he was inspecting led to calls by some enforcement and industry representatives at the 1996 Commercial Vehicle Safety Alliance annual meeting to end roadside inspections.

The Pennsylvania permit is for 94,000 pounds, however the axle limits of 21,000 pounds (single axle) and 42,000 pounds (tandem axle) cannot be exceeded within the existing length limit. The permit is only valid off the Interstate. No law was introduced in Maryland in 1996.

This observation confirms the findings presented in Transportation Research Board Report 225.

IMPROVING THE EFFECTIVENESS OF THE TRUCK SIZE AND WEIGHT PROGRAM

Interviews with representatives of the FHWA's OMC regarding the size and weight certification process and MCSAP indicate that activities are underway in both areas that may have an impact on operations of State enforcement. Of particular interest in the context of this discussion are the completion of "pilot projects" on implementation of relevant evidence legislation in four States: the Oregon study under way on size and weight violation data and carrier safety compliance history; and revisions to the certification and SEP process published under an Advanced Notice of Proposed Rulemaking (ANPRM) 93-28 in 1993.

ADMINISTRATIVE ADJUDICATION OPTIONS: RELEVANT EVIDENCE

In 1985, an FHWA Study was completed on the problem of administrative adjudication for weight enforcement in the States. The study identified various options for administrative adjudication that could be used to improve the effectiveness of State enforcement programs. One such option was "relevant evidence" as used in Minnesota since 1980. "Relevant evidence" allows the use of bills of lading, weight tickets, and other documents that indicate the weight of a truck to be used as evidence in a civil court proceeding to establish overweight violations." Enforcement is accomplished through an audit, generally of the shipper or freight forwarder, and civil action can be taken against the driver, the shipper, the owner and/or the lessee for all or part of the fine, depending on the degree of responsibility for causing the overweight movement. The audits also provide a means to enforce the multiple trip permits and recover some of the damage costs as well as to determine frequency of use. ²⁹

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[&]quot;Effectiveness of Relevant Evidence in Reducing Truck Overweights," Report made through a cooperative effort of the Minnesota DOT and the Minnesota Department of Public Safety, p.2.

Minnesota's weight enforcement personnel interviewed in the case studies believe the program has been a great success and are strong supporters of the approach. The findings of a 1985 program effectiveness audit by Minnesota DOT and State Police indicated that, as part of a comprehensive weight enforcement system, relevant evidence proved to be extremely successful in restricting the operation of illegally overweight vehicles.

In 1993 FHWA initiated a "pilot project" to assist a selected number of States³⁰ in adopting "relevant evidence" laws. The project was completed in 1996 with none of the States succeeding in passing legislation to implement relevant evidence. The preliminary observations from the relevant evidence project indicate that industry opposition to proposed legislation succeeded in defeating the bills. Renewed interest in "relevant evidence" laws has been expressed by several States; this may be a viable option in the future under what could be a new paradigm of weight enforcement.³¹

Another approach to administrative adjudication was reviewed in the discussion with the Georgia program administrator. Georgia adjudicates all weight citations through an administrative process within the DOT rather than through a court system which in theory should increase the probability of collecting fines. The process is quite similar to the way in which tax audits are processed, that is, the citation is issued, and the fine must be paid within a period of time or a hearing requested. Failure to pay results in initiation of a collection process by the DOT Investigative Unit. The result of the collection process may be impoundment of the vehicle, suspension of the registration or placement of a lien.

INCREASED TECHNOLOGY DEPLOYMENT

COMMERCIAL VEHICLE INFORMATION SYSTEMS AND NETWORKS; DEVELOPMENT AND OPPORTUNITIES

Commercial Vehicle Information Systems and Networks (CVISN) describes the ITS elements which support CVO. CVISN includes activity associated with commercial vehicle credentials and tax administration, roadside inspections, and freight and fleet management. It is a national effort to coordinate and integrate technologies in use or under development to improve efficient operation of motor carrier programs to benefit government, carriers, and other stakeholders.

Until recently, the use of technology for CVO has been more prevalent in the West and Northwestern States than East and Northeast. In its oversight role of the State weight enforcement programs, the Federal interest and involvement in technology use and deployment for CVO has been most prominent in the advocacy of WIM and AVI. The ISTEA provisions for

The four states selected were Iowa, Louisiana, Mississippi, and Montana. Each state received \$50,000 in funding from the Federal-Aid program as supplemental grants to MCSAP.

