

NATIONAL TRUCK WEIGHT REGULATIONS

Historical Background and Emerging Issues

JOHN P. EICHER

Background

The federal government began regulating truck size and weight in the United States more than 30 years ago, and until 1982 these federally imposed limits remained relatively constant. In 1956, when funding was established for the National System of Interstate and Defense Highways, states were required to adhere to maximum weight limits in order to receive federal funding, an action taken to protect the newly created highways from premature deterioration as a result of excessive loads.

Before 1956, truck size and weight were controlled exclusively by the individual states, most of which imposed a gross weight of 73,280 lb or less. With the passage of the 1956 legislation, the maximum allowable weights for trucks were 18,000 lb for a single axle, 32,000 lb for a tandem axle, and 73,230 lb gross vehicle weight. States that had limits lower than the federal limits on the Interstate system were not required to raise them, and states whose limits were higher than the federal limits before 1956 were not required to lower them. The 1956 legislation effectively froze the upper limits on allowable weights.

This article on national truck size and weight issues is a summary of a keynote address by John P. Eicher, Director of Program Management Support, Office of Motor Carriers, Federal Highway Administration, delivered at the International Symposium on Heavy Vehicle Weights and Dimensions, Kelowna, British Columbia, Canada, on June 8, 1986.

In 1974, the maximum allowable single- and tandem-axle limits were raised to 20,000 and 34,000 lb, respectively, and the gross vehicle weight was raised to 80,000 lb, subject to the federal bridge gross weight formula, which controls gross weight according to the number of axles and their spacing. The 1974 legislation also required that all states certify annually that they are regulating and enforcing truck weight limits. Certification was strengthened in 1976 to require each state to quantify its truck weight monitoring program, as well as the methods by which trucks are weighted, number of citations issued for overweight trucks, penalties for overweight truck violations, and number of overweight permits issued exempting trucks from legal limits.

As a result of the permissive federal weight limits and grandfather provisions, a wide variety of weight limitations remained in effect, varying from state to state and from region to region. The energy crisis from 1974 to 1979 prompted further demands for uniform weight limits.

By 1981, most states had adopted the federal gross vehicle weight limit of 80,000 lb, but three states—Arkansas, Illinois, and Missouri—retained lower gross limits, which formed a barrier to long-haul operation of 80,000-lb trucks. There was also inconsistency among states in allowable axle loads.

To address this persistent problem of nonuniformity, the U.S. Congress in

1982 established new federal mandatory weight limits to replace the permissive maximum weight limits. States were required to allow trucks to carry 20,000 lb on a single axle, 34,000 lb on a tandem axle, and 80,000 lb gross vehicle weight, subject to the federal bridge formula. All states now have these federal limits on the Interstate system. (Truck weight limits on roads other than the Interstate system are still governed by the individual states.) These are also the maximum limits and cannot be exceeded unless a state has grandfather rights. One grandfather clause legalizes the continuation of all single-axle and tandem-axle loads and gross weights that were in effect in a state on July 1, 1956. The second grandfather clause legalizes formulas or tables that vary from the federal bridge formula and that were in effect in a state on January 4, 1975. The intent of the grandfather clauses was to freeze the upper weight limits and to maintain the status quo for previously legal loads.

Truck Weight: Unresolved Issues

Nonuniformity Among States

The Federal Highway Administration recognizes a state's claims to grandfather rights as long as they are consistent with explicit provisions of the law.

Preservation of the grandfather weight provisions in the 1982 legislation has encouraged increased variability among the states on the upper limits of allowable truck weights on the Interstate system. For example, in the western states, gross vehicle weights sometimes exceed federal limits, but axle weights typically do not. The opposite is true in eastern states—axle loads may exceed federal limits whereas gross vehicle weights generally do not exceed the 80,000-lb capacity. A total of 19 states have grandfather weight provisions on the Interstate system that exceed federal limits. In addition to the wide latitude in legal weight limits, states may also issue permits for the operation of overweight vehicles that carry loads that cannot be easily dismantled or divided.

The number of citations issued for overweight trucks has increased slightly as the number of truck weighings has grown. For example, in 1985 more than 103 million trucks were weighed and 681,000 citations were issued. By 1986 the number of trucks weighed rose to 110 million and citations for overweight violations increased to 685,000.

