STATEMENT OF

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AND

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HEARING ON FREIGHT TRANSPORTATION AND INTERMODAL CONNECTIONS

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On behalf of the members of the Association of American Railroads (AAR), thank you for this opportunity to discuss key issues relating to our nation's freight transportation capabilities as a result of the remarkable growth of international trade.

Since Colonial times, the growth and vitality of our economy has been closely tied to the development of trade. The railroads' role in the settlement and development of the United States is well known, and yet the efficiency of our ports, international border crossings, and inland transportation systems is just as critical today. We must take steps to insure that our freight transportation system will be able to handle what is certain to be a huge increase in international trade volume in the years ahead. Today, I will focus on ways that our nation can combine the advantages of various transportation modes to reduce costs, save energy, better protect the environment, and increase transportation efficiency — thereby enhancing our productivity and international competitiveness.

INTERNATIONAL TRADE

International trade is becoming the lifeblood of both the world and U.S. economy, and has been a major driving force behind world economic growth over the past decade. From 1990 to 2000, global GDP increased at an average annual rate of 2.0 percent, but the volume of world merchandise trade increased during the same period at an average annual rate of 7 percent — more than three times as much. In the case of the United States, which is the world's single largest exporting and importing nation by a significant margin, GDP over the same period increased at an annual average rate of 3.2 percent, while the volume of merchandise exports increased at an average annual rate of 6.5 percent and imports increased at an annual rate of 8.5 percent.[1]

The importance of international trade relative to U.S. economic output has also risen dramatically. In 1975, U.S. exports plus imports was equal to less than 16 percent of GDP, but by 2000 that figure had risen to more than 26 percent.[2] Manufacturers and agricultural producers

[1] World Trade Organization, International Trade Statistics 2001, Table I.1, p. 19, available at www.wto.org/english/res_e/statis_e/its2001_e/its01_toc_e.htm).

[2] *Economic Report of the President,* February 2002, p. 253.

in the United States depend upon foreign trade to reach markets for their products, and consumers have enjoyed both a richer variety of products and lower prices as a result of trade opportunities. According to the Office of the U.S. Trade Representative, U.S. exports alone support more than 12 million American jobs, including one in five jobs in the manufacturing sector.[3]

In 2001, the value of U.S. international merchandise trade was $1.9 trillion. According to figures from the Maritime Administration, United States ports handled over 1.1 billion tons of foreign trade in 2001. The liner sector, consisting mostly of containerized shipments, accounted for 68 percent of the value of this trade.[4] More than 20 million loaded containers were imported or exported through our nation's ports in 2001, with the ports of Los Angeles and Long Beach ranked number 1 and 2, respectively — each handling over 3.3 million loaded containers. Additional intermodal traffic flows across our borders with Canada and Mexico. Our ports and border crossings also handle significant volumes of bulk commodities, including grain, coal, non-metallic minerals, forest products, and petroleum products. Railroads serve U.S. ports on the Atlantic, Pacific, and Gulf coasts and the Great Lakes, and provide through service to and from Canada and Mexico at more than 30 border crossings. Railroads handled approximately 5.2 million international containers in 2000, which represented about one-half of their total intermodal traffic.[5]

U.S. trade with Canada (long our largest trading partner) and Mexico (now our number two trade partner) has grown rapidly following the lowering of trade barriers under the North American Free Trade Agreement of 1993. Together, Canada and Mexico account for approximately one-third of U.S. foreign merchandise trade.[6] The value of this North American trade had increased

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[3] Office of U.S. Trade Representative, *Benefits of Trade: Information on the Globalization Debate,* September 19, 2001 available at www.ustr.gov/new/benefits.html.

[4] See "U.S. Foreign Waterborne Transportation Statistics," U.S. Maritime Administration press release, March 28, 2002, available at www.marad.dot.gov/statistics/usfwts/PR2001/PRDEC2001.htm.

[5] Intermodal Association of North America, *Year 2002 Industry Statistics – Overview;* American Association of Port Authorities; and Association of American Railroads data and analysis.

[6] U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Statistics Annual Report 2000,* BTS01-02, Washington, D.C. 2001, p. 161.

by 85 percent from 1994 to 2000, before declining slightly in 2001 largely following the September 11 terrorist attack. The freight railroads of Canada, Mexico, and the United States, which form a seamless, integrated network that provides the world's most efficient, lowest-cost rail service, have achieved major increases in their trans-border traffic — up 22 percent by value between Canada and the United States and up 72 percent between Mexico and the United States just from 1997 to 2000.[7]

Our seaports, airports, and land border crossings — the gateways that connect us to the rest of the world through commerce — are clearly critical to the economic well being of our nation. Moreover, more efficient modern container ships carrying 6,000 or more TEUs[8] are increasingly being used, up from the 4,500-TEU standard that has been dominant up to now. These larger ships will place increasing demands on port and landside facilities.

Existing congestion at these facilities must not be permitted to worsen. Moreover, as the Federal Highway Administration documented in a recent study,[9] funding for intermodal connectors — public roads averaging less than two miles in length that lead to/from major intermodal terminals — has not been adequate under the Transportation Equity Act for the 21st Century (TEA-21) and these critical components of the freight transportation system suffer many deficiencies. According to the FHWA, "States and MPOs often see freight as a low priority when compared with the pressing needs of passenger travel. NHS connectors are "orphans" in the traditional State and MPO planning processes." We must make the investments needed to improve our ability to handle international traffic efficiently, while limiting impacts on surrounding communities in terms of congestion, noise, and air pollution.

GROWING IMPORTANCE OF RAIL INTERMODAL SERVICE

U.S. freight railroads move just about everything — from lumber to vegetables, from coal to orange juice, from grain to automobiles, from chemicals to scrap iron — and connect businesses with each other across the country and with markets overseas. America's freight railroads carry

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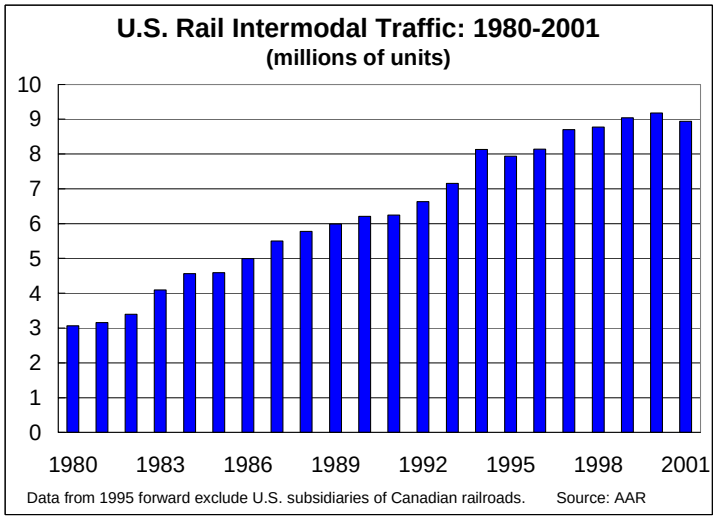
[7] AAR analysis of U.S. Bureau of Transportation Statistics transborder trade data.

[8] Twenty-foot equivalent units.

[9] U.S. Federal Highway Administration, *NHS Intermodal Freight Connectors*, July 2000, p. 4.

more than 40 percent of the nation's intercity freight (measured in ton-miles); about 70 percent of vehicles from domestic manufacturers; 67 percent of the nation's coal to coal-fired power plants (coal generates more than half the nation's electricity); and massive amounts of grain, chemicals, forest products, ores, and other commodities. They also contribute billions of dollars to the economy through wages, purchases, and taxes.

Intermodal rail freight transport — the movement of cargo in trailers or containers by rail in combination with at least one other mode of transportation — has been the fastest growing major segment of traffic for the U.S. freight railroad industry over the past decade. Indeed, while volumes of non-intermodal rail traffic for 2002 to date are below those of last year for the same period as a result of the weak economy, U.S. rail intermodal traffic through August 2002 is 5.1 percent above the 2001 level, including increases of between 7.4 percent and 9.4 percent each month from April through August. U.S. intermodal traffic has grown from 3.1 million trailers and containers in 1980 to nearly 9.0 million in 2001. It now accounts for approximately 20 percent of revenue for Class I carriers and is vying for the number one ranking among all rail commodities. Approximately half of U.S. intermodal traffic is either U.S. exports and imports, and intermodal traffic moves throughout the North American rail network.



There are several reasons why intermodal transport has become such a vital part of the U.S. freight transportation mix:

1. **Convenience and lower cost.**

   Intermodal combines the door-to-door convenience of trucks with the long-haul efficiency and cost-effectiveness of rail. As a result, railroads, trucking companies, international steamship lines, intermodal marketing companies, and others engage in productive partnerships to combine the best characteristics of all modes.

2. Fuel efficiency.

Railroads are the mode of choice in terms of fuel efficiency. According to studies sponsored by the U.S. Department of Transportation (U.S. DOT) and others, railroads are three or more times as fuel efficient as trucks. Fuel efficiency means reduced emissions and reduced dependence on foreign oil.

3. Improved air quality.

The Environmental Protection Agency estimates that for every ton-mile, a typical locomotive emits roughly three times fewer nitrogen oxides and particulates than a typical truck. Other studies suggest that locomotives have a much greater environmental advantage relative to trucks, depending upon the pollutant measured.

4. Reduced traffic congestion.

An intermodal train can take approximately 280 trucks from the highways. Since a single combination truck requires the same highway capacity as approximately four automobiles, a single intermodal train can mean the equivalent of more than 1,100 fewer cars on the highway. According to the Texas Transportation Institute's (TTI) *2002 Urban Mobility Study*, the aggregate cost of highway traffic congestion in just the 75 urban areas the institute studied is $67.4 billion, representing the cost of 3.6 billion hours of extra travel time and 5.7 billion gallons of fuel wasted while sitting in traffic. Since 1982, according to TTI, the cost of congestion has risen by approximately 400 percent in inflation-adjusted terms. Rail intermodal service is a highly effective way to reduce the staggering costs of highway congestion and the associated pressure to build costly new highways.

5. Innovative technology, specialized equipment, and tailored services.

Doublestack trains — with specialized rail cars that can accommodate one container atop another — are now in widespread use. RoadRailers look like conventional trailers, but come equipped with both rubber tires and detachable steel wheels so they can ride directly on the rails or on a highway. By using specialized equipment, railroads are targeting mid- and short-distance hauls, in addition to traditional long-haul markets. Rail service offerings include the use of flat cars in dedicated trains operating on a fixed schedule that

are specially designed to quickly load, unload and carry standard, non-reinforced highway trailers without damage to the goods or the trailers themselves.

The market for intermodal freight is extremely competitive, and U.S. freight railroads must continue to make major investments so that they can further enhance their cost efficiency and meet customer service requirements that are continually becoming more stringent.

Capital Expenditures as a Percentage of Revenue for Various U.S. Industries: 2000

All manufacturing	3.7%
Petroleum & coal products mfg	2.1%
Transportation equip. mfg	2.6%
Food manufacturing	2.7%
Wood product mfg	3.3%
Machinery mfg	3.1%
Fabricated metal product mfg	3.7%
Primary metal product mfg	3.8%
Paper manufacturing	4.9%
Computer & electr. product mfg	5.5%
Chemicals manufacturing	4.6%
Nonmetallic mineral product mfg	6.2%
Class I Railroads	**17.8%**

Source: U.S. Bureau of the Census, AAR

Railroads are incredibly capital intensive, and each year freight railroads must invest heavily to maintain and improve their infrastructure and equipment, that, together, comprise a national system that is the envy of the world. In 2000, Class I railroads directed 17.8 percent of their revenue to capital expenditures; the comparable figure for the U.S. manufacturing sector as a whole was just 3.7 percent. Indeed, since 1980 when the Staggers Rail Act partially deregulated the rail industry, major U.S. railroads have spent more than $290 billion for this purpose — an average of more than $13 billion per year over this extended period. Much of this spending is either directly attributable to intermodal service (*e.g.*, the construction or expansion of intermodal hubs, raising underpass clearances to allow for doublestack trains) or indirectly related to intermodal traffic (*e.g.*, capacity expansion and enhanced signaling systems to allow faster, more frequent trains of all types throughout the rail network).

