MOTOR VEHICLE TRACTOR LENGTHS

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

UNITED STATES SENATE

NINETY-FIFTH CONGRESS

SECOND SESSION

ON

OVERSIGHT HEARINGS ON TRUCK LENGTHS AND

S. 3431

TO AMEND CERTAIN PROVISIONS OF TITLE 23, UNITED STATES CODE, RELATING TO COMMERCIAL VEHICLE LENGTHS AND AXLE WEIGHT LOADS

SEPTEMBER 7, 1978

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MOTOR CARRIER TRACTOR LENGTHS

THURSDAY, SEPTEMBER 7, 1978

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, D.C.

The subcommittee met at 10 a.m. in room 235, Russell Senate Office Building, Hon. Howard Cannon, chairman of the committee, presiding.

OPENING STATEMENT BY THE CHAIRMAN

The CHAIRMAN. Today the Committee on Commerce, Science, and Transportation is conducting an oversight hearing on the issue of motor carrier safety. Specifically, the committee will be looking at the effects of motor carrier length laws on highway safety, and the safety problems resulting from certain tractor-trailer combinations.

Through this hearing the committee hopes to gain a better insight into the exact nature of the safety problems facing truckdrivers and the causes of those problems.

The committee welcomes testimony pertinent to driver safety and comfort, State motor vehicle length laws, motor carrier operating efficiency and various tractor designs. I encourage the witnesses in their prepared statements to address both the broad issue of truck lengths as well as the issues raised by Senator Kennedy's legislation, S. 3431, including the economic implications.

[The bill follows:]

95TH CONGRESS
2D SESSION

S. 3431

IN THE SENATE OF THE UNITED STATES

AUGUST 18 (legislative day, AUGUST 16), 1978

Mr. KENNEDY introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To amend certain provisions of title 23, United States Code, relating to commercial vehicle lengths and axle weight loads.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 127 of title 23, United States Code, is amended to read as follows:

"§ 127. Vehicle weight, length and width limitation—Interstate System

"No funds authorized to be appropriated for any fiscal year under section 108 (b) of the Federal-Aid Highway Act of 1956 shall be apportioned to any State within the boundaries of which the Interstate System may lawfully be used

by vehicles with weight in excess of twenty thousand pounds carried on any one axle, including all enforcement tolerances; or with a tandem axle weight in excess of thirty-four thousand pounds, including all enforcement tolerances; or with an overall gross weight on a group of two or more consecutive axles produced by application of the following formula:

$$W=500\left\{\frac{LN}{N-1}+12N+36\right\}$$

where W=overall gross weight on any group of two or more consecutive axles to the nearest five hundred pounds, L=distance in feet between the extreme of any group of two or more consecutive axles, and N=number of axles in group under consideration, except that two consecutive sets of tandem axles may carry a gross load of thirty-four thousand pounds each providing the overall distance between the first and last axles of such consecutive sets of tandem axles is thirty-six feet or more: *Provided,* That such overall gross weight may not exceed eighty thousand pounds, including all enforcement tolerances, or with a width in excess of ninety-six inches, or the corresponding maximum weights or maximum widths permitted for vehicles using the public highways of such State authority in effect on July 1, 1956, except in the case of the overall gross weight of any group of two or more consecutive axles, on the date of enactment of the Federal-Aid Highway Amendments of 1974, whichever is the greater.

"Funds authorized to be appropriated for any fiscal year under section 108 (b) of the Federal-Aid Highway Act of 1956 shall only be apportioned to any State within the boundaries of which vehicle length limitations of tractor and semitrailer combinations or tractor, semitrailer, and trailer combinations used on the Interstate System apply after June 1, 1980, exclusively to the semitrailer, trailer or combinations thereof: *Provided,* That any State may limit the overall length of any such combination if such overall length limitation exceeds by fifteen feet or more the length limitation designated for semitrailers, trailers, or combinations of semitrailers and trailers: *And provided further,* That no State may so limit trailer length of any such combination so as to make unlawful the continued use of semitrailers, trailers, or combinations thereof which were in use and within lawful length prior to the date of enactment of this proviso.

"Any amount which is withheld from apportionment to any State pursuant to the foregoing provisions shall lapse. This section shall not be construed to deny apportionment to any State allowing the operation within such State of any vehicles or combinations thereof that could be lawfully operated within such State on July 1, 1956, except in the case of the overall gross weight of any group of two or more consecutive axles or in the case of vehicle length limitations

provided for in this section on the date of enactment of the Federal-Aid Amendments of 1974. With respect to the State of Hawaii, laws or regulations in effect on February 1, 1960, shall be applicable for the purposes of this section in lieu of those in effect on July 1, 1956. Notwithstanding any limitation relating to vehicle widths contained in this section, a State may permit any bus having a width of one hundred and two inches or less to operate on any lane of twelve feet or more in width on the Interstate System.".

The CHAIRMAN. Because of the rather lengthy witness list and relatively short period of time we have for the hearings, I must insist that all witnesses be as brief as possible in their oral presentation. Since the committee has already received and reviewed the written statements, please do not read it in full for us this morning; merely summarize the key points you want to emphasize. This will allow more time for questions and answers on the important safety issues which are the subject of today's hearings. If you summarize your statement the complete text of the written statement will be printed in the hearing record. Before we hear from our first witness, the Honorable Joan Claybrook, Administrator, National Highway Traffic Safety Administration [NHTSA] Senator Magnuson has a statement which I would like to read into the record.

This is Senator Magnuson's statement:

Mr. Chairman, the primary issue to be addressed by the Committee today is the issue of safety. In reecnt years the Congress has acted to increase truck weights in this nation's interstate highway system. However, in the area of truck length limitations authority remains with the individual states. I feel that overall trailer lengths should not be used as a justification for decreasing the size and safety of the driver cab. I hope that today's hearings help to focus attention on this problem and provide solutions. Mr. Chairman, I look forward to working with you toward this goal in the upcoming months.

The CHAIRMAN. And with that, Ms. Claybrook, we will let you proceed.

STATEMENT OF HON. JOAN CLAYBROOK, ADMINISTRATOR, NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION; ACCOMPANIED BY JOHN HASSELL, JR.; GEORGE PARKER; AND HOWARD ANDERSON

Ms. CLAYBROOK. Thank you, Mr. Chairman. I am pleased to appear before you to discuss S. 3431, a bill that would govern the application of State limits on the length of tractor-trailer combinations used on the Interstate System. With me today are John S. Hassell, Jr., the Deputy Administrator of the Federal Highway Administration (FHA); Howard L. Anderson, the Associate Administrator for safety of the FHA; and George L. Parker, chief of the crash avoidance division of the NHTSA.

This bill reflects an increased Federal concern about present State truck-length laws which have resulted in the design of truck cabs that do not adequately provide for the safety and comfort of commercial truckdrivers. The bill is designed to place a Federal priority on the welfare of the pofessional truckdriver while leaving to the States their existing authority to set truck-length limits. Accordingly, the bill accommodates two basic presumptions. that: (1) The States should continue to set truck-length limits; and (2) the fairest and most expeditious way of assuring the proper protection of the health and safety of truckdrivers is to remove by legislation the economic incentive for using truck cab space for carrying cargo.

Specifically, the bill would require that if a State sets limits on truck lengths used on the Interstate System after June 1, 1980, it must set them on the trailer alone, or, if a State desires to set overall tractor-trailer length limits as well, the overall limit would have to exceed the

trailer length by at least 15 feet. The sanction provided for not meeting the bill's requirements is the loss of a State's Federal funds for interstate highway construction. It is important to note that States also would be prohibited from setting any new trailer limits that would make unlawful any trailer lawfully in use in the State before the date of the bill's enactment.

Truck length is not regulated by Federal law, and the States have typically set limits on the overall length of tractor-trailers. Since there is an economic benefit for the trucker to have as much of the vehicle devoted to carrying cargo as possible, truck combinations are generally designed to maximize the capacity of their cargo-carrying units while staying within overall State length limits. Any increase in cargo-carrying capacity under present law must therefore come at the expense of the size of the truck cabs and occupant compartments.

The typical overall tractor-trailer length limits set by the States range from 55 to 65 feet. A number of carriers are presently using trailers in excess of 45 feet in length. The trailers that exceed 45 feet are predominantly 48 feet, although one company has 57½-foot trailers operating intrastate in Texas. The shortest cab dimension for a tractor designed to be used in combinations that conform to State overall length laws is 4 feet 2 inches, measured from the front of the bumper to the back of the cab.

The welfare of the drivers of commercial vehicles has often been ignored and even abused in some of the occupant compartment designs that serve as their workplace. Some examples are: The limited space between the driver and the dashboard causing a driver's knees to rest on the dashboard and the steering wheel to rest against the driver's stomach; and the well-known problem of the "doghouse"—the fiberglas cover on the part of the engine that protrudes into the cab. The doghouse is a source of intense heat and it requires an awkward and uncomfortable placement of foot controls. If the cover is lose, it permits engine fumes to enter the cab. The value of this amendment would be to reduce the economic incentive that has produced these adverse effects on driver safety and health.

The DOT has conducted some preliminary research and investigation into the safety implications of the reductions in the size of truck cabs and occupant compartments. Some of the results of these efforts are contained in a May 1976 "Interagency Study of Post-1980 Goals for Commercial Motor Vehicles" which suggested that regulating the length of trailers rather than combinations could help to assure adequate space for the driver, could improve ride quality, and could enhance the range of possible aerodynamic refinements in truck-tractor designs and thus improve fuel economy.

In their comments on the "goals study," many users of longer trailers suggested that, if improved occupant space and ride quality are needed, one way to assure these improvements would be to address these issues through Federal regulations, rather than have the States set specific limits only on the length of the cargo-carrying portions of trucks.

In consideration of these comments, the FHA, through its Bureau of Motor Carrier Safety, issued on February 14 of this year an advance notice of proposed rulemaking to solicit comments on proposed additions to the Federal motor carrier safety regulations. The com-

ment period on the ANPRM closed on June 14 and the comments are being analyzed. In general the professional drivers support the rulemaking action and the trucking associations oppose it. Preparatory to coordinated rulemaking in this area, the National Highway Traffic Safety Administration is presently engaged in joint research with the FHA.

Through this rulemaking process, the DOT is considering the adoption of safety regulations to specify minimum size and performance requirements for the cab portion of regulated commercial vehicles manufactured after a certain date and operated in interstate or foreign commerce. We would like to emphasize that the Department sees no contradiction between our rulemaking activity and S. 3431 as proposed. Indeed, we view the bill and our rulemaking activity in this area as complementary.

The bill sets a Federal priority on the welfare of truckdrivers for humane reasons and to avoid the devastation wrought on the highway when a large truck is involved in a crash. It does not attempt to set detailed cab performance requirements or to address the economic impact of this priority but rather leaves to the States the authority to lessen the potential economic impact through revision or elimination of overall truck length requirements.

The Department's rulemaking, on the other hand, would address the specific performance characteristics that must be met in the design and manufacture of truck cabs to assure that they allow sufficient space and other protections for the drivers. But the Department does not have the authority to amend existing State requirements to lessen the potential economic impact of improving truck cabs that inevitably will take away cargo-carrying space from some trucks.

Accordingly, the bill provides the framework for designing a solution to the problems facing truckdrivers and allows the States to accommodate any economic impacts on the trucking industry. Thus, the bill is designed to protect the interests of the trucking industry as well as the drivers.

At this point, we would like to mention briefly some areas of potential benefit that could be expected to result from tractor length increases:

1. IMPROVED BRAKING, HANDLING, AND STABILITY

These benefits should occur since longer wheelbase tractors experience less weight transfer to the steering axle in braking maneuvers. Also, smaller steering forces would be required for a given turning maneuver by the driver of a longer wheelbase tractor.

2. IMPROVED DRIVER COMFORT AND SAFETY

An increase in the length of the driver compartment—in either cab-over-engine [COE] or the conventional cab-behind-engine [CBE] vehicles—would permit greater priority to be given to driver comfort and optimum placement of controls and instruments, both of which are important to the safe operation of the vehicle. Also, occupant crash protection could be improved.

3. IMPROVED RIDE QUALITY

Short wheelbases and high fifth-wheel-offsets—that is, the distance the hinge point of the trailer is forward of the tractor drive axle—often affect ride quality adversely, which tends to induce driver fatigue and occupationed health problems associated with high levels of vibration. A longer wheelbase would give the designer greater latitude in selecting the specifications of a vehicle for a particular operation, and thereby offer the possibility of improving ride quality.

4. IMPROVED INGRESS TO AND EGRESS FROM THE CAB

Present overall length constraints, which affect the cab of the vehicle, frequently result in cab entrance and egress designs which are more awkward and less safe than if more space were available. On cab-behind-engine tractors, today's overall length limits can result in up to 4 feet of steps and footholes located to the rear of the door rather than directly in line with it. Greater freedom to revise the exterior shape of tractors could reduce the height of steps and the hazard of climbing them. Such considerations are important since slips and falls while entering or leaving the cab are a major source of injury to truckdrivers.

5. A WIDER BERTH IN CABS THAT HAVE SLEEPING COMPARTMENTS

Minimum sleeping accommodations as presently specified for commercial motor vehicles are claimed to be too narrow to permit adequate rest. With more comfortable sleeping conditions, a person could be expected to obtain more rest and be in better condition to operate the vehicle safely.

6. IMPROVED AERODYNAMICS, REDUCING WIND RESISTANCE WITH IMPROVEMENTS IN FUEL ECONOMY

Given more opportunity to revise the shape of exterior cab surfaces, aerodynamic design could be introduced by manufacturers to reduce wind resistance, and thus provide improved fuel economy without encroaching upon the already limited space available to the driver in the cab. This applies to both conventional cab-behind-engine and cab-over-engine configurations.

7. IMPROVED FUEL TANK LOCATION

On some of the short wheelbase cab-over-engine tractors, clearance between the fuel tanks and the tractor tires leaves little margin against damage to the tank envelope by the front wheels in case of an accident. While there is yet no direct accident correlation with fuel tank location, the incidence of fire in truck accidents has increased in recent years. The possibility of a longer wheelbase offers the potential for better loation of the fuel tank.

On the other hand, we should also address whether safety problems might occur as a result of requiring the States to establish length limits specifically for the cargo-carrying units of trucks. First, it is important

to emphasize that we do not know precisely what overall length limits might result since they would be determined by the individual States. However, there is no apparent practical reason after enactment of this bill for tractors to exceed present cab-behind-engine tractor lengths, provided that any temptation to increase tractor length to permit mounting of cargo-carrying dromedaries is eliminated through proper drafting of the State's truck length amendments.

Whatever length is added to tractors that might occur would, to the extent of that addition, increase the time required by another vehicle to pass it. For those attempting to pass a truck, the added exposure time to pass would increase by less than 1 second if the truck were 7 feet longer and the speed differential between the vehicles were only 5 miles per hour.

The safety effect of passing longer vehicles, however, will depend more on what highway is involved. On the Interstate System or other limited access highways, these concerns should make only a small difference because of multiple lanes. Longer vehicles do pose a greater problem in passing on two-lane roads. To date, however, our accident data show that the safety records of slightly longer combination vehicles operating west of the Mississippi are generally comparabble to the 55-foot long vehicles operating in the East.

For all of these reasons, the Department supports the bill. It provides significant opportunities for increased safety and driver comfort by setting a sufficient truck cab size that must be considered by the States in setting truck length limits. While it could result in additional costs in some cases, the consideration of its economic implications is left to the individual States. The 15-foot allowance for the tractor provided by the bill could reduce trailer lengths in States that choose to keep their present overall length limits, but there is no evidence that the States would not permit an increase in overall length or even drop their present overall length limits.

The States are unlikely to accept economic dislocations where they can be avoided, especially in light of their current energy conservation concerns. We believe that careful consideration by the State legislatures of length limits and the bill's grandfather clause for existing trucks will minimize possible adverse economic effects.

While the Secretary and I have always opposed further increases in the lengths and weights of large trucks, the small additional allowance which this bill will foster is not so significant as to overshadow the great value of improved drive safety. Accordingly, we regard the bill as a reasonable way in which to reduce the motivation for growth in truck cargo-carrying capacity at the expense of the professional driver behind the wheel.

This concludes my prepared statement. My associates and I would be pleased to answer any questions you might have.

The CHAIRMAN. You say that you and Secretary Adams traditionally oppose the longer lengths. Is that because of the safety aspect?

Ms. CLAYBROOK. I think, speaking for the Secretary and myself, that we believe that larger truck sizes, both heavier and longer, of any significant amount, could pose safety implications. Also, they do pose a greater problem on the two-lane highways or the smaller highways off the interstate, particularly on the east coast.

The CHAIRMAN. Where do you draw the line then? You say this requirement here would be insignificant. Where do you draw the line as being the difference between significant and insgnificant in the length and the weight of the truck?

Ms. CLAYBROOK. On the length issue, which is what this bill addresses, there is a possible increase of 5 feet. There's been some discussion in the Department that perhaps the 15-foot allowance for the size of the tractor in this bill could be reduced by several feet if there was concern that there would be an overall increase in the length of trucks that should not occur, which essentially——

The CHAIRMAN. How much could the tractor be reduced from 15 feet?

Ms. CLAYBROOK. We have thought that perhaps 12 feet would be sufficient. That's the best estimate that we have been able to make. Where you're attempting to balance all the various considerations, we feel that it would be fair to say 12 feet, which would mean a difference of approximately 2 feet from the present allowance in most States.

The CHAIRMAN. I was a little surprised to hear you say that the Department doesn't have jurisdiction to address the economic impact of the length of the trailer itself. It would seem to me that the trailer and the cab have to be treated as one single unit from a safety standpoint and I would certainly think that you would have jurisdiction to treat the entire vehicle from a safety standpoint, even though it does impinge on the economic aspect.

Ms. CLAYBROOK. We do have regulatory authority to require certain changes in vehicles for safety reasons, but we do not have authority to change any State laws that have length limitations. The economic considerations really go to the length limitations because the trucking industry wants to have the maximum space for carrying cargo.

The CHAIRMAN. Are you saying you couldn't fix the overall length of the truck and the trailer based on safety reasons? It would seem to me you ought to have that authority.

Ms. CLAYBROOK. That is certainly my belief.

The CHAIRMAN. Let's ask your lawyers.

Ms. CLAYBROOK. I'm pretty sure that's correct. We can submit a memorandum for the record.[1] We have never had authority to set length limitations.

The CHAIRMAN. You're really saying length has no relation to safety. You'd better think about that before you answer the question because that's the implication. If you have never had authority to set the length, then the presumption would have to be that length itself has no relation to safety. If it does, you would have the authority to limit it. Suppose a State wanted to come in and make a 100-foot truck length plus the 15-foot cab, 115 feet. Do you think there would be no safety consideration there?

Ms. CLAYBROOK. Well, in fact, Mr. Chairman, five Western States do allow something I think up to 105 feet for truck length.

The CHAIRMAN. Then let me use 150 feet.

Ms. CLAYBROOK. I think that there is a relationship between safety and length, but the authority to set the length requirements has very specifically in Federal statute, been left to the States as I understand

[1] See p. 137.

it. I cannot give you that citation right here, but I would be delighted to submit a memorandum for the record.

The CHAIRMAN. I wish you would supply something for the record to show that as far as you're concerned, the law would not permit you to enter into the overall length aspect simply because that gets into the economic aspect and yet might directly have an impact on safety.

Ms. CLAYBROOK. Length certainly has a direct impact on safety, but there is no one in the Department who believes, as far as I know, that we could preempt the truck length requirements the States presently set.