Enforcement

Weigh-In-Motion

Truck weight enforcement programs are intended to ensure compliance with legal load limits and thus prevent trucks from prematurely damaging highway pavements and bridges. Although state truck weight enforcement activities have increased in the last few years, the relatively small number of weigh stations in most states and the avoidance of scales by drivers of overweight trucks undermine the collection of representative data.

Nevertheless, the number of states using weigh-in-motion (WIM) for weight-enforcement purposes has increased. In 1984, 11 states weighed 5.7 million vehicles using WIM systems; in 1985 and 1986, the number of vehicles weighed using WIM increased to more than 10 million. Current efforts by the federal government to fund WIM demonstra-

tions and promote the use of WIM should further accelerate the adoption of less labor-intensive data collection and weight-enforcement practices.

Penalties for Weight Violation

Penalties for weight violations vary among states. For example, fines can vary from \$20 to \$1,000 for a 4,000-lb tandem-axle violation, from \$25 to \$10,000 for a 10,000-lb gross weight violation, and from \$25 to \$20,000 for a 20,000-lb gross weight violation. The methods by which states impose fines for weight violations also vary. About 20 percent of the states have fixed fines that are assessed administratively rather than through the courts. In addition to imposing fines, about 25 percent of the states require weight violators to unload their trucks to conform to legal weights before proceeding, which can be a major deterrent to the practice of overloading. Nevertheless, overloading will continue as long as it remains economically viable. The possibility of a penalty for overloading may be viewed as a risk of doing business in a highly competitive environment.

Truck Weight: Emerging Issues

As previously mentioned, several factors have led to wide variability in truck weight limits on the Interstate system, particularly grandfathered weight rights. At present, states define the grandfather rights to which they are entitled. Segments of the motor carrier industry are encouraging states to relax interpretations of their grandfathered weight rights, and some states have begun to liberalize their weight limits through loopholes in the interpretation of the federal legislative provisions on grandfathered weight. In some cases, these provisions are restricted to the movement of certain types of commodities, such as agricultural, timber, or mining products, or are reserved for particular truck configurations. These developments have led to even wider variability in state truck weight laws. The emer-



John P. Eicher, Director of Program Management Support, Office of Motor Carriers, FHWA.

gence of WIM systems and the enthusiasm with which many states are installing them will enable the population of overweight trucks to be better defined. Preliminary data from WIM sites in three or four states indicate that between 40 and 60 percent of large trucks exceed current legal weight limits, especially during late-night hours when fixed-scale installations are typically closed.

Recognition of increasing pavement deterioration and bridge overstress is now stimulating interest in more stringent weight-enforcement practices.

Federal Designation of a National Truck Network

When federal weight limits were established by the 1956 legislation, a 96-in. maximum allowable vehicle width on the Interstate system was also introduced. In 1976, states were granted the authority to allow 102-in.-wide buses on Interstates. By 1982, considerable variability in allowable truck lengths and configurations existed among the states. Tractor-semitrailers were allowed to operate in all states, but generally the eastern and southern states imposed tighter length restrictions. Most western states allowed short twin-trailer combinations, but twin trailers generally were

not allowed in the eastern and southern states.

Another feature of the 1982 legislation was the establishment of a national truck network. The network consists of the entire Interstate system and other designated highways on which the state must allow twin-trailer combination

trucks and single-unit combinations with at least 48-ft semitrailers, all of which could be up to 102 in. wide, to be operated. States were required to allow at least 28-ft twin trailers to be driven on the network and were precluded from imposing overall truck length limits. In addition, the legislation afforded special

treatment for automobile transporters, household goods movers, and other specialized equipment.

The new law on size and weight was not without controversy—eastern states did not want to allow double trailers whereas western states did not want long, single trailers; and wider trucks were unwelcome in states from coast to coast.

At present, there is a designated network of approximately 181,000 miles for the longer and wider trucks—42,700 miles of the Interstate system and 54 percent of the 256,000 miles of the non-Interstate, federal-aid primary system.

In 1984, Congress passed the Tandem Truck Safety Act, which clarified some of the ambiguities in the 1982 legislation and liberalized the access afforded by the states to single-unit combination trucks with semitrailers 28 ft or less long.

Turner Proposal May Boost Truck Productivity While Saving Highways

In an address at the 1984 Annual Meeting of the American Association of State Highway and Transportation Officials (AASHTO), former Federal Highway Administrator Francis Turner proposed adopting heavy truck regulations that would encourage more efficient use of highways for freight transportation by reducing both pavement and freight costs simultaneously. The proposal would allow higher gross weights but would lower the allowable weight on each axle. Truckers would gain the added productivity of higher gross weights by adding enough extra axles to reduce the load carried by each one. Highway pavements would last longer and require less frequent repair because of the decreased axle loads.

AASHTO asked the Transportation Research Board to undertake a brief study to determine whether the proposal warranted detailed analysis. According to this study, roughly one-fourth of all large truck travel in the United States might be attracted to the kinds of vehicles that would be allowed under one version of the proposal. Annual pavement costs to highway agencies would decline, but bridge-related costs would increase somewhat because the added stress on some bridges would reduce their service lives. The estimated productivity gains from the new vehicles would reduce shipper costs by as much as several billion dollars annually. These impact projections as-

sumed that the new vehicles would be largely confined to main roads and that truck operators could choose to operate under either the new limits or the ones now in effect.

The preliminary study concluded that the proposal does appear feasible and that it might yield important benefits to all road users but that further examination would first be necessary in the areas of carrier acceptance, alternative vehicle configurations and route restrictions, potential safety impacts, and the costs of bridge overstress. At AASHTO's request, therefore, TRB has convened a special study committee to conduct a comprehensive examination of the proposal. The study will be completed in March 1990 and will be funded through the National Cooperative Highway Research Program.

The committee directing the study includes public and private transportation administrators, representatives of the driving public, and experts in the relevant engineering and economic disciplines. The committee is analyzing the market acceptance and productivity of the various vehicle and route options; evaluating bridge, safety, and pavement impacts; and may make recommendations on future policy actions. Professor C. Michael Walton of the University of Texas is the committee chairman.

Truck Length and Width: Unresolved Issues

Although the major provisions of the 1982 legislation on truck length and width have been carried out, unresolved issues remain, such as final regulations on automobile transporter lengths, grandfathered semitrailer lengths, designations for specialized equipment, and provisions for access to and from the national network.

The 1982 legislation required that all states allow the longer and wider vehicles reasonable access between the national network and terminals and facilities for food, fuel, repairs, and rest. The Federal Highway Administration is monitoring the situation in each state to determine if longer and wider trucks are being provided reasonable access. Wide latitude in access policy has evolved in individual states. Some states limit access to and from the national network to distances less than one-half mile whereas other states allow unlimited access. This variability has led to considerable confusion, especially among the long-haul segments of the trucking industry.



Five-axle tractor-semitrailer, the most important vehicle in the nation's freight truck fleet.



Federal size and weight laws also govern weights of buses.



Eight-axle straight truck.



Long, nine-axle double trailer truck, sometimes called a turnpike double. Similar vehicles operate in about 13 states.

TRB To Study Truck Size and Weight Regulations

Motor vehicle size and weight limits have a considerable effect on the nation's economic productivity, as well as the cost of its highway system. An investigation of truck size and weight limits conducted by the U.S. Department of Transportation in 1981 determined that increases in limits could reduce the cost of goods movement by more than \$4 billion per year. However, the same increases in limits could result in a \$1.5 billion per year increase in pavement costs and require the reconstruction of many bridges. Moreover, considerable uncertainty surrounds the highway safety consequences of such increases.

In response to continuing debate on this issue, Congress, under Section 158 of the Surface Transportation and Uniform Assistance Act of 1987, requested that the National Academy of Sciences, through the Transportation Research Board (TRB), conduct a study of truck size and weight regulations.

In answer to this request, two committees have been formed to conduct the study. One will deal with truck weight issues, particularly the federal bridge formula and grandfather exemptions to federal weight limits. The other will handle access issues for the longer and wider trucks mandated on the Interstate and some other primary highways by the 1982 Highway Act. Each committee will estimate the benefits and costs of various changes in federal truck size and weight limits to affected parties. These include the effects on pavements, bridges, safety, revenue and cost responsibility, and the productivity of various segments of the trucking industry.