In addition to making necessary infrastructure improvements, railroads have responded to customer needs by instituting a series of operational improvements and service initiatives. Some of these initiatives involve the improved use of information technology. For example, most major railroads now offer comprehensive Internet-based car ordering, car tracing, pricing, and billing capabilities. Railroads have also increasingly entered into productive partnerships with other carriers. These alliances expand the focus for a particular railroad beyond the interchange

point, encompassing the total movement and providing customers with seamless service — giving rail customers more value for their transportation dollar.

Since the Staggers Act, freight railroads have improved earnings, but as a group they still do not come close to earning their cost of capital. In 2001, the rail industry's cost of capital (as determined by the Surface Transportation Board (STB), an independent regulatory agency within the U.S. DOT) was 10.2 percent, compared with a return on investment (ROI) of 6.9 percent, as determined by the STB. Rail profitability is consistently in the bottom quartile of all industries.

This cannot continue forever, and this fact explains why — notwithstanding the tremendous gains railroads have made in intermodal and other service offerings in recent years, and the massive investments they have made — the future strength and vitality of our nation's rail system requires that earnings be aligned with investment needs.

Especially over the past couple of years, freight railroads have become increasingly constrained in how much capital they can devote to infrastructure. Rail stockholders and outside capital providers are becoming ever more focused on the railroad financial performance, and now increasingly insist that railroads demonstrate a compelling case for further investments. This financial discipline is necessary and appropriate in a market economy, but it discourages railroad investments that would yield significant public benefits (*e.g.*, congestion mitigation, emissions relief, enhanced mobility, enhanced safety, economic efficiency), but only limited direct railroad benefits. As profit-driven private entities, freight railroads simply cannot afford to make investments, including investments in intermodal projects and facilities, that yield primarily public benefits.

Unless this issue is addressed head on, it will worsen in the years ahead as pressure on our nation's freight rail network intensifies. The U.S. DOT expects freight traffic to nearly double in the next 20 years. Rail customers will continue to demand improved service levels. With highway congestion consuming a growing share of our nation's economic output, and with the need to reduce emissions, conserve fuel, and promote safety on the rise, the need for railroads to provide relief will increase.

SURFACE TRANSPORTATION REAUTHORIZATION

TEA-21 expanded the reliance on an intermodal approach to transportation planning that was the focus of the landmark Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). Today, we are seeing the benefits that can be gained by taking this comprehensive approach.

As planning for the reauthorization of TEA-21 proceeds apace, the AAR is pleased to be an active participant in the Freight Stakeholders Coalition, an organization comprised of diverse freight interests that work cooperatively to promote policies benefiting freight transportation. Besides the AAR, members of the Freight Stakeholders Coalition include the American Association of Port Authorities, the American Trucking Associations, the Coalition for America's Gateways and Trade Corridors, the Intermodal Association of North America, the National Association of Manufacturers, the National Industrial Transportation League, the U.S. Chamber of Commerce, and the World Shipping Council.

The Freight Stakeholders Coalition has unified behind a nine-point agenda designed to promote sound, effective transportation solutions. The agenda includes:

1. **Protect the integrity of the Highway Trust Fund.**

   Reauthorization of the firewalls provided for in TEA-21 would ensure that the funds collected in the HTF would be used for dedicated transportation purposes and not for deficit reduction or general government operations.

2. **Dedicate funds for National Highway System (NHS) highway connectors to intermodal freight facilities.**

   NHS intermodal freight connectors provide for a broad array of intermodal transport services and options. The FHWA has identified 517 NHS freight terminals (253 ocean and river ports, 203 truck/rail terminals, and 61 pipeline/truck terminals). These 517 freight terminals, augmented by 99 major freight airports, connect to the mainline NHS via more than 1,200 miles of NHS connectors. Typically, connectors are located in older, industrialized and mixed land use areas that are subject to physical constraints and environmental considerations.

TEA-21 directed the FHWA to review the condition of connectors and potential investments to improve their condition. In a June 2000 report to Congress, FHWA found that the connectors have significantly poorer physical and operational characteristics, and are underfunded when compared with all NHS mileage. Such conditions on these "last-mile" segments can slow freight movement, damage goods in transit, and decrease efficiency and safety. U.S. DOT estimates show that the cost of improving connectors to an adequate level of service over the 2002-2020 time frame is $3.5 to $4.0 billion.

3. Establish a national freight industry advisory group to provide input to the U.S. DOT.

The advisory group should be funded and staffed, and should consist of freight transportation providers from all modes as well as shippers and state and local planning organizations. There is not a sufficiently focused federal voice for freight; an advisory group would meet the need for regular and professional interaction between the department and the diverse freight industry, and could help identify critical freight bottlenecks in the national freight transportation system.

4. Create and fund a Freight Cooperative Research Program.

More accurate and timely data on freight movements would allow state and local governments to plan transportation infrastructure improvements that more closely match actual transportation needs. To this end, a dedicated, funded research effort led by an industry-based steering/oversight group would allow for the collection and dissemination of more timely, complete, and detailed commodity flow and other types of freight data and better planning tools for freight planning professionals and others.

5. Expand freight planning expertise at the state and local levels.

Unfortunately, transportation planning typically focuses almost exclusively on highway and transit projects, with scant attention paid to freight (including freight rail). To address this deficiency, planning organizations should be strongly encouraged to consider freight transportation needs, including railroad projects and intermodal projects, more fully in their planning. Given the importance of freight mobility to the national economy, states and metropolitan planning organization (MPOs) should be provided additional funds for

expert staff positions dedicated to freight issues, commensurate to the volumes of freight moving in and through their areas.

6. **Develop ways to increase available funds without new user fees and taxes by creating a toolbox of innovative financing options specifically aimed at freight capacity improvements and enhancements.**

New capital investment in critical freight transportation infrastructure leads to major public benefits including higher productivity, enhanced global competitiveness, and a higher standard of living for our nation. With freight traffic now forecast to double within the next 20 years, the United States must expand its limited transportation infrastructure dollars by leveraging additional public and private sources of funding. This will require innovative approaches to maximize transportation-related investments.

Two financing options in which freight railroads are most interested are discussed below.

The first option calls for tax incentives and tax exempt financing to companies that make investments in intermodal freight infrastructure. This option would provide targeted income tax benefits (investment tax credits, expensing in lieu of capitalization, accelerated depreciation, and/or tax-exempt financing) to companies for investments made in qualifying assets to improve the efficiency or increase the capacity of the national intermodal freight transportation system. Qualifying assets would include track and roadbed located on intermodal corridors, intermodal transfer facilities, freight handling machinery and equipment at intermodal transfer facilities, and intermodal information infrastructure. Under this option, the tax benefits would accrue to any company that made such investments, not just railroads. Such a program would recognize the huge societal benefits derived from an expansion of intermodal transportation solutions.

The second option calls for allowing the funding of rail infrastructure through the issuance of tax-exempt indebtedness. Under this option, holders of "Qualified Railroad Indebtedness (QRI)" would qualify for an income tax exclusion for interest earned on the QRI. QRI would be any type of indebtedness, regardless of the form, issued to fund the acquisition, construction, improvement, maintenance, or repair of "Qualified Railroad Property" (QRP). QRP, in turn, would be any expenditure for the acquisition or

maintenance of depreciable property, such as track, bridges, tunnels, grading, wharves and docks, terminal facilities, signals, computer systems, and public improvements either used or to be used in the railroad's trade or business. The tax benefits would flow directly to the holders of the indebtedness in the form of income tax exclusion for interest earned, and indirectly to railroads in the form of lower capital costs.

7. **Significantly increase funds for an expanded corridor/border and gateway program.**

This proposal would build on the highly popular but underfunded "Corridors and Borders Program," but adds the important concept of gateways. The funding should be freight specific, and there should be a qualification threshold (based on volumes) so that dollars get directed at high volume corridors/borders/gateways rather than wish-list projects. The AAR is a member of the Coalition for America's Gateways and Trade Corridors, which is leading the effort among freight interests to expand funding for this important program.

8. **Streamline environmental permitting for freight projects.**

Multiple and often duplicative federal laws and regulations delay environmental review of transportation projects. Language in TEA-21 directing federal agencies to streamline the review process for highway projects has not been effective. Consequently, other measures to simplify the review process for all freight projects should be considered.

9. **Increase funding and promote the use of the Congestion Mitigation and Air Quality Improvement Program (CMAQ) for freight projects that reduce congestion and improve air quality.**

CMAQ was designed to fund projects that will help reduce transportation-related emissions. Although CMAQ has supported some freight projects, it has been used primarily to address passenger needs. CMAQ funding should be dedicated to projects that can be shown to reduce congestion or improve air quality. Total funding for CMAQ should be increased and the use of CMAQ funds for freight projects should be clarified and strongly encouraged.

In addition to the Freight Stakeholder Coalition proposals outlined above, the railroad industry proposes additional measures which we believe will enhance the ability of our nation's transportation providers to function effectively. Like the proposals from the Freight Stakeholder

Coalition, the rail proposals expand further the emphasis on intermodalism that was fundamental to the original TEA-21 legislation. The rail proposals include the following:

1. **Increase funding for the Section 130 grade crossing program and clarify that funds can be spent on maintenance activities.**

   The most critical safety problems faced by railroads are collisions at highway-rail grade crossings and incidents involving trespassers on railroad rights-of-way. Both of these problems generally arise from factors that are largely outside of railroad control. In 2001, these two categories accounted for 96 percent of rail-related fatalities.

   Due largely to railroads' and others' efforts to close grade crossings and to educate the public about the dangers of grade crossings, in conjunction with the Section 130 federal grade crossing program, the number of collisions, injuries, and fatalities at highway-rail grade crossings has fallen steadily over the years. From 1980 to 2001, the number of grade crossing collisions was reduced 70 percent, injuries declined by 70 percent, and fatalities were down 49 percent. Despite these impressive declines, far too many grade crossing accidents occur each year.

   The Section 130 Program provides federal funds to states and local governments to eliminate or reduce hazards at highway-rail grade crossings on public highways. Current funding, under a set-aside to the Surface Transportation Program of TEA-21, is approximately $155 million per year. The vast majority of Section 130 funds have been spent on the installation of new active warning devices such as lights and gates, upgrading existing devices, and replacing or improving grade crossing surfaces.

   The high cost of current active warning devices — approximately $150,000, on average, per installation — has limited the number of crossings at which they have been installed. Research into improved low-cost grade crossing warning systems is underway, but increased federal funding for highway-rail crossing hazard abatement would permit additional crossings to be protected immediately.

   The Section 130 program is an important element of the HTF. Grade crossing warning devices are highway traffic control devices, there to protect the motoring public, not trains.

Increasing Section 130 funding and clarifying that such funds can be spent on grade crossing maintenance projects would allow additional crossings to be protected and further enhance highway safety.

2. Expand the Railroad Rehabilitation and Improvement Financing (RRIF) Program and remove restrictive program requirements.

The Railroad Rehabilitation and Improvement Financing (RRIF) program provides low-interest loans and loan guarantees (not direct federal grants) to help finance railroad capital investments. As authorized by TEA-21, RRIF authorizes up to $3.5 billion in direct loans and loan guarantees, of which at least $1 billion is reserved for small railroad projects. It is administered by the Federal Railroad Administration. Due largely to an exceedingly long delay in the release of implementing regulations and overly restrictive regulatory requirements (especially lender of last resort and collateral requirements), to date very few RRIF loans have been approved.

Railroads seek a major expansion of the RRIF program, and an easing of regulatory barriers to its use, in order to help railroads of all sizes — both freight and passenger — to continue to provide safe and efficient transportation service. Pending legislation (S. 1530 – "RAIL-21", H.R. 2950 – "RIDE-21", and S. 1991 "The National Defense Rail Act") would increase to $35 billion the amount of loans and loan guarantees available through the RRIF program. These proposals would also countermand unnecessary existing regulatory barriers pertaining to lender of last resort provisions and collateral requirements.

OPPOSITION TO TRUCK SIZE AND WEIGHT INCREASES

Notwithstanding the broad agreement detailed above among the freight railroads and other transportation modes on many issues relating to our national transportation needs and capabilities, there are some limited areas of disagreement among the modes. One such area concerns truck sizes and weights. Recently, proposals to allow larger and heavier trucks on our nation's highways have been offered. The rail industry strongly opposes these efforts.

Under current federal law, trucks operating on the 46,000-mile U.S. Interstate Highway System can have a gross vehicle weight of no more than 80,000 pounds, and the use of longer combination vehicles (LCV — a tractor and two or more trailers or semi-trailers longer than

28 feet each) is limited to 14 Western states that allowed such trucks before 1991. These limits were frozen by Congress in the 1991 ISTEA legislation, largely in response to concerns about the safety of longer and heavier trucks. Since then, various interests have proposed that the weight limit be increased (for example, to 97,000 pounds) and that the use of LCVs be permitted on all or parts of the U.S. interstate highway network. Since 1991, all attempts to thaw the federal freeze have been rejected by Congress.

Increased truck size and weight (TS&W) limits would, according to the U.S. Department of Transportation, have a disastrous effect on freight railroads. Railroad revenues would decline by $2.9 billion to as much as $6.7 billion per year. Contribution to railroad fixed and common costs would fall by $2.1 billion to $3.1 billion per year. As the contribution to fixed costs declined, less funding would be available for current and future investments, and so fewer such investments would be made. The reduction in investment would directly translate into reduced capacity, lower efficiency, degradation of service, a reduced ability to handle freight, and, eventually, further disinvestment. Remaining shippers on the rail network would face higher rates, reduced service, or both. Social costs associated with diversion of rail traffic to truck — more highway accidents, pollution, greenhouse gases, congestion, energy consumption, noise — would rise, and the cycle would continue in a vicious circle. This outcome is certainly not in the best interest of our nation.

A primary basis for the rail industry's opposition to larger and heavier trucks is the unfair dichotomy between costs paid and costs incurred among the modes. Rail-competitive trucks, which are the heaviest, highest mileage operators among all trucks, do not come close to fully paying for the damage they cause to the highway system. The U.S. DOT's recent comprehensive Highway Cost Allocation Study concluded that combination trucks weighing 80,000 to 100,000 pounds pay an estimated 50 percent of their cost responsibility, and trucks weighing over 100,000 pounds would pay only 40 percent of their cost responsibility. Rail-competitive trucks already underpay by billions of dollars per year, representing an enormous competitive hurdle that railroads must overcome. Liberalizing TS&W limits would only exacerbate the existing inequity.

A committee of the Transportation Research Board (TRB), an arm of the National Research Council, which in turn is part of the National Academy of Sciences, recently released a report on the truck size and weight issue. The report was *Special Report 267: Regulation of Weights, Lengths and Widths of Commercial Motor Vehicles.* The report recommends an immediate thaw in the TS&W freeze via the introduction of 90,000-pound single trailer trucks and a 50 percent increase in the weight of double trailer combination vehicles (while also boosting the size of the vehicles). These dramatic changes would be followed by further TS&W increases and the authorization of LCVs through "pilot programs" overseen by a proposed new government agency. The TRB report calls for much of the regulatory authority associated with TS&W to be transferred from the federal government to the states.

The TRB report has many shortcomings that undermine its usefulness in the debate over TS&W, as detailed in Dr. Gerard McCullough's August 2002 evaluation of the report, undertaken for the AAR and included here as Attachment 1. As Professor McCullough[10] explains, the TRB report starts with the faulty premise that there is widespread "dissatisfaction" with existing TS&W limits, when, in fact, existing limits represent an equilibrium wherein the needs of truckers and truck shippers are balanced against the safety concerns of motorists and the national goal of maintaining a healthy overall freight transportation system. Professor McCullough notes that the TRB report contains no new quantitative analysis. For example, the report is critical of the way previous studies calculated bridge damage costs due to changes in TS&W, but does not provide an estimate of what it views as the correct costs. Instead, the report says that the correct analysis has not been done yet. In other words, the TRB report admits it does not know what the effect would be of a TS&W thaw on bridge costs, but it nevertheless recommends a thaw.

Professor McCullough stresses that an efficient freight market is one in which the users absorb the full marginal costs that they impose. Unfortunately, the TRB offers no specific proposal by which the substantial current truck underpayment for the pavement damage they inflict would be

[10] Dr. McCullough is Associate Professor of Applied Economics, University of Minnesota, St. Paul, MN, and Senior Consultant, Charles River Associates, Boston, MA. He is former Director of the Center for Transportation Studies at Minnesota and former Deputy Director of the Center for Transportation Studies at the Massachusetts Institute of Technology (MIT). He has been a consultant on transportation to the World Bank and the Federal Highway Administration (FHWA) and various private organizations. He was a Special Assistant at the U.S. Department of Transportation from 1977-1980. His Ph.D. is from MIT.

ameliorated. These underpayments would sharply increase as gross vehicle weight increased, making existing inequities even worse. Finally, as the TRB report admits, serious questions exist regarding the safety implications of increasing TS&W limits. Yet the TRB calls for addressing this issue by instituting a "pilot program" that would essentially force unknowing and likely unwilling highway users to participate in an experiment to determine the safety implications of changes in TS&W.

As noted above, increasing the size of trucks without insuring full cost recovery would greatly exacerbate the problems caused by large trucks. It is interesting to note that under a recent proposal by the Reason Foundation, a Los Angeles "free market" think tank, truck-only tollways would be built on highway median strips. Under Reason's proposal, LCVs and heavier trucks would be allowed on the truck tollways, but the roads would be completely user-financed. Railroads are pleased that the Reason proposal explicitly endorses what the railroads have long maintained — that heavy trucks should pay their own way.[11] Every year that goes by means that motorists pay billions of dollars in subsidies, while heavy trucks continue to avoid their cost responsibility.

COMMUTER AND INTERCITY PASSENGER ACCESS

Another important issue that could significantly affect the freight railroads' ability to provide the quality of service that today's freight shippers require to remain competitive in the global marketplace is the increasing demand for both intercity and commuter rail service.

Rail passenger service can play an important role in alleviating highway and airport congestion, decreasing dependence on foreign oil, reducing pollution, and enhancing mobility and safety. Freight railroads have demonstrated their willingness to work cooperatively with Congress,

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[11] While a detailed analysis of the Reason proposal is beyond the scope of this testimony, it should be noted that while railroads support the requirement that trucks fully repay the cost of the damage they cause to the highway system, care should be taken to insure that all costs — such as right-of-way acquisition, property taxes, truck staging areas, etc. — be fully recovered. For example, the publicly-owned median should not just be given to the private sector motor carrier industry without their having to pay for it. Railroads repaid the federal government several times over for the value of the land grants they received from the federal government. A 1943 study by the Board of Investigation and Research concluded that the value of compensation provided by railroads to the federal government has "fully counter-balanced these aids which were conferred many years ago." A 1977 study by the U.S. Department of Transportation concluded that "...the federal government has been a net beneficiary of its railway aid programs," having been more than fully reimbursed for its land, with interest.

Amtrak, commuter railroads, the states, and local jurisdictions to insure that the public's transportation needs can be met in the most efficient possible manner. Currently, freight railroads host commuter operations in cities around the nation, operate commuter trains under contract to local authorities in several cities, and own 97 percent of the mileage over which Amtrak operates. Moreover, at least 29 cities are proposing to establish new or expanded commuter rail operations, and the U.S. Department of Transportation has designated 11 corridors for the introduction of high speed passenger rail systems across the country.

Freight railroads once provided all of our nation's rail passenger service, but large and growing deficits following World War II led them to exit the business. Existing rail passenger service is supported primarily by the public through federal, state, or local government programs. While passenger railroading is important to our country, it pales in comparison to the importance of freight railroading. Our privately-owned freight railroad system is a vital and strategic national asset — moving more freight, more efficiently, and at lower rates than anywhere else in the world, according to Lou Thompson, the World Bank's Railways Advisor. The safe, efficient, and cost-effective transportation service that freight railroads provide is critical to the domestic efficiency and global competitiveness of our nation.

Therefore, we must find the most effective way to provide the passenger services that America needs, but without burdening the freight rail system — operationally, financially, or in any other way. Congress should resist calls to legislate mandated passenger access to freight-owned track, as proposed in H.R. 2654 in the current Congress. Access by passenger railroads to facilities owned by private freight railroads must be negotiated on a case-by-case basis by the parties, without government interference.

Freight railroads have developed a series of principles regarding the future of intercity passenger rail service. Our principles call for future rail passenger public policy to acknowledge the extreme capital intensity of railroading and to ensure that railroads' investment needs can be met. Policies which add to freight railroads' already enormous investment burden, such as further saddling them with the support of passenger rail infrastructure needs, or which reduce their ability to provide the quality of service needed by their freight customers, must be avoided. To

do otherwise would undercut our nation's freight rail capabilities and be counterproductive in addressing our country's congestion, environmental, safety, and economic concerns.

SECURITY OF OUR NATION'S RAIL NETWORK

Finally, I would like to touch on the issue of security. This issue is relevant to this hearing because of the tension between the free flow of commerce and the assurance that our transportation systems are adequately protected from terrorist threats. Congress should strike a proper balance between protecting our country's transportation assets and its citizens, and providing for the free flow of goods and promoting our international competitiveness.

Following the terrorist attacks on September 11, 2001, railroads took numerous proactive steps to increase the security of our nation's rail network. Railroads immediately began developing a comprehensive Terrorism Risk Analysis and Security Management Plan. The industry formed a security task force composed of railroad representatives with expertise in areas such as operations, legal issues, railroad police activities, hazardous materials transportation, and information technology. Outside consultants with expertise in intelligence and counter-terrorism were retained to provide advice on best practices.

The task force created five Critical Action Teams addressing hazardous materials, operations security, infrastructure, information technology and communications, and military liaison. The task force undertook a comprehensive risk analysis which identified critical assets, vulnerabilities, and threats, and assessed the overall risk to people, national security, and the nation's economy. The task force then identified more than 50 countermeasures. The Terrorism Risk Analysis and Security Management Plan, which is now in effect, utilizes all this information and establishes four different alert levels, with implementation of specific countermeasures dependent on the alert level in effect.

The plan also provides for the establishment of a Railway Alert Network (RAN), a 24-hours-a-day, 7-days-a-week communications center operated by the AAR. Through the RAN, railroads share information with the intelligence community. In addition, the RAN provides a means for instituting appropriate alert levels and beginning to take the appropriate countermeasures.

The AAR also operates the Surface Transportation Information Sharing and Analysis Center (ST-ISAC). Presidential Decision Directive 63 called for the creation of private sector ISACs to protect the nation's critical infrastructure from attack. The ST-ISAC, formed at the request of the U.S. DOT, collects, analyzes, and distributes security information from worldwide resources to protect vital information technology systems from attack. The ST-ISAC also operates 24-hours-a-day, 7-days-a-week.

CONCLUSION

Our nation's global economic supremacy is derived in large part from a transportation system that is second-to-none. Freight railroads are an indispensable element of that system. Going forward, we must ensure that our freight transportation capabilities will meet the increasing demands placed upon it. We are confident that the rail industry can play a major role in meeting this challenge. However, our nation's ability to provide transportation alternatives that promote mobility, economic efficiency, and environmental responsibility depends critically on the further development of the intermodal approach initiated by ISTEA and TEA-21 in which the full capabilities of each mode can be fully realized. No less important to freight railroads is the rejection of public policies that would unnecessarily and unfairly restrict their capability to deliver their maximum value to the U.S. economy.

Attachment 1

Evaluation of Transportation Research Board Special Report 267: Regulation of Weights, Lengths and Widths of Commercial Motor Vehicles

By

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EXECUTIVE SUMMARY

The purpose of this memorandum is to provide an evaluation of the Transportation Research Board's (TRB) *Special Report 267: Regulation of Weights, Lengths and Widths of Commercial Motor Vehicles* (hereafter, "the Report"), which was released on May 16, 2002. The Report was produced by the TRB Committee for the Study of the Regulation of Weights, Lengths and Widths of Commercial Motor Vehicles ("the Committee").

The Report contains a series of conclusions and recommendations regarding TS&W regulation in the United States. It concludes that "opportunities exist for improving the efficiency of the highway system through reform of federal truck size and weight regulations" (p. ES-1) and finds that "changes in truck size and weight regulations…offer the greatest potential to improve the functioning of the [highway] system" (p. ES-2). The Report recognizes that "it is essential to examine the safety consequences of size and weight regulation" (p. ES-3), but cautions "it is not possible to predict the outcomes of regulatory changes with high confidence" (p. ES-3).

To facilitate the liberalization of TS&W limits, the Report recommends a revised regulatory regime that would involve federal supervision of state-set limits with evaluation provided by an independent Commercial Traffic Effects Institute (CTEI). The Committee calls for pilot studies to evaluate the consequences of changes in TS&W regulations, and recommends that states be allowed to issue permits for the operation of longer and heavier trucks once the CTEI is established and able to monitor and evaluate their performance.

The Report adopts a too-narrow analytical perspective that significantly limits its usefulness in establishing national transportation policy. The report starts with the questionable assumption that there is widespread dissatisfaction with existing federal truck size and weight regulations, when, in fact, the current system represents a balancing of the needs of truckers and truck shippers against the needs of motorists and the national goal of maintaining a healthy overall freight transportation system. In addition, it also fails to recognize:

- The need for an analysis of total freight supply and demand, including the role of shipper logistics costs.
- That changes in TS&W limits affect the capacity of the highway freight network and this in turn affects the performance of railroad and other freight networks (and their shippers).
- That the goal of TS&W regulation — after safety — should be to improve the overall efficiency of the national freight market, not just to reduce direct trucking costs.
- That an *efficient* freight market is one in which the users absorb the full marginal costs that they impose.

There is no analytical basis, either in the Report or in earlier TS&W studies evaluated by the Committee, for many of the Report's most important conclusions and recommendations. For example, the Committee's recommendations for immediate changes in TS&W (subject to the creation of a CTEI) are not consistent with its own finding that the effects of such changes are uncertain. Nor is there any legal or economic analysis of why an independent CTEI would be more effective, or more appropriate, than the federal DOT in determining the need for, and evaluating the performance of, TS&W regulations. There is also no analysis from an experimental design perspective of how the committee's pilot studies would demonstrate the effects of changes in TS&W limits, or an explanation of the potentially serious ethical issues a pilot program might entail.

Perhaps most importantly, the Report does not evaluate the effects of changes in TS&W limits on the overall freight transportation market. Unfortunately, this decision causes it to omit certain points which are essential to a thorough evaluation of TS&W regulations. These include:

- Significant diversion of freight tonnage off the rail and barge networks and onto the highway network.
- Significant increases in the social cost — accidents, pollution, greenhouse gases, congestion, energy consumption, and noise — of moving this freight.
- Potential increases in the rates paid by freight shippers who remain on the rail network.
- Potential disinvestment by railroads, reduced intermodal and other service offerings by railroads, and secondary diversion of more freight onto the highway system.

The Report has some strengths. It recognizes the uncertainty that exists regarding the benefits and full costs of changes in TS&W limits; the need to better understand nuisance-related and stress-related costs from mixed auto and truck traffic, and the potential benefit of separating auto and truck.; the potential role of cost-based user fees in managing infrastructure and mitigating negative effects of trucks; and the importance of regulatory institutions and enforcement mechanisms.

Overall, because of its shortcomings, the Report provides extremely limited usefulness to policymakers interested in evaluating TS&W regulations. Previous studies relating to TS&W issues, produced by the U.S. Department of Transportation and other TRB Committees, do a more satisfactory job of including all pertinent factors in their analyses.

I. BACKGROUND

The current U.S. truck fleet comprises about 8 million vehicles, about a fourth of which are combination trucks. Most combination trucks are large, with about 70% having registered maximum gross vehicle weights (GVW) over 75,000 pounds. The number of trucks on the road is small by comparison to private passenger vehicles, but because on average trucks are driven more frequently, their share of vehicle miles traveled (VMT) is disproportionate to their numbers. However, combination trucks still make up only about 5% of total VMT, as shown in Table 1.

Table 1. Total Vehicles and Vehicle Miles Traveled by Vehicle Class (2000)

Vehicle Class	Total Vehicles	Total VMT (millions)	Percent of Total Vehicles	Percent of Total VMT
Autos	137,967,488	1,612,393	61.1%	58.6%
Pickups/Vans	79,084,979	924,018	35.0%	33.6%
Buses	746,125	7,601	0.3%	0.3%
Single Unit Trucks	5,926,030	70,583	2.6%	2.6%
Combination Trucks	2,096,619	135,208	0.9%	4.9%
Total	225,821,241	2,749,803	100.0%	100.0%

Note: Autos category includes motorcycles.

Source: Federal Highway Administration, *Highway Statistics 2000*, Table VM-1.

Despite their relatively small numbers, trucks have an important and significant impact on the U.S. highway system. Trucks are disproportionately involved in fatal traffic accidents[1] and are a major factor in urban traffic congestion and noise pollution.[2] Trucks also produce significant emissions and because of the their weight, produce much greater wear on pavement than do private passenger vehicles.[3]

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[1] According to the Federal Motor Carrier Safety Administration, large trucks are involved in 9 percent of fatal accidents and 78 percent the victims in truck-related fatal accidents are occupants of the other vehicles. See *Large Truck Crash Profile: The 1998 National Picture*, Tables 1 and 4.

[2] The Federal Highway Administration has found that a combination truck imposes the congestion costs equivalent to 2.5 to 15 automobiles, depending upon the highway's grade and speed, the weight-to-power ratio of the truck, and the vehicle length, and that the most common semi-trailer trucks impose more than 30 times as much noise pollution costs as autos. See Federal Highway Administration, *1997 Federal Highway Cost Allocation Study Final Report*, August 1997, Table V-26.

[3] Pavement wear increases exponentially with vehicle weight, such that 80,000-pound trucks on urban interstates impose marginal pavement costs per mile that are more than 400 times greater than

Since the creation of the Interstate Highway System, trucking has become an increasingly important component of the U.S. freight market. Trucks now carry about 29 percent of total intercity freight volume in terms of ton-miles in the United States versus the 41 percent carried by railroads. In terms of revenue, trucking is even more significant – intercity trucking now represents 81 percent of all intercity expenditures for freight transportation in the United States, as shown in Table 2.

Table 2. Freight Transportation Outlays by Type of Transport – 2000

Mode	Millions of Dollars	Percent of total
Rail	36,454	9.0%
Truck- intercity	328,632	80.7%
Water	3,501	0.9 %
Oil pipeline	9,467	2.3 %
Air carrier	19,800	4.9 %
Other	9,111	2.2%
Total	407,119	100.0%

Source: Eno Transportation Foundation, Inc., *Transportation in America* 2001.

Existing TS&W Regulation

The dimensions and weights of commercial vehicles are regulated at both the federal and state levels. Federal laws regulate both maximum permissible gross vehicle weights and maximum axle weights, and the width, length, and number of trailers. A summary of current federal TS&W regulations is provided in Table 3.

All states have laws governing the weights and dimensions of trucks. All but seven states apply some modification of the federal regulations on a limited basis through permits, exemptions, and "grandfather rights." Altogether, regulations in the 50 states and the District of Columbia represent over 40 different combinations of single axle, tandem axle, bridge formula, gross vehicle weight, and interstate/non-interstate specifications.[4]

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automobiles. See Federal Highway Administration, *1997 Federal Highway Cost Allocation Study Final Report*, August 1997, Table ES-6.

[4] A complete inventory of current state size and weight limits, as well as a thorough discussion of the nature, extent, and present status of grandfather rights is provided in U.S. Department of Transportation, *Comprehensive Truck Size and Weight Study*, Volume II Issues and Background, 2000, pp II-8 – II-24.

Table 3. Summary of Current Federal Truck Size and Weight Regulations

	Criteria	Applicability	Limit
Weight	Single Axle limit on Interstate System	Interstate System	20,000 lbs.
	Tandem Axle limit on Interstate System	Interstate System	34,000 lbs.
	Total gross vehicle weight	Interstate System	80,000 lbs.
	Gross weight on any group of two or more consecutive axles (bridge formula)	Interstate System	500(LN/(N-1)+12N+36)
Size	Vehicle width	National Network	102 inches
	Semi-trailer length	National Network	48 feet (minimum)
	Twin trailer length	National Network	28 feet (minimum)

Notes: National Network refers to a network of roads designated by the Secretary of Transportation pursuant to the Surface Transportation Assistance Act of 1982. It includes virtually all Interstates and some other highways and totals more than 200,000 miles. For Bridge Formula W = overall gross weight on any group of two or more consecutive axles to the nearest 500 lbs., LN = distance in feet between the extreme of any two or more consecutive axles, and N = number of axles in the group.

Source: U.S. DOT, *Comprehensive Truck Size and Weight Study*, Volume I Summary Report, p. 3.

Federal TS&W regulation has its origin in the creation of the Interstate Highway System in 1956. The passage of the regulations was motivated by the significant role of the federal government in funding 90percent of the construction of the system. The federal weight limits were originally set at 73,280 pounds, 18,000 pounds, and 32,000 pounds for gross vehicle weight, single axle weight, and tandem axle weight, respectively, but were increased to those shown in Table 3 in 1975.

In 1982, the federal role in TS&W regulation was increased through the passage of the Surface Transportation Assistance Act (STAA), which required states to adopt federal weight limits on Interstate highways and allow single 48-foot trailers and twin 28-foot trailers on a "National Network" designated by the Secretary of Transportation in consultation with the states. This network consists of virtually the entire Interstate system plus another 156,000 miles of highways.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) prohibited the states from expanding either the number of routes on which Longer Combination Vehicles (LCVs) could be operated or the maximum weights and dimensions allowed for these vehicles.[5] This regulation has come to be known as the "LCV freeze" and in 1998 it was extended by the Transportation Equity Act for the 21st Century.

[5] Longer combination vehicles (LCVs) refers to multi-trailer combinations longer than the standard twin 28-foot trailer combination vehicle (the so-called STAA double). The LCVs include seven-axle "Rocky Mountain" doubles, eight-axle "B-Train" doubles, nine-axle "turnpike doubles", and seven-axle triple-trailer combinations.

The study of TS&W issues by the federal government predates its involvement in funding of the highway system. The first major study was completed in 1941 by the Interstate Commerce Commission.[6] A major impetus for these studies has been the claim that higher size and weight limits increase the efficiency of the freight markets. The main findings of previous TS&W studies, especially those that are relevant to conclusions and recommendations in TRB *Special Report 267*, are reviewed in Appendix A1.

II. OVERVIEW OF TRB SPECIAL REPORT 267

The Transportation Equity Act for the 21st Century (TEA-21) contained a provision specifically requiring the Secretary of Transportation to request that TRB conduct a TS&W study. The charge given in the act is quite general in scope, specifying only "… a study regarding the weights, lengths, and widths of commercial motor vehicles operating on Federal-aid highways…" and that the study provide policy recommendations.[7]

The law requires TRB to consult with the U.S. Department of Transportation, states, the motor carrier industry, freight shippers, highway safety groups, air quality and natural resource management groups, and commercial motor vehicle driver representatives. It requires TRB to consult with "other appropriate entities," although it does not specify what these entities might be. It also requires TRB to consider and evaluate the impact of its recommendations on the economy, the environment, safety, and service to communities.

The Committee for the Study of the Regulation of Weights, Lengths and Widths of Commercial Motor Vehicles was formed in 1998, and its original purpose was to review certain aspects of the U.S. DOT's TS&W study. As it happens, TRB had already begun planning for a TS&W study before TEA-21, and so the Committee was reassigned to this task when the law was passed. The committee consisted of 13 members representing state transportation officials, professional researchers, and academics, overwhelmingly in the field of civil engineering, with a small representation from economics. A summary list of the members and their respective affiliations is provided in Appendix A2.

As part of the process of conducting the study, the Committee solicited comments from outside parties on the issue of changes to TS&W regulations. Of the 46 organizations receiving letters, 25 provided comments in response. The full list of organizations contacted is shown in Appendix A3.

The Committee's request for comments included the following three specific questions:

1. What revisions to federal law and regulations regarding commercial vehicle weights, lengths, and widths should the committee consider?

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[6] Interstate Commerce Commission, *Federal Regulation of the Sizes and Weight of Motor Vehicles*; Letter from the Chairman, Interstate Commerce Commission, 77th Congress, 1st Session, House Document No. 354, August 14, 1941.

[7] PL105-178, Section 1213, Subsection (i).

2. What factors should it take into account in evaluating possible revisions?

3. Should the committee recommend revisions to federal law and regulations?

Responses to the three questions were quite varied. In response to Question 2, four respondents explicitly stated that the Committee should not consider the issue of modal competitiveness or the diversion of freight from the railroads in evaluating possible TS&W revisions. Three of these were trucking industry interests.[8] The other was the National Industrial Transportation League.

The basic conclusion in *Special Report 267* is that increased TS&W limits have the "greatest potential" to improve highway freight efficiency, but that their full effects (including safety effects) are uncertain and that there is a "substantial probability" that there will be safety ramifications. To facilitate the liberalization of TS&W limits, the Report proposes a revised regulatory regime that would involve federal supervision of state-set limits with evaluation provided by an independent Commercial Traffic Effects Institute (CTEI). The Report suggests that the states should not be able to begin liberalizing the regulations until the CTEI is established and is able to conduct careful assessments. A full list of the Report's conclusions and recommendations is in Table 4.

Table 4. Conclusions and Recommendations of TRB Special Report 267

Conclusions	Recommendations
1. Opportunities exist for improving the efficiency of the highway system through reform of Federal truck size and weight regulations. Such reform may entail allowing larger trucks to operate.	1. Create a Commercial Traffic Effects Institute
2. Appropriate objectives for Federal truck size and weight regulations are to facilitate safe and efficient freight transportation and interstate commerce, to establish highway design parameters, and to manage consumption of public infrastructure assets.	2. Evaluate the consequences of changes in truck size and weight regulations through pilot studies
3. Changes in truck size and weight regulations made in coordination with complimentary changes in the management of the highway system offer the greatest potential to improve the functioning system.	3. Allow certain immediate changes in Federal regulations
4. The methods used in past studies have not produced satisfactory estimates of the effect of changes in truck weights on bridge costs.	4. Allow certain Longer Combination Vehicles (LCVs)
5. It is not possible to predict the outcomes of regulatory changes with high confidence.	5. Routes and roads to which Federal standards should apply
6. It is essential to examine the safety consequences of size and weight regulation. 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.	6. Conduct research on enforcement, environment and safety effects, bridge costs, freight markets, driver stress, and dedicated truck infrastructure.
7. Although violations of size and weight regulations may be an expensive problem, monitoring of compliance with the regulations is too unsystematic to allow the costs involved to be estimated.	

[8] The American Trucking Associations, the Distribution & LTL Carriers Association, and the National Automobile Transporters Association.

III. EVALUATION OF TRB *SPECIAL REPORT 267*

General Observations

The most detailed analysis in the Report (pp. 2-17 to 2-29) focuses on new probabilistic techniques for assessing bridge costs. The actual analysis of freight market efficiencies - the *raison d'Être* for the Report - is limited to a few bullet-points on pages 2-12 and 2-13. There is some discussion on pages 2-36 to 2-39 of the relationship between freight markets and land use - a topic some would regard as very important - but the Report elects not to weigh these effects: "Predicting and evaluating the effect of changes in size and weight regulation on land use would be extremely difficult" (p.2-39).

The Report does recognize the uncertainty that exists regarding TS&W issues. The Executive Summary cautions: "Throughout its work, the Committee found that a lack of information about the costs and benefits of truck transportation and the impacts of the size and weight regulations hindered its effort to provide useful policy advice" (p. ES-1). In a more detailed summary of these uncertainties (p. 2-11), the Report concludes that pavement impacts and traffic impacts are well enough understood to facilitate regulatory change, but that there is inadequate knowledge of safety effects, bridge costs, changes in the volume of truck traffic, motorist stress and discomfort, and administrative feasibility. Not all would accept the claim that the infrastructure and traffic effects are well known.[9]

The Report also acknowledges the potential importance of motorist comfort and distress to TS&W. The Report does not devote an extensive amount of time to discussing the issue, but it does acknowledge that research should be conducted to determine whether these effects are "real costs that should be considered in evaluations of highway regulations" (p. 5-18).[10] The Report also mentions the potential benefits to be gained from separating truck and auto traffic by constructing separate highway and bridge facilities for trucks. *Road Work*, the 1989 Brookings Institution study of the U.S. highway system by Small, Winston, and Evans developed this idea that there may be

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[9] The Committee appears to be less than certain about its knowledge of traffic effects. It recognizes (pp. 2-36) that the methods used to estimate congestion and pollution costs involve "oversimplified treatment on the complex interactions between trucks and other vehicles in the traffic stream. Changing the traffic volume, dimensions, and acceleration abilities of trucks will change how motorists drive around them, affecting other vehicles' patterns of acceleration and braking." The Committee also acknowledges (pp. 2-33 to 2-34) that the predicted effects on traffic flow depend critically on freight diversion forecasts, (which the Report discounts).

[10] The Report makes the methodological suggestion that the only way to evaluate the economic value of driver stress is to observe changes in traveler behavior where automobile drivers chose different routes to avoid big trucks. To see the limitations of this method, consider a case with which the Committee members might be familiar—the installation of Traveler Information Systems on public transportation systems. The economic value of these systems, which let travelers know in real time when the next bus or train is arriving, is not measured solely by the number of travelers who divert from highway to transit. The valuation should include some measure of the usefulness of information provided existing users.

"diseconomies of scope" that result from combining cars and trucks on the same system."[11] The Report acknowledges that separate truck facilities could help to accommodate the growth in freight demand, though it does not discuss the financing of these facilities.[12]

Finally, the TRB Report recognizes the potential role that cost-based user fees could play in managing the utilization of highways and bridges and mitigating the negative effects of trucks. Though the Report's discussion is mostly limited to cases where the imposition of fees would facilitate the implementation of higher TS&W limits (p. 3-28), the general endorsement of highway pricing is a policy advance. This is coupled with the important recognition that the design of regulatory institutions and enforcement mechanisms as well as standards are important elements of the regulatory process.

A major shortcoming of the Report is that it fails to provide any real analysis of supply and demand in the freight market, even though the explicit aim of the Report is to increase the efficiency of this market. The economic theory upon which the Report is based is uncomplicated: "The regulations have important economic consequences because trucking accounts for four-fifths of expenditures on freight transportation in the United States, and trucking costs are influenced by truck size and weight."

The DOT *Comprehensive Truck Size and Weight Study* does not necessarily contradict this theory, but it does provide a more thorough picture of the freight market to provide a basis for careful policy decisions. For example, the U.S. DOT study points out in Chapter IV that overall logistics costs — not truck or rail rates — are the factors that determine freight market decisions. It notes that savings in inventory carrying costs are about equally important as reductions in (truck and rail) transportation costs in increasing the efficiency of freight markets. The U.S. DOT study also spends a considerable amount of time analyzing the impact of TS&W regulations on the freight railroad industry (Volume III, Chapters II, III, IV, XI). These impacts are important because they have direct bearing on the *overall* efficiency of the freight market.

The notion of freight market efficiency developed in *Special Report 267* is too narrow to be useful in a discussion of national transportation policy. The sole focus of the Report is on the movement by truck from Point A to Point B at the lowest direct expense to some motor carriers and shippers. An *efficient* national freight market is an intermodal system of air, water, highway, rail and shipper activities which take full advantage of linked networks of transport assets. Moreover, (as the TRB itself recognized in *Special Report 246*[13]) an *efficient* freight market is one in which the users absorb the full marginal costs that they impose.

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[11] Small, K., Winston, W., and Evans, C., *Road Work: A New Highway Pricing & Investment Policy*, Washington DC: The Brookings Institution, p. 102.

[12] The Report also acknowledges here that "other modes" (p.5-18) will be part of the solution.

[13] TRB *Special Report 246*, Paying Our Way: Estimating Marginal Social Costs of Freight Transportation, 1996, Table ES-1, p. 8.

Using this metric, *Special Report 246* found rail operations to be two-to-five times more efficient than truck operations on a corridor-by-corridor basis. This suggests that higher TS&W limits, which would divert freight from the rail network onto the highway network, would increase social costs and decrease efficiency. One could argue that the reduction in private costs to truckers and truck shippers could partially offset this effect, but a national policy report should make that argument explicitly.

POINT-BY-POINT EVALUATION OF REPORT CONCLUSIONS AND RECOMMENDATIONS

This section provides a point-by-point evaluation of the TRB Report's conclusions and recommendations. A serious shortcoming of the Report is its failure to establish an analytical basis for the recommendations which it makes. There is no analytical justification, for example, either in earlier TS&W studies or the Report itself, for its novel regulatory proposal — federal "supervision" of state TS&W permitting with oversight provided by an independent Commercial Traffic Effects Institute (CTEI). Nor is there an analysis from an experimental design perspective of how the Report's pilot studies would demonstrate the effects of changes in TS&W. Other recommendations for immediate change that the Report makes appear to be inconsistent with its own finding that the effects of increased TS&W limits are uncertain. The Report does suggest that states should not be able to begin liberalizing the regulations until the CTEI is established and is able to conduct careful assessments.

A. Conclusions of the TRB Report

Conclusion 1: Opportunities exist for improving the efficiency of the highway system through reform of federal TS&W regulations. Such reform may entail allowing larger trucks to operate.

The proper focus of TS&W policy should not be solely on lowering the private costs of trucking firms and/or some freight shippers, but on minimizing the public costs (infrastructure, safety, pollution, energy consumption, congestion) of truck transportation and ensuring the overall efficiency of the national freight market. An *efficient* market is one in which the users absorb the full marginal costs that they impose.

It is wrong for the Report to conclude — without a more careful analysis — that there is a direct relationship between increases in TS&W limits and increases in freight market efficiency. The data for such analyses were available to the Committee in TRB *Special Report 246*, in a 1998 DOT-sponsored study by David J. Forkenbrock of the University of Iowa entitled *External Costs of Truck and Rail Freight Transportation*, in the DOT's 2000 *Comprehensive Truck Size and Weight Study*, and in the *2000 Addendum to the 1997 Federal Highway Cost Allocation Study*.

According to the *2000 Addendum to the 1997 Federal Highway Cost Allocation Study,* heavy trucks in the 75,000-80,000 pound range cover only 80 percent of the infrastructure costs they impose, and heavy trucks in the 80,000-100,000 pound range

cover 50 percent.[14] The full marginal social cost of bigger trucks — much of it not recovered — is on the order of $0.20 to $0.70 per mile.[15]

Table 5 summarizes the relevant results of the TRB's own *Special Report 246*, comparing the efficiency of two representative freight movements by rail and by 5-axle tractor semitrailer:

- Case 1 compares the full costs of a grain movement from Walnut Grove, MN to Winona, MN, a distance of about 200 miles. Case 1A summarizes the full costs of a direct truck move using local roads. Case 1B analyzes the truck costs by Interstate. Case 1C is a combined truck/rail movement.

- Case 3 compares the full costs of a container movement from Los Angeles, CA to Chicago, IL, a distance of about 2,000 miles. Case 3A is a truck movement by Interstate. Case 3B involves truck and container railcar.

In both corridors, the rail movements are more energy-efficient and labor-efficient and impose lower social costs. The modes are competitive largely because of public subsidies to trucking and the high valuation that shippers place on the flexibility and speed of the truck mode.

Table 5. Efficiency Comparisons: Truck versus Rail ($)

	Case 1A	Case 1B	Case 1C	Case 3A	Case 3B
Marginal External Cost					
Congestion	8.94	6.25	0.00	295.81	0.75
Accidents	46.04	26.11	9.19	89.43	77.72
Air Pollution	6.54	6.75	1.43	63.65	34.83
Energy Security	3.10	3.63	0.39	16.64	5.36
Noise	2.31	0.00	0.78	20.68	12.65
Marginal cost of public infrastructure	38.63	61.02	0.00	141.47	1.81
Total	105.57	103.77	11.78	627.67	133.12
Less: User fees ($/truckload)	51.16	59.90	0.65	285.14	10.50
Equals: Net subsidy ($/truckload)	54.41	43.87	11.13	342.53	122.62
Carrier's average cost ($/truckload)	454.16	442.73	124.87	2469.06	1049.44

Source: *TRB Special Report 246*, Tables 4-2, 4-3, and 4-4.

The implication is that the liberalization of TS&W might improve the efficiency of the highway system, but in so doing it would also add external costs (negative impacts on

[14] Federal Highway Administration, *2000 Addendum to the 1997 Federal Highway Cost Allocation Study Final Report*, Table 7.

[15] *Ibid*., Table 13.

other transportation modes, and increased costs to some transport users) that would not be recovered. Thus, total freight transport efficiency would be harmed.

Conclusion 2: Appropriate objectives for federal TS&W regulations are to facilitate safe and efficient freight transportation and interstate commerce, to establish highway design parameters, and to manage consumption of public infrastructure assets.

The Report recognizes here that the goal of TS&W regulation is not to improve the efficiency of the "highway system," but to balance the public costs of truck travel against the efficiency of the freight transportation market. However, the Committee does not follow its own admonition, because the focus throughout the Report is overwhelmingly on lowering the private costs of trucking.

A more balanced statement of goals is in the DOT's *National Freight Transportation Policy Statement* (January 1997), which guided the *Comprehensive Truck Size and Weight Study*. These goals include:

- Ensure a safe transportation system;
- Promote economic growth by removing unwise or unnecessary regulation and through the efficient pricing of publicly financed transportation infrastructure;
- Protect the environment and conserve energy;
- Provide funding and a planning framework that establishes priorities for allocation of Federal resources to cost-effective infrastructure investments that support broad National goals;
- Promote effective and equitable joint utilization of transportation infrastructure for freight and passenger service.

Notice the emphasis on safety, transportation infrastructure (not just highways), environment, and effective and fair use of all of the nation's transportation assets. It is worth noting, also, that when the DOT conducted its *Comprehensive Truck Size and Weight Study*, direction was provided by a Policy Oversight Group which included officials from FHWA, the Federal Railroad Administration, and the Maritime Administration. In addition, a Multimodal Advisory Group was established to provide technical assistance.

It is surprising that a national panel of transportation experts would view this broad set of goals and multimodal working structure as a "shortcoming" (p. 2-1), and yet that is the conclusion of the TRB *Special Report 267*. The Report claims that a fundamental problem with the 2000 study and earlier studies is that "analyses have not started with clear definitions of the objective of regulation" (p. 2-1) which should be "asking how the size and weight regulations can be used as a part of a strategy for increasing the benefits of the highway system" (p. 2-3). What the Report means by "increasing the benefits" is liberalizing the TS&W limits.

Conclusion 3: Changes in TS&W regulations made in coordination with complimentary changes in the management of the highway system offer the greatest potential to improve the functioning of the system.

The Report provides no analytic basis for its conclusion that changes in TS&W have "the greatest potential" to improve the functioning of the freight market or the efficiency of the highway system. There is no analysis of the role of logistics costs, for example, or of the impact of deregulation, computerization, containerization, and advanced communications on freight productivity. Nor is there a complete analysis of the role that prices could play in making highways more efficient.

The Report's failure to consider logistics contrasts with the U.S. DOT's *Comprehensive Truck Size and Weight Study*, which recognizes that the freight market properly understood is a $600 billion activity (p. IV-12). The DOT study estimates that business logistics costs declined by about $65 billion during the 1980s, but that a large portion of that savings ($30 billion) was attributable to reductions in inventory carrying costs. The other $35 billion of savings was attributed to reductions in transportation costs for all modes including truck, rail, water, pipeline and air.

With respect to the highway system, *Special Report 246* concludes that the best way to guarantee improvement for all users of the system would be to charge the right prices. Quoting the earlier Committee:

> It is desirable that shippers and carriers pay the full social cost of their freight operations - that is, that the special taxes and fees paid by the shipper or carrier for each shipment of freight be enough to offset the cost to the government of the shipment and the external costs that the shipment imposes on others. If the shipper and carrier do pay the full cost of each freight shipment, then they will be more likely to use transportation services responsibly and efficiently.[16]

TRB *Special Report 267* also recognizes the potential role that cost-based user fees could play in managing the utilization of the highway system, but the focus is on applying these fees to larger-permit trucks in order to "facilitate" the implementation of higher TS&W limits (p. 3-28). There are technical problems with such a fee scheme that are discussed below under Recommendation 3. The more general problem is that the pricing described in this Report would do little to reduce the truck-related stresses that motorists feel, the safety risks they face, or the cross-subsidies they pay for infrastructure.

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[16] *TRB Special Report 246, Paying Our Way: Estimating Marginal Social Costs of Freight Transportation,* 1996, p. 1.

Conclusion 4: The methods used in past studies have not produced satisfactory estimates of the effect of changes in truck weights on bridge costs.

In its *Comprehensive Truck Size and Weight Study*, the U.S. DOT estimates that nationwide legalization of six-axle 97,000-pound single trucks would reduce shipper costs by 5.1 percent, but increase bridge costs by 33.1 percent. Similarly, nationwide operation of LCVs would decrease shipper costs by 11.4 percent, but increase bridge costs by 34.4 percent. Large expenditures for bridges - $53 billion in capital costs and $266 billion in user delay costs - would offset the efficiency gain to truckers and truck shippers.

The reason for this large estimate is that heavier singles and LCVs would overstress bridges beyond their design limits and force them to be replaced. The DOT recognizes that it probably overestimates bridge costs since "some bridges could be strengthened and replacement of bridges on highways with low volumes of the damaging vehicles would not have to be improved at all."[17]

The TRB Report puts considerable emphasis on the fact that a risk-based analysis would reduce the projected cost of bridge replacement.

> Very high estimates of bridge costs from liberalized regulations are inconsistent with the experience of jurisdictions — in particular Michigan and Ontario — that have opened their roads to use by trucks much heavier than the federal weight limits without experiencing costs of the magnitude estimated. Most important, the DOT estimates ignore the great potential for lower-cost methods of maintaining bridge safety that the states are increasingly capable of applying because of the widespread adoption of bridge management systems (p. 2-29).

The Report recognizes that a proper, risk-based analysis has not yet been conducted. It does not fully acknowledge the difficulties that might be involved in such an analysis or the possibilities for upward revision of the DOT estimates. The Report is skeptical of the DOT's ability to predict regulatory outcomes in markets governed by supply and demand (see Conclusion 5 below), but confident of its ability to predict the behavior of state highway agencies and the legislative committees that fund these agencies.

Also, as the Report notes on p. 2-19, the U.S. DOT study omits fatigue costs attributed to larger vehicles markets which state engineers feel are underestimated. And, as the Report notes on p. 2-21, there are alternative rating systems for judging how much a bridge can be loaded and the choice of the higher rating system would revise the DOT estimate upward. The methods used in the past may not have produced satisfactory estimates, but they have not necessarily produced exaggerated estimates, as the Report claims.

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[17] U.S. Department of Transportation, *Comprehensive Truck Size and Weight Study*, Volume I Summary Report, 2000, p. ES-20.

Conclusion 5: It is not possible to predict the outcomes of regulatory changes with high confidence.

It is true that there is uncertainty involved in the prediction of regulatory outcomes. However, economists have made considerable progress in the empirical analysis of various network industries, and these results have been used extensively to improve the regulatory framework and the functioning of the economy. An example which a TRB panel should have been aware of is railroad deregulation in 1980. The regulatory changes accompanying rail deregulation were supported by extensive economic studies before the fact, and have been validated by subsequent analyses. One might point to similar work in most other network industries - airlines, electricity, telecom, gas, water, etc.[18]

It is one thing to conclude, as the Report does (p. 2-6), that a 1986 TRB committee was not able to predict the exact length (53 ft) of the trailers that the trucking industry would adopt in response to a change in statutory language, or (p. 2-6) that a 1970s Canadian study did not anticipate the variety of specialized trucks that would evolve as a result of new provincial weight limits. It is another thing to decide - as the Committee apparently does - that it could disregard the work in the *Comprehensive Truck Size and Weight Study* aimed at forecasting the effects of TS&W changes on the intercity freight markets.

Those effects can be quite striking. The illustrative TS&W scenarios analyzed in the DOT study show that bigger trucks would divert between 4.0 percent and 19.6 percent of annual rail traffic (measured in car-miles) onto the highway system (Table ES-12). This means between 1.02 billion car-miles and 5.0 billion car-miles would be converted into highway trailer-miles each year. It also means a projected loss of railroad contribution to fixed costs ranging from 38.2 percent to 55.8 percent. This is money that would no longer be available to the railroads to cover the fixed costs of their operations and sustain investment.

The problem that the DOT report recognizes is that railroad fixed costs are high, so the losses would have to be recovered (to some extent) in the form of higher prices to remaining rail shippers. In other words, a reduction in costs to some highway shippers must lead to an increase in rates for some rail shippers. In response to trucks cutting rates, railroads in many cases would have to lower their rates to stay competitive or else lose the traffic. Losing traffic means that remaining shippers must bear the burden of providing fixed costs, and so on, and you get a vicious circle. The TRB Committee, with a mandate to consider overall economic efficiency, should have recognized this.

[18] Economists involved in these reforms are aware of the mistakes that have been made and of the limitations of such analyses, but no one has concluded that the analysis efforts are irrelevant. For a critical overview of these developments see Michael A. Crew and Paul R. Kleindorfer, "Regulatory Economics: Twenty years of Progress?" pp. 5-22, in a special issue of the *Journal of Regulatory Economics*, 21(1), January 2002.

Conclusion 6: It is essential to examine the safety consequences of TS&W regulation.

In its *Comprehensive Truck Size and Weight Study,* the U.S. DOT concludes that safety must be the primary goal of TS&W policy along with "the considerable public concern about mixing larger trucks with passenger cars on our highways."[19]

> Collisions between medium to heavy trucks and other, smaller vehicles (principally passenger cars and light trucks and minivans) can be particularly lethal to the occupants of the smaller vehicles, principally because of the difference in weight (mass) between the two vehicles, and for head-on collisions, the high vehicle closing speeds typically involved. In total, collisions with medium to heavy trucks account for 22 percent of all passenger car and light truck/van occupant fatalities sustained in collisions with other motor vehicles. (p. V-2)

The DOT study acknowledges that it is difficult to use statistical inference to establish a relationship between TS&W limits and highway safety. Longer combination vehicles account for less than two percent of annual truck VMT, while 5-axle single trailers comprise 65.4 percent. It is difficult to develop robust estimates for vehicles larger than the typical vehicle in use. Also, the crash rates for larger vehicles now operating in highly controlled situations may not be transferable to other operating situations. The DOT's approach, therefore, is to focus on the systematic components of truck safety, comparing physical differences in vehicles and equipment, driver performance, and operating environment in standard versus larger trucks.

The TRB Report recognizes the lack of conclusive information about the relationship between truck size and weight and truck safety. It also recognizes that this kind of information is critically important in formulating potential changes to TS&W regulation. The approach that the Report proposes is different from the DOT's and raises serious questions. According to the Report, pilot studies would solve the information problem by facilitating "direct observation of the primary impact of interest" (p. 5-9) which would be frequency and severity of accidents. This amounts to the use of unknowing or unwilling human subjects (motorists) in large-scale (or lengthy) safety experiments.

> The most successful past studies of the relative accident rates of trucks of differing dimensions have used data obtained from truck operators that include records of large numbers of trips made by different kinds of trucks operating between the same origins and destinations…In pilot studies involving a small number of vehicles, it would not be possible within a reasonable time span to measure small differences in relative accident risks. (pp. 5-9, 5-20)

The pilot studies are endorsed despite the DOT's findings that combination trucks are more susceptible to rollover than conventional trucks and induce greater driver fatigue, as well as repeated substantiation that the public is strongly opposed to longer, heavier

[19] US Department of Transportation, *Comprehensive Truck Size and Weight Study*, p. V-1

trucks and, therefore, would likely not wish to be party to a "pilot study" to examine the safety effects of TS&W changes. [20]

Conclusion 7: Monitoring of compliance with TS&W regulations is too unsystematic to allow the costs (of violations) to be estimated.

This is an important observation, and the report rightly points out the need to better quantify the nature and extent of violations in order to inform the process of TS&W regulation. The Report identifies a number of techniques as being promising for improving enforcement, especially more widespread use of automated, information technology based systems.

B. TRB Report Recommendations

Recommendation 1: Establish an independent Commercial Traffic Effects Institute to monitor and evaluate TS&W changes.

The Report stresses that the design of regulatory institutions and enforcement mechanisms, as well as performance standards, are important elements of the TS&W regulatory process. This is an important contribution, but the Report offers no legal, economic or administrative analysis of why a Commercial Traffic Effects Institute (CTEI) would provide more effective regulation than the DOT — especially in an area where there are significant public concerns.

The primary justification for CTEI is that "under present practices federal size and weight policy has been deadlocked for more than a decade, in spite of general dissatisfaction with the regulation" (p. 5-5). In fact, it is debatable that there is widespread dissatisfaction with the existing TS&W regulations, at least as far as it concerns liberalization, among the general driving public. The Report recognizes that the DOT's recent analysis of TS&W issues was "comprehensive" (p. 5-6), and that the DOT has the authority to regulate truck safety (p. 3-4), but it concludes that the way to end the "deadlock" is to establish a separate agency (p. 5-6).

The CTEI would be an "independent public organization," financed from the Highway Trust Fund, and governed by a Congressionally-appointed board of federal, state and industry representatives. The CTEI's professional staff of engineers, statisticians and economists would work on pilot studies and other research funded by government or the private sector. Here is how it might work, according to the Report:

> For example, a group of carriers in one industry segment or one region might have a particular interest in having research or a pilot study conducted on a vehicle or operating practice they believed would be of value to them. In such a circumstance, the carriers should be expected to contribute a major portion of the costs of the evaluations. Legislation would be needed to provide the proper legal form for such contributions. (p. 3-5)

[20] Ibid., p. I-22 and V-11.

The Report predicts that under such arrangements the Institute "would come to be seen by industry, state governments, and others as a means to implement ideas about more efficient highway management and truck regulation" (p. 3-4). This seems accurate, but it is not clear that the public interest would be protected.

Recommendation 2: Evaluate the Consequences of Changes in TS&W Regulations Through Pilot Studies.

While the concept of pilot studies is, in principle, not inappropriate for research of this nature, the specific proposal put forth in the TRB report is problematic at best. As described by the Report, the pilot program would expose ordinary travelers to bigger/heavier experimental trucks in traffic if the CTEI determined, based on all available information, that the pilot could be conducted without harm to safety (p. 5-10).

One might consider pharmaceuticals as a model for the evaluation of innovations with the potential to both produce public harm and benefit, but what is proposed here is not really analogous to pharmaceutical regulation. In that industry, it takes about 13 years to develop one new drug, and the process is characterized by systematic, sequential incremental testing of the product for 7-8 years before it is tried on any humans. When human testing begins, extensive tests are initially conducted on healthy human volunteers just to ensure the product does no harm. Critical to the process is extensive monitoring in a controlled environment. Moreover, safety is always first - before a new drug is even tested for efficacy it is tested to ensure that it does no harm to human beings. Clearly, any public policy innovation that could potentially harm the public needs should be examined in a similar risk-averse, safety-based framework.

Nor is it clear that the pilot studies recommended by the Committee would establish the "consequences" of TS&W changes. The DOT study recognizes how difficult it is to use statistical inference to establish a relationship between TS&W limits and highway safety. One reason is that the current use of such vehicles is highly controlled so that the results would not generalize to different operating conditions. The same caveat would apply to pilot studies.

Another troublesome aspect of this recommendation is that it gives individual states responsibilities for making decisions that affect the overall efficiency of the national freight network. Increases in TS&W limits lower the per-ton operating costs of long-haul trucks and this has an immediate effect on rail traffic—about one-third of which (on a ton-mile basis) is competitive with long-haul trucks. Because the rail and highway networks are interrelated — and because the rail network has high fixed costs— all shippers are affected.

The Report fails to recognize that there is a difference between the optimal management of highway pavement and bridge structures and optimal regulation of a complex national freight network. It may make sense for the United States to further "devolve" responsibility for the management of pavement and bridge assets to state highway agencies (or regional agencies, or regulated private firms), but it is wrong to confuse the management of infrastructure with the regulation of national freight operations.

Recommendation 3: Authorize the states to participate in a federally-supervised permit program allowing for a) six-axle tractor semi-trailers with maximum weight of 90,000 pounds, and b) double-trailer configurations with each trailer up to 33 feet long.

The Committee has been careful in its recommendations regarding changes to existing TS&W limits. The maximum gross vehicle weight of 90,000 pounds for six axle semi-trailers, for example, is just below the threshold estimated to cause negative bridge impacts, according to the DOT study.[21] Because axle weights are not increased, such a limit would (according to the DOT study) not necessarily cause increased pavement damage. However, the current bridge formula would allow 33-foot double-trailer configurations with weights up to 120,000 pounds on a nine-axle vehicle, 115,000 pounds on eight axles, or 110,000 pounds on only seven axles. A seven-axle vehicle at 110,000 pounds may not be as damaging to bridges as a 120,000-lb. nine-axle vehicle of the same length, but it certainly does more pavement damage. Notwithstanding the issue of infrastructure impacts, questions still exist regarding the safety implications of increasing TS&W limits, even in this limited fashion. The TRB report describes the lack of statistically reliable evidence both concerning the relationship between truck weight and accident involvement, and regarding the relationship between truck weight and the probability that an accident will result in a fatality (pp. 2-44 to 2-45).

In addition, the Report recognizes that nuisance-related and stress-related costs from mixed auto and truck traffic should be considered in the evaluation of any TS&W policy. In focus groups conducted as part of the U.S. DOT study, a vast majority of automobile drivers said they opposed changes in TS&W regulations.[22] Truck drivers in the survey groups also questioned the need for change. Truck sizes and weights are a serious issue for the public, and this must be an important consideration in any public policy decision.

The Report recommends that "fees related to costs be adopted to accompany the proposed new size and weight limits" (p. 3-27), but it does not appear that these would cover the marginal costs of pilot programs. The Report does not explicitly endorse the pricing of *all* truck traffic (which would be logical) but only the pricing of experimental *permit* trucks to cover their "added costs". The report recognizes (p. 3-28) that the "added costs might be proportional to the volume of permit traffic up to some traffic level but increase at an accelerating rate at higher volumes." As truck traffic increases, in other words, the *marginal* cost of the permit trucks would be increasing. But this implies that increases in conventional truck traffic would also increase the marginal cost of permit trucks, and *vice versa.* Under the plan that the report describes, increase in marginal costs of existing trucks would not be covered.

Recommendation 4: Allow the states to conduct pilot studies involving any longer combination vehicles as long as the pilot study is judged safe by the CTEI.

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[21] The 90,000-pound GVW six-axle semitrailer is examined as part of "North American Trade scenario." See U.S. DOT, *op. cit.*, Volume III, Table VI-I.

[22] U.S. DOT, Volume II, pp. V-17-V-18.

In addition to proposing the allowance of the 33-foot doubles described in Recommendation 3, this recommendation suggests that States be allowed to conduct pilot studies with *any* configuration of LCVs, so long as they are judged safe by CTEI.

The open-ended nature of this aspect of this recommendation raises two important questions:

1. What types of LCVs are likely to be proposed for pilot studies?

2. How broad would the scope of these pilots be?

With regard to the first question, the DOT study indicates that the economics of the industry are such that if longer combination vehicles were allowed to operate nationwide, they would become the dominant configuration, eventually constituting the *majority* of US truck VMT.[23] In this context, the second question becomes critical.

Here the DOT study concludes that "(e)ven if Federal law did not require States to allow larger or heavier vehicles, some States fear that if neighboring States allow LCVs, they will face irresistible pressure to also allow LCVs to keep their businesses competitive."[24] This raises the possibility that, even within the carefully designed pilot studies advocated by the Committee, larger LCVs could eventually dominate the intercity freight market.

A majority of automobile drivers oppose these vehicles. LCVs are less stable than conventional tractor-trailers, and the effects they would have on congestion and pollution are uncertain. LCVs would have a significant effect on the overall viability of railroad operations across their service offerings as described in the discussion under Conclusion 5.

Recommendation 5: Do not extend federal TS&W regulations to the non-Interstate portion of the National Highway System.

The Committee reports a recommendation that there is no justification for extending federal weight regulation to the non-Interstate portion of the National Highway System. There is no discussion of this issue in the body of the Report and the Committee's Congressional mandate is to analyze the regulations "on Federal-aid highways to which Federal regulations apply on the date of enactment of this Act."[25] The recommendation appears to be aimed at HR3132, the "Safe Highway and Infrastructure Preservation Act", which would extend the current federal TS&W limits beyond the 44,000 miles Interstate system to the entire National Highway System of nearly 157,000 miles.

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[23] U.S. DOT, *Comprehensive Truck Size and Weight Study*, Volume III Scenario Analysis, 2000, pp. IV 32 – IV-33.

[24] U.S. DOT, *op. cit.*, Volume I Summary Report, p. 40.

[25] PL 105-178, Section 1213.

The recommendation is not inconsistent with the idea proposed in the Report that there should be a "redefinition" of federal and state TS&W regulatory responsibilities. The Report describes that redefinition as follows:

> The federal government would have diminished involvement in defining numerical dimensional limits on the Interstates and other federal-aid highways, since the states would have more discretion with respect to limits on these roads. However, the federal government would take on greater responsibility for ensuring that state rules governing the use of vehicles on federal-aid highways were contributing to meeting national objectives. (p. 3-21)

The Institute (Recommendation 1) would play a key role here, providing "monitoring, oversight and research" (p. 3-21), and the federal government would focus on performance standards: "states could propose solutions to problems, and the federal government would have to assess whether the proposals met qualitative objectives" (p.3-22).

The Report does not identify these qualitative objectives. It also does not recognize that changes in TS&W limits change the capacity of the highway freight network, and this affects the overall efficiency of the national freight network. Because the rail and highway networks are interrelated, all shippers (and all motorists) are affected. State agencies may well provide optimal management of highway and bridge assets but this does not mean that they can optimally regulate the performance of the national freight network.

Recommendation 6: Specific TS&W topics requiring research include enforcement effectiveness, air quality effects, truck characteristics and crash involvement, risk-based bridge costs, freight market behavior, driver stress, and truck-only facilities.

The report makes a good case that there are several key areas in which more information would improve TS&W policy.

The recommendation for more freight transportation market research should consider not only the relationship between truck costs and truck traffic, but should examine the broader context of total logistics costs and shipper preferences across modes. Advanced and well-accepted market research techniques now exist that would, within a carefully designed program of research, allow the estimation of models that quantify shippers' relative valuation of the most important freight service characteristics. These models could then be used to forecast the likely impacts of service changes across the freight industry. This work could build on the DOT (2000) study.

The proposed research into the nuisance costs of mixed auto and truck traffic is also an important recommendation, particularly given that the report rightly points out that these costs may be independent of actual accident rates. But the conclusion that such costs should only be considered in policymaking if they lead to observable changes in driver behavior is wrong. The stress or anxiety associated with driving with large trucks may impose costs on drivers that are real, but for a variety of reasons do not cause changes in behavior. Research into the adoption of advanced information technology in the public

transit sector, for example, has demonstrated that travelers may value useful information for its ability to reduce stress and uncertainty, but may not necessarily change their travel patterns as a result of having access to it. Modern market research techniques could similarly be used to estimate and clarify drivers' valuations concerning the stress associated with truck traffic.

Appendix A1. Previous TS&W Studies

DOT (1981) An Investigation of Truck Size and Weight Limits

This study was conducted in response to a Congressional directive that the U.S. DOT examine the appropriateness of uniform TS&W standards throughout the United States. It examined the range of benefits and costs to the U.S. economy and society, as well as to specific groups, that would result from alternative changes in TS&W regulations. Five categories of changes were considered, including grandfather clause elimination, barrier elimination, uniformity, rollback to pre-1974 limits, and increases in limits.

The study found that transport cost savings from increased truck productivity could exceed the increase in highway and bridge maintenance costs and increased accident costs that would accompany the introduction of higher TS&W limits. At the same time, however, it found that additional infrastructure investments would be required to accommodate such increases, and that it was uncertain as to whether or not funding would be available for these investments. If these investments were not made, the study found that the negative impacts of TS&W changes could be much greater. The study estimated that diversion from rail would be small under the specific scenarios examined, but did not attempt to estimate the resulting effect on the railroad industry.

TRB (1986) Special Report 211: Twin Trailer Trucks

The purpose of this study was to examine the potential impact of new rules adopted in the 1982 STAA, with a particular focus on safety. It found that twins were probably less safe than semis, but that little change in accidents should be expected because it was assumed that truck VMT would decline overall. On the other hand, it concluded that twins were expected to produce 90 percent more wear on asphalt pavement and 20 percent more wear on concrete pavement than the semis they would replace. This study did not independently estimate the diversion of freight traffic from rail to trucks using twin trailers, but traffic forecasts used in the study assumed that any such diversion would be very small. This assumption was based on the prediction that LTL carriers would be the primary users of twins, and that rail was not a good substitute for LTL truck service.

TRB (1990) Special Report 227: New Trucks for Greater Productivity and Less Road Wear: An Evaluation of the Turner Proposal

The purpose of this study was to evaluate a proposal to reduce road wear and increase truck productivity. Known as the Turner Proposal, the concept was to increase allowable truck lengths and gross vehicle weights but at the same time decrease allowable axle weights. The study evaluated the impact of “Turner Trucks” in terms of productivity, safety, traffic, bridges and pavement. It examined both nationwide and less-than-nationwide adoption scenarios.

For nationwide adoption, it found that that savings to carriers or shippers switching to Turner trucks would average 12 percent of linehaul operating costs, and the aggregate cost savings would be 1.4percent of total truck freight shipping. Approximately 4percent of rail ton-miles would be diverted, causing rail to lose 5percent of its gross revenue. Some of the designs proposed were predicted to have negative safety or traffic effects, but the study predicted that total truck VMT would decrease. The study found that bridge costs would be increased markedly, but that pavement wear would be reduced, such that under nationwide adoption the net effect would be a savings in total infrastructure costs. Under less than nationwide adoption, however, the study found that bridge costs could exceed reductions in pavement costs. Overall, the study found that the Turner proposal would produce benefits and recommended that states consider its adoption under certain circumstances.

DOT (1997) Federal Highway Cost Allocation Study

As part of its role in administering the federal-aid highway system, the Federal Highway Administration has from time to time undertaken analyses aimed at estimating the costs imposed on the various parts of the system by different classes of vehicles. The total costs of building and maintaining the system are generally known, but the purpose of these studies is to *allocate* the costs among users. Known as Highway Cost Allocation Studies (HCAS), these analyses are major efforts requiring significant data collection and analysis, and have therefore been relatively infrequent. The most recent was conducted in 1997, the first HCAS since 1982.

The 1997 HCAS provides the most up-to-date estimates available of the relative costs imposed on the system by cars and trucks. A specific objective of the study was to determine how changes in the federal highway program and the user fees that support it have affected the *equity* of the user fee structure. The study also estimated the responsibility of different vehicle classes for the *external costs* associated with highway use, an important addition not included in the 1982 report. In addition to estimating marginal pavement and bridge costs imposed by each class of vehicle, therefore, the study estimated per mile congestion and noise costs. An addendum to the report published in 2000 provided estimates of per mile air pollution costs by vehicle class. The study found that combination trucks with registered weights over 75,000 pounds (about 70% of all combination trucks as shown in Table A-1) are not paying their fair share of highway costs. Trucks with registered weights of over 80,000 pounds are on average paying only 50% or less of the infrastructure costs they impose.[26]

The study was closely coordinated with the Comprehensive Truck Size and Weight Study then being conducted by the U.S. DOT, in order to provide a consistent set of assumptions and methods for estimating the differential impacts on the highway system by vehicle class. The DOT study is described below.

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[26] Federal Highway Administration, *1997 Federal Highway Cost Allocation Study Summary Report*, Table 7.

DOT (2000) Comprehensive Truck Size and Weight Study

This study was intended to be a comprehensive examination of the issues related to TS&W regulations and the potential impacts of changing them. The aim of the study was *not* to promote a specific policy objective, which is noted in the TRB Report.[27] Rather the aim of the study was "… to develop an information base and set of analytical tools upon which to evaluate alternative TS&W options."[28] The study is comprehensive in many respects. For example, it attempts to make "… a significant improvement in the analysis of diversion from other modes by explicitly considering inventory and other logistics costs that shippers evaluate in making real-world transportation decisions."[29] The study recognizes the role of TRB in evaluating changes to TS&W regulations, with the assumption being that the TRB Committee charged with examining TS&W issues would internalize the results of the DOT study.[30]

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[27] Transportation Research Board, *TRB Special Report 267*, pp. 2-3.

[28] US Department of Transportation, *Comprehensive Truck Size and Weight Study*, Volume I Summary Report, 2000, p.4.

[29] U.S. DOT, *op. cit.*, p. 6.

[30] U.S. DOT, *op. cit.*, p. ES-11.

Appendix A2. List of Committee Members and Affiliations

Member	Affiliation
James W. Poirot, *Chair*	Chairman Emeritus CH2M HILL, Mukilteo, WA
Kenneth D. Boyer	Professor, Department of Economics, Michigan State University
Robert G. Dulla	Senior Partner, Sierra Research Inc., Sacramento, CA
Nicholas J. Garber	Professor and Chairman, Department of Civil Engineering, University of Virginia
Thomas D. Gillespie	Research Scientist and Adjunct Professor, University of Michigan
Ezra Hauer	Professor, Department of Civil Engineering, University of Toronto
James H. Kopf	Deputy Executive Director and Chief Engineer, Mississippi Department of Transportation
Sue McNeil	Director, Urban Transportation Center, University of Illinois, Chicago
Eugene E. Ofstead	Assistant Commissioner of Transportation Research and Investment Management, Minnesota Department of Transportation (*Retired*)
John R. Pearson	Program Director, Council of Deputy Ministers Responsible for Transportation and Highway Safety, Ottawa, Ontario
F. Gerald Rawling	Director of Operations Analysis, Chicago Area Transportation Study
James E. Roberts	Chief Deputy Director, California Department of Transportation, (*Retired*)
John S. Strong	Professor of Finance and Economics, School of Business Administration, College of William and Mary
C. Michael Walton	Ernest H. Cockrell Centennial Chair in Engineering, Department of Civil Engineering, University of Texas at Austin

Source: Transportation Research Board, *TRB Special Report 267*.

Appendix A3. Organizations Contacted by the Committee for Comments

Responded	Did Not Respond
American Bus Association	Association of Waste Hazardous Materials Transportation
American Trucking Associations	National Private Truck Council
Distribution & LTL Carriers Association	American Road and Transportation Builders Association
Motor Freight Carriers Association	Associated General Contractors of America
National Automobile Transporters Association	International Brotherhood of Teamsters, AFL-CIO
National Solid Wastes Management Association	JB Hunt Transport
Western Highway Institute	Schneider National Carriers
Owner-Operator Independent Drivers Association, Inc.	United Parcel Service
Truck Manufacturers Association	Freightliner Corporation
Truck Trailer Manufacturers Association	Intermodal Association of North America
Federal Express Company	National Small Shipments Traffic Conference
Motor Coach Industries, Inc.	Advocates for Highway and Auto Safety
National Industrial Transportation League	Surface Transportation Policy Project
Association of American Railroads	Minnesota Department of Transportation
American Automobile Association	New Jersey Department of Transportation
Coalition Against Bigger Trucks	New York State Department of Transportation
Insurance Institute for Highway Safety	American Association of Port Authorities
Connecticut Department of Transportation	American Assoc. of State Highway and Trans. Officials
Florida Department of Transportation	Commercial Vehicle Safety Alliance
Georgia Department of Transportation	International Bridge, Tunnel and Turnpike Association
Idaho Department of Transportation	National Governors Association
Indiana Department of Transportation	
Michigan Department of Transportation	
New York Department of Transportation	
Texas Department of Transportation	

Source: Transportation Research Board, *TRB Special Report 267*, pp. C-21 and C-22.