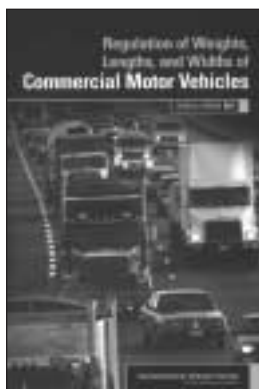


# Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles

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Federal and state regulations govern the weight and dimensions of trucks, buses, and trailers on U.S. highways. The regulations have economic consequences—trucking accounts for four-fifths of expenditures on freight transportation in the United States, and trucking costs are influenced by truck size and weight. Size and weight limits also influence highway construction and maintenance costs and the convenience and safety of highway travel. In addition, the regulations affect international commerce, because Canada and Mexico have different limits, and because international containers often do not meet U.S. standards.

States began to regulate vehicle dimensions before World War I. Federal limits were first enacted in 1956 in the Federal-Aid Highway Program legislation. The federal role originally was to protect the investment in roads and bridges and to allow uniformity of highway geometric design.

Extensive revisions of federal truck size and weight limits in 1983 included the first requirements that states conform to the federal standards. In 1991, federal regulations prohibited the states from expanding the operation of longer combination vehicles (LCVs)—multitrailers with a unit longer than 28 feet—on most major federal-aid roads.

The last two decades have brought changes in the use and characteristics of the highway system, as well as important structural changes in the freight industries. Congress has received proposals for revisions to the federal limits from industry groups, state governments, and others.

Proposals for changes in federal regulations governing vehicle size and weight are controversial, however, because larger trucks could increase some categories of highway costs and attract freight from railroads. Trucking firms and shippers' groups typically advocate liberalization, because larger trucks reduce costs. The railroad industry, highway safety advocacy groups, some trucking firms—especially smaller ones—and some states have opposed increases in federal size and weight limits.

## Commissioning the Study

In June 1998, in the Transportation Equity Act for the 21st Century, Congress directed the Secretary of Transportation to request the Transportation Research Board (TRB) to conduct a study of the regulation of weights, lengths, and widths of commercial motor vehicles operating on federal-aid highways under federal regulation, and to develop recommendations. The National Research Council of the National Academies convened the Committee for the Study of the Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles (see box, page 37), under the auspices of the Transportation Research Board (TRB).

After reviewing past evaluations by the U.S. Department of Transportation (DOT), TRB, and others, the committee developed preliminary conclusions addressing the performance of federal size and weight regulations and the adequacy of information available for guiding regulatory decisions. The committee's recommendations involve organizational arrangements to promote reform of the federal regulations, and regulatory and management changes to improve the efficiency of freight transportation and to reduce the public costs of truck traffic.

The committee found that regulatory analyses of the benefits and costs of changes in truck dimensions are hampered by a lack of information. The uncertainty could be alleviated with a program of basic research.

## Committee's Conclusions

*Reform of federal truck size and weight regulations could improve the efficiency of the highway system. Reform may allow larger trucks to operate.* The federal standards are poorly suited to the demands of international commerce. Special exemptions, generally granted without evaluation of the consequences, are eroding the regulations' effectiveness. Moreover, freight traffic may be bypassing Interstates to use secondary roads, generating higher public costs. Inflexible regulations also discourage private- and public-sector innovations to improve highway effi-



ciency and to reduce costs. Finally, highway users are not accountable for all the costs they generate.

*Federal truck size and weight regulations should facilitate safe and efficient freight transportation and interstate commerce, establish highway design parameters, and manage consumption of public infrastructure assets.* These objectives are consistent with the intentions of the Congressional legislation. Truck size and weight regulations ought to be complemented by other policies aimed at the same goals.

*Changes in truck size and weight regulations with complementary changes in the management of the highway system offer the greatest potential to improve the system.* The best way to control the costs of accommodating truck traffic is by coordinating practices in all areas of highway management: design and maintenance of pavement and bridges; highway user regulations, including safety-related vehicle and driver regulations; and highway user fees. When contemplating a change of policy in one of these three areas, Congress should consider complementary changes in the other two.

*Past studies have not produced satisfactory estimates of the effect of changes in truck weights on bridge costs.* Past studies have not evaluated how changes in truck weights affect the changes in the risk of bridge failure or a bridge's useful life. Instead, studies have estimated the cost of bridge replacement to maintain legal loads. Bridge replacement is the biggest component of the projected costs for accommodating larger trucks, but many of the replacements would achieve minimal risk reduction. Past studies have not quantitatively evaluated alternatives for attaining the same or greater risk reduction through less costly bridge management strategies.

*It is not possible to predict with high confidence the outcomes of regulatory changes.* Improved models are needed for analyzing the costs of operating trucks of different designs. Models and data, however, will never provide more than plausible indications of how institutions, markets, and technology will react to regulatory changes. Nevertheless, maintaining the status quo would miss opportunities to reduce the costs of transportation.

Responsible regulation is a process: the regulatory authority must do the best preliminary analysis possible, and when regulations change, the consequences must be observed systematically and the necessary adjustments must be made. The chances are greater that a regulatory change will yield a positive outcome if highway users have incentives through enforcement, user fees, and application of performance standards.

*Examining the safety consequences of size and weight regulation is essential. Research and monitoring*

*needed to understand the relationship of truck characteristics and truck regulations to safety and other highway costs are not being conducted today.*

Understanding these relationships is key to the design of better highways, vehicles, and safety management and pollution control programs, and to providing a solid basis for truck size and weight regulation. Also important are information systems that record the performance of regulations and the consequences of changes.

Promising techniques are available to improve the safety of large trucks, but little is known about the effectiveness of the techniques. This knowledge gap, along with a lack of scientific understanding about the relationship of safety to truck design, road features, and other risk factors, makes it likely that opportunities to reduce accidents are being missed and that resources are being wasted on ineffective actions.

*Although violations of size and weight regulations may be an expensive problem, monitoring of compliance is too unsystematic to allow estimates of the costs involved.* Direct and systematic observation of the frequency and impacts of oversize and overweight vehicles—as well as of legally operated overweight vehicles—is needed, to determine the costs of violations and to evaluate the effectiveness of enforcement methods. The technology for low-cost monitoring is available.

## Recommendations

### Commercial Traffic Effects Institute

Congress should create an independent public organization, the Commercial Traffic Effects Institute, to observe and evaluate commercial motor vehicle performance and the effects of size and weight regulation. The institute would develop federal size and weight standards and related highway management practices, recommend regulatory changes, evaluate the results of the implementation of new regulations, and support state implementation of federal regulations. The institute would enter into agreements with private-sector entities to conduct joint programs of data collection, research, and evaluation.

### Functions

The institute's objective would be to reduce the public and private costs of truck freight and passenger coach transportation by developing proposals for changes in size and weight regulations, as well as changes in related highway system management and operating practices, including user fee policies. The institute would promote innovation by providing a means to evaluate and implement private-sector or state proposals for new motor vehicle or highway operating practices that require federal regulatory accommodation.

The scope of the institute's activities would include

- ◆ Pilot studies of proposed new vehicles and related operating practices, as well as research on the relationship of vehicle characteristics to highway transport costs.

- ◆ Monitoring and program evaluation in three areas: truck and coach traffic volumes, as well as the distributions of vehicle dimensions and configurations; the administration of regulations, including enforcement and fees; and the costs of truck traffic to highway agencies and to the public.

- ◆ Support for state implementation of federal size and weight regulations.

The institute would recommend changes in federal regulations when evidence shows that the changes would further the objective of reducing the public costs of commercial highway transport. The institute also would recommend ways to harmonize areas of federal highway policy in size and weight regulation and truck costs, including safety regulation, enforcement, infrastructure design and management, and user fees.

#### *Organization*

The institute would be governed by a board with members drawn from the federal and state governments and the private sector. Funding for core and continuing activities would come from federal highway user fees. Private sponsors of proposed new vehicles or regulations would participate in funding the evaluations of their proposals. A professional staff with diverse expertise would be essential.

The board would prepare a business plan and a technical plan for the institute. The business plan would specify the form of cooperative relationships with the states, the private sector, and other federal agencies. The technical plan would set forth a process that could become an essential part of the government's management of the highway system. The institute would be subject to a sunset review by Congress after a specified time, possibly 6 years.

#### *Pilot Studies*

Congress should authorize the Secretary of Transportation to approve pilot studies involving temporary exemptions from federal motor vehicle size and weight regulations for vehicles operating within alternative limits and operated by motor carriers that agree to participate in evaluation of the safety, infrastructure cost, and other impacts of the alternative limits. U.S. DOT would approve pilot studies recommended by the institute, which would be respon-

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sible for planning the studies, carrying out the evaluations, observing that carriers comply with the conditions of the studies, and making recommendations to U.S. DOT and Congress if changes in federal regulations are warranted.

#### ***Immediate Regulatory Changes***

Federal law should allow any state to participate in a federally supervised permit program for the operation of vehicles heavier than the present federal gross weight limit, if U.S. DOT has certified, on the advice of the institute, that the state meets all requirements. The institute would be responsible for monitoring the consequences of the federally supervised permit program, which would rationalize the present, largely uncontrolled and unmonitored system of state-issued exemptions.

With the permit program, the federal government would have diminished involvement in defining dimensional limits, but greater responsibility for ensuring that state regulations governing the use of vehicles on federal-aid highways are contributing to



the attainment of national objectives. In effect, federal oversight would tend toward performance standards: states would propose solutions to problems, and the federal government would assess whether the proposals met qualitative objectives. Federal regulation would provide a buffer for state highway programs against local, short-term economic pressures to depart from best management practices.

#### *Size and Weight Provisions*

States would be allowed to issue permits so that the following vehicles could operate on any road from which they are now prevented by federal law:

- ◆ Six-axle tractor-semitrailers with maximum weight of 90,000 pounds; and
- ◆ Double-trailer configurations with each trailer up to 33 feet long; seven, eight, or nine axles; and a weight limit governed by the present federal bridge formula.

After a transition period, all trucks operating under grandfather exemptions or state-specific exemptions from federal rules would be subject to the monitoring and evaluation requirements of the proposed permit program. Reliable information on the impacts of grandfather operation would allow Congress to decide whether to alter the grandfather provisions or to extend additional permitting flexibility to all states.

The recommended permit vehicle specifications are not presented as optimal. The definitions of the vehicles eligible for permitting would be subject to revision.

#### *Implementation Provisions*

**Enforcement.** A legislatively defined joint federal-state program for enforcement under the permit program would establish

- ◆ Formal and effective performance monitoring of enforcement functions;
- ◆ Application of new enforcement tools, which may include federal penalties for violation of federal limits;
- ◆ Adequate enforcement funding, including federal contributions from user fee revenues; and
- ◆ A program to advance the application of information technology as an enforcement tool.

**User Fees.** Legislation creating the permit program should specify a quantitative test for the revenue adequacy of the permit fees. As far as possible, fees should be structured to deter the use of truck configurations that incur public costs exceeding private benefits. Fees should cover estimated adminis-

trative and infrastructure costs for the program at a minimum; however, state proposals for fees that reflect other external costs or benefits would be acceptable.

**Safety Requirements.** As a temporary measure, equipment requirements of the most rigorous state permit programs would be imposed on permit recipients. States that apply to participate would submit requirements for review by the institute and for approval by the U.S. DOT secretary.

**Bridge Management.** If larger trucks are allowed under its permit program, a state will need a cost-effective plan for alleviating constraints caused by deficient bridges. U.S. DOT will need to evaluate a state's management of the bridge costs of larger trucks.

#### *Longer Combination Vehicles*

Federal law should allow LCVs to operate under the provisions of the federally supervised permit program and to participate in pilot studies.

#### *Routes and Roads*

The committee does not see justification for revising the specifications for the networks of roads subject to federal dimension regulations. In particular, there does not appear to be justification for extending federal weight regulation to the non-Interstate portion of the National Highway System, now governed mostly under state regulations. New enforcement mechanisms and a plan for evaluating the safety effectiveness of route restrictions are necessary before enactment of any new federal regulations for truck operations on restricted roads.

#### *Research*

The preceding recommendations call for three kinds of activities involving data analysis and research: systematic monitoring of truck traffic and truck costs to evaluate regulatory effectiveness, basic research on the relationship of truck characteristics to highway costs, and pilot studies to test new vehicles. The following are specific topics for research:

- ◆ Evaluation of the effectiveness of the enforcement of size and weight regulations,
- ◆ Air quality impacts of changes in truck characteristics,
- ◆ Relation of truck performance to crash involvement,
- ◆ Risk-based bridge costs,
- ◆ Freight transportation market research,
- ◆ Costs of mixed automobile and truck traffic in terms of nuisance and stress, and
- ◆ New infrastructure development and truck-only facilities.

The author, Senior Program Officer, TRB Division of Studies and Information Services, served as study director for this project.