Dr. Lester A. Hoel, Hamilton Professor and Chairman of the Department of Civil Engineering of the University of Virginia, has been appointed chairman of the Truck Weight Study Committee.



Six-axle semi, with long trailer and low profile tires to allow a lower trailer floor, designed for maximum cargo volume capacity.



Six-axle tractor-semitrailer used in Michigan; similar vehicles operate in other states.



Nine-axle double with trailers each about 32 ft long, used to haul produce and other commodities in several western states. In trailer lengths, axle configuration, and axle loads, the vehicle is similar to the Turner truck concept.

Truck Length and Width: Emerging Issues

What Is "Reasonable Access"?

The trucking industry is currently pushing for liberalization of the national network in many states. But there is mounting public pressure in some states to eliminate portions of the national truck network and to impose restrictions on the operation of large trucks.

A number of states impose restrictive access provisions on and off the network; the trucking industry wants these access provisions liberalized. Compounding the access problem are the differences in enforcement practices not only among but within states. Because twin trailers and longer tractor-semitrailers were already running in western states before the establishment of the national network, certain segments of the trucking industry in the western states feel shortchanged, claiming that the legislation raised their highway user fees but gave them no benefit relative to increased size and weight.

Legislation was introduced in the 99th Congress that would liberalize access to the national network for the longer and wider trucks and lift the gross vehicle weight cap but retain the axle limits and bridge formula compliance requirements on the Interstate system in 17 western states. The proposed legislation also sought to liberalize the grandfather semitrailer length provisions outlined in the 1982 legislation. Although this proposal was not enacted, it indicates growing sentiment for more widespread operation of longer tractor-semitrailers on the national network.

There is some concern that liberalized access for longer tractor-semitrailers may increase safety problems because of the restricted maneuverability of these rigs, which can make negotiating curves and intersections difficult. There is additional concern that if the gross vehicle weight cap is lifted for the western states, it is just a matter of time before there is pressure to lift the weight cap in other states and allow the longer combination vehicles to operate nationwide.

Further indications of interest in longer trucks are legislative proposals, also considered by the last Congress, that would have allowed even longer combination vehicles to be operated on the Interstate system in western states. These longer vehicles would probably include turnpike doubles, which include twin 40- or 45-ft trailers, that could be as long as 110 ft. Some proposals for longer combinations were to allow a "triple" consisting of three 28-ft trailers with an overall truck combination length of about 95 ft. Fourteen western states currently allow some form of longer combination on a selected portion of their Interstates. Five eastern states permit longer combinations on their turnpikes.

Efforts to monitor the safety performance of longer and wider trucks are hampered by limitations in available data. Studies are currently under way to assess the safety performance of large trucks and to better quantify the relationship among truck dimensions, highway and traffic volume characteristics, and driver factors and accident causation.

Current Proposals

Francis Turner, a former Federal Highway administrator, has proposed that the national size and weight limits be changed to allow the operation of trucks with higher overall gross weights but lower axle loads. Such vehicles would significantly increase truck payload capacity while reducing overall pavement damage and increasing bridge service life. He suggests adding an extra axle to both standard tractor semitrailers and western doubles. Turner also advocates a double trailer configuration wherein the trailers would be 30 to 35 ft long and fully equipped with tandem axles on the trailing units. The tandem axles could be limited to 25,000 lb as opposed to the current 34,000 lb, but the configuration would be allowed a gross vehicle weight in excess of 100,000 lb.

A variety of alternatives is being analyzed. One option would be to eliminate the gross vehicle weight limit of 80,000 lb nationwide and phase out grandfa-

thered weight provisions. Axle weight limits and bridge formula requirements on the Interstate system add variables to the complex equation. To avoid major degradation in pavement service life, there may be a need to require trucks in excess of 80,000 lb to use tandem axles on all trailing units and abandon single-axle trailers. Also, the bridge formula may need to be modified to avoid overstressing bridges. Lifting the weight cap would yield a productivity increase for the trucking industry, but certain segments of the industry, particularly short-wheel-based vehicles in the East, would lose their current ability to carry heavy loads under grandfather provisions. Eliminating grandfathered weight rights would be a major step toward achieving nationwide uniformity in truck weight limits on the Interstate system.