The CHAIRMAN. You supply us something on the record on that because I'd say that the Federal Government preempts the States every day of the week, that we pass laws up here. So this would be a rather unusual situation if we find a situation where the Federal Government can't preempt the States. I wish we could find more of them, but I would be interested in that.

What is the nature of the safety problem facing the truckdrivers with respect to the tractor-trailer combination? Is it a question of uncomfortable cab space, of difficulty in steering, of shortened wheelbase length, of illegal weight loadings on the front axle, or of the driver sitting flush against the windshield or a combination of those factors?

Ms. CLAYBROOK. It's a combination of those factors. The ride quality is certainly important; also the amount of space allowed, the placement of the controls, the foot controls, for example, which are influenced by the doghouse design, the heat in the cab itself, the visibility. There are many different aspects of safety that are involved in the cab design.

The CHAIRMAN. And those are all issues relating to cab size, not the length of the trailer necessarily?

Ms. CLAYBROOK. That's correct.

The CHAIRMAN. Do you have any statistics as to the cause of accidents being directly attributed to this particular factor from the National Transportation Safety Board (NTSB)?

Ms. CLAYBROOK. The NTSB does individual accident investigations. They don't usually do statistical analyses of their investigations.

The CHAIRMAN. But you can certainly compile their statistics based on the track record of what has caused the accidents.

Ms. CLAYBROOK. That's possible, but they have not done that much on trucks. The best information we have to date in the Department, as far as I know, is on the relationship of fatigue to accidents. Definitive information has not been developed on the relationship of the various physical factors of the vehicle to the causation of accidents. The causation of accidents is usually a multifaceted problem. It has to do with the weather and the highway and the drivers's capacity, the design of the vehicle. There are many different factors involved.

The CHAIRMAN. Are you saying, then, that your statistics simply say when the accidents occur that it's generally because of the fatigue of the driver?

Ms. CLAYBROOK. We have found in some research that there's a relationship between the fatigue of the driver and the causation of accidents. We have also, through communications with drivers that we receive rather frequently, had many, many complaints about the cab design affecting their ability to drive the truck.

The CHAIRMAN. The complaints might not necessarily be related to the statistics that cause or do not cause accidents. One person might want a plush seat to sit on in the cab and another one might want a hard seat.

Ms. CLAYBROOK. That's correct. We receive complaints from drivers about cab design that are fairly obvious, but you can tell that they clearly must have some effect on the driver's capacity.

I'd like to ask Howard Anderson to also comment further.

The CHAIRMAN. Let me give you one other factor to feed into that too. You know in railroad operations we fix a maximum duty time, so maybe if you're saying it's a fatigue problem, maybe the best solution here is for the Federal Government to come in and look at the effects of driving time on driver safety. Now let me hear you.

Mr. ANDERSON. We have finished a FHWA study comparing accidents of cab-over-the engine and the engine-in-front, which is the short cab versus the long cab. The indications are that the fatality rate and accident frequency in the cab-over-engine is sizably more frequent relative to the number of vehicles on the road than is the engine-in-the-front.

We are also conducting several studies at the present time to further elaborate on these frequencies of the cab-over versus engine-in-front, and also concerning the weights and lengths of the vehicles. We have about four contracts underway now to study those factors.

Ms. CLAYBROOK. I might also mention, Mr. Chairman, that the fatality rate for large trucks—that is, the tractor-trailer combinations—is significantly higher than for automobiles. This is per 100 million miles traveled.

The CHAIRMAN. Is it higher than a truck of slightly shorter length?

Ms. CLAYBROOK. No; our statistics——

The CHAIRMAN. You've got different States that have different length requirements. Now do the longer truck lengths have more accidents than the next shorter size?

Ms. CLAYBROOK. No; the longer vehicles do not have, as far as I know, any statistically significant difference in accident rate; that is, the ones that operate west of the Mississippi versus the ones that operate east of the Mississippi.

Mr. ANDERSON. In fact, if you take it on a ton-mile basis of travel, the longer vehicle and heavier vehicle is safer per ton-mile of cartage.

Ms. CLAYBROOK. That's true.

The CHAIRMAN. If the heavier vehicle is safer, the longer vehicle is safer, why don't we legislate here on the basis of safety and increase the length of all of these cab and trailers, preempt the field?

Ms. CLAYBROOK. That is certainly an option that you have. As I understand it, that's not an option that we have administratively, but it certainly would be for you.

The CHAIRMAN. Two of our principal witnesses today, the Teamsters and the American Trucking Association, have presented diametrically opposite statements as to the practical effects of the Kennedy proposal.

For instance, the ATA's written testimony is based on the premise that there would be a reduction in the commonly used 45-foot semi-trailer to 40 feet in 25 States as well as a reduction in States in which twin trailers are permitted. This assertion is rejected by the Teamsters.

What do you see as the practical effects of S. 3431 on the size of the trailer?

Ms. CLAYBROOK. We really can't predict what the State legislatures are going to do. Our presumption has been that they are unlikely to make any significant change in the length of trailers.

The CHAIRMAN. So this means, then, if they do not make any significant change and this bill goes through, then somebody is going to have to bear the economic loss of this requirement.

Ms. CLAYBROOK. There could be an economic loss if they did make a change. If they, for example, change the limits of trailers which are now commonly 45 feet to 40 feet, then each truck trailer would have 5 feet less space in which to carry cargo.

The CHAIRMAN. But you say you don't think States are going to make any change. According to my list, there are a substantial number of States that would have to make changes.

Ms. CLAYBROOK. I mean in the trailer lengths.

The CHAIRMAN. They might have to make a change in the size of the trailer.

Ms. CLAYBROOK. In the trailer length. They are unlikely to cause significant changes in trailer lengths.

The CHAIRMAN. You're saying they are likely to make changes in their laws?

Ms. CLAYBROOK. Yes.

The CHAIRMAN. I misunderstood you. You stated that a little differently.

Ms. CLAYBROOK. Yes; but I do want to emphasize we have no specific way of predicting exactly what the States are going to do.

The CHAIRMAN. In your prepared statement you said there's no evidence that the States would not permit an increase in overall length.

Ms. CLAYBROOK. That's correct.

The CHAIRMAN. Now, why haven't the States with the 55-foot overall length limitations already acted to correct the situation on their own?

Ms. CLAYBROOK. I presume because there hasn't been a motivating factor for them to do so.

The CHAIRMAN. But from a safety standpoint, wouldn't safety be a motivational factor, if this truly is a safety issue?

Ms. CLAYBROOK. I should think so, but there hasn't been any pressure for the legislatures to make that kind of a change. There has generally been opposition in the States, it's fair to say, to making large increases in either the weights or lengths of trucks because they're rather large already in comparison to other vehicles on the highway. They are much, much larger than other vehicles and the general population is not enthusiastic about great increases in length or weight of trucks.

The CHAIRMAN. Well, now, this proposal, which you support, has 15 feet as the appropriate figure for the tractor length. You say that you think that could be reduced to 12. Where does the 15-foot figure come from? Is there any magic in 15 or 12 or why isn't it 11 or 11½ or——

Ms. CLAYBROOK. There are a number of different kinds of tractors and they range up to about 15 feet in overall length. The cab dimensions are as small as 4 feet or a little over 4 feet. The question is what is——

The CHAIRMAN. Some of the tractors go down to 4 feet?

Ms. CLAYBROOK. Yes. That is the dimension from the front of the bumper to the back of the cab. That's one of the issues that's being raised.

The CHAIRMAN. How do they get a wheel in that distance?

Ms. CLAYBROOK. One of my colleagues tells me that 11 States have set a 45-foot trailer length limit within a 60-foot or greater overall length. This means that those States have already taken steps to accommodate essentially what this bill attempts to achieve, which is no basic change in the trailer lengths but large allowance for the tractor's size or the cab size.

To go back to the answer to your question on the 15 feet and its magic, I don't know the source of the 15 feet in the legislation.

The CHAIRMAN. Now give me that statement again where you said a number of the States have already gone to the 45-foot trailer length which gave them a 15-foot cab.

Ms. CLAYBROOK. That's right.

The CHAIRMAN. How many?

Ms. CLAYBROOK. As I understand it, it's 11 States.

The CHAIRMAN. According to my statistics here, there are 10 States that have a total tractor-trailer length of 60 feet, which if you said 15 feet for the cab, then it would be only 45. There are 11 States that have 65 feet, 2 States that have 70, and 1 that has 65.

Do your statistics differ from that?

Ms. CLAYBROOK. The list I have—Alaska has 45 and 65; Ohio has 45 and 60; Minnesota has 45 and 60; Massachusetts has 45 and 60; and Utah and Washington have 45 and 65. Those are 60 or 65 overall length.

The CHAIRMAN. I don't think you answered my question as to whether or not you knew where the 15-foot figure originated.

Ms. CLAYBROOK. There are six States that have a 45-foot trailer and 60- or 65-foot overall length, which would allow at least 15 feet for the cab.

The CHAIRMAN. Do you know where the 15-foot figure originated?

Ms. CLAYBROOK. No, I don't know. I presume it came from some of the State allowances, but I'm not sure.

The CHAIRMAN. What type of studies have been conducted to assess the safety merits of conventional tractors versus the cab-over-engine?

Mr. ANDERSON. We have completed a preliminary study which compares accident rates and the numbers of vehicles in the traffic stream of the cab-over versus the engine-in-the-back, which indicates that the cab-over is involved in accidents more frequently and also that the driver is more adversely affected. We have four studies underway to come up with more conclusive results.

The CHAIRMAN. So you're saying you don't have conclusive results now as to whether this is a question of the cab-over versus the conventional or the big cab-over versus the small cab-over or what have you?

Mr. ANDERSON. That is true. We started the studys about 1 year ago, Senator, and they should be completed in about another 9 months.

The CHAIRMAN. Do you think it would be wise for us to take any legislative action until you had statistics to support clearly what we are trying to do here?

Mr. ANDERSON. It certainly would give you more basis of fact upon which you could base your judgment.

The CHAIRMAN. The Bureau of Motor Carrier Safety is conducting a preliminary rulemaking to analyze cab size. What kind of changes are being contemplated that would tend to increase the cab size?

Mr. ANDERSON. We have completed an anthropometric study of driver size, from the 5th percentile up to the 95th percentile, to determine what movements are required to reach the gear shift lever, for instance, and also for leg action. We will complete other studies concerning the absolute minimum that the driver requires to perform his functions in a reasonable manner in any size cab.

The CHAIRMAN. What kind of changes are being contemplated that would tend to increase cab size?

Mr. ANDERSON. As an example, if we would determine that a 300-pound man has to be accommodated in a cab, it could result in a longer-length requirement between the steering wheel and the back of the seat. This then would reflect certainly in the minimum cab dimensions that are required to accommodate that type of an individual.

The CHAIRMAN. Well, maybe you're looking at the wrong problem. Maybe you ought to look at the size of the man instead of the size of the cab. I remember the Air Force at one time would not take a man in for pilot training if they were over a certain height and if they were under or over a certain weight. So maybe that's what you need to be looking at as well.

Mr. ANDERSON. That was the reason we completed the anthropometric study which determined that we should accommodate the 95th percentile large person and the 5th percentile small person, because in the small range we are getting more and more women drivers, which again——

The CHAIRMAN. Hiring all women might be a way to eliminate the problem.

Mr. ANDERSON. Maybe that's true.

The CHAIRMAN. How far can the Bureau proceed in mandating larger cab sizes without getting into the issue of longer tractor lengths?

Mr. ANDERSON. If the studies show that a 4-foot 2-inch cab is not adequate to accommodate a driver, then it certainly could have an influence upon the present 48-foot trailer if the State chooses not to reduce the trailer length and if the State retained the overall bumper-to-bumper requirements they have today.

The CHAIRMAN. What has been the trend in cab sizes?

Mr. ANDERSON. It has been smaller as far as the size of the cab is concerned and certainly if I was in the business of being a carrier I would probably take the same attitude because every foot they add to the length of the trailer is money as far as transporting goods.

The CHAIRMAN. Thank you very much. We appreciate your testimony this morning. We may have some additional questions later on for written comment.

The next witness is R. V. Durham, director, Safety and Health, International Brotherhood of Teamsters.

STATEMENT OF R. V. DURHAM, DIRECTOR, SAFETY AND HEALTH, INTERNATIONAL BROTHERHOOD OF TEAMSTERS, WASHINGTON, D.C.; ACCOMPANIED BY PROFESSIONAL DRIVERS KEN RITTMAN; BOB MYERS; LARRY BERRY; ROBERT WATERMAN; DON THOMAS; JAMES T. TEAT; B. H. PANNELL; AND J. G. McGEORGE

Mr. DURHAM. Mr. Chairman, we have a little problem. I've got a number of professional drivers with me and it seems it exceeds the number of chairs, so what I'd like to do is have them stand close by and do a little musical chairs job here, if that meets with your approval.

The CHAIRMAN. That would be fine.

Mr. DURHAM. Mr. Chairman, I am R. V. Durham, with the International Brotherhood of Teamsters Safety and Health Department. I have here with me today a number of professional drivers from various locals across the country. We have submitted a statement. In the interest of time and to give an opportunity for these people to express themselves and answer any questions that you possibly would have of the individuals, I am going to forego reading the statement.

I would like to say that we have with us here today Kenneth Rittman and Bob Myers from local 89 in Louisville, Ky.; Larry Berry and Robert Waterman from local 533, Reno, Nev.; Don Thomas, local 776 from Harrisburg, Pa.; James Teat from local 135 in Indianapolis; B. H. Pannell from local 886 in Oklahoma City; and J. G. McGeorge from local 391 in Greensboro. All of these men are professional drivers and/or are officers who were formerly drivers operating over the highways driving the tractor-trailers we have heard discussed here this morning.

I'd like just to take a minute or two and review with you the background and what brings us here today. We certainly support S. 3431 which has been introduced by Senator Kennedy. The statement we have submitted on behalf of our general president, Frank Fitzsimmons, I have left with the committee and certainly would be glad to answer any questions you might have.

We have seen over the years—I was a professional driver for 12 years before I became an officer for the last 18 years of our organization, and we have seen a trend that has in the last few years, certainly in the passing of the permissible weight increases to 80,000, has really become acute in the area of driver safety and comfort as it relates to the shorter wheelbase tractors, the improper placement of the fifth wheel, the cramped cab space as it affects the driver fatigue-wise, heat, fumes, and what we feel is the excessive loading of the front axle to the point that it is unsafe. These individuals that we have with us today will be touching on various areas that I mentioned.

According to the Truck Trailer Manufacturers Association report on sales of trailers, the sale of the 42½-foot and longer trailers has been drastically on the increase as far as percentage of the trailers sold. An example, in 1970, only 15.3 percent of the trailers sold in that year of van trailers were 42½ foot or longer, as opposed to 1976, the last year we got a report, of 55½ percent of all trailers sold during 1976

van type trailers were 42½ foot or greater. So I think we can see the trend there and what has brought about the complaints from the drivers and, of course, when the drivers start complaining we feel the effects of it, being the leaders of the various local unions.

The CHAIRMAN. In your union contracts, do you not negotiate on the size of the trailers or the size of the cab?

Mr. DURHAM. No, sir.

The CHAIRMAN. Why not?

Mr. DURHAM. Well, I guess one of the primary reasons is that this would put the carriers that we have contracts with at a competitive disadvantage to the carriers that are not under contract if we put them under more stringent standards. We feel that the answer is not in the contracting area, but in the legislative area. We have heard some reference to the suggestion maybe that we are fighting cab-over-engines. We are not fighting cab-over-engines as such. There are many cab-over-engines that are better to handle and better to ride and better to drive than the conventionals.

What we really are upset about is where the cab-over-engine and/or the conventional cab is being reduced in size to the point where the driver just does not have sufficient space to work in, and you were good enough, among some of the other Senators and staff, to come down and see some of the trucks that we had on demonstration recently and of course saw the pictures and some of your staff even saw the cab-under-truck, which is now being introduced. So we can see that we have a problem with the increase in sales.

The CHAIRMAN. On that particular one, which looked like a monstrosity I may say, will you people drive that vehicle?

Mr. DURHAM. No, sir, we have been pushed in the corner, I guess you might say, Mr. Chairman, to the point that our organization has gone on record that we are not going to be put in a position of having to go down the highway with 80,000 pounds of freight with the driver 8 inches off of the highway sitting under the trailer. We just feel, and we would certainly appeal to you or to the agencies, to take care of that problem for us because we have taken care of it to the extent that we have notified our employers that we do not want to operate that truck.

The CHAIRMAN. Is that vehicle used for some specialized purpose or is it just proposed as a general transportation vehicle?

Mr. DURHAM. As I understand it, it has been introduced simply to allow for additional cubage. In other words, by placing the tractor under the trailer you can get 10 feet more on the trailer. The manufacturer of this particular configuration is a trailer manufacturer, so they are interested in selling more traliers.

The CHAIRMAN. Is that vehicle being driven out on the interstate highway today?

Mr. DURHAM. Yes; it is.

The CHAIRMAN. That's being used solely as an in-town transit mechanism or anything like that?

Mr. DURHAM. I read a report recently where a carpet manufacturer in the State of Georgia had purchased it. By going to the cab-under they could put another tier of carpet in the trailers. But the point I'm trying to make, Mr. Chairman, is that we can see the trend. The trend is that we are going to shorter and shorter tractors. Now the question has been asked, well, isn't the answer just to establish minimum cab

size? The cab size is just one part of the overall problem. The overall problem is the smaller cab, the shorter wheelbase, the sliding of the fifth wheel forward. There are so many things that one ties into the other.

The CHAIRMAN. Well, are you saying that your drivers are equally concerned with cab size and with vehicle length? I thought a minute ago that you indicated that it was mainly cab size.

Mr. DURHAM. I think a fair statement would be—and we have a couple of drivers from your State here—the drivers are not so concerned about whether it's a 45-foot trailer or a 48-foot trailer. The concern is to give the driver a proper piece of equipment to where he can handle that combination of rigs that's following behind him. We have seen the increase in weights and the increase in the amount of trailer to where it's 13½ feet high.

The CHAIRMAN. You mentioned my State. We permit the dual trailers now. What is the driver to do when he comes to Utah, let's say, driving between Nevada and Utah? Can he use a dual in Utah?

Mr. WATERMAN. I think it is legal in Utah.

The CHAIRMAN. What's your name?

Mr. WATERMAN. Bob Waterman. I think it is legal and I think it's legal for triples in Utah now because they run clear through Utah and Nevada with triples, 105 feet.

The CHAIRMAN. Well, tell me, then, pick out another State where you can't drive.

Mr. WATERMAN. The next one over going south, California.

The CHAIRMAN. What do you have to do?

Mr. WATERMAN. They break the third one up, say at Verdi, and they hook two of them—say two of them come across Nevada. When they get to Reno or out to Verdi, they make three sets instead of two.

The CHAIRMAN. And does the cab then go on and make a return trip to hook up that extra trailer?

Mr. WATERMAN. Right. That's why they shortened the cab up, in order to stay under that cab length. In California where it's 65 feet they pull two 28's. They've got the tractor so short, not only is the cab too small, but when you shorten the wheelbase in that slick mountain it's hard to keep it ahead of you. I mean, it's twice as easy to lose a tractor with a 90-inch wheelbase than one with a 200-inch wheelbase, and so really they are just shortening the whole tractor. It's not only the cab that's tough, but then they move the fifth wheel farther ahead so they can get the trailer closer to the back of the cab and it makes it harder to turn. In fact, every turn you go into the fifth wheel is so far ahead of the drive axle it's pushing you instead of you turning it.

The CHAIRMAN. So really when you drive from Nevada either into California or Utah, then you've got that fifth wheel moved forward so that it becomes a dangerous condition then?

Mr. WATERMAN. We have no problem in Nevada because we pull tractors 20 feet long and they are cab-overs and they've got big cabs and they're beautiful, but when you get down to pulling the doubles and triples and we run between both States so they are building the tractors so short in order to stay underneath the overall limit and by shortening that tractor's wheelbase it's hard to handle plus they are shortening the cab and you're in a box where your head is touching the back of the cab. The comfort isn't as much as the confinement gets to you.

The CHAIRMAN. Well, let me ask you, Mr. Durham, what is the likely effect, if we should adopt this legislation? What is going to happen in these States that now have the shorter restrictions?

Mr. DURHAM. Well, we certainly disagree, I guess, with the American Trucking idea of what's going to happen. I think Ms. Claybrook expressed it. Nobody can predict what States will do. I think that the best way to look at it is what have the States done that have set a trailer length as we are suggesting in this bill, and the States that have set the trailer lengths, none of them to our knowledge have outlawed any of the existing equipment and all of them make provisions for the 45-foot box, even California, which you mentioned, is 38 feet. That's figured from the kingpin rather than the front of the trailer. In California you can pull 45-foot boxes. Based on our experience of what's happened already in the 9 or 11 States, we just don't see the States chopping off 5 feet of that trailer, as the American Trucking suggests would happen.

The CHAIRMAN. Could you explain where the 15-foot standards for tractor size originated and whether that is an appropriate number from a safety standpoint?

Mr. DURHAM. I guess it represents a compromise to the extent that if you're operating with a sleeper cab, conventional, and you saw one of those, the last truck that you were looking at, that still presents a problem with 15 feet. It would give us some space. In talking with some of the manufacturers that build these trucks, they feel that they would be comfortable in a position where they could build a decent configuration and get the engine out of the cab and back up front of the firewall where it belongs. It seems that those States primarily that have set the length limit of the trailer and then set an overall, they are using the 15 feet. So it seems to be pretty much an accepted figure.

The CHAIRMAN. You referred to some of the safety implications for drivers in the use of the so-called cab-under configuration. Has there been any actual experience of accidents that you know of using that vehicle at the present time?

Mr. DURHAM. The cab-under?

The CHAIRMAN. Yes. The one we saw out there.

Mr. DURHAM. No. Quite frankly, I think they are having a problem selling it and I don't know if they have really had enough experience with it to get any statistics. I don't know of any.

The CHAIRMAN. Now, has there been any discernible trend in cab size in the cab-over-engine tractors? As I understand it, you don't have any fault necessarily with the cab-over-engines as long as you've got the space in there: is that correct?

Mr. DURHAM. That's right.

The CHAIRMAN. These cab sizes, the cab-over-engines, have they been getting consistently smaller or what's been happening?

Mr. DURHAM. They've got to the point where we have what is referred to as the 50-inch bbc—which is bumper to the back of the cab. I think one manufacturer even attempted to build a 48-inch and they just could not get the driver behind the wheel. It's causing a lot of problems. The manufacturers are having to build a smaller steering wheel in order to clear their hands around the windshield and around the driver's belly. There's all kinds of things that the

manufacturers are being forced to do in order to try to stay within the restraints that's mandated or required.

The CHAIRMAN. If you go to some of the small women drivers, is that going to help solve your problem?

Mr. DURHAM. Well, it certainly—it would solve part of the problems as far as behind the steering wheel, but we have the other problems too, which is the 5th percentile to the 95th percentile, and that's the range we have to try to take care of. But I would like to talk to you and tell you about are some of the problems that hiring of women has caused us, especially in our sleeper operation where we have two people on the truck, but I know that's not what we're talking about here today. I would like, if you would permit, to introduce Mr. Larry Berry, who's also with the Reno local, and ask him to give you his comments on his concerns.

The CHAIRMAN. All right.

Mr. BERRY. Our main concern at this time is we don't get stuck under these trailers, as you apparently saw this cab-under truck the other day. Our concern is we do allow sufficient room for the driver to operate the vehicle safely, and as to the wheelbase of the tractor itself it's very important in this area. If you shorten them up you get too quick and they're easy to lose on wet or snowy pavement. So if we can maintain and set-aside some length for the tractor itself, I'm sure that the safety of the vehicle and the driver himself and the motoring public would be much more preserved.

The CHAIRMAN. Now Nevada is not restricted in the semitrailer and trailer, is that correct?

Mr. BERRY. In Nevada, with the permit, you can run two 40-footers or three 27-footers or 28-footers. We are not concerned with the length. They can stretch them out 15 trailers for all we care.

The CHAIRMAN. That gives you no problem, the overall length, as long as you've got a reasonable trailer size?

Mr. BERRY. Just preserve us some place to ride besides under the trailer.

The CHAIRMAN. Now do you drive beyond Nevada? Which States do you drive in?

Mr. BERRY. I haven't driven for the last 4 years. I drove 16 years over the road before I took my present job. During that time the carrier I was driving with we operated in California, Arizona, Nevada, Utah, Idaho, sometimes Oregon. So far as the type equipment and various conditions, I have covered just about all of them.

The CHAIRMAN. Had they started going into the smaller sizes at the time you were driving or is that basically in the last couple years?

Mr. BERRY. Primarily at least in our area, the 45 foot is relatively new inasmuch as it's only been the last couple years they have come out with a 45-foot trailer in our area. As far as overall length, naturally we have had that for a number of years.

Mr. DURHAM. Mr. Chairman, I'd like to introduce you to Bob Myers, who is a road driver who operates out of the city of Louisville, Ky., and ask Bob to express to you some of his concerns.

Mr. MYERS. Mr. Chairman, we again are not necessarily talking about conventional cab trucks or cab-overs. The experience with the company I work for now, our 5th wheels are probably 10 inches above center, but a problem we are having is if the 5th wheel is

moved up to give more capacity in the trailer, then we feel one of the 15-foot limit from the front of the trailer to the bumper would give the companies enough leeway to move the 5th wheel back to give you a more comfortable ride, more room in the cab, plus relieve the front axle weights that we are having tremendous problems with steering, front tire blowouts, and such. The tractors we drive, if you carry a suitcase you're going to have to strap it down across the doghouse. You don't have room in the forward cab as such. We have had tremendous amounts of tire blowouts. With all the weight there when the tire blows you're not going to control the truck with all that weight up there. We feel if the span was given to get the fifth wheels back it would give you less weight on the front axle and give you more control of the truck, especially in the wintertime when you should have control of the truck. With all that weight you find it very hard to control the trucks on icy roads and such. We have had, out of Louisville, one driver that has blown a front tire that's off work, been off for over 2 years and will never return to work because of not being able to control the unit and taking it into a bridge abutment. We have experienced many drivers blowing the front tires and losing the vehicle and tearing down 200 or 300 feet of guard rail, and the stand was that the driver went to sleep. In some cases that was the trend, but the witnesses were there to prove that the cause of the accident was from a blown tire.

The location of the steps to get the driver in and out of the truck are flush against the back of the cab now with no protection of slips or falls during ice and what have you on the steps. On several occasions we have had drivers hurt from that standpoint.

But again, we are not necessarily concerned about the length of the trailer, but we sure would like to have enough room in the cab so we can sit comfortable without our head being on the back of the cab and our face right in the windshield and enough room for leg comfort to be able to move about.

The CHAIRMAN. Mr. Durham, do you have any statistics that you have compiled as to the cause of accidents that you can relate here now to the size limitations?

Mr. DURHAM. We do not. I was interested to hear that the DOT has conducted some studies. The only thing that we know is what we're hearing from the drivers. I do know there's been a drastic increase in the last couple years in the fatalities but to say that this was caused by any one particular thing, nobody has nailed that down. But we hear from drivers that have driven 20 or 25 years without an accident come in and really just tell you some stories with some of these pieces of equipment that really raises the hair on your head, if you had any.

I have one other driver and I had a number of witnesses and I appreciate the long agenda—I have one other driver with us that I would like to ask to give you his comments. He is a driver for Roadway Express who is the largest carrier in this country, and I think it is interesting to note that they did not have anything longer than a 42-foot trailer until after the passage of the increase in weights and since that time they are converting their entire fleet, and this company employs about 24,000 employees. They are converting their entire fleet to 45-foot boxes and what is referred to as the Road Boss II and the

90-inch shortnose tractors, and as we pointed out in our written submission we have a number of problems with those short conventionals that we didn't even have with the cab-over-engines.

Mr. McGeorge. I would like to say that the main concern of the drivers that I work with and me too, No. 1—well, not No. 1 but No. 1 on the list—is heat in the cab because of having to go to—because of emission, they are having to go to turbocharged engines which run at I believe 2,600°. This turbocharger is setting approximately 10 or 15 inches from our right leg or right foot and there's a tremendous amount of heat that builds up in the cab. When you drive down a road your head is beating against the back of the cab and your knees are hitting the dashboard. You get your back slapped and your head hits the back and your knees hit the dash. If you can't get behind the steering wheel they just make a smaller steering wheel and put it on the tractor.

I have been driving 28 years. We never used to hear people sit and talk about blowing front tires because we cannot think about this driving up the highway all the time and survive. This is one of the things we don't think about. We know it happens but we just put it in the back of our head. But now you hear drivers every day more and more talk about blowing a front tire. I know that when I blow a front tire on this short tractor and long trailer, the way it's designed, the way the fifth wheel sits and the way the weight is distributed, that I cannot hold it on the road.

The main thing is the heat and the handling ability. When you go around a curve to the right or left you have a scooting front end of the tractor, a scooting tendency to slide sideways and you cannot handle it. On a slick road in the wintertime it's a nightmare. I think everybody has covered the main parts and most of the things I wanted to say.

The Chairman. All right. Mr. Durham, don't you consider any of these things in your negotiations, your contracts? For example, if those front tires need to have a stronger tire on the front, don't you try to get into that sort of thing in your negotiations as well as this problem of the excess heat in the cab?

Mr. Durham. Yes, sir. We have addressed those issues on the front tires, even though the DOT permits—which is really ridiculous—but they permit recaps on the steering axle of the trucks, even though they do not permit it on buses. We have negotiated in our contract requirement for first line tires.

As to the heat, we have negotiated a requirement as of April 1, 1977, for air-conditioning, but recently even with air-conditioning one of the major carriers in this country had a driver to receive first- and second-degree burns to his foot as a result of this firewall doghouse and everything being so crowded in there. This was brought out in a meeting in Kansas City 2 or 3 weeks ago by one of the management representatives on our National Safety and Health Committee. They are presently trying to work out the problem with the manufacturers but the manufacturers are caught in a squeeze. They are having to build a truck that will sell and the only trucks that will sell are the trucks that can pull the longer trailers that stay within the overall length. We have addressed a number of other concerns, but when you get into setting the size of the truck or the trailer, again, as I explained earlier, the concerns we have is that we certainly do not want to put our employers in that position of where they cannot compete.

The CHAIRMAN. Do you have any suggestion as to how the economic impact ought to be handled here if we should adopt this legislation, or do you believe there would not be any economic impact?

Mr. DURHAM. I honestly do not believe there will be any, based on what has been happening in the States. New York just enacted 45 and 60, the same thing we are talking about, but the Governor vetoed the bill.

The CHAIRMAN. What was the basis of his veto in his veto message?

Mr. DURHAM. I asked that question this morning and I haven't received an answer, but he did veto it. I understand there was some pressure, possibly by some of the groups that do not favor any additional length, but the point is there is a growing concern even in the State legislatures.

The CHAIRMAN. Senator Schmitt?

Senator SCHMITT. Mr. Chairman, I apologize to you and the witnesses for being late this morning and I do have a couple of questions, but if they have been answered just say they have been answered and we will press on.

There's been a claim that shorter cabs and the forward movement of the fifth wheel have created highway safety problems. What basically are those problems and what is the contention based on?

Mr. DURHAM. Well, I think we have already addressed some of them, but let me just maybe in 10 seconds tell you some of them.

The cramped cab, the small cab, the driver environment, resulting in the driver not being in a position to carry out his duties properly; heat in the cab because of the engine being moved back into the cab; the fume problems where the doghouse enclosure comes loose; the excess weight on the steering axle because of the shorter wheelbase and the fifth wheel being moved forward; the handling stability. If you would take a Volkswagen and hook it to maybe one of these 12-foot-wide house trailers and go down the highway, I think you would get a similar sensation, and that is that the trailer is not the problem; it's what's up front; and that's the thrust of our whole case here that we're attempting to submit to you gentlemen, that we would like to have a decent piece of equipment up front. And I don't want to misquote the American Trucking Association, but I was reading their submission and even they concede that setting the trailer lengths is a good idea, setting the cargo container part. Where they find fault is allowing the States to set an overall also because they're afraid it's going to take some of the trailer away and that's not our intent at all.

Our intent is not to take anything away from the cargo-carrying part of the unit; just simply give the driver a better piece of equipment.

Senator SCHMITT. And you think S. 3431 will in fact create the incentive to make a safer cab?

Mr. DURHAM. Yes. We think that S. 3431 is the better approach than attempting to mandate minimum cab size because we believe in our discussions with the manufacturers, if it's left to the manufacturers, they will build a decent proper piece of equipment if the tractor is left out of the equation, and they will build a truck that will get the job done. I think that's a lot easier than trying to say that there's got to be x amount of inches from the bumper to the back of the cab, x amount of inches from the steering wheel to the back of the seat. I think the

better approach is to leave it to the manufacturers, but they cannot do it as long as the restraints are there.

Mr. MYERS. If you look at the truck up there, you will see that the truck was designed to pull the trailer, and with the overall length that we have been faced with and given the weight increase and going to longer trailers, what the driver is now facing is that these are starting to haul the weight on the tractor instead of pulling it with his tractor, which is causing a tendency to push into a curve—you're not driving the truck around the curve; it's pushing you around with all that weight sitting on the short-wheeled tractors, and we're not knocking the 45-foot trailers but we would like to have a little more space to drive them instead of having it push.

Senator SCHMITT. I don't know whether the question has been discussed, and I'm not even frankly sure whether it's part of the bill as it now stands, but the rear bumper question has been raised by some of my constituents in New Mexico, particularly with respect to safety.

Do you gentlemen care to comment one way or the other?

Mr. DURHAM. That is presently in rulemaking, both jointly in NHTSA and BMCS. We support this. The reason is automobiles are being built smaller and the current regulation, in our opinion, is not sufficient to give the protection that's needed. The Insurance Institute recently put out a film which I thought was very impressive in pointing out some of the problems that face the motoring public when they do happen to go underneath the back of the trailer.

Senator SCHMITT. Mr. Chairman, I will have a question for Ms. Claybrook.

The CHAIRMAN. Thank you very much, Mr. Durham and gentlemen. We appreciate it.

[The statement follows:]

STATEMENT OF FRANK E. FITZSIMMONS, GENERAL PRESIDENT, INTERNATIONAL BROTHERHOOD OF TEAMSTERS, CHAUFFEURS, WAREHOUSEMEN AND HELPERS OF AMERICA

Good morning, my name is R. V. Durham, Director of Safety and Health with the International Brotherhood of Teamsters. This statement is presented on behalf of General President Fitzsimmons who is unable to be with us today.

In our statement supporting S. 3431 today, we would like to address ourselves to: (1) The genesis of S. 3431; (2) the conditions this bill seeks to correct; (3) what this bill would—and would not—do; (4) the reasons for S. 3431; and (5) some concerns raised by those not entirely familiar with this measure.

1. Background—Genesis of driver concern

In reviewing a recent publication of the Trucking Industry,[1] we find the following commentary on Cab over engine (COE) trucking equipment:

"Operators were taking a second look at the industry's 'standard' in a heavy-duty truck, the COE. Drivers complained of killing steering, the hard ride, plus a cab and/or seat difficult to climb in and out of maybe fifty times a day. Not much has changed; drivers still prefer the conventional type to the COE, and for the same reasons."

It is interesting to note that this commentary deals with driver concerns in the year 1912, and as the publication states, not much has changed.

While the concerns remain the same, the reasons for them have been given greater intensity, especially in light of Congress raising the permissible weight limits in 1974.

[1] The Golden Years of Trucking, Ontario Trucking Association (1977) at page 143.

In fact, the situation has become so serious that we believe it is more than a truck driver's concern; we believe it has become one of the major safety matters in highway transportation, because unsafe driving conditions for truck drivers adversely affect everybody who uses the Nation's highways.

During deliberations on that legislation, we testified in support of increased weight limits, provided proper consideration was given to driver safety.

The weights were increased, but no real consideration has been given to our members, thus our appearance before the Committee today.

In that connection, prior to the enactment of the 1974 law most states were authorized to establish weight limits for Interstate highways within the following parameters: Overall gross, 73,280 pounds; single axle, 18,000 pounds, and tandem, or double axle,[2] 32,000 pounds.

With the adoption of the 1974 amendments, signed into law in 1975, these limits rose to: Overall gross, 80,000 pounds; single axle, 20,000 pounds, and tandem axle, 34,000 pounds.

2. Conditions S. 3431 would correct

Just as the 1974 Amendments provided the opportunity for increased payloads for motor carriers, they also created a number of serious safety problems for over-the-road truck drivers and the motoring public.

CONDITIONS AFFECTING OVER-THE-ROAD DRIVERS

Initially, we would note that the increased weights, in and of themselves, did not create these major safety problems. Rather it was these increased weights combined with other factors, most notably overall length laws within the states, that make operation of large trucks an extremely risky proposition.

In other words, the combination of overall length laws and increased weights have forced carriers to purchase longer trailers in order to take full advantage of maximum payload opportunities.

Given these circumstances, drivers are faced with the following conditions both within and without the driving compartment:

(1) CONDITIONS WITHIN THE DRIVING COMPARTMENT

A study prepared for our organization by the Highway Safety Research Institute, University of Michigan,[3] stated the situation thusly: "in essence this means that the cab needs to be designed around the operator instead of asking the operator to mold himself into the cab for the average to large driver." (Page 3)

Examples in this area are:

Distance between the steering wheel and seat back.—As the HSRI Study demonstrates, page 6, many trucks being offered for sale today fail to meet even minimum recommendations for this distance. Aside from the obvious steering difficulties this creates, the result is increased likelihood of abdominal injury in a crash situation.

In cab heat.—While we have negotiated air conditioning into collective bargaining agreements, heat is still a problem. One of our members recently suffered second degree burns on his right foot from a superheated accelerator in one 90 inch BBC tractors.

Cab ingress and egress.—In a 1977 study by DOT, it was found that 14 percent of all driver personal injuries resulted from slips and falls.

In our view, one of the major contributing factors is the COE power unit. As the HSRI Study notes: "Such tractors have smaller BBC (Bumper-to-Back of Cab) dimensions than Cab-Behind-Engine Tractors, and can be more difficult to enter and exit."

Driver hazard—horizontal plane.—Before proceeding, we would note two important factors: (1) the meaning of driver hazard and (2) the location of the tractor-trailer coupling device, commonly known as the fifth wheel (point K on the attached chart).

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[2] For an explanation of these terms, please refer to attachment A.

[3] Human factors considerations regarding the advance notice of proposed rulemaking "minimum" cab space recommendation (MC–89 BMCS).

First, when we speak of driver hazard, we mean conditions that provide an unsafe atmosphere in which a long distance truck can be operated—unsafe in terms of the driver and unsafe in terms of the motoring public.

With regard to the fifth wheel, its location is of critical importance to the driver himself and to the safe operation of the vehicle.

Ideally, the fifth wheel should be set anywhere from point P to 10 inches forward of this point.

When the fifth wheel is moved forward of that range, more weight is absorbed by the tractor.

As a result, drivers are experiencing physical hazard from the trailer lurching forward on the fifth wheel commonly referred to as back-slap. In a number of instances this produces severe bruises in the small of a driver's back.

Driver hazard—vertical plane.—With fifth wheels moved to the radical forward position, tractors must absorb additional shocks; and suspension systems are inadequate to provide adequate ride quality for drivers.

Sleeper berths.—In 1973, the DOT's Federal Highway Administration proposed to extend minimum sleeper berth dimensions. At that time the minimum width in a sleeper berth was 21 inches. We petitioned for an increase to 36 inches. The DOT increased the width to 24 inches. As noted in the HSRI Study, a recent test shows that 92 percent of the drivers in a survey exceed 24 inches when sleeping in a prostrate position.

At the time, the DOT granted the princely increase of 3 inches one of the major reasons for going no further was this: State Overall Length Laws.

In summary, the combination of State Overall Length Laws coupled with increased trailers have created an unsafe cab environment for over-the-road truck drivers.

(2) CONDITIONS OUTSIDE THE DRIVING COMPARTMENT

Thus far, we have discussed conditions affecting drivers inside the cab. In addition to these concerns there are other, equally important matters that affect the handling of long distance trucking equipment. Among the more serious problems are these:

Difficulty in steering.—Again referring to the location of the fifth wheel, Point K, the further forward this device is moved the greater the load on a steering axle. Under ideal conditions, the weights on the steering axle should be 10,000 to 11,000 pounds.

We are now hauling trucks with steering axle weights of up to 14,000 pounds.

A recent study [4] by DOT demonstrates that as the weight on the steering axle increases, the effort required to steer the vehicle increases at a greater rate than the proportionate rate of weight increases on that axle.

Moreover, this report demonstrated that present length laws—which contribute to overloaded steering axles, improperly placed fifth wheels and cramped driver's compartments—also results in a phenomenon known as "understeer."

That is, on a fully loaded truck the steering wheel must be rotated through a greater angle to effectuate a turn. Thus, the unit "understeers" and the driver must overcorrect to keep the vehicle on the road.

Moreover, with greater weights on the steering axle it requires greater physical exertion to turn the wheel.

Front tire blowout.—This is perhaps the most feared of all situations, for its occurrence reduces a driver to literal helplessness.

That is, a driver cannot predict truck movement in the event of a front tire blowout; and the driver can take little, if any, defensive action in such a situation.

Although the DOT requires tires to accommodate weights,[5] the regulation is impossible to administer.

Moreover, the regulation only addresses itself to static weights and does not take into account such factors as temperature change or sudden weight shifts—fairly common occurrences.

Jackknife.—In a jackknife situation, the rear tandem, points D–E, goes out of control causing the trailer to "jack" to one side or the other.

Again, it is a very difficult situation to control and has led to serious, fatal accidents.

Under current conditions, the likelihood of a jackknife increases as the wheelbase of the power unit, points A–C, is decreased.

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[4] This study, made in response to section 210 of the Federal-Aid Highway Act of 1976, confirmed concerns voiced by drivers of heavy trucks.

[5] 49 C.F.R. 393.75(f).

In its study on this subject, HSRI stated the problem as follows: "A long wheelbase configuration by itself generally offers superior ride qualities over short wheel base tractors, and long wheel base tractors are often preferred because of their reduced demand on jack-knife control." page 17

The study summed up, all too accurately, our members' concerns: "We must conclude that constraints on overall length, especially the tighter constraints found in the Eastern states, cultivate not only shorter cabs but by necessity shorter wheel bases as well. This has led and continues to lead the designers of cabs in directions which make them more unsafe from a handling viewpoint."

Summing up, these handling factors—difficulty in steering, understeering, front tire blowout, and jackknifing—compel an answer to our concern, thus our support for S. 3431.

(3) WHAT S. 3431 WILL AND WILL NOT DO

Thus far, we have discussed the history and conditions giving rise to S. 3431. We would now like to discuss what S. 3431 will and will not do.

A. WHAT S. 3431 WILL DO

In brief, S. 3431 provides as follows:

1. States may continue to establish the actual dimensions of length, but they would be required to establish them in terms of trailer lengths only;

2. If, after establishing these trailer lengths, a state wishes to provide for an overall length, it must provide—at a minimum—15 feet in addition to the limits established for the trailer(s); and

3. Equipment in use could not be legislated away by any State.

Beyond that, S. 3431 will provide a number of economic advantages to motor carriers, including:

Fuel economy.—In a fuel economy test conducted for a number of truck manufacturers and motor carriers, Professor Howard Chevalier of the Texas A&M Department of Aerospace Engineering made the following observation.

"One of the things people misunderstand about aerodynamic streamlining is that you don't have to go to extremes. As I approach the air, if I can start with a small area and build this up in a measurable manner, such as the step design of the conventional. I'll still get reasonable drag reduction." [6]

Thus, cab-over-engine tractors, those used to obtain maximum length, have higher air drag—thereby using more fuel—than conventional cabs, that is, tractors with engines forward of the cab.

Under the bill being considered today, S. 3431, the incentive is available for carriers to purchase the conventional tractor.

Other economic factors.—In addition to the fuel economy noted above, conventional tractors provide additional incentives for carriers.

In comments to the DOT on that Agency's proposed minimum cab rule, Mack Truck Co. had this to say:

> "It must be acknowledged, however, that COE configurations have less enegy absorbing material ahead of the driver than conventional configurations.
>
> The elimination of overall length limits would negate the primary advantages of the COE configuration and would undoubtedly lead to its decline, *since it is heavier and more expensive than conventional models.*" (Emphasis Added)

B. WHAT S. 3431 WILL NOT DO

Much has been made of the probable effects of S. 3431, some of them erroneous. To clear up any misconceptions on this we note that this bill would not:

Require 15 foot tractors.—Under the terms of S. 3431, states would be permitted to establish an overall length if that length exceeds the trailer length by a minimum of 15 feet.

Thus, the 15 feet would accommodate the tractor; but 15 foot tractors would not be mandated.

As things now stand such a proposal could not, practically, be made a regulation because any minimum cab size regulation would place some equipment in jeopardy of state overall length laws. However, with the adoption of S. 3431, such a regulation could be adopted. On the other hand, such a regulation may not be required because the economic incentives would be so strong for carriers to return to conventional models that the cab size would take care of itself.

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[6] Commercial Car Journal, May, 1978 at pages 133–135.

Beyond that, carriers could continue to use present equipment; but, again, the incentives are there to go to the long nose conventional.

Wipe out existing equipment.—This is a classic. In order for this conclusion to be true one must assume that members of state legislatures will somehow react in opposite fashion from their federal counterparts.

That is, the bill contains a provision which protects existing equipment; and we do not believe the state regulatory bodies will adopt truck length laws that reduce the ability of the industry to deliver commodities and stay competitive with other modes of transportation.

(4) REASONS FOR S. 3431

By way of background, regulation of vehicle sizes and weights are shared by federal and state governments.

At the federal level, the mechanism is the Federal-Aid Highway Act, as amended. Under this law, the Government is authorized to withhold highway funds to a state if that state authorizes weights on the Interstate System in excess of those noted above, that is, 80,000 pounds gross, 34,000 pound tandem; or 20,000 pound single axle.

In addition a vehicle may not exceed 96 inches in width.

Thus, states may not exceed any of these limitations and participate in the Federal Highway Program.

Please note that some states have so-called grandfather rights under federal law and in these states the federal limit is exceeded.

As to regulation at the state level, wide latitude is available in governing sizes and weights of vehicles, although a recent decision by the Supreme Court overturned state length restrictions as being a burden on interstate commerce.[7]

To preserve the states' discretion in this area and at the same time bring a badly needed solution to this matter, we are supporting S. 3431.

Our reasons are these: (A) The 1974 law has resulted in dangerous highway conditions, enumerated above, for not only truck drivers but also the motoring public; (B) there is a very real concern among all drivers in the area of safety; and (C) the cube-power race is leading, inevitably, to equipment—so-called cab unders-that is frightening in its potention.

A. CONSEQUENCES OF 1974 LAW—NEED FOR ADDITIONAL CONGRESSIONAL ACTION

When the 1974 law was being considered, our organization supported the measure if some safety consideration were given to drivers.

In that connection, we supported an amendment, offered by Senator Phil Hart, that would have limited the steering axle weight to 10,000 pounds.

We supported that amendment because we foresaw the handling difficulties that would accompany increased weights. The amendment was accepted by the Senate, but dropped by the Conference Committee.

We again raised concerns in 1976 when those Federal-Aid amendments were being considered.

In that law, Congress adopted Section 210 which required DOT to study steering axles weights.

Again, that study confirmed what our members said in 1974. The major conclusion of the study was that as the weight on the steering axle increases, the effort required to steer the vehicle increases at a greater rate than the proportionate rate of weight increases on that axle.

In a word, we are urging Congress, through S. 3431, to make necessary corrections to the Federal-Aid Highway Act because the conditions described above are serious and they will not be alleviated until this law is amended.

B. DRIVER CONCERN

Our members have many problems with the conditions described in this statement, and they need a solution to this problem.

In that connection, a recent survey of 10,000 long haul truck drivers by D. Daryl Wycoff, a professor at the Harvard Business School, gives additional information on this score. His survey found that drivers have major problems in six areas: noise, vibration, fumes, seating, temperature/humidity and cleanliness.

Of these, five would be corrected significantly if S. 3431 were enacted into law.

Further, as each of our members appearing here today can attest these conditions are very real and very constant.

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[7] *Raymond Motor Transportation, Inc.* v. *Zel S. Rice*, 46USLW4109 (Feb. 21, 1978).

C. EXTENSION OF CUBE-POWER RACE

Recently, a major trailer manufacturer brought its so-called cab-under equipment to Washington for inspection.

For those who saw this truck, it was an experience not soon to be forgotten. We have heard that the carriers have no intention to use this equipment.

However, we believe competitive pressure will be so great that carriers will be forced to this equipment. Please bear in mind there is no law or regulation, to our knowledge, prohibiting cab-under equipment.

On the other hand, adoption of S. 3431 will establish a policy of placing cargo where it belongs—in the trailer; and extensions, if any, will be made in this area without encroaching on cab space.

(5) REPLY TO ASSERTIONS OF CARRIER REPRESENTATIVES

As was noted above, motor carrier representatives have made certain assertions which are, at a minimum, inaccurate.

Listed below are the carrier representatives' statements, together with our reply to these charges.

Carrier assertion No. 1.—The practical effect of this proposal would be a reduction in the commonly used 45-foot semi-trailer to 40 feet in 20 states. A similar assertion is made for states in which twin trailers are permitted.

Our reply. Not true. The amendment provides that states have the perogrative to establish trailer length limitations.

For this assertion to have any validity, one must assume that a state legislature will, out of hand, ask the citizens within its jurisdiction to absorb the enormous costs of a proposal to wipe out a significant fraction of the trailers used in a particular state.

Besides insulting members of state legislatures, this assertion ignores the fact that our organization and others would oppose any attempt by a state legislature to impose undue restriction on the industry.

Moreover, where this approach has been used in the various states the carriers were accommodated. That is, in each and every state where this approach has been used, the legislatures have allowed 45 feet, or its equivalent, for trailer length. Our organization supported these efforts in the state legislatures.

Finally, the Amendment contains a provision that will protect carriers from such action.

Carrier assertion No. 2.—This is nothing but a "featherbedding" proposal that would force the trucking industry to run one additional truck for every nine now on the road. In addition, our organization was mentioned specifically as being in the fore front of the so-called feather-bedders.

Our reply.—Again, not true. What we are seeking is an improved set of incentives for carriers to purchase equipment that is safer to operate and at the same time efficient.

With regard to driver safety, we have already noted the Amendment would, eventually, improve most, if not all, of our concerns.

As to economic efficiency, please note the comments of Mack Trucks, Inc. on the minimum cab size proposal of the Bureau of Motor Carrier Safety.

As to featherbedding, we have consistently supported efforts to make motor carriers competitive with other modes of transportation. For example, we supported the permissible weight increases in the 1974 law.

According to the Bureau of Labor Statistics Report on Industry Productivity for 1977 we find the following:

INTERCITY TRUCKING INDEXES OF OUTPUT PER WORKER

	Index (1967=100)	Percent change
1971	113.6	
1972	120.9	+6.4
1973	123.4	+2.1
1974	120.5	−2.4
1975	121.2	+.6
1976	134.7	+11.1
1977	142.6	+5.9

What we ask here is some consideration for the driver.

Carrier assertion No. 3.—Moreover, proper cab dimensions are now subject of a rule making proceeding by the Department of Transportation until it is determined on a scientific and engineering basis what practical dimensions should be, it is premature for the Senate to seriously consider this proposal.

Our reply. Again, not true. First, the carrier association opposes the DOT's current proposal on minimum cab sizes, and with history as precedent the Association will oppose virtually any proposal that touches on involuntary equipment changes.

More to the point, however, is the fact that a DOT minimum cab size regulation could place some equipment out of compliance with state overall length laws. The result: no regulation.

On the other hand, enactment of this Amendment, with its incentives to go to longer tractors would enhance the prospects of meaningful results from the minimum cab size proposal of DOT.

This assertion is reminiscent of 1974 when the carriers used the DOT's proposed braking standard to justify additional weight increases and then challenged the regulation successfully at the Agency.

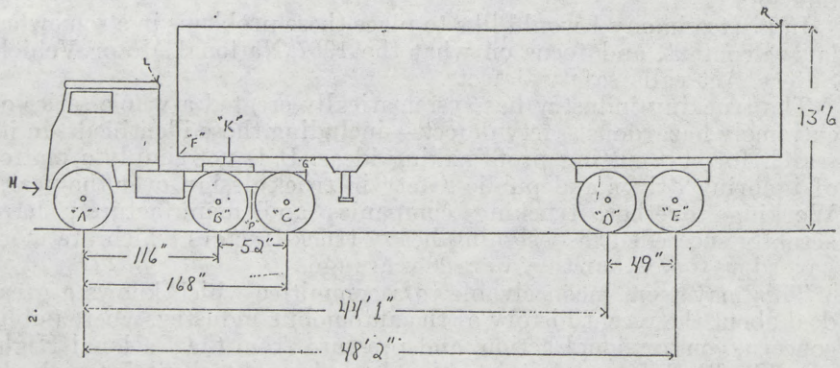
We are not here addressing ourselves to this braking standard but, rather, to the fact that the carriers used it in arguing for higher weights.

In summary, we believe these assertions contain serious deficiencies both as to the assumptions they make and the conclusions they arrive at.

Should you need additional information on this matter, please do not hesitate to contact our office.

Thank you for your consideration in this matter.

ATTACHMENT A



Center of Kingpin "K" to Centerpoint of Axles "P" -- 14 inches

Center of Kingpin "K" to End of Chassis "G" -- 62 inches

Center of Kingpin "K" to Nose of Trailer "F" -- 48 inches

Vehicle Width -- 96 inches Overall Length -- 55 feet

Overall Tractor Length -- 18 feet Overall Trailer Length -- 45 feet

Fifth Wheel slides a total of 45 inches, so that at extreme points the kingpin could be located 31 inches forward or 14 inches rear of the centerpoint of axles "B" and "C".

A - Single axle. This is also the steering axle.
B - C and D - E - Tandem axles
K - F - 5th wheel

The CHAIRMAN. The next witness is Susan Ginsburg, Professional Drivers Council.

STATEMENT OF SUSAN GINSBURG, PROFESSIONAL DRIVERS COUNCIL, WASHINGTON, D.C.; ACCOMPANIED BY MILT McLARTY; ROBERT MILLER; AND PAUL GEORGE

Ms. GINSBURG. My name is Susan Ginsburg. I am safety and health director of the Professional Drivers Council, also known as PROD.

PROD is an independent group of teamsters founded in 1971 to work for reform of the union and for the reduction of deaths and injuries due to highway truck accidents. We are entirely supported by dues from members. Most of our members are over the-road truck-drivers for the Nation's largest trucking companies.

With me are several members of PROD, all of whom are over-the-road drivers, whom I will introduce in a few minutes and who will speak briefly about their personal experiences. We are here to comment on S. 3431 introduced by Senator Kennedy on August 18, 1978, which would require that States having laws which set overall truck length allow at least 15 feet for the trailer. We are in full support of this legislation.

The committee has already heard a complete description of the characteristics of current tractor-trailer configurations which make this bill necessary—in particular, overloaded front axles, overloaded front tires, forward mounted fifth wheels, and cramped tractor interiors.

In my testimony I would like to place these problems in a somewhat larger context, and focus on what the 1967 National Motor Vehicle Safety Act calls safety defects.

The trucking industry has systematically created a whole series of extremely hazardous safety defects—including those identified—in its search for cost-cutting profitmaking ideas. It is not simply a matter of ignoring driver and public safety in truck design over the years. Working together, trucking companies and manufacturers have actually succeeded in designing heavy truck-tractors which are more hazardous today than they were 20 years ago.

This may seem inconceivable to a committee which knows a great deal about the recent history of the automobile industry, where public concern, congressional action, and pressure from the National Highway Traffic Safety Administration have brought about increasingly safe car designs.

The trucking industry's fatality record, both in terms of occupational deaths and in terms of highway accidents, is terrible, and rapidly worsening. Deaths from heavy truck accidents have jumped 29.2 percent since 1975. This compares with a 4.1-percent increase during the same period in automobile accidents.

The committee should know that several of the manufacturers producing these hazardous truck-tractors—Ford, GM, White Motor, International Harvester—are automobile manufacturers who, a decade after Congress passed the Motor Vehicle Safety Act, should, and do, know better. They are getting away with it because the law permits it.

I request permission to submit for the record 11 photographs of a similar Ford model, specified out by Centralia Cartage of Centralia, Ill. The photographs illustrate only the problems of interior tractor size; not visible are the problems of vehicle driving and control.

The CHAIRMAN. Let me say that we'd be happy to receive them for the committee files.

Ms. GINSBURG. All right. Unlike automobile consumers, the big trucking companies are full partners in creating design specifications for their tractors. In addition, carriers typically add to the problem of unsafe design by unsafe operating practices, such as mounting the fifth wheel too far forward. This is done to shift weight onto the front axle, in order that other axles will not exceed axle weight limits.

I would like with your permission to place several letters in the hearing record [1] which describe the hazards of typical current tractor models.

The CHAIRMAN. They will be made a part of the record.

Ms. GINSBURG. I emphasize that truck design is the one area where truckdrivers, especially those employed by trucking companies, have absolutely no say. So far, unions have chosen not to bargain in this area. Even independent operators are compelled by economic pressures to follow, in general, the design leads of the big trucking companies.

The question is, since the industry has not only refused to regulate itself in the matter of design but has flagrantly risked, and lost, the lives of hundreds of its own employees and contributed to the deaths of thousands of other motorists, what Government agency has taken charge of the problem? The answer is, none.

The NHTSA, charged by Congress with the regulation of unsafe vehicles, has almost totally ignored the heavy truck population, in spite of repeated complaints by truckdrivers, annual data showing rapidly increasing fatalities and a rate of fatal accidents more than twice that of automobiles.

Except for the controversial FMVSS 121 brake standard, NHTSA has promulgated virtually no significant safety standards for heavy trucks either for accident prevention or for occupant protection. Its recently published 5-year plan for regulations also contains no plans for significant safety standards in the near future.

I would like to request permission to place a copy of PROD's comments on NHTSA's proposed 5-year plan in the hearing record. The comments identify some of the most blatant heavy truck design problems.

The FHA's Bureau of Motor Carrier Safety is responsible for the regulation of the operating practices of motor carriers as distinct from NHTSA's authority over vehicle design. To this day, the BMCS is reluctant to admit there is such a problem as an overloaded front axle, in spite of the testimony of fatalities and a long line of sick, injured, frightened and angered over-the-road drivers. Although the BMCS did publish a rulemaking notice entitled "Cab Dimensions," in April, the accompanying material indicated no understanding of the problems surrounding tractor size nor, indeed, a conviction that there are serious problems. The notice simply invited communications on the subject from interested parties, and made clear that its schedule for rulemaking is something on the order of a decade.

Now let me turn briefly to the role of Congress and the States in this matter.

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[1] See p. 50.

In 1971, the Senate Labor Committee held hearings on unsafe practices in the trucking industry. Unsafe truck design—including cramped cab interiors—is the subject of over 100 pages of the hearing record.

In 1974 and 1975, House and Senate members heard extensive descriptions about the hazards of overloaded front axles. In 1974, the Senate fixed a 10,000-pound limit on front axle weight, but the amendment was dropped in conference.

The legislation which you are considering today addresses the same problem of vehicle design and vehicle control which was in issue in the 1974 axle weight limit legislation. The difference now is that the weight increase granted by Congress in 1974—from 73,280 pounds to 80,000 pounds—has worsened the problems. To take advantage of the weight increase, the trucking industry has lengthened its trailers to contain more weight, and shortened its tractors to meet State overall length laws. To comply with Federal and State rear axle weight laws, weight has been shifted through the fifth wheel forward to the front axle, rendering the short tractors even harder to control.

While weight has been added and these new designs have been developed, no equipment and safety improvements have been made in response to the changes. Power steering and air suspension are almost nonexistent. If the attack on the FMVSS 121 braking standard is successful, it will bring truck braking capacity back to what it was years before Congress granted the trucking industry a weight increase.

PROD endorses and will strongly support this bill. It is a major forward step in insuring truck safety. If this bill becomes law the pressures which have led to shorter and shorter tractors—with increased hazards for drivers—and longer and longer trailers, with alleged benefits for shippers, will be lessened and perhaps avoided.

We recognize, of course, that the bill was not designed to solve the entire problem. It will not, for example, require truckers and manufacturers to build 15-foot cabs and add essential safety devices and systems. It is intended, as we read it, to provide an incentive to manufacturers and truckers to build somewhat larger and safer tractors—without Government regulation and direction. If after this gentle nudge in the direction of safety and rationality the industry fails or refuses to take the necessary action to protect drivers—and the motoring public—then we and others will be back asking NHTSA to intervene with tractor regulations and specifications.

The CHAIRMAN. Thank you very much. Did you want to call on some of your colleagues for a very brief statement?

Ms. GINSBURG. Yes.

Mr. MCLARTY. My name is Milt McLarty. I have 16 years as a road driver. Two and a half years of that I was an owner-operator in a cab that I could live in. I have 13 years working now with Terminal Transport out of Atlanta, Ga., in cabs that we can't live in.

As far as overall length is concerned, personally I don't think that a 5-foot longer truck would necessarily be any less safe than a 50-foot truck. But the cab designs now, for instance, the GMC Chevrolet, White Roadboss 2, are as the other people have stated. In the White Roadboss 2 the dash is so close to you that a man my size is bumping the back of the cab with his back and head and the dash with his knees.

The CHAIRMAN. What is the length of that?

Mr. McLARTY. The wheelbase of that truck is 146 inches. The actual dimension of the inside cab, I don't know. We do have pictures of it. But when a man my size sitting in the seat with the proper amount of air to hold you up and hold you in a position where you can be safe to drive, your head is literally pushed into the headliner. I have pictures to show that the hair is making marks on the top of the cab. The configuration of the pedal, the brake pedal, the clutch pedal and accelerator, is such that you're sitting with your legs bent. To lift your foot from the accelerator to apply brakes, you hit your leg every time on the steering column, I mean literally bump your leg.

In an emergency, such as panic stop, if you were to jerk your leg from the accelerator to the brakes, you might well hit your leg, and it would be with such a shock you wouldn't even get to apply the brakes.

The doghouse design is so far over that the brake pedal is to the left of your steering column. The accelerator is under the steering column and, as you can see in the pictures, there is a head mark on the top of the head liner.

The other danger points in these cabs are the front axle overweights. The placement of the fifth wheel is so far forward in our company that our fifth wheels are 18 inches ahead of center. This puts excessive weight on the front axle, in some cases 13,000 or 14,000 pounds on your steering axle.

The CHAIRMAN. What is the length of your boxes?

Mr. McLARTY. 45 feet. We're pushing 54 feet 11½ inches. They are right against the limit on weight.

The CHAIRMAN. 55 feet?

Mr. McLARTY. It's the legal limit in the areas we run.

The CHAIRMAN. You say your tractor is really 12 feet 2 inches. Did you hear Ms. Claybrook say that she thought this size of the tractor could be reduced from 15 foot to 12 foot?

Mr. McLARTY. No, sir. You won't get it in 12 feet. You won't get the needed safety factor. I can't walk between the cab and the nose of the trailer. In fact, we have trailers with nose mount refrigeration units that we cannot pull with this type of tractor. We have several different tractors in the fleet, some cab-over units, where the cab is a narrow cab, called a half-cab, the GMC Astro.

The CHAIRMAN. If we required 15 foot on the tractor, that still would not necessarily increase your size, would it, of your cab inside size?

Ms. McLARTY. Well, as I understand the law, it's only asking the industry to do it. It's not forcing them to do it. If we did get legislation to put additional length on the unit, then it could be put in a lot safer than it is now. The way they are now, there's no way that they can go with the 55 legal limit. It's going to have to be the footage put in, hold the trailers at what they are, and give a decent amount of length for the tractors.

The CHAIRMAN. Have you made any attempt to try to get the States to change their overall limit in States that have this shortened length?

Ms. GINSBURG. No, we have not.

The CHAIRMAN. Why not?

Ms. GINSBURG. We are a very small organization. It seems to me that the complaint of the trucking industry that the States are un-

likely to increase overall lengths is questionable. The industry has succeeded remarkably well in getting State legislatures to increase lengths as well as in getting the Congress to increase weights. We are here today to talk about tractors, though, not about trailer lengths.

The CHAIRMAN. Yes, but if Congress increases the length of the tractor and the States don't do anything about it, there's going to be a tremendous economic loss there that somebody is going to have to sustain.

Ms. GINSBURG. I'm not at all convinced that the States would not do something about it. I think that's an assumption that we can't make.

The CHAIRMAN. Yet you haven't done anything to try to convince the States to increase their size already, you say. So it would seem to me that you don't have any information to base that judgment on if you haven't actually tried to get the States to change. Now in Georgia it's what?

Mr. MCLARTY. In Georgia it's 55.

The CHAIRMAN. Georgia is 55 and the State right next to it on my chart is 65. If you had 65, then you've got the leeway for the size of the bigger cab. Do you want to have your other gentleman comment?

Ms. GINSBURG. Yes, Mr. Miller.

Mr. MILLER. Good morning. I'm Bob Miller, teamster and former over-the-road driver and a member of the Professional Drivers Council. I'd like to express my appreciation for the opportunity to be here today.

I have driven tractor-trailers for several trucking companies and also been an owner-operator over the past 14 years. During this 14 years I have never had an accident and I have received only one ticket. I would consider that a pretty good record, but it was marred by a discharge from Associated Truck Lines in Grand Rapids, Mich., in July 1977 for refusing to drive a 1972 Louisville model Ford with only 12 inches of clearance between the steering wheel and the seat back.

This problem I had fought since starting to work for Associated Truck Lines when I realized the amount of small cab tractors they operated. It reached a head when in November 1976, I was dispatched on the same tractor I was later fired for refusing to drive. Being dispatched from Fort Wayne, Ind., to Grand Rapids, Mich., and after attempting to refuse this tractor, I proceeded to drive it to my destination. This trip was the most startling experience of my life. By ability to steer was hampered by the constant pressure of my stomach area which resulted in several near accidents. It was those near accidents where, upon braking suddenly, I found that with all my weight being pushed forward I was completely helpless to control that vehicle.

I feel that my attempts to get this problem rectified led to my being dispatched on this tractor again some 9 months later and consequently my discharge.

In my 14 years of driving, the most reecnt have seen conditions getting worse and not better. The equipment now is in worse shape than ever, and as the cost of inflation has risen the quality of our equipment and the maintenance or upkeep has decreased. The introduction of the 80,000-pound weight increase has made things worse as nothing was done to increase braking power or in any way make these rigs worthy of hauling an additional 7,000 pounds. We now must contend with overloaded front axles even to the extent of broken and cracked axles,

and steering tires which are loaded beyond the manufacturer's recommend capacities.

To cure these problems I believe the Congress must now do what the manufacturers and the companies have been reluctant to do. They must be sure that these 40-ton trucks are not rolling toward death and destruction. Good enforceable laws can make these unsafe conditions a thing of the past.

In reference to the length amendment which concerns us today, I'm not here to talk about the safety of different overall truck lengths or what the optimum truck length is, because I don't believe there is an optimum truck length. It depends too much on existing conditions at the time—the road, traffic and congested areas all present different problems.

What I am concerned with is the many tractors on our highways that are unsafe to haul any trailers whether they are 45, 48, twin 27 or twin 40 feet, unsafe because of the lack of Congress so far to address the problem of cabs far too small to be safely operated.

I hope that these hearings today will start a trend of improvements for an industry that moves America. For years it has been taken for granted that a truck interior would be large enough for a larger than average driver to maintain adequate control. Many company drivers throughout the country now know this isn't true, for in order to haul the highest volume of freight and stay within the length laws, many trucking companies now use long trailers and short power units, thereby putting the safety of the driver far behind the ability to haul high volumes of freight.

Truck manufacturers, knowing that many companies buy power units that will allow them to pull long trailers, now offer a variety of these shrunken cab tractors. I feel that required minimum interior cab dimensions are a necessity to cure this very serious problem. A 15-foot tractor length would be sufficient in some, or even many cases, but with the many conventional models now in the market this would not be a sure cure in an industry where the driver comes dead last to any improvements.

Another serious problem caused by the length laws as they now apply is the tendency to move the connecting apparatus on the fifth wheel, as we call it, as far ahead as possible in order to gain some important inches toward maintaining that overall length. In solving the length problem in that way, another has just been created only much more serious and deadly than operating 6 inches over length. We now have in many cases overloaded the steering axel which if not the cause of steering tire blowouts certainly multiplies the seriousness of it. Chances of steering a 40-ton semi with a flat front tire are very slim. That slim chance is gone with much over 10,000 pounds on the front axle.

All these efforts by trucking companies to make trucks haul more and more and to have drivers work longer hours are causing death on our highways. These trucks can only be so big, and so heavy, and still enable a driver to safely operate them.

This length amendment is a good start. It will at least provide some incentive to get rid of the small cabs which now abound our highways, but I believe more regulations may still be needed to insure the public safety on our streets and highways.

I would like to thank you again for this opportunity to tell my side as an experienced driver who's seen the problems. If any part of my statement needs clarification or if there are any questions, I would be glad to answer them to the best of my ability.

The CHAIRMAN. Well, I don't have any questions to you, Mr. Miller, but it seems rather odd to me that of the witnesses so far that nobody has any statistics to present to us as to accidents being caused because of the condition that's being complained of.

Ms. GINSBURG. I think one of the problems, Senator, is that the NHTSA, which would be the agency to conduct those kinds of investigations, has put such a low priority on the truck population in relation to the automobile population that studies simply haven't been done. The Bureau of Motor Carrier Safety has jurisdiction only over interstate trucks and they depend for their accident information on reports volunteered to them by carriers. They have estimated that they get about 80 percent return rate from the common carriers, about 30 to 40 percent from the private carriers, and about 10 percent from the independent operators. In addition, the reports they do get contain analyses performed by the companies and, not surprisingly, the companies blame about 96 percent of the accidents on driver error.

The CHAIRMAN. Doesn't your organization go into the cause of the accidents that your people are involved in as well as the teamsters that I mentioned here to Mr. Durham earlier and try to find out statistically what the causes are? And if you do, it would seem to me you ought to be able to come up with some statistics and say this percent of accidents are caused for this reason.

Ms. GINSBURG. Well, I think it might be a good idea if the teamsters did that.

Mr. MILLER. Sir, I also believe part of that problem is in accidents caused by this it's very hard to actually convince anybody that that was the reason. When you lose control normally, this is all that is included in an accident report later. It's hard to go back and read an accident report and say this man lost control of a vehicle because he could not steer it. Normally, God forbid, the drivers are not in very good condition to be interviewed at the time of the accident.

The CHAIRMAN. But, on the other hand, you tell us all this horror story, all of these terrible conditions that exist, and you, yourself, have never been involved in an accident. You have driven apparently under these conditions and driven very well and very successfully. I'm not suggesting that that's the sign that nothing needs to be done, but it seems to me there ought to be some kind of statistics to support the contention you're making. Mr. Miller was complaining about a dozen other things that aren't even covered in this bill.

Ms. GINSBURG. I think there are statistics which show the drastic increase in fatality rates in the trucking industry over the last couple of years. The precise reasons for that increase since 1975, when the weights went up, have not been fully specified. But I think it's reasonable to assume that weight has been a factor.

The CHAIRMAN. It's interesting that the NTSB apparently has not come up with some statistics in this area.

Ms. GINSBURG. The NTSB is not in the business of gathering statistics. What they do is simply investigate particularly bad accidents and——

The CHAIRMAN. To try to find out the cause.

Ms. GINSBURG. That's right.

The CHAIRMAN. That then becomes a statistic certainly.

Ms. GINSBURG. That's right, and they have, but only in a limited way. The Congress has complained to them recently in oversight hearings that the NTSB has not done enough with the truck population. That is a problem.

The CHAIRMAN. Senator Schmitt?

Senator SCHMITT. Thank you, Mr. Chairman, and I thank the witnesses for their testimony.

We haven't heard from the second gentleman on your left. Does he have a comment?

Mr. GEORGE. Well, my name is Paul George and I drive for Specter Freight. The only comment I have is on the fifth wheel. It seems over the years they kept moving the fifth wheel forward. This is when you lose control of the vehicle. On icy roads or wet roads we just don't have the control of the rig, and at the same time they shrunk the cabs. We have cabs where the seat has actually worn holes in the back of the cab from the seat rubbing up and down on it. You had to put the seat clear back to get any room to steer at all.

Senator SCHMITT. Well, I frankly sympathize with the drivers' gut feeling about what's wrong with these things, and I also understand I think, in part why no statistics really are available. I don't think anybody outside the drivers themselves have really focused on the problem. The NTSB is really a Board that makes recommendations to DOT based on their investigations, and to my knowledge there have been no significant recommendations made one way or the other on the basis of the accident investigations.

I frankly don't know how many trucking accidents they have investigated in the last couple years. Do you have any idea on that?

Ms. GINSBURG. I don't know exactly how many they have investigated. Very few. They do make recommendations which I don't believe, in general, have been adopted by the DOT. The current chairman of the NTSB has said that truck accidents will receive more attention than they have in the past. They have received very little attention in the past.

Senator SCHMITT. Do you know or are you aware of whether or not some of the cab design changes have been because of the energy saving criteria?

Ms. GINSBURG. There have been design modifications to improve aerodynamics, but these are not the kind of changes that have resulted in the problems we're talking about today. There have been other problems, but not the kinds we're talking about today.

Senator SCHMITT. The new aerodynamic designs—I'm not sure what they're called in the trucking industry, have they caused any stability problems or steering problems?

Mr. MCLARTY. The cab wind breaker has created, in the cases I'm familiar with, on the cab design we have, a problem in bad weather—they cover your mirrors up. It's a hazard. It does save on fuel but it creates a safety hazard because you can't see out of your mirrors. When you roll the windows down—we are not fortunate enough to have air-conditioned trucks—there's a pocket on the side that brings the heat and fumes right back in the cab.

And about the statistics—speaking about the gentleman not having an accident—unfortunately, when we have an accident, a lot of times it's fatal and we don't get to come back and tell you this.

I'm experiencing a hip problem because, as in the picture showed you there, when I put enough air on the seat to hold me up I can't clear the cab. If I let it down where I can sit and clear the top of the cab, then I'm constantly pounding the bottom. I'm bending out with the air seat and sitting on my hips, so my legs are not taking any of my load. And I have to bend my leg in such a position that it's creating a joint problem in my hip.

But these are some of the things that we're able to tell, but the statistics on wrecks and things—I hope and pray I never have one. We do have one gentleman that is nearing retirement age who, since the weight increase on tires on the front end, has blown three front tires. Thank God he's lived through it. In one of the blow-outs he held on the road, and in two he left the road. It happened to be in Florida and the road shoulder was built in such a way that he went down and went out in the field. That accident didn't hurt him and didn't kill anybody, but we had one tire blowout that did. Just after the weight increase, a sleeper team blew a tire and went across the median and killed five people, and these things are on the record.

Senator SCHMITT. Is this the major—and all of you can answer—is this the major cause of the fatal accidents now, the front tire blowing?

Mr. MCLARTY. I think it would be a majority.

Senator SCHMITT. Is this the thing you're most concerned about, blowing out one of those front tires?

Mr. MCLARTY. This is my biggest concern.

Mr. GEORGE. My biggest concern as a driver out of Pennsylvania is that 6 months out of the year you've got icy roads to run on and you can't control the truck once it starts sliding. You've just got to go where it goes and hope it's on a shoulder where you can pull out and get going somewhere. You've got to take the curves on the inside and leave it sliding. There's no control. Even coming around the Washington beltway, when you're into the curves, if you're traveling at a safe speed, you still have to hog two lanes to control that on wet and icy days, because the truck slides on you if the weight is on that steering axle instead of on the drive where it belongs.

Senator SCHMITT. Has there been a change in tire design too for some reason that's made this worse?

Mr. GEORGE. Well, we went to radial tires, but it hasn't helped.

Senator SCHMITT. Well, under icy conditions you're probably getting more pressure melting underneath the tires, for one thing, with more weight out on the front, but you see that also on the wet roads; is that correct?

Mr. GEORGE. Yes.

Senator SCHMITT. I get the impression that your feeling is that most of the accidents now and this increase in accident rate is a result of the increased front-wheel loading and the inability for clear control within the cab, the combination of those things are causing the increase? Is that your general feeling? Is that what you think most of the drivers feel?

Mr. GEORGE. I do.

Senator SCHMITT. Maybe it's a blown tire. Maybe it's an icy road. But, nevertheless, the combination of the lack of steering authority

plus your inability to steer to begin with, the combination is causing the problem; is that correct?

Mr. GEORGE. I feel that drivers out of the terminal in my outfit all feel that this is what's giving us most of our problems. If you have a fatal accident the driver ain't there to tell you what happened.

Senator SCHMITT. What about speed? You don't have to admit to anything, but are we seeing an increase in speed above the 55 m.p.h. speed limit?

Mr. GEORGE. I couldn't answer that, if it's speed or not, but I feel it's the handling ability. Usually it's a rough situation of rain or snow when these guys are having these accidents. They lose control.

Senator SCHMITT. It's not the dry, straight, high speed road?

Mr. GEORGE. No.

Mr. MCLARTY. As I say, the driver fatigue from the smaller cabs is causing a lot more drivers fatigue. It's just like your personal car. If you have a sports car and a Cadillac, you take a trip in the Cadillac, not the sports car, because it's not as comfortable. If you're comfortable driving, you're more alert longer than you are if you're sitting there uncomfortable. I mean, in a truck that I'm comfortable in I can run the 450- or 500-mile-run that we run and feel a whole lot better than driving one of the smaller cabs where I'm cramped and I'm constantly in pain one way or another. I'm uncomfortable and I'm dodging to keep from hitting a rough place in the road to keep from jamming against the head line or I'm trying to drive defensively to keep from hitting these places, and it wears you out. This is another factor in saftey causing accidents because the small cabs are beating us to death, killing us. The cab design, the fifth wheel placement, the extra weight on the front end—you're sitting up and you have to mandhandle those things.

Speaking of the lady drivers, I don't know how some of them drive the rigs that I have to drive.

Senator SCHMITT. Well, at least they're usually a little smaller, right?

Mr. MCLARTY. Well, they're smaller and they have the comfort in there. That's true.

Senator SCHMITT. Maybe that's what they have done; maybe they have designed it for the new woman driver.

Mr. Chairman, I think at the very least that drawing on the experience I had in flying airplanes, that there is clearly a greater degree of concern in the NTSB for aircraft accidents, and I think there's a reason for that, at least a commercial accident, because there are more people involved in a single incident. However, if you look at the total picture of fatalities you're dealing with a comparable, if not greater problem with respect to the highways and trucks. It would be my hope that this committee, as a result of these hearings, will start to see the Board take a greater and more detailed interest in the investigation of the cause of an accident developing the kind of statistics that I think both you and I would like to see as we try to approach what is the best legislative remedy for some of these problems.

You can read Aviation Week every week and see—or every few weeks, and see an extremely detailed and very high quality analysis of an aircraft accident and that information is important in the development of better and safer equipment and standards. I'm not aware that you see that kind of indepth analysis of trucking accidents and I think

it's important that the Board start to concentrate on providing the Congress, as well as the trucking industry, that kind of information.

The CHAIRMAN. Thank you very much, Ms. Ginsburg and your associates.

[The attachments referred to follow:]

PROD—"TEAMSTERS UNITED FOR TEAMSTER REFORM"

PART I—GENERAL OBSERVATIONS AND SUMMARY OF RECOMMENDATIONS

We commend NHTSA for developing and inviting public comment on a 5-Year Plan for fuel economy and vehicle safety. As an organization of Teamster commercial vehicle drivers, concerned particularly with heavy truck safety (trucks over 26,000 lbs., especially combination vehicles), this innovation enables us to determine how well NHTSA is responding to its legislative mandate with respect to truck accidents.

We also appreciate that this longer range view will enable the trucking industry, both manufacturers and purchasers, to be apprised of upcoming rules, and will allow them ample opportunity to plan for timely implementation.

For truck safety standards, unhappily, the principle of early notice—timely implementation remains academic. The plan gives minimal consideration to truck accidents; it does not provide a firm basis for the reduction—even gradual—of the deaths and injuries that result from them. There may well be no fewer deaths and injuries of truck drivers at the end of five years than there are presently. The plan thus continues past neglect of this area, despite increasing truck traffic, increasing numbers of truck accident deaths, and an extraordinarily high occupational death rate among drivers of heavy trucks. We object to the plan for three reasons:

(1) It offers no specific analysis of truck-related safety problems.

(2) It contains not a single proposal to provide "occupant protection" for truck drivers. Truck drivers are included in only one car occupant protection standard. Automatic, passive protection is not proposed even on an exploratory basis.

(3) Although trucks are included in several standards aimed at *preventing* accidents, and although exploratory work will be continued in truck braking, critical areas of need are totally ignored.

Agency planners have given no specific thought to trucks and truck drivers as distinct highway populations. Truck proposals in the plan appear most frequently as extensions of auto proposals, ignoring truck safety requirements, which often dictate a different set of priorities than automobiles. The result is that truck safety standards are being developed and promulgated without regard to their role in reducing the numbers of truck accidents and the deaths and injuries resulting from them. The scheme, in this significant aspect, totally lacks balance.

We strongly urge that the agency recast the plan to include an independent component for truck regulation. This does not mean that rulemaking would then be completely consistent with the safety priorities analysis. Where auto research is relevant to truck standard setting, there is a practical reason for linking the two. But often this is not the case, and without having first conducted an independent analysis based solely on safety, the part this practical consideration should play cannot be determined.

Automobile safety standards are largely designed to protect motorists in single vehicle and multi-vehicle car crashes, and to a lesser extent, persons in car-light truck and car-van crashes. Omitted are at least five distinct types of crashes: (a) car-heavy truck; (b) light truck-heavy truck; (c) van-heavy truck; (d) heavy truck-heavy truck; (e) single-vehicle heavy truck crashes. The population of motorists exposed to trucks is largely unprotected by current standards from accidents involving trucks. The truck occupant is wholly unprotected.

We appreciate that NHTSA's concentration on automobiles (to the exclusion of trucks and truck drivers, with the exception of FMVSS 121) derives from the fact that truck accidents deaths constitute a small, though dramatically increasing, portion of the annual highway death toll. We believe this is not a sufficient reason for failing to develop a rational scheme for preventing these deaths.

NHTSA has stated that its first criterion for setting priorities on safety standard development and promulgation is "number of deaths and injuries."

While this concept is appealing if the agency accepts the adequacy of its current level of resources, it arbitrarily denies the several omitted populations an equal chance to survive highway accidents and an improved chance of avoiding them. This is an unacceptable policy. NHTSA's first criterion should be revised to include "number of deaths and injuries in each exposed population of highway users." This would allow NHTSA to give equitable consideration to truck drivers and others involved in truck accidents.

Pedestrian protection

NHTSA recognizes this principle, at least in part, in its identification of pedestrians as a population of concern. Pedestrians, like truck drivers and other victims of truck accidents, are largely unprotected by current federal motor vehicle safety standards. Although the number of pedestrian deaths annually (7,000) exceeds the number of people killed annually in truck accidents (5,000), both are relatively small groups compared to car accident victims, but truck accidents are increasing at a much higher rate. The special emphasis NHTSA accords pedestrians underscores its disregard of those killed in truck accidents.

Supervening congressional policy

The argument for according truck drivers protection as a group—distinct from the total population killed in truck accidents—must also be viewed in light of the 1971 Occupational Safety and Health Act. The purpose of the law is "to assure so far as possible *every* working man and woman in the Nation safe and healthful working conditions and to preserve our human resources . . ." Although the Act is enforced by OSHA, industries regulated by government before enactment of the law were exempted from Department of Labor standards and enforcement processes. It was the intent of Congress—upheld in many administrative and judicial decisions—that the established responsible agencies would fulfill the principles of the new law.

The trucking industry was already regulated by both NHTSA and the Federal Highway Administration. Although FHWA's authority extends only to interstate vehicles and drivers, it covers "qualifications and maximum hours of service of employees, and safety of operation and equipment."

The National Traffic and Motor Vehicle Safety Act directs NHTSA to protect the public "against unreasonable risk of accidents occurring as a result of the design, construction, or performance of motor vehicles . . . and unreasonable risk of death or injury to persons in the event accidents do occur . . ."

Clearly, both agencies share the responsibility of fulfilling OSHA's mandate with respect to the trucking industry. To the extent that safe truck design will help to assure workers in the trucking industry safe and healthful working conditions, NHTSA has an obligation under the Occupational Safety and Health Act to pursue that goal.

Consequences of neglect

The exemption of commercial motor vehicles from most federal motor vehicle safety standards, particularly occupant protection standards, is reflected in the extremely high rate of on-the-job deaths among drivers of heavy trucks. There are about 500,000 such drivers in this country; NHTSA's as yet incomplete estimate is that 954 were killed in 1977. By comparison, in the same year, 141 miners were killed out of a working population of 200,000 miners. The rate of death among heavy truck drivers is nearly three times higher, with 1 out of every 524 truck drivers being killed. A June 1978 report by two accident researchers in Wisconsin concludes that the occupational death rate among truck drivers is 9 times higher than any other occupational group in the state.[1]

Truck driver deaths are increasing at a phenomenal rate. From 1975 to 1977, NHTSA estimates that heavy vehicle driver deaths increased nearly 30 per cent; OSHA states that from 1975 to 1976, work related deaths *declined* about 13 per cent.[2] Although some drivers killed in truck accidents were self-employed, and the industry undoubtedly added workers, the occupational death rate among truck drivers nevertheless is one of the highest—perhaps the highest—in the nation.

Cost consideration

Finally, trucks are more dangerous than cars. Per hundred million miles of travel, about twice as many people are killed in truck accidents than car

[1] Karlson, Trudy A., Baker, Susan P., Fatal Occupational Injuries Associated With Motor Vehicles.
[2] Press release, Bureau of Labor Statistics, Dec. 1, 1977.

accidents.[3] More important, about 4.8 heavy truck occupants are killed annually per 10,000 heavy trucks, versus 2.4 occupants per 10.000 vehicles, for all motor vehicles combined, excluding motorcycles.[4] A safety measure taken in a truck is thus twice as likely to prevent an accident or save a life as in other vehicles. Because trucks are more expensive than cars, the safety costs are of course far smaller as a percentage of the vehicle's total costs.

We ask for an end to the existing NHTSA policy of highway traffic tirage; it is scandalous that truck drivers, and the other victims of truck accidents have been almost totally ignored, as a group, in actions thus far taken to ensure motor vehicle safety. Rapidly rising death rates, cost-benefit considerations, congressional policies and, indeed, the precedent of NHTSA's established concern for pedestrians all dictate that at least a beginning be made in allocating an equitable portion of available government resources to this obvious area for public concern.

In formulating a plan to reduce truck accident deaths and injuries, NHTSA must take a different approach than with automobiles. For the latter, NHTSA has evolved a philosophy of reduction of death and injury primarily through occupant protection measures. The policy takes account of the fact that accidents will occur, regardless of how safe the vehicles are, due to other, non-vehicle related causes. Coupled with the concentration on occupant protection is a decrease in emphasis on accident prevention through engineering improvements, although the 100 series standards continue to be added to and improved.

In seeking to reduce truck accident deaths and injuries, NHTSA must give high priority to *crash prevention* as well as to occupant protection, for three reasons. (1) An accident involving a truck is likely to have more serious consequences than a car crash—a heavy truck is ten times as likely as a car to be in a *fatal* crash during a given period of time.[5] (2) Crash prevention measures are especially important because they will protect both the truck driver and the more likely victims of truck accidents, car drivers. (3) Trucks have serious design and performance problems of a kind a degree simply not present in automobiles. These problems, which involve braking, steering, suspension, cargo loading and interior cab design, severely impair the driver's ability to respond in an emergency situation, and impose a constant strain upon him, causing deterioration of his driving alertness and abilities.

We have already underscored NHTSA's long neglect of truck occupant protection measures, In Part II, we make specific suggestions in both areas.

SUMMARY OF PROD RECOMMENDATIONS (DISCUSSED IN PART II)

(*A*) *Occupant protection*

(1) 1979: Advanced Notices should be issued extending FMVSS 201 (Interior Impact), 203 (Steering Impact) and 204 (Steering Column Displacement) to heavy trucks.

Explortory Rulemaking should be initiated to develop automatic passive protection requirements for truck drivers, comparable to FMVSS 208.

(2) Other near-term priorities: The following FMVSS should be added and/or modified to apply to heavy trucks:

FMVSS 214—Side Door Strength.
FMVSS 216—Roof Crush.
New—Extricability.
FMVSS 212—Windshield Mounting.
New—Cargo Displacement.
FMVSS 207—Seating Systems.

(*B*) *Accident prevention*

Truck Braking. As planned.
1979: FMVSS 117. Retreads should be banned on heavy truck front axles.
1979: Rear Underride Guards.
New—Low Tire Pressure Warning Device. As planned.
Truck Ride Quality. Rubber block suspension systems as currently used should not be allowed.

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[3] Interagency Study of Post–1980 Goals For Commercial Motor Vehicles, June 1976, pages IV–5, 6.
[4] Baker, Susan P. Docket Submission, June 9, 1978, re: 78–0.
[5] Baker, Susan P., Reducing Deaths and Injuries in Crashes Involving Heavy Trucks.

The following FMVSS should be added and/or applied to heavy trucks:
New—Direct Fields of View.
FMVSS 111—Rearview Mirrors.
FMVSS 108—Rear Lighting and Signalling.
FMVSS 103—Windshield Defrosting (revision).
FMVSS 104—Windshield Wiping (revision).
Improvements are needed in FMVSS 119 and 120, tire and rim standards.
A comprehensive overhaul of FMVSS 101 (Interior Dimension and Controls) is required.
A new FMVSS needs to be developed in the area of safe cargo securing measures and truck overturn.
Exploratory—Handling and Stability. Special focus should be given to 5th wheel placement.
New—Speedometer/Odometer. As planned.

(*C*) *Fire protection*

FMVSS 301—Fuel System Integrity.

PART II—SPECIFIC PROPOSALS

(*A*) *Occupant protection*

NHTSA's 5 Year Plan ignores truck occupants. Safety measures to protect heavy truck operators under the current plan would be limited to a standard improving seat belt assemblies—a detail, albeit critical, in NHTSA's list of automobile proposals. We suggest that the plan be reconsidered, and that the standards discussed below be included.

1. 1979 Rulemaking:
FMVSS 201—Interior Impact.
FMVSS 203—Steering Column Impact.
FMVSS 204—Steering Column Displacement.
FMVSS 208—Passive Protection.

Since frontal impact collisions are the most prevalent type of fatal truck accident, preventing their consequences should be NHTSA's first priority in heavy occupant protection.[6] It should come as no surprise that trucks sustain 16 percent more frontal impact fatalities than automobiles, since trucks spend more time travelling on routes with fewer intersections and turns than do automobiles.[7]

Advanced Notices of proposed rulemaking should be issued in 1979 extending FMVSS 201, 203, and 204 to trucks. At the same time, Exploratory Rulemaking should be initiated to find a means of automatic protection in frontal impacts, comparable to FMVSS 208.

FMVSS 201, 203, and 204 provide respectively for cushioning in the event of interior impacts, energy absorbing steering wheels, and limitations on steering wheel displacement toward the driver. None of these safeguards are mandated for trucks, although truck compartments are loaded with features which pose many more risks to their occupants than are present to automobile occupants. In the words of truck engineers consulted by PROD:

"The horizontal mounting angle for most heavy truck steering wheels is such that operator's lower stomachs will receive a penetrating impact in a frontal crash. In cars, the wheel angle allows a more overall engagement of the total chest area, a distributed impact, and possive restraint systems will provide an overall reduction in upper body injuries. . . . To withstand the constant vibrations of the cab environment and to control a much heavier mass, they (truck steering wheels) are also sturdier. . . . Interior impact surfaces are more solidly constructed and injury producing in truck cabs than in lighter road vehicles. These include shift levers, brake controls, etc." [8]

Detailed research on the causes of fatal injuries from truck crashes has been done by accident specialists Trudy Karlson and Susan Baker. Their conclusions were published in a paper entitled "Fatally Injured Truck Drivers," which is attached to these comments. Karlson and Baker identify "steering wheel rim and orientation" as the principal cause of fatal injuries.

In addition to extending FMVSS 201, 203 and 204 to truck tractors, NHTSA should initiate Exploratory Rulemaking in the area of passive, or automatic protections. While we fully support NHTSA's plan to improve seat belt assem-

[6] Dynamic Science, Inc. Truck Safety Assessment, June 28, 1978 page 38.
[7] Ibid., page 38.
[8] Ibid., pages 24, 44.

blies, it must be recognized that seat belts are frequently not worn by truck drivers. The three reasons commonly cited by truck drivers for not wearing belts are:

(a) Discomfort of the belt over the long periods of time they must drive due to rough ride characteristic of trucks.

(b) Grease and dirt on belts.

(c) Desire to be able to jump out of the tractor before a crash in order not to be crushed by the load, or burned or trapped in the cab.

Solutions to each of these problems are available. The grease and dirt problem could be largely solved if belts were required to be retractable. If NHTSA were to address the very real problems related to rollover, extricability in crashes, fire, and load displacement (to be discussed below), as well as to create a more cushioned cab environment through application of FMVSS 201, 203 and 204, drivers would not have cause to fear their belts.

The problem of belt discomfort should also be addressed. One frustrated seat belt user has written:

"These trucks are equipped with Bostrom air-ride seats with the fore and aft float, but the seat belt anchors to a part of the seat frame that doesn't float. This means that if the seat belt is worn snugly, as it is supposed to be, that it negates the fore and aft float action."

Were these kinds of complaints officially addressed, seat belt usage among truck drivers would increase dramatically.

Although NHTSA has undertaken extensive truck driver education of the 55 mph speed limit (with special reference to fuel economy), little has been done to teach trucks drivers about the importance of seat belt usage. This should be done. NHTSA should bear in mind, however, that until drivers' legitimate objections to seat belts are resolved, it would be fruitless to initiate an education program to alleviate irrational objections or fears.

Even with the best seat belt programs, including crucial engineering improvements and driver education, not all drivers will respond. As with automobiles, passive, automatic devices must be developed in order to ensure needed protection. Exploratory rulemaking should be undertaken to determine whether passive belts or airbags, as designed for cars, are the answers for truck cabs also. Safety analysts Karlson and Baker stated last year:

"The general position of the steering wheel makes it an obvious possibility for incorporation into a device that passively restrains a driver, whether by deploying in a crash (e.g., an air bag) or by being otherwise designed to restrict his motion at the same time that it cushions his body. The safety and effectiveness of the airbag has already been demonstrated in automobiles, making this an approach that should receive immediate and serious consideration for trucks. While the more horizontal plane of the steering wheel in many trucks, especially heavy trucks, may limit the applicability of present steering wheel airbag designs, possibly steering wheels can be redesigned to incorporate airbags and other restraints. Some steering wheels for vans are being designed to move to a somewhat more vertical plane when impacted by the driver . . ." [9]

2. Other Occupant Protection Measures:

FMVSS 207—Seating Systems.

FMVSS 216—Rollover-Extricability.

FMVSS 212—Windshield Mounting.

FMVSS 214—Side Door Strength.

New—Cargo Displacement.

FMVSS Nos. 207, 212, 214 and 216 should, with appropriate modifications, be mandated for heavy trucks. In addition, standards addressing the problems of cargo displacement during a crash and driver extricability after a crash should be developed.

FMVSS 207.—This rule, providing seat structural integrity standards, is currently applicable to both trucks and cars, but some seat designs in heavy trucks "are suspect in accident causation because of the column type construction and the tendency to cause injuries by allowing head impact with cab roofs." [10]

FMVSS 212.—This rule, providing minimum standards for windshield mounting, is not currently applicable to trucks. Ejection rates among truck drivers are high and the windshield is a major avenue of ejection. Extension of this standard to trucks would greatly reduce the risk of ejection for truck drivers as it has for automobile occupants.

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[9] Karlson, Trudy A, Baker, Susan P., Morton, Bert F., Fatally Injured Truck Drivers.
[10] Dynamic Science, Inc. Truck Safety Assessment, June 28, 1978, page 26.

FMVSS 214, 216.—These two standards ensure the structural integrity of doors and roofs. Neither standard is applicable to heavy trucks. Although the relatively high location of truck drivers contributes to the lower incidence of truck driver fatalities compared to occupants of other vehicles, a serious problem does exist in extricating truck drivers from their cabs after crashes, particularly where the truck has been struck from the side. Because of the weight and strength of many truck cab structures, rescuers must labor much longer to free truck occupants. Such delays result in many unnecessary fatalities, particularly where fire erupts. NHTSA should explore the possibility of mandating emergency escape routes, possibly through the roof, as well as rules ensuring the integrity of the existing doors when impacted during accidents. Rollover protections should also be investigated and mandated where applicable.

Cargo Displacement—New.—One major problem for truck occupants is cargo penetration of the cab. NHTSA should explore the need for structural integrity of the fronts of trailers and the backs of tractors as well as the effectiveness of existing mechanisms for securing cargo in trailers.

(B) Accident prevention

Improved truck braking is NHTSA's highest priority among standards aimed at preventing truck accidents, and we support it fully. NHTSA should move as soon as possible toward setting a stopping distance which is shorter than current FMVSS 121 requirements. Since shorter stopping distances necessitate the use of anti-lock systems, these devices should not be abandoned.

This organization has repeatedly stated that truck brake problems derive to a great extent from inadequate industry brake maintenance. The National Transportation Safety Board came to the same conclusion in an accident report issued in June. Their recommendation was self-adjusting brakes for trucks. This proposal should be seriously considered in NHTSA's proposed Exploratory Rulemaking in truck braking. Similarly, Brake Inspectability and Aftermarket Braking have obvious heavy truck implications and should not be excluded from consideration.

FMVSS 117.—Retreads are currently permitted on the front axles of heavy trucks, but not on buses. FMVSS 117 should be extended to trucks to ensure that this highly hazardous practice is eliminated.

FMVSS 119, 120.—This standard requires tire rims to fit tires described in FMVSS 119. Blowouts from various causes of rim and wheel failures due to overstressing and manufacturing defects are frequent, based on FHWA data [11] FMVSS 119 and 120 should be reassessed for their adequacy in handling maximum loads, and to consider special qualifications for tires and rims on front steering axles. In addition, FMVSS 120 should be modified to explicitly prohibit the use of multi-piece wheels. PROD lends its full support to the recent petition on this subject filed by the Insurance Institute for Highway Safety.

New—Low Tire Pressure Warning Device.—From a safety viewpoint, low tire pressure warning devices are considerably more important for heavy trucks than for automobiles, because of the increased likelihood of fatalities in truck tire blow-out accidents. We support NHTSA's plans for rulemaking in this area, especially for critical front axle tires. A warning light on the dashboard is essential to notify drivers of low presure, since drivers typically travel long distances without stopping. Durability requirements should be considered.

Exploratory—Truck Ride Quality.—Our views on this docket are well known. However, we feel there is insufficient recognition at NHTSA of the urgency of one particular aspect of the problem of severe vibrations—the rubber block suspension system. Truck drivers consistently single out these systems as a driver's nightmare, complaining specifically about Ridewell and Hendrickson models. Originally designed for off road use, the system is now purchased for highway use by many of the nation's largest trucking companies. Drivers complain that use of these suspensions causes intense physical pain and severely interferes with their ability to control the vehicle. Rubber block suspensions as currently used are improper and inherently unsafe and should be banned.

New—Direct Fields of View.

FMVSS 111—Rearview Mirrors.

FMVSS 108—Read Lighting and Signalling.

FMVSS 103—Windshield Defrosting.

FMVSS 104—Windshield Wiping.

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[11] Ibid., page 31.

New—Truck Underride Guard.

Truck visual systems need significant improvement. First, NHTSA's plan to increase viewing requirements under FMVSS 111 must take into consideration the special rear view mirror requirements of heavy trucks. Since direct sight through the center of the vehicle is generally not possible, rear viewing through outside mirrors is critical. A frequent driver complaint is that inclement weather reduces rear view mirror visibility to zero. Systems to maintain the mirrors' functioning should be investigated, as well as increased field of view.

Direct fields of view may be useful for heavy trucks which travel in cities as well as for buses. Accident data should be examined.

Curiously, NHTSA's tentative proposal to eliminate high mounted marker lights comes at a time when it is putting an increased emphasis on rear lighting in its high mounted brake lights proposal. The increased visual emphasis on brake lights will help motorists respond more quickly to vehicle stopping and starting, so that the proposed revision of FMVSS 108 makes sense. But the proposal to remove high mounted marker lights on heavy trucks seems counterproductive. They serve a useful purpose in signaling the rear approaching motorist that the vehicle in front is a truck, and will therefore be moving more slowly on an upgrade, cannot stop as quickly, will be more difficult to pass. While rear-side marker lights may also do this, they do not do so nearly as effectively and clearly. We oppose removal of the rear marker light height requirement. At the same time, we do propose that NHTSA require lighting or reflective paint on the sides of trucks, measures which would help to prevent front-to-side underrides.

Windshield defrosting and wiping standards should also be reviewed for heavy trucks. PROD receives frequent complaints that they are not adequately designed to maintain visibility when needed. One driver from California wrote us the following about the windshield wipers in use by his company.

"For some reason, International Harvester mounted the windshield wipers at the top of the windshield with the pivot on the left side and the blade level at the far right end of its arc. This means that instead of pushing the water down and to the side, the wiper pushes it to the top of the windshield, and when the blade comes back down the water follows it back down. This is bad in the rain, but it is nothing less than brutal in a snow storm. This design also leaves an unwiped area about 20 square inches directly in the line of vision of a tall driver. A third problem is that instead of one moving line, the blade, moving across the driver's line of vision, there are two, the blade and the arm."

One final comment. We note with astonishment NHTSA's proposal to delay a standard on truck underride guards until 1982–83. It is well known that the Insurance Institute for Highway Safety has itself developed an effective, functioning, life-saving underride guard. There is no reason to delay this standard beyond 1979.

For the future, NHTSA should also consider additional protection for motorists in the form of reflective paint and additional lighting on the back of trucks. Research in this area, however, should not be used to further delay the underride standard, already proven effective. Lives could be saved with present knowledge.

FMVSS 101 Interior Dimensions and Controls.—This standard needs major revisions applicable to trucks. Two fundamental problems need to be addressed. First, today's cab interiors are too cramped, and controls are placed to close together for safe operation. Driver complaints in this area are numerous and specific.

In some cabs, for instance, steering wheels are off center to truck drivers' bodies, and so close to the left side of the cab that their arms contact it while attempting to turn the wheel. In other models, a truck driver must remove his hands from the wheel while turning in order to circumvent an open wind vent. Some models are designed so that a driver must move his left foot rightward, upward and leftward before stepping on the clutch, because the base of the seat is too close to the clutch pedal to permit the normal movement.

As the following comments from drivers indicate, the above list is only the beginning of the problem:

"No cab-overs—there's no protection . . . If you're tall your knees are knocking the dashboard, if you're heavy you can't move about safely . . . Minimum cab clearances are a must . . . Some road tractors such as GMC and Chevrolet don't have enough room even for a 5 foot 9 inch driver. There should be minimum standards for head room, dash to seat back, dash to back of cab, left door to center of steering wheel, accelerator pedal distance to left of steering post . . . I believe all cabs should be uniform with enough room to be comfortable while driving and access to instrument panels should be the same in all makes of trucks so a

driver knows where every light switch is, so no one has to take his eyes off the road to find them . . . Drivers should not be squeezed against the steering wheel and the roof of the cab should be far enough from the driver's head so that he doesn't hurt his neck when thrown upward when rolling over a bump. This has happened too many times already . . . Cab size should be large enough so your knee doesn't get banged against a switch knob every time you hit a bump in the road . . ."

The need for greater standardization in truck cab design is the second fundamental problem which must be addressed in a revision of FMVSS 101.

Standardization is more important for trucks than for cars, because, "the professional truck driver, in many instances, will 'hot seat' a different vehicle quite often, perhaps twice in one day if operating on delivery service in a large urban area. In emergency situations, rapid response to highway conditions is deteriorated by non-standardization in locations and placarding of controls, of which there are several more to use on heavy trucks than lighter vehicles. Standardization should be prescribed wherever practicable." [12]

We hope to file a separate rule-making petition in this area soon. There is no reason why NHTSA could not move immediately into rulemaking to set minimum standards for cab design.

New—Cargo Securing and Vehicle Overturn.—The effects of failures of cargo securing measures and of cargo shifting, including liquid surging, can be devastating on a driver's ability to control a truck. Research has been conducted in this area, yet there are no applicable safety standards. Prevention of vehicle overturn is particularly urgent in the case of tank trucks, which often carry hazardous explosive materials. More specifically, research conducted by one group of engineers indicates that "type MC 306 cargo tanks are very likely to spill their cargo in rollover type accidents. If the cargo is gasoline or other highly flammable liquids, the potential for accident-related fatalities deserves more DOT attention. Another recent test vehicle program . . . indicated that trucks carrying flexible loads (such as hanging meat) are more likely to overturn for a given turning speed. These special types of truck vehicles require consideration of rollover as a high priority area for safety improvement." [13]

Exploratory—Handling and stability—Fifth wheel placement

Performance requirements in this area are urgently needed for heavy trucks, as they are virtually uncontrollable under certain load conditions. Special attention must be given to problems created by overloaded front axles and forward mounted fifth wheels. These problems have been exhaustively recounted by PROD in various forums, including a rulemaking petition filed with NHTSA in 1974.

New—speedometer/odometer

We commend NHTSA on its proposal to require accurate speedometers in all vehicles. FHWA currently requires that speedometers on heavy trucks are accurate only to within plus or minus 5 m.p.h. when vehicles are in use. NHTSA's new standard should consider aftermarket use as well as vehicles at the point of manufacture.

(C) protection

FMVSS 301 fuel system integrity.—1975 FARS data indicate that for both single vehicle and multi-vehicle collisions, heavy trucks had a much higher incidence of fatal fire/explosions than did passenger cars.

	Percent
Single vehicle collisions:	
Passenger cars	2.1
Heavy trucks	9.4
Multiple vehicle collisions:	
Passenger cars	1.8
Heavy trucks	3.4

These figures do not indicate which fires are due to fuel tank explosions and which to flammable cargo explosions. But fuel tank location on many heavy trucks is obviously hazardous. In many cases, tanks of several hundred gallons capacity extend nearly tire to tire right underneath the driver. The proximity to the tires and road surface, combined with an easily punctured metal surface renders these tanks extremely dangerous. We urge that fuel system integrity standards should be extended to heavy trucks, including standards for tank placement.

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[12] Ibid., page 46.
[13] Ibid., page 39.

[The following excerpts from letters were referred to on p. 33:]

The company I work for now are using the Ford Louisville, short-nosed conventional tractor, as their main power source for the twin screw tractors. These tractors have a 141 and 144 inch wheel base, all new units have radial tires, the fifth-wheel is set 14 and ½ inches in front of dead center, and they use a conventional steering and not power steering. The front axles on these tractors carry between 11,000 and 12,500 pounds varying on the weight of the load.

The interior room between the steering wheel and the rear of the cab and the dash to the clutch pedal will not allow an average person to ride in comfort. I am 5'7" tall and weigh 205 pounds and consider myself to be around the average build of most road drivers. If the seat is slid far enough back to give you room between the steering wheel and your stomach, the back of the seat hits the back of the cab everytime you hit a bump in the road. If you keep the seat far enough forward to keep from hitting the back of the cab, your stomach rubs on the steering wheel making the tractor awkward to turn and very uncomfortable and your knees hit the dash making it hard to use the clutch pedal. These tractors are equipped with Bostrum air rides and allow a lot of adjustment in the seat itself. As a result of this I drive with the seat as close to the steering wheel as possible without touching the steering wheel and the rear of the seat touching the rear of the cab to be able to control the unit. This gives me a constant pounding around my shoulders and the lower part of my back while going down the road. This has resulted in myself having quite frequent back and neck aches after running a 450 to 500 miles dispatch.

With these units being so short a wheel base and with the 5th wheel set so far forward it causes a bucking of the tractor evrytime you hit a bump making the rough ride even more apparent. This combination of short wheel base and 5th wheel set forward also makes the unit very hard to control. There is no such thing as setting back and letting the unit roll as in a passenger car, but you must stay on top of it constantly. These tractors have a very bad tendency to wander causing the driver to oversteer or understeer to keep the unit going in the right direction. They also have a tendency to follow every crack in the road. When you are running light or empty every time you hit a bump it wants to jump sideways causing it to be hard to control. On wet pavement or ice the problem is considerably more dangerous as you are on a slick surface to begin with. These short wheel based units have a tendency to overdrive the steering axle tires with the drivers when making a corner letting the steering tires slide rather than letting them grip as a longer wheel based tractor does. This is especially bad in wet weather and a driver has to be extremely cautious, otherwise he will end up jack-knifing or running over a curb.

The problems caused by carrying such heavy loads on the steering axle are numerous. In town the tractor almost requires a man to stand up to make a corner when loaded heavy because the units are so hard to turn. Most tires have a 6000 to 6400 pounds as a maximum load rating used on these tractors and you are constantly putting them under the maximum rating on the steering axle, since there are no weight laws on the steering axle, but the same tire is used on the drivers where we have a weight law of 34,000 pounds divided among eight tires allowing only 4250 pounds per tire maximum. As you can see, we have far more steering axle tire failures than driving axle tire failures. In the majority of steering tire failures, the driver can not control the unit and keep it in his lane and in many instances this results in a severe accident.

PROD: I have been employed as a road driver at Roadway Express for 18 years. Had a safety meeting last week, I was a fine driver, as my boss said, with aprox.. 1.5 million miles with out an accident. That was before I tried to trade one of the new Ford tractors we have.

I weigh 243 lbs. Extra heavy bone structer, 6'.2½"—These units are much to small for one my size. They are traded out for most all drivers over 6' tall. The wheel is about 1" to 2" in my stomach, with knees on dash. I gave the young smart alec driver foreman a hard time about this unit. So he told me to drive it or quit and go home. Which I did by blocking the left door open with a block of wood. I sit on the left side the seat, with the door strapped in place with tarp straps. Reaching over to right to hold the steering wheel. This worked fine until I got in the heavy traffic in Winston Salem, N.C. I took the block out and closed door, with the wheel down in my stomach. I ran in the bridge just out of Winston,

hitting a rough bump, with these rubber blocks back brakers. It buried the wheel in my stomach so hard that I lost my breath, when I came to myself, I was on the right shoulder of road, I threw up all over windshield, dash etc.

When I reported it in Winston terminal, they just laughed. So I went on to motel to take my time off. Was hurt so bad I did not sleep. Then they called me to come home. I went on to terminal, thinking I could drive any of the other units home without further damage to my gut. I was hooked to this same unit 87002 back home. I couldn't get my sore stomach in by the wheel. I went back to the motel to wait for some one to get in office in Atlanta, to send me to doctor. When I ask to be sent to company doctor in Winston, they told me they did not have a company doctor. That they had been instructed to send back to Atlanta in same unit. After I called Atlanta, they made arrangements for me to see a doctor—But someone had called him to tell him I was overweight—that was the reason I could not get in these tractors. When this Dr. Phillips (a stranger) came in office where I was waiting, I stood, put out my hand to introduce myself, he pulled back and his first words was, "How long have you been overweight like this?"

I weighed 268 at the time I was employed in 1959. I am 50" in chest, solid 40" in waist. My avg. weight has been around 250 since I was out of service. Not over weight for my large frame. So this Dr. Phillips said I could take you off on your high blood, and send you home on the bus if you want to do that. He said it would be a few days before he could get me x-rayed, he didn't do anything for me at all.

When I first filled out an accident report it was 12:00 midnight Saturday. Went to doctor in my own car, waited until after 4:30 a.m. on emg. treatment, was took off from work for 3 days, pills for pain, back to Co. Dr. Mon., he did make X-rays, said I would be sore for 8 or 10 more days, and I could go back to work if I thought I was not to sore.

The Co. has informed me I would not be paid my 8 hours layover pay, or my hotel bill while I waited to see doctor.

I was 24½ hours seeing the first Dr. Check with almost anyone in Winston Shop as to my bruises and throwing up in the unit—by blood pressure checked in Atlanta was 156/90—Record at Dekalb Gen. Hosp., Decatur, Ga.

Mr. Charles Blackburen Kernersville shop checked conditions on N.C. how I drove the same unit home, still hooked and waiting for me from Thursday until Saturday. Tied door open about a foot—proped with block—all the way out from under steering wheel. Hanging on seat with right leg, held by seat belts.

I only have 5 months to retire, but I will get people to know of your good job. (PROD)

P.S. After writing this—I also got a warning letter for driving with door open. Most all log & dump trucks here in this Georgia heat, takes doors off. I also got a warning letter for writing up headlights need adjusting.

"Also they bought 150 Road Boss Whites, talk about no room in the cabs. And they put in an oil barrel in the cab too—no room for my suitcase. I can't see out of the windshield unless I sit on the seat with out any air on it. No room for your foot to get to the fuel peddle unless I go down sideways and then if I have to brake fast, the shoe gets caught under the brake peddle. Talk about safety, Ha."

" . . . The particular bane of my existence is the '74 International Harvester West Coast Cabover model. (I believe later models are the same; '74 was the last year my employer bought equipment.) It is almost as if the engineers went out of their way to see how miserable they could make them.

The driver is needlessly squeezed into an uncomfortably small space. I say needlessly because Delta Lines uses all Cummins 350s and these tractors have a BBC of 51". The engine sticks out a foot behind the cab. There is, of course, no way that this space can be used for cargo, and boy, would that extra foot of length make the cab a hell of a lot more liveable. (The last time I checked Peterbilt, Kenworth, and Freightliner all made a 63" BBC nonsleeper cab which just comes to the back of a Cummins N series block, but I.H.C. does not.)

Then to make matters worse, there is a false back behind the seat that prevents you from using the back 4" of the cab. I.H.C. has partially compensated for this short fore-and-aft dimension by installing a seat with only 1" of padding in the seat back. This doesn't help the riding qualities any.

This particular year model doesn't have the problem of insufficient clearance between the wheel and the seat (that you attribute to Ford's LN models.) Earlier I.H.C.'s like your '66 and '67 did.) But they solved the problem not by moving the seat back, but by moving the wheel forward until it is now too far forward in relation to the pedals and you either have your legs scrunched up or have to stretch for the wheel.

1974 is the year that I.H.C. switched to a suspended clutch pedal and narrowed the foot-well space by 2" creating several new problems. Because of the location of the brake pedal and dimmer switch the only place you can rest your left foot on the floor is directly under the clutch pedal. You can move it only about 1½" sideways and ½" to 1½" fore-and-aft depending on the clutch adjustment. This puts your shin right up against the edge of the clutch pedal which is so sharp it prompted one of drivers to tell the road boss that he had chopped wood with axes that were duller than the clutch pedal. I believe that the later models have been rounded off slightly, but they still present a real hazard in case of the slightest accident.

To get your foot on the clutch pedal you have to lift it up past the dimmer switch and then twist it to the side around the clutch pedal, hitting your knee against the steering wheel. After reading your article in issue 29, I tried a Ford LN7000, and with my short legs, had no trouble with the clutch and steering wheel, but I do in the '74 I.H.C. This truck is equipped with a Bostrom air-ride seat with the fore-and-aft float feature (without which a driver's back wouldn't survive a week) and when the seat floats forward and stays there the driver's left foot is trapped under the clutch. The one time I have had to make a full panic emergency stop, I couldn't clutch and didn't dare take my hands off the wheel to slip the transmission out of gear. It finally killed the engine but in doing so, somewhat diminished my breaking effort.

The housing for the trailer brake control is in a perfect place to crack hell out of the driver's right kneecap when the seat floats forward in an emergency stop. Previous models had the housing in the dash and did not present this problem.

A similar problem exists on the left side of the steering wheel for units equipped with the original model Sangama Tachographs. If you set the turn signal control housing at a low enough angle to clear the door of the tachograph, then the control lever would jab your left knee when you de-clutch with the lever in the left turn position. We had this problem with our '71 and '27 models but in '74 switched to the small round tachographs which eliminated this problem.

As mentioned above, these trucks are equipped with Bostrom air ride seats with the fore-and-aft float, but the seat belt anchors to a part of the seat frame that doesn't float. This means that if the seat belt is worn snugly, as it is supposed to be, that it negates the fore-and-aft float action.

The air tank bleed valves are located so that it is necessary to crawl under the fuel tanks to operate them. Drivers and fuelers simply will not do it.

Last, but far from least, is the windshield wipers. For some reason, undoubtedly connected with manufacturing cost, I.H.C. decided to regress 20 or 30 years and mounted the wipers at the top of the windshield with the pivot at the left side and the blade level at the far right end of its arc. This means that instead of pushing the water down and to the side, that the wiper pushed it to the top of the windshield, and when the blade comes back down the water follows it back down. This is bad enough in the rain, but nothing less than brutal in a snow storm. This design also leaves an unwiped area about 20 square inches directly in the line of vision of a tall driver. A third problem is that instead of one moving line (the blade) moving across the driver's line of vision, there are two—the blade and the arm.

There were so many driver complaints when these tractors were put into service that I.H.C. sent a factory rep around. I and other senior drivers had him for an hour. He listened patiently, made lots of notes and promised to contact us personnally after taking our complaints back to the factory. We never heard a word.

In subsequent discussions with Delta's safety department, I was told politely, but firmly, that Delta would not spend extra to air suspension or even for bottom pivoted windshield wipers.

Incidentally, I disliked this tractor so much that I did a short line run assigned an old sleeper cab tractor primarily to get away from this '74 model."

The CHAIRMAN. Our next witness is Bennett C. Whitlock, president, American Trucking Associations.

STATEMENT OF BENNETT C. WHITLOCK, PRESIDENT, AMERICAN TRUCKING ASSOCIATIONS; ACCOMPANIED BY EDWARD V. KILEY, ASSISTANT TO THE PRESIDENT FOR POLICY, PLANNING AND DEVELOPMENT; AND LARRY W. STRAWHORN, DIRECTOR, ENGINEERING DEPARTMENT

Mr. WHITLOCK. Thank you, Mr. Chairman. I am Bennett C. Whitlock, Jr., president of the American Trucking Associations, Inc. Accompanying me today are Edward V. Kiley, assistant to the president for policy, planning, and development; and Larry W. Strawhorn, director of ATA's engineering department.

Mr. Chairman, we have filed a statement with the committee which I would ask be made a part of the record and, in addition, we have filed a summary of the written statement and I would like for it to be in the record as read because in the interest of time I will not even cover all the points made in summary.

Let me reiterate that the trucking industry is opposed to a legislative solution to this extremely technical and complex subject, particularly while it is still under study by the Bureau of Motor Carrier Safety in MC–79.

The CHAIRMAN. What's the date that you expect them to come out with a rule on that?

Mr. WHITLOCK. Mr. Chairman, I do not know. I cannot predict it.

The CHAIRMAN. It's quite obvious there won't be any legislative solution to this issue this year because we are so far along in the year. It would be just simply impossible this year. So I was wondering whether that study would be completed and the process completed at an early time next year.

Mr. WHITLOCK. I would seriously doubt Mr. Chairman, that they would complete it by the first of next year. As I said, it really is an extremely complex subject. I would think that 1 year would be too much of a limitation. I certainly think it should be completed in 2 years.

The CHAIRMAN. You have had an opportunity to hear the testimony of Ms. Claybrook of DOT and Mr. Durham of the teamsters. What is your response to their statement that there's no evidence for your fears that this legislation would have an adverse economic impact upon the industry?

Mr. WHITLOCK. Well, Mr. Chairman, I was delighted to hear the DOT is changing their position and will be in favor of longer vehicle lengths. That has not been the case in the past. In addition, I can only tell you that we have had much more experience in State legislatures in seeking length increases and our experience is that it is extremely difficult to get increases.

In fact, in 1978 we sought length increases to 60 feet in eight States and in seven States it did not even go to the floor of the legislature and in one State New York, as Mr. Durham said, Governor Carey vetoed the legislation.

The CHAIRMAN. You said in your statement that this bill would increase the cost of trucking by 13 percent. Presumably that reflects the fact that it takes nine 40-foot trailers to carry the same freight as eight 45-foot trailers. Is that correct?

Mr. WHITLOCK. That's correct.

The CHAIRMAN. Elsewhere in your statement you said this bill would reduce trailer size in 25 States and D.C. unless those States changed their length laws. In the other 25 States trailer size would be unaffected. Is that correct?

Mr. WHITLOCK. That's correct.

The CHAIRMAN. Can you estimate what percentage of total truck freight would continue to be carried in 45-foot trailers under S. 3431?

Mr. WHITLOCK. Well, of course, under this bill we have no idea because it depends on what the States do on overall length laws.

The CHAIRMAN. You can't estimate it exactly but it certainly would be something substantially higher than zero, so it would have an economic impact and your figure would have to be changed?

Mr. WHITLOCK. Absolutely.

The CHAIRMAN. Your figure of 13 percent would have to be reduced by whatever proportion of the U.S. freight would be unaffected by the bill in order to get the true increase in the cost of trucking?

Mr. WHITLOCK. Not necessarily, Mr. Chairman. We have system carriers. It only takes one State to block the use of a 45-foot trailer by a system carrier. In other words, in a system carrier, if any State does not go to 45-foot and 60-foot, the carriers would have to load to the lowest capacity.

The CHAIRMAN. I must say I don't agree with you on that. I think they are better managers than that. They would find some States that they could operate the higher capacity and arrange their scheduling accordingly, just like the airlines do. You have a lot of airports in this country that can't handle wide bodied jets. They haven't all gone to narrow-bodied jets simply so they can land on every airport in the country.

Mr. WHITLOCK. Yes; but, Mr. Chairman, that in itself would increase the cost of trucking. It would mean breaking down the units for a system carrier so that they could go through a State which had a 40-foot length. I agree with you that it could be done, but again, it would increase the cost of the operation.

The CHAIRMAN. We're in the middle half of a vote right now, so I will have to go over and vote. The committee will stand in recess for about 10 minutes.

[Recess.]

The CHAIRMAN. The committee will come to order.

You say that this bill would increase trucking costs by 13 percent and increase fuel use by 9.3 to 11.1 percent. Why are those figures different?

Mr. WHITLOCK. The cost includes, Mr. Chairman, increased maintenance, more drivers, all the other factors other than fuel.

The CHAIRMAN. So that the fuel is the big percentage but not all of the cost that would be involved?

Mr. WHITLOCK. That's right.

The CHAIRMAN. You say that it's unlikely that States would change their length laws. Is this true for every one of the 25 States plus District of Columbia or are there some that are more likely to change than others?

Mr. WHITLOCK. Well, Mr. Chairman, on that particular point, in 1976 there were six States that went to 60 feet overall accommodation length.

The CHAIRMAN. When?

Mr. WHITLOCK. In 1976. Two of those also have 65 feet overall combination length limit for twin trailers. Since then, we have gone to eight States and been turned down, and as I said before, in seven States and by a gubernatorial veto in New York.

Mr. Chairman, the legislative history of our attempt to get twin trailers at 65 is even worse than our attempt to get 60 feet and we have put together a recent history of legislation introduced in State legislatures to permit 65-foot twin trailer combinations and I'd like to put that into the record if I may.[1]

The CHAIRMAN. It will be made a part of the record.

But if all of the States did change, then this bill would have little impact on trucking costs; is that correct?

Mr. WHITLOCK. Well, yes, if all the States changed.

The CHAIRMAN. And if some changed, then the impact of course would be less, the cost would be lessened below the figure that you have estimated.

Mr. WHITLOCK. But going back to the statement I made before, except with the system carriers. One point I'd like to make, Mr. Chairman, is in seeking 65 feet we have been very unsuccesful and the idea that we could get 72 or 73 feet just to us is politically unrealistic.

The CHAIRMAN. In your prepared statement you indicated that the concept of applying length limits to trailers, semitrailers, or combination trailers has merit but not in the context of overall length limitations. Does this mean you would favor eliminating State overall length laws at the congressional level?

Mr. WHITLOCK. Our position, ATA's position, is that we do not believe that lengths should be a matter of Federal statute. Because of the regional characteristics, length limits are better left to the States. However, if the Congress in its wisdom should move in that direction to not have this flaw in the concept as I have stated, the Congress would have to mandate to the States that no longer would there be any combination length limits, that you could only specify limits on trailers or the cargo-carrying units only, and I would also suggest that one of the studies, the Interagency Study on Post-1980 Goals, they say the legislation should also include the recommendations included in that study that minimum semitrailer lengths should be a minimum of 45 feet, and the minimum for a trailer used in combination should be 28 feet. That would be a necessity to protect the present operations of the trucking industry.

The CHAIRMAN. Under what circumstances do you perceive the increased usage of the so-called cab-under tractor?

Mr. WHITLOCK. Mr. Chairman, to me, even the somewhat discussion of that unit is preposterous. There are only two of them.

The CHAIRMAN. Only two vehicles?

Mr. WHITLOCK. Only two of them, and I'm more or less convinced that it's more of a publicity gimmick on the part of the manufacturer. The industry has no inclination to move to that. There's no interest whatsoever. It's an aberration and, as I say, there are only two.

The CHAIRMAN. What purpose are they used for, those two?

Mr. WHITLOCK. I have no idea. I understand, and Mr. Durham said it and I have seen the picture, that there is a carpet manufacturer and

[1] See p. 75.

supposedly he has bought it. I think the other unit is still owned by the company that manufactured it. I'm not positive. I don't want to be held to that.

The CHAIRMAN. What has been the industry trend in the use of cab-over-engine tractors over the last 15 or 20 years?

Mr. WHITLOCK. The trend is no different today than it was I think in 1968, Mr. Chairman. In the full statement I have a chart which details the percentage. In 1968 the breakdown that we have is the conventional cab was 63.5 percent; the cab-over-engine was 36.5; and in 1977 it's 62 percent for conventional and 38 for cab-over.

The CHAIRMAN. So you apparently don't see any relation to cab-over with respect to weight increases.

Mr. WHITLOCK. No.

The CHAIRMAN. What are the advantages of the cab-over? Why did they go to the cab-over?

Mr. WHITLOCK. Mr. Chairman, may I ask my engineer to answer that question?

The CHAIRMAN. Sure.

Mr. STRAWHORN. Well, certainly the advantage of being able to carry the longer trailers within an overall length limit, that's one of the advantages. Along with that, you have better maneuverability. So when you get a long trailer in the city where you have to do a lot of maneuvering, the cab-over is an advantage. It's an advantage for maintenance because once you tilt the cab you can see the engine, the transmission, the brakes, the axles, and everything else, instead of just the engine, and all of that equipment is readily accessible to you. So there are operational advantages. There are terminal advantages. One consideration is a lot of fleets have covered facilities where they literally drive the whole tractor and trailer underneath the cover. In New York City and places like that where property is at a premium, where those things have been in existence for a long time, it takes a cab-over-engine to fit inside. So size is an advantage and then also certain accessibilities are an advantage.

The CHAIRMAN. What is your response to these drivers that you heard this morning talk about the cramped conditions that they are in, the heat conditions, the inability to control, the moving forward of the fifth wheel, and so on? It would seem to me that this would not be in the best interests of—this kind of condition would not be in the best interests of the trucking association.

Mr. WHITLOCK. Mr. Chairman, I don't disagree with that and this is why I say that at this particular time we do not know what should be the minimum cab dimensions to allow driver comfort and driver safety. That is the whole purpose of MC–79. Now I do quarrel with some of the statements they made concerning the fifth wheel. I said in my summary that this legislation, unlike what the proponents allege, would actually move the fifth wheel forward further than it is on the 40-foot semi. Now certainly a certain amount of weight forward is an advantage. As I understand it, a certain amount of weight forward improves steerability; it does not hinder it. This is an engineering question and, not being an engineer, if you would like a definitive answer on it, I would again turn to the engineer.

The CHAIRMAN. Has your association studied that precise problem from an engineering standpoint to see where the optimum position is? You heard the problem this morning on the front tire blowouts. Ob-

viously that's certainly an undesirable situation from you association's standpoint.

Mr. STRAWHORN. I couldn't agree more; it certainly is, and we have work going on now and we have done work in the past. In our full statement you will see, for example, results of tests that we cooperated with the National Safety Council, where during their winter driving hazards tests in four programs separated by about 20 years, we studied fifth wheel advance, putting the fifth wheel ahead of the axle. The range of advance studied under those tests was somewhere in the neighborhood, short of looking it up, of a 3- or 4-foot variation, and in those four tests over 20 years by different drivers with different vehicles there was never any handling problem found. With the fifth wheel right over the axle, the vehicle handled as well as it did when we had a greater advance. There were indications that the advance was advantageous, but the data weren't clear enough to say whether it was or was not. Certainly it was clear enough to say there was no disadvantage.

The CHAIRMAN. If there is no disadvantage, why is it when these people who have the flexibility in moving that wheel, they move it back when they get into a State where there's no restriction? Why would a driver want to do that if there's no advantage?

Mr. STRAWHORN. If he can stretch his whole vehicle out, it might be that his particular vehicle with his suspension and whatever trailer he has might ride better. There could be several reasons for that, but it varies by vehicle.

The CHAIRMAN. The only drivers that I have talked to—and I have talked to a few of them—have told me that when they can get that fifth wheel moved back further they have better control than when it's moved forward over the axle ahead of the axle.

Mr. STRAWHORN. And that's the very thing we have never been able to find theoretically or in actual tests. Advance placement of the fifth wheel in terms of handling has always seemed to be optimal.

The CHAIRMAN. All right. Thank you very much, gentlemen. We appreciate your being here.

[The statements and attachments referred to follow:]

SUMMARY OF STATEMENT OF BENNETT C. WHITLOCK, JR., PRESIDENT, AMERICAN TRUCKING ASSOCIATIONS, INC.

Mr. Chairman and members of the committee; I am Bennett C. Whitlock, Jr., president of the American Trucking Associations, Inc (ATA). ATA, with headquarters in Washington, D.C., is the national organization of the motor carrier industry. Accompanying me today are Edward V. Kiley, Assistant to the President for Policy, Planning and Development, and Larry W. Strawhorn, Director of ATA's Engineering Department.

We deeply apreciate the opportunity to appear before this committee in opposition to S. 3431. This legislation being prompted under the guise of truck safety reduces the productivity of the trucking industry and flies in the face of the President's energy conservation policy.

The bill would withhold all federal-aid highway funds from states which do not set limits on the length of truck trailers or trailer combinations. It would also mandate that where state laws limit overall truck lengths they must include the trailer length plus a minimum of 15 additional feet.

The practical effect of these provisions would be a reduction in the commonly used 45-foot semitrailer to 40 feet in 25 states plus the District of Columbia, unless those states are willing to increase their present vehicle length limits—an extension which, to be realistic, is highly unlikely. It would also effectively ban 27-foot twin trailer operations—the safest and most energy-efficient unit of production used by the trucking industry—in 24 of the 31 states where such equip-

ment is now permitted, unless those states are likewise willing to increase their present overall limits on truck lengths. It should be pointed out we have included in the seven states which allow lengths greater than 72 feet, Idaho, Montana, Nevada, Utah and Washington. These states permit the greater lengths by annual permit. It is not clear what effect this legislation would have on these special over length permits.

If a state were to enact a semitrailer length limit of 45 feet, it could *not possibly* have an overall combination truck length limit of less than 60 feet, although 25 states and D.C. currently have lesser limits. Our experience in seeking increased lengths in state legislatures indicates that most of the affected states, faced with having to exceed their present 55-foot overall truck length limit or with requiring shorter semitrailers, would obviously choose the latter and comply with the bill by limiting semitrailers to 40 feet.

A similar situation applies to twin or combinations of semitrailers. The typical twin-trailer unit consists of two 27-foot trailers with a 3-foot drawbar connecting the units, giving the two trailers a total length of 57 feet. Adding another 15 feet for a tractor to pull the two trailers, as the bill would require, results in an overall length of 72 feet. Only 7 states permit twintrailer combinations longer than 70 feet either by statute or special permit.

(Attachment No. 1 of my full statement diagrams how the legislation would affect typical tractor-semitrailer combinations now in use. Attachments 2 and 3 show how states would be affected.)

Therefore, the motor carrier industry represented by ATA is adamantly opposed to this legislation. Our opposition is threefold:

(1) *Inflationary impact on the U.S. economy.*—The legislation would have the effect of reducing the cargo-carrying capacity of trucks, thereby increasing the cost of trucking operations by almost 13 percent. To haul in smaller trailers the same amount of freight now being transported means hiring more drivers, buying more trailers and tractors to pull them, more fuel consumed, larger terminals to load and service the increased number of vehicles, more traffic on the highway. This would add hundreds of millions of dollars to the cost of shipping goods and materials at a time when the nation is already struggling with extremely high rates of inflation. The industry would be forced to pass these increases on to consumers in the form of higher freight rates.

(2) *Increased fuel consumption.*—The legislation would be at complete odds with the President's energy policy and the commitment of the trucking industry to reduce fuel consumption. It would force the motor carrier industry to increase fuel by 9.3 to 11.1 percent simply to haul the same amount of freight.

(Attachments 4 and 5 of my full statement show current cargo-carrying capacity for typical truck combinations and the increased number of trips required if that carrying capacity is reduced.)

(3) *No positive impact on highway safety.*—Though its proponents allege that longer truck tractors are safer, the bill in no way prohibits continued use of shorter tractors. Proper cab dimensions, moreover, are now the subject of a rulemaking proceeding by the U.S. Department of Transportation. Until it's determined on a scientific and engineering basis what practical cab dimensions should be, it is premature to give this bill serious legislative consideration.

In the time I have remaining, let me detail some additional concerns:

The legislation involves an extremely technical and complex subject (trailer length), especially in its application to the diverse operations provided by the various specialized motor carriers within the trucking industry. There is little relationship between the size of today's conventional truck tractors and the 15 foot minimum specified in the bill. This minimum 15 foot requirement seems to have been picked at random with no scientific or engineering basis for its inclusion. One of the significant problems of the bill is that the correct dimension for vehicles used by a tank carrier will not be the correct dimension for vehicles used by a general freight carrier or a cattle hauler or an automobile transporter or any of the other specialized carriers in today's trucking industry. Cab dimensions, as I mentioned, are now the subject of a major proceeding (MC–79) being conducted by the DOT's Bureau of Motor Carrier Safety.

The concept of applying length limits to trailers, semitrailers or combinations of trailers has been advanced solely in the context of no overall limit on vehicle lengths. The concept has merit in that it would regulate the size of the cargo-carrying unit but leaves truckers free to use the kