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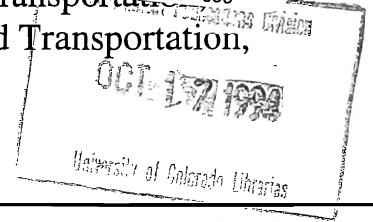
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Longer Combination Vehicles

Potential Infrastructure Impacts, Productivity Benefits, and Safety Concerns

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Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify on the results of our three issued reports on the safety and economic impacts of longer combination vehicles (LCV).¹ At least 14 states and six turnpike authorities permit limited operation of long multiple-trailer trucks commonly referred to as LCVs. LCVs can transport a given amount of cargo at less cost than shorter combinations because fewer tractors and drivers are needed and less fuel is used. As you know, our work regarding LCVs was mandated by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

Our testimony focuses on three LCV issues: (1) the economic impact on infrastructure--pavements, bridges, and interchanges--that result from expanded LCV operations; (2) the potential benefits from and industry's use of LCVs; and (3) the safety of LCV use. In summary, we found the following:

- While generating benefits in the form of lower transportation costs, LCVs could also generate costs for public agencies that provide and pay for the infrastructure. Analyses of benefits and costs attributable to LCVs have been somewhat theoretical because of the various assumptions used to analyze data. LCVs would probably not increase pavement wear, but according to recent Federal Highway Administration's (FHWA) analyses, nationwide use of LCVs on the interstate highway system could require additional investments of \$2.1 billion to \$3.5 billion to replace bridges, improve interchanges, and provide staging areas for the breakdown and assembly of LCVs. Much of the projected infrastructure costs would be incurred in the more densely populated areas of the country. If LCV expansion were limited to carefully selected routes away from major population areas, the cost impact would be limited, but the benefits would also be reduced.

- A 1990 analysis for the trucking industry projected that nationwide use of LCVs on interstate and some primary highways would reduce annual trucking costs by about 3 percent, or \$3.4 billion. As annually recurring benefits, these savings would exceed the one-time infrastructure investment costs estimated by FHWA. However, expansion of

¹Truck Safety: The Safety of Longer Combination Vehicles is Unknown, (GAO/RCED-92-66, Mar. 11, 1992). Longer Combination Trucks: Driver Controls and Equipment Inspection Should Be Improved, (GAO/RCED-94-21, Nov. 23, 1993). Longer Combination Trucks: Potential Infrastructure Impacts, Productivity Benefits, and Safety Concerns, (GAO/RCED-94-106, Aug. 9, 1994).

the routes open to LCVs would benefit some sectors of the trucking industry more than others. One sector, the large companies that consolidate packages or shipments under 10,000 pounds, could benefit immediately from even a partial expansion of LCV routes. These less-than-truckload companies have extensive terminal networks for collecting and distributing shipments, and they can use triple 28-foot trailers for trips between terminals. The truckload sector, which moves cargo by the trailerload from a shipper's dock to a receiver's dock, could benefit from double 48-foot trailers if a national network of highways were open to them. In the absence of such a network, large truckload companies have not adjusted their operation to accommodate doubles.

- Any decision to allow the expanded use of LCVs involves safety concerns as well as economic factors. We reported in March 1992 that LCVs have operational characteristics making them less stable and maneuverable than single-trailer trucks. LCV trailers tend to sway more and sudden steering movements can be amplified toward the rear of LCVs. Furthermore, LCVs can require longer distances to stop and often lack the acceleration needed to move smoothly with traffic. These characteristics of LCVs could make them a greater safety risk than single-trailer combinations if allowed on congested highways. We also found that states had limited data available to monitor LCV operations. Without such data, states may not recognize emerging problems as traffic density grows and as less experienced drivers and companies begin to operate LCVs. We believe that drivers' qualifications are critical to the safety of LCV operation and thus have recommended that FHWA include LCV driver experience requirements in the Federal Motor Carrier Safety Regulations.

In our August 1994 report, we said that if the Congress wishes to allow the expanded use of LCVs, it should authorize the Secretary of Transportation to consider exceptions to the freeze on LCV expansion only if requested by states and accompanied by the following:

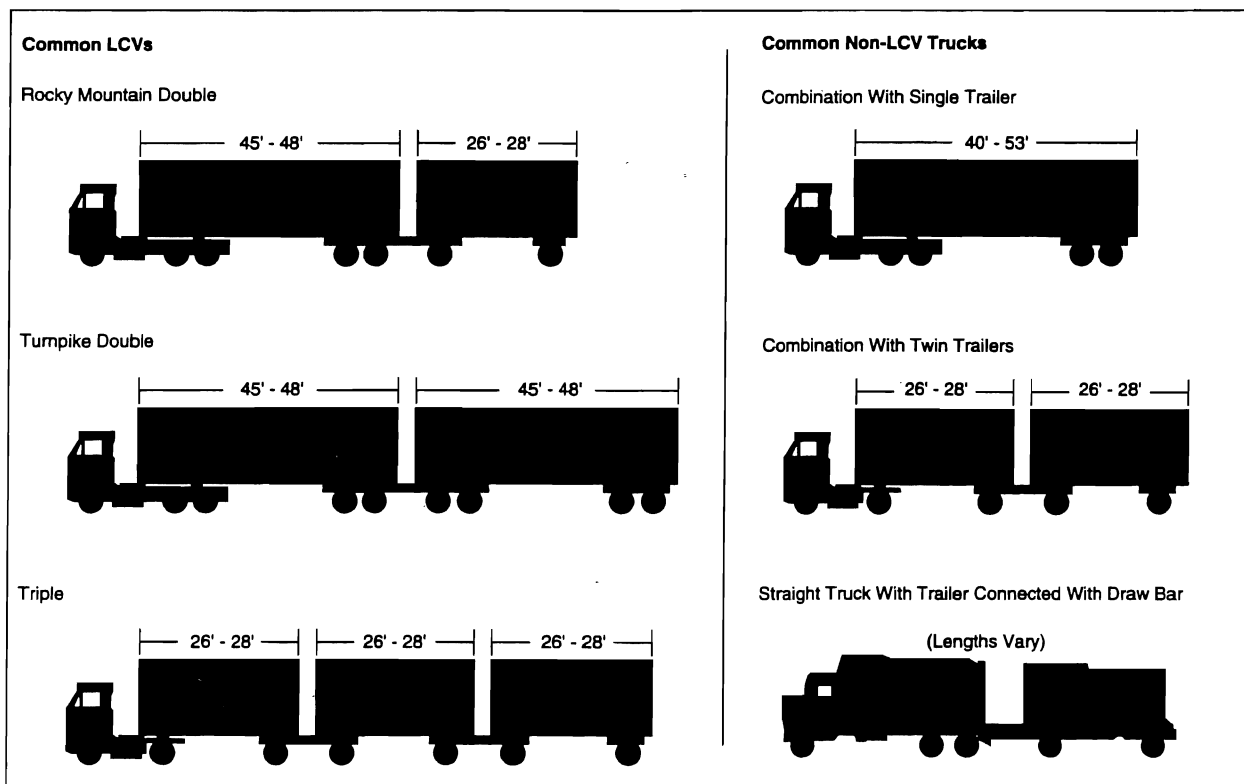
- A state analysis of each proposed route to demonstrate its suitability in terms of the density of traffic, condition of bridges, and adequacy of interchanges. States should determine whether additional infrastructure costs would be generated and how these costs would be recovered.
- A certification that the state will enforce qualification standards for LCV drivers, ensure adequate inspection of LCV equipment, and monitor the experience of LCVs to identify any emerging safety problems or negligent carriers.

Appendix I discusses recommendations contained in our first two reports. These recommendations to the Secretary of Transportation related to providing more complete information on the safety of LCVs and for improving truck accident and travel data.

BACKGROUND

The most common LCVs are triples (a third 28-foot trailer added to two others), turnpike doubles (a second long trailer added to a 45- or 48-foot single), and Rocky Mountain doubles (a short trailer added behind a long one). Figure 1 illustrates these LCVs and distinguishes them from combinations allowed to operate nationwide. Trucking companies, particularly in the West, also use variations of these configurations (particularly different types of trailers) for special transportation needs.

Figure 1: Distinguishing LCVs From Other Trucks

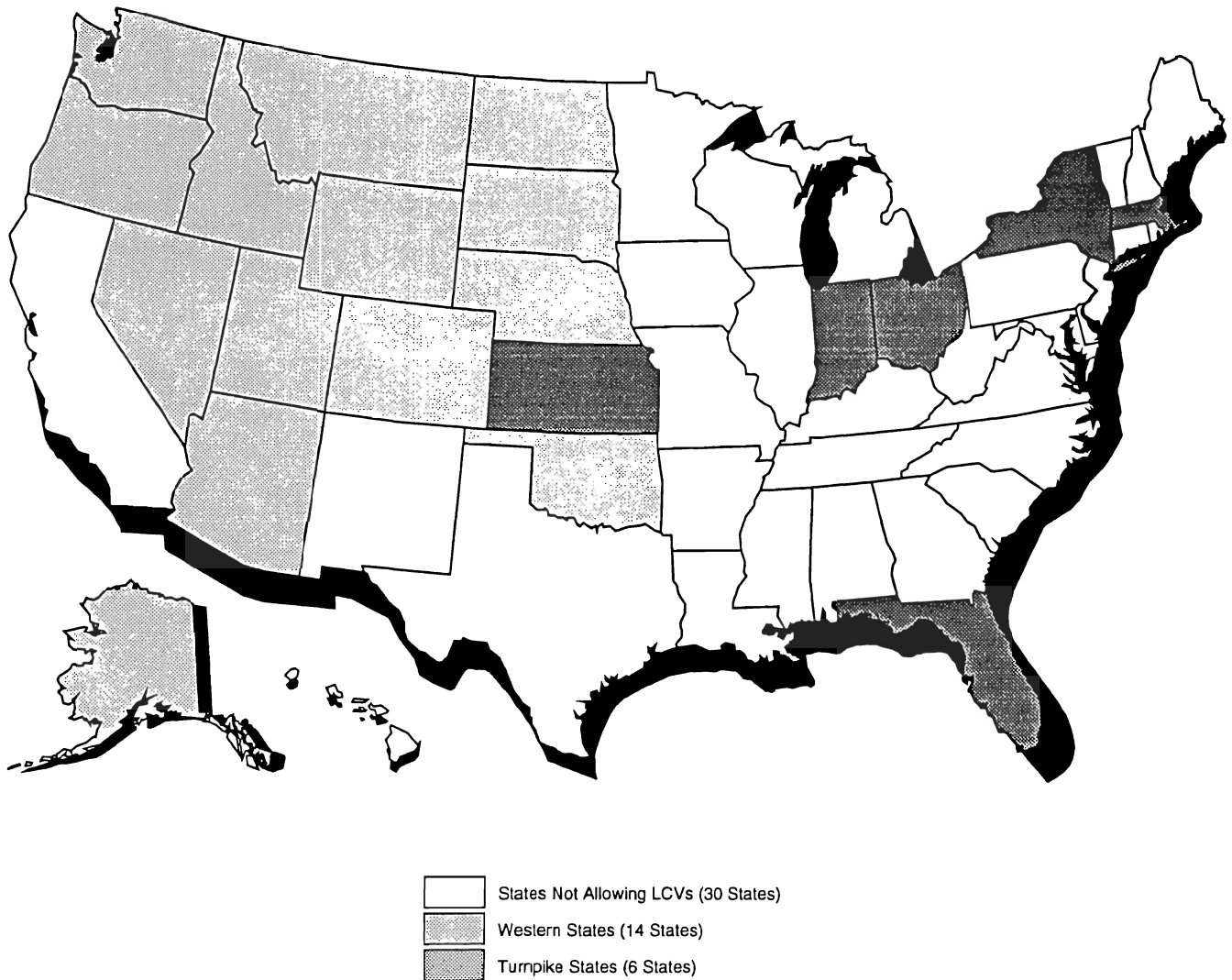


Source: American Trucking Associations and Transportation Research Board.

Since 1974, federal law has limited gross vehicle weight on interstate highways to 80,000 pounds. However, 14 western states have allowed LCVs to operate at heavier gross weights under "grandfather" exemptions from the federal law. In addition,

turnpike authorities in six other states allow some LCV operations. LCV operations are often restricted. For example, LCVs may be limited to interstate highways, and Nebraska only permits empty trailers on LCVs. On the other hand, Oregon allows triples on many state roads, and western states generally allow Rocky Mountain doubles to operate widely. Figure 2 shows 14 western states and six turnpike authorities that allow some type of LCV to operate.²

Figure 2: States and Turnpike Authorities Allowing LCVs



²ISTEA required FHWA to identify state regulations allowing LCV operations as of June 1, 1991. FHWA officials said that by using the technical definition of an LCV stated in ISTEA, their final rule will include some additional states allowing LCVs to operate and would not include Florida because its turnpike is not designated as part of the interstate system.

LCVs COULD INCREASE INFRASTRUCTURE COSTS IF ALLOWED NATIONWIDE

Because LCVs spread their higher gross weight over more axles, they generally do not increase pavement wear relative to shorter combinations and may actually be less damaging. However, the higher gross weight of LCVs (especially turnpike doubles) can pose a load capacity problem for some bridges. Because bridges are designed to support much higher loads than expected, there is room for disagreement on the margin of safety deemed necessary for loads on a bridge. At our request, FHWA provided two different estimates of the number of bridges considered inadequate for LCV use and the cost to replace them. The Association of American Railroads, which views turnpike doubles as a threat to rail business, favors using a conservative bridge capacity rating to estimate the potential impact of LCVs. When FHWA used this rating, the analysis projected replacement costs of over \$5 billion for rural interstates and over \$13 billion for urban interstates. The second analysis, using a capacity rating considered by FHWA to be closer to that used in most states, projected \$248 million for rural interstates and \$1.1 billion for urban interstates.

In addition to bridge replacements, nationwide use of LCVs would require improvements to some interchanges as well as the provision of staging areas adjacent to interstate highways where LCVs could be assembled and broken down. The cost depends on how many points of access to the interstate system are deemed necessary for effective LCV operations. In 1985, FHWA estimated these access costs at between \$750 million and \$2.2 billion. A later study sponsored by the trucking industry questioned whether such extensive access was really needed. The study also noted that many of the access problems were in densely populated eastern states and that current states that allow LCVs already provided staging areas or let the private sector provide its own.

Infrastructure costs could also increase if LCVs diverted freight from railroads to highways. Several analyses have projected that nationwide use of LCVs (mainly turnpike doubles) would lead to such diversion and would increase trucking ton-miles from 5 to 16 percent. Most of these analyses were derived from a computer simulation model maintained by the Association of American Railroads. However, as explained in our August 1994 report, the model has significant shortcomings. Most importantly, the model makes no allowance for ongoing productivity gains by the railroads, which have been substantial in recent years. These gains have made the railroads more capable of preserving their market share against trucking competition. As we reported, railroad intermodal service has improved and grown dramatically in recent years.³ The model

³Intermodal Freight Transportation: Combined Rail-Truck Service Offers Public Benefits, but Challenges Remain (GAO/RCED-93-16, Dec. 18, 1992).

also assumes that the truckload sector will generally convert to using turnpike doubles, which is unlikely if LCV routes are expanded selectively.