Dynamic Environment

A dynamic regulatory and operating environment will continue. An active research program related to large truck safety and operations is under way. New activities are planned in both the public and private sectors. The federal government has either planned research or is involved in ongoing research related to highway geometrics and large truck operations, safety and handling abilities of longer truck combinations, the impact of various truck configurations and loading patterns on pavement damage and bridge overstress, cost responsibilities and user fee alternatives and the associated taxes levied on the trucking industry, and the impact of regulatory alternatives on various segments of the trucking industry. In addition, plans are being developed for improving motor-carrier-related accident and travel data that will enable a more accurate assessment of the safety performance of various truck configurations.

FHWA motor carrier activities currently under way are described in the box. Some of these activities will be discussed in more detail in future issues of *TR News*.

FHWA Sets New Agenda for Motor Carrier Activities

The Federal Highway Administration (FHWA) is currently working closely with representatives of the states and the motor carrier industry to improve the safe operation of trucks and buses on our nation's highways. Considerable resources are being devoted to a wide array of truck and bus safety issues and related activities.

Staffing and Organization: The FHWA motor carrier staff in Washington, D.C., and more than 78 field offices has grown from 276 employees in 1981 to 440 in 1988. In 1985, motor carrier operations were consolidated under a single associate administrator.

Motor Carrier Safety Assistance Program: Through this program, established in 1982, \$139 million has been made available to the states to expand their motor carrier safety and enforcement activities. Program funding tripled from \$17 million in fiscal year 1986 to \$50 million in fiscal years 1987 and 1988. During the fiscal year ending September 30, 1987, states conducted approximately 1 million driver and vehicle inspections.

Safety Reviews: Although states have increased their role in roadside inspection of commercial vehicles and related enforcement activities, the FHWA has stepped up on-site reviews of motor carrier operations by 80 percent. Safety reviews are conducted on all unrated motor carriers that operate in interstate or foreign commerce. During fiscal year 1987 alone, approximately 45,000 carriers were contacted for safety reviews. In addition, five states received training in the performance of safety reviews and initiated programs to assist in the rating process. Twelve additional states plan to participate during fiscal year 1988.

Commercial Driver's License: Implementation of a new law requiring that each commercial motor vehicle operator (a total of 5 million truck and bus drivers) be issued one license only is under way. This program requires that all states test and license commercial drivers according to federal standards being developed by FHWA.

Information Systems: Three major information systems are under development to provide comprehensive and current data on the safety performance of motor carriers, drivers and

vehicles, and other important indicators of the makeup of the industry. Users will be able to access data on safety reviews of the carriers, vehicle and driver inspections, licensing activities, and industry operations.

Regulations: All Federal Motor Carrier Safety Regulations (FMCSRs) are being reviewed and repromulgated, as required by the Motor Carrier Safety Act of 1984. The FHWA expects to complete this initiative in early 1988. Work is also currently under way on approximately 24 additional rulemaking activities, including 11 affecting truck size and weight.

Safety Regulatory Review Panel: The Federal Highway administrator chairs the review panel established by the Motor Carrier Safety Act of 1984. Approximately 70,000 sections of state laws and regulations are under review and analysis for consistency with the FMCSRs and other safety considerations.

In addition to the foregoing activities, the FHWA also

- Manages the designation of the federal-aid primary truck route system for larger trucks and issues size and weight standards for the Interstate system;

- Worked with the National Governor's Association during the past 3 years to develop recommendations designed to simplify state regulations for motor carrier taxes and registration;

- Managed truck and bus research and development activities totaling \$2.1 million in fiscal year 1987 to benefit the states and the motor carrier industry;

- Completed congressionally mandated studies and is currently working on study topics such as employee safety in the motor carrier industry, effectiveness of state and federal motor carrier regulations, user taxes for trucks, and an appropriate standard for determining when a motor carrier operator is considered driving while intoxicated; and

- Responds to almost 600 requests a year about motor carrier activities under the Freedom of Information Act and 1,500 written inquiries about motor carrier activities.