Milan Krukar and Ken Evert described their view of a paradigm shift in TS&W enforcement at a 1993 conference, noting that ISTEA accelerated the shifts. The eleven paradigm shifts they observed are: (1) the traditional relationship between the motor carrier industry and enforcement has evolved from one of having to check all trucks to emphasis on potential violators; (2) a change in internal organization and attitude of transportation departments toward enforcement; (3) technology shifts toward combinations of WIM, AVI and other technologies to replace the traditional measurement methods; (4) use of relevant evidence laws to hold shippers/owners responsible for violations rather than drivers; (5) changes in weight citations toward a WIM standard; (6) metric conversion; (7) intermodal impacts and opportunities for enforcement, licensing, taxation of all modes; (8) infrastructure capacity control of truck traffic with technology; (9) integration of intermodal time schedules with technology; (10) weight overload citation changes from the criminal to the civil court system and the use of ESALs rather than pounds for weight violations; and (11) global enforcement needs for standardized limits.

a Federal role in the deployment and testing of ITS technology, including a CVO element, has generated interest and support from many States.

Although CVISN technology holds some long-term promise in the identification of overweight vehicles and the enforcement and permitting of size and weight regulations, issues remain. The use of ITS technology holds promise for State administrative functions, such as permitting of vehicles and loads, and the collection of enforcement data into a "real-time" entry and access database. In fact, many States have either implemented computerized permit systems or are in the process in doing so.³²

The technology discussed below has been in use, is currently being tested, or is available for use for State size and weight administration and enforcement. The Federal role in promoting the use of technology in the 1980's focused on the combination of WIM and AVI for monitoring and collecting data on vehicles and in encouraging States to use WIM for screening of vehicles. As new technologies evolve, additional opportunities for improving enforcement effectiveness may present themselves.

Weigh-In-Motion

The use of WIM for screening at fixed weigh facilities provides enforcement with a tool to improve the efficiency and effectiveness of operations³³. Although WIM is excellent for screening purposes, it is not without its problems. WIM equipment has frequent maintenance requirements arising primarily from heavy use. Thus, this almost indispensable enforcement tool is often inoperable for extended periods of time.

A 1994 study conducted by the Florida DOT for the purpose of assessing the feasibility of using WIM for weight enforcement personnel, exemplifies the benefits to be gained from the use of WIM. The findings strongly support WIM use by enforcement for identifying areas in need of weight targeting. The findings also support conclusions of previous studies that lack of any enforcement results in high noncompliance and the highest enforcement results in complete, or near complete, compliance for those trucks weighed.³⁴

Other possible uses of WIM for enforcement exist, such as combining WIM with photo imaging and assessing civil penalties for violations. Another possibility within the scope of CVISN is to expand the use of high speed weigh-in-motion (HSWIM) off the Interstate System for

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Minnesota's computerized permit system was one of the first implemented and has served as a model for other States, reducing the time involved for carriers and the State agency for issuing a "routine" permit to approximately 30 seconds.

[&]quot;Weigh-In-Motion Technology Improves Highway Truck Weight Regulation," Laurita, Sellner, and DuPlessis discuss the benefits and problems, citing New Jersey and Delaware's incorporation into planning of weigh stations and uses in bypass route monitoring.

Periodic replication of this study methodology in other States could provide useful information for evaluating the extent of the overweight problem nationwide. One recommendation made by the study group was to require the States to report on weigh station bypass enforcement in the annual certifications. One limiting factor of the study is the vehicles weighed were exclusively 5-axle tractor trailers.

enforcement in States not currently using WIM. This could increase the number of trucks that could be screened and weighed by portable scales.

Weigh-In-Motion and Photo Imaging

Photo imaging is a technique currently used for traffic enforcement in some States and large metropolitan areas where laws allow a citation to be issued for a violation (such as, stop sign or red light) based on a photograph or video reading of the vehicle plate. A combination of WIM and a camera plate reader to match up an overweight truck with the vehicle owner is being tested and evaluated in Minnesota. The impact of weather and speed on the photo image is one area being evaluated. This combination of technologies could provide a means to enforce weight limits on overweight vehicles by-passing scales if problems associated with climate can be resolved.

Automatic Vehicle Identification and Automatic Vehicle Classification Systems

Automatic Vehicle Identification (AVI) and Automatic Vehicle Classification (AVC) systems have been in use for many years, primarily by the private sector for such things as tracking intermodal containers, parking lot control, and fee assessment. The potential use of AVI for CVO and enforcement was tested in the Heavy Vehicle Electronic License Plate (HELP) Crescent Demonstration Project in the 1980s. The HELP/Crescent evaluation team concluded that there were benefits to be derived if technical problems and barriers could be overcome. They concluded that the CVO services that are closest to being ready for deployment and implementation are the automated roadside dimension and weight screening technologies.

Bar Codes and Readers

Bar codes and readers may be used in the future to facilitate permitting and enforcement. This could potentially include checking credentials and data collection on registration, taxation and overweight permits. Since approximately 1990, bar codes have been in use by customs brokers on the Canadian border for international freight documents. This allows the documents to be scanned by customs officers providing a screen display of the data and entry into a database.

The HELP/Crescent project tested AVI, AVC and WIM in combination on the I-5 corridor and involved the States of Washington, Oregon, California, and Arizona and the province of British Columbia. The project was initiated in 1983, the demonstration element implemented in 1991 and concluded in 1993. The crescent shape of the I-5 corridor led to the project name.

Geographic Information Systems

Geographic information systems (GIS) is a technology currently in use by State transportation planners with potential for use in strategic weight enforcement planning. State DOT GIS databases could include information related to truck operations, such as known "generators of truck traffic" (i.e., asphalt plants, quarries, landfills) and access to the information could be provided to enforcement programs. Although individual enforcement officers may be familiar with the location of facilities in their patrol areas, a compilation of Statewide facilities is unlikely. Alone or coupled with WIM data, the GIS could provide a strong tool for enforcement planning.

Pilot Projects on Brake Testing Equipment

The FHWA's OMC is funding two States (Maryland and Minnesota) to evaluate brake testing equipment and its potential for use as a screening device for MCSAP inspections. The Minnesota brake testing equipment was installed in 1995 and has just completed a year in use. In addition to the braking data, a diagram is generated with weight distribution on axles and tires shown (see Appendix ___). Therefore, not only can an axle weight be determined but the distribution of weight on each tire can be obtained.

COSTS OF TECHNOLOGY DEPLOYMENT AND MAINTENANCE

The use of ITS-CVO technology beyond the completion of Federal "prototype" and "pilot" State testing and evaluation will be contingent on overcoming barriers to include: (1) institutional; (2) legal; (3) industry acceptance; and (4) financial. Cost related to technology deployment and the required maintenance of the systems are two particularly important issues which remain to be resolved.

To illustrate the commitment of resources required to implement, Oregon developed a strategic plan for ITS-CVO in 1993. The State calculated the cost to implement and maintain such a system to be \$23.3 million (1993 dollars) over a six-year period.³⁶ The technology included WIM & AVI (7 Interstate sites, 14 sites on the State primary system, and other sites on/off the State highway system) and dynamic warning systems. Federal funding for implementation of a portion of the plan as a National CVO project prototype was made available at an 80/20 match, with six million dollars appropriated for the Federal share.

The Oregon plan projected total costs over a 20-year period to be \$48.2 million and the benefit to the State as \$150.2 million due to reduced tax administrative costs, tax evasion and road damage. Motor carrier costs were also estimated over the same 20-year period to be \$23.1 million, and benefits equal to \$195.1 million from time savings, reduced procedures, and reduced tax administrative costs.

^{\$13.2} million for construction, \$4.6 million for operations and maintenance, \$4.1 million for information systems, \$0.9 million for research and development testing, and \$0.5 million for planning and coordination.

Obviously costs and benefits vary from State to State, or region to region, an ongoing financial commitment of significant funds will be needed in order to realize the benefits.

CURRENT REGULATORY REGIME AND IMPLICATIONS OF CHANGES

The current National policy was established by Congress in 1982 when certain State laws pertaining to length and legal vehicle configurations were preempted for the Interstate Highway system and selected non-Interstate highways. Since that time FHWA has generally worked with the States one-on-one whenever a State fails adequately to enforce TS&W laws. The current relationship between the Federal and State administrators of the TS&W Enforcement Program is best characterized as Federally-guided and State-administered.³⁷

The effectiveness of the relationship was questioned in a 1991 program audit by the Office of Inspector General which found that improvements are needed in the vehicle weight enforcement program and that FHWA should strengthen its administration of the program. How FHWA should proceed to strengthen its administration centered around the three elements shown in Table VII-12. The FHWA responded by clarifying several legal and operational misunderstandings and moved ahead to implement other suggested improvements in the program. Key recommendations from the OIG report follow.

TABLE VII-12
OIG PROGRAM EFFECTIVENESS MEASURES FOR STATE WEIGHT ENFORCEMENT

Quantification of Nature and Extent of Overweight Vehicles	2. Plans and Strategies to Combat Overweight Vehicles	3. Application and Evaluation of Enforcement Techniques
✓Expanded use of WIM to collect data for use in quantifying the magnitude of the problem	✓Comprehensive criteria to evaluate the adequacy and effectiveness of State programs	✓Consideration of damage factor in permit fees
	needs to be developed by FHWA	✓Adequacy of fines and penalties
✓Increased use of WIM for		
planning enforcement details to	✓ Current SEPs lacking required	✓No tolerances are acceptable
be more effective	information needed to measure	
	effectiveness	✓Off-loading usage
✓Improved calibration of WIM,		
New equipment purchases	✓WIM data obtained from 4 states	✓Use of "relevant evidence" laws
	indicates increase in the percent	
	of overweight tandem axles on	
	non-interstate highways	

The specific recommendations for FHWA program administration improvements noted in the OIG audit report were:

Federal guidelines for annual certification and SEPs are specified in Part 657 of Title 23, CFR.

- Identify the nature and quantify the extent of overweight trucks;
- Direct FHWA Divisions to more actively promote, monitor, and evaluate the use of WIM;
- Direct FHWA Divisions to work with the States to evaluate existing fine structures;
- Analyze SEPs more critically;
- Initiate Congressional action to prohibit use of divisible load permits and multi-trip non-divisible load permits on the Interstate System;
- Promote use of nontraditional enforcement techniques; and
- Enforce prohibition of administrative weight tolerances.

FHWA RULEMAKING: "CERTIFICATION OF SIZE AND WEIGHT ENFORCEMENT"

In December 1993, the FHWA issued an ANPRM for the State Certification of Size and Weight Enforcement. Comments were requested on nine "problems" with the certification and SEP procedures identified by FHWA (see Appendix __):

- The magnitude and location of the overweight problem is unknown;
- Weight tolerances at scales are common despite Federal law;
- Preparation of SEPs and Certifications is time consuming;
- Not all states are taking advantage of improved data collection to enhance program management and effectiveness;
- The amount of pavement wear attributable to vehicles with special permits is unknown;
- Permit fees and overweight penalties do not always reflect true costs;
- Enforcement plans lack specific, measurable goals;
- There is inadequate vehicle size and weight enforcement in some urban areas; and
- Sanction procedures do not clearly identify State settlement options.

Comments to the docket were received from twenty-one State DOTs, nine State enforcement agencies, and twenty from other interested parties. Generally there was agreement among the States on the following:

- The magnitude of the overweight truck problem could possibly be measured with the use of WIM technology but only with an infusion of significant Federal funding to the States;
- Enforcement discretion on tolerances should be accepted as a given with less emphasis by FHWA, and if any tolerances are to be adopted by FHWA, they should not be percentage based;
- The process for preparation and submittal of the SEPs and certifications is time consuming (one estimate is 4,160 hours in the aggregate) and could be improved;
- The use of ITS will be limited until it has proven reliability and durability;
- Permit fees do not recover damage costs;
- There is no one model for enforcement that fits all States;
- "Relevant evidence" should not be mandated unless Federal funds are provided to implement;
- Certifications and SEPs should take into account "regional" enforcement performance; and
- The use of sanctions should be replaced with incentives such as a grant program for the States.

FHWA is considering all comments received, in depth.

The process for submittal and acceptance of the annual State certifications and SEPs is complex, time-consuming, and convoluted. Additionally, the process for review of the SEPs by the OMC is also time-consuming and complex (see Appendix ___). The increasing demand for more detailed information from the States is not only the result of a need to measure program effectiveness for the Administration and Congress but also of a need to be able to provide comparative data on potential conflicts and inconsistencies in policies.

FUTURE ENFORCEMENT

The rulemaking has been temporarily suspended pending the completion of this CTS&W Study and potential Congressional revisions to TS&W regulation as part of ISTEA reauthorization. The rulemaking will be completed subsequent to this Study and necessary revisions made to ensure effective enforcement of the Federal law.