BENEFITS AND INDUSTRY'S POTENTIAL USE OF LCVs

According to a study done for the trucking industry, opening the interstate system and some primary highways to LCVs would lower annual trucking costs by \$3.4 billion (about 3 percent). Expanding routes open to LCVs would benefit some sectors of the trucking industry more than others. For example, if expansion of LCV routes were limited to highways with low traffic density, the potential benefits would be lower and would apply mostly to companies that use triple 28-foot trailers to transport consolidated small shipments between terminals. These less-than-truckload and package companies make extensive use of double 28-foot combinations nationwide and add a third trailer wherever triples are legal.

On the other hand, officials of large truckload companies that sell by the trailerload see little opportunity in using turnpike doubles in the absence of a nationwide highway network open to them. These companies would have to change their mode of operation to use turnpike doubles (double 48-foot trailers). Their drivers often travel from shipper's dock to receiver's dock to another shipper's dock and so on until arriving at home. Such an operation requires close coordination even with single-trailer combinations but would be substantially more complex with turnpike doubles. Because turnpike doubles would be limited mainly to interstate highways, companies would have to organize pickup and delivery at a customer's dock by single trailer and then assemble doubles at staging areas. In the current fragmented system of LCV routes, truckload companies have not found it practical to organize such operations.

Even with a nationwide highway network open to LCVs, it is questionable whether turnpike doubles would be widely used in the truckload industry. Small companies and owner-operators would have particular difficulty in managing the logistics of wide area doubles operation. In some specific situations, however, small truckload companies and private fleets have used turnpike doubles or Rocky Mountain doubles profitably, and selective expansion of LCV routes would probably create some new opportunities.

SAFETY CONCERNS MAY JUSTIFY LIMITS ON LCV EXPANSION

Our March 1992 and November 1993 reports showed that LCVs have operating characteristics that can reduce their stability and maneuverability compared with those of single-trailer vehicles, making it imperative that drivers be well qualified. LCVs generally require longer distances to stop than single-trailer trucks. Stability is more of a concern for triples than for doubles, since triples are more apt to sway, and sudden steering

movements can be amplified toward the rear. LCV doubles can present problems when merging into traffic because of their slow acceleration and can also be very slow-moving on grades. Doubles also need a wider turn path than do single-trailer trucks and can move outside their lane of travel, a condition called off-tracking.

Many traffic data bases fail to identify LCV configurations, making it difficult to determine their safety record. The limited data available from a few states and several large companies indicate that LCVs have not been a safety problem on the turnpikes and western highways where they have operated. Whether this record could be maintained in heavier traffic is open to question.

Efforts to study the accident rates of multiple-trailer trucks have reached differing conclusions concerning the safety of LCVs. Weaknesses in the data at both the national and state levels as well as differing study approaches contributed to the differences. For example, the lengths of trailers are rarely recorded on accident forms, making it impossible to separate accidents involving turnpike or Rocky Mountain doubles from those involving the double 28-foot trailers operated nationwide. Also, very little mileage data on LCVs are available, thus making it difficult to compare accident rates of LCVs with those of single-trailer trucks.

Trucking industry officials agree that to minimize the safety risks, LCVs need well-qualified drivers as well as proper loading and brake adjustment. However, our November 1993 report showed that most states that allow LCVs do little to monitor LCV operations, regulate drivers' qualifications, or inspect the vehicles. While guidelines from both the Western Highway Institute and the Western Association of State Highway and Transportation Officials recommend that drivers be experienced and have good safety records, very few western states have any special requirements for drivers. States also have not done special inspections of LCVs to monitor the condition of LCVs or the drivers' adherence to safety regulations, and some evidence suggests that the longer combinations have been underrepresented in roadside inspection programs. Considering these factors, any expansion of LCV routes should be subject to careful analysis and accompanied by better state supervision of LCV operations.

CONCLUSIONS

Any decision to allow the use of LCVs involves safety concerns as well as economic factors. While LCVs may require some additional public investment in the highway infrastructure, these costs appear to be exceeded by the recurring annual benefits in the form of lower transportation costs. The safety issues are less easily answered. The apparently good safety record of LCVs to date must be viewed in the context of the less-congested highways where they have operated and the use of triples mainly by large less-than-truckload and package companies with good safety records. A

wider use of LCVs could bring them in proximity of major metropolitan areas and on more-heavily traveled highways, which would entail greater risks to the passenger traffic with whom trucks share the highways.

Analyses on the costs and/or benefits of LCVs have assumed that these vehicles would operate nationwide. If, for safety reasons, LCVs were kept off the more-congested highways, such as those east of the Mississippi River, this would significantly reduce both the infrastructure costs and potential benefits from LCVs. The most favorable cost-benefit ratios could be achieved through selective designation of suitable routes, taking account of traffic density, the capacity of bridges, the adequacy of interchanges, and the need for staging areas. To the extent that additional infrastructure costs are identified, states must decide how to recover them.

Triple-trailer combinations would show the most obvious economic benefit under selective route expansion because (1) they can be accommodated more easily by the existing infrastructure, (2) they can often operate out of company terminals with few new staging areas, and (3) less-than-truckload and package companies could expand the use of triples incrementally if additional states authorized them. Specific, limited uses can be found for turnpike doubles in a fragmented network, but substantial use of these combinations would require a national network of highways open to them. Even with such a network, it is questionable whether these long doubles would be a viable alternative to the current trends in the truckload industry, which involve using longer single trailers and intermodal rail service.

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This concludes my prepared statement. We will be pleased to answer any questions.

STATUS OF GAO RECOMMENDATIONS**Truck Safety: The Safety of Longer Combination Vehicles is Unknown**
(GAO/RCED-92-66, Mar. 11, 1992)

Recommendation: To improve transportation data and to help determine LCV safety, the Secretary of Transportation should improve truck accident data, especially as they relate to the reporting of nonfatal accidents, the estimates of truck travel, and the identification of truck configurations.

Status: FHWA is providing grants under the Intermodal Surface Transportation Efficiency Act of 1991 to states to adopt the uniform accident reporting form and data elements recommended by the National Governors' Association which also require reporting data on truck configurations. At least 23 states have adopted the form and data elements. FHWA plans to continue its efforts to get the remaining states to adopt these reporting practices. FHWA estimates it will take about 2 years for this effort to be accomplished.

Longer Combination Trucks: Driver Controls and Equipment Inspection Should Be Improved
(GAO/RCED-94-21, Nov. 23, 1993)

Recommendation: To provide better and more complete information on the safety of LCVs, the Secretary of Transportation should direct the Administrator of FHWA to further investigate the safety of LCV operations through the targeting of LCVs for inspections or through special studies, such as the ongoing FHWA study of LCV accident rates, and encourage states to use inspection data to monitor the adequacy of companies' maintenance.

Status: In January 1994, FHWA awarded a contract for a special study to determine the accident rates of 100 motor carries using LCVs. The contract is expected to be completed in December 1995.

Recommendation: To provide better and more complete information on the safety of LCVs, the Secretary of Transportation should direct the Administrator of FHWA to include in the Federal Motor Carrier Safety Regulations requirements concerning the driving experience and the past safety records of drivers assigned to LCVs to help ensure that drivers are adequately qualified to operate them.

Status: FHWA has considered including LCV driver experience requirements in the Federal Motor Carrier Safety Regulations and plans to publish in October 1994 a Notice of Proposed Rulemaking which establishes minimum training standards for LCV drivers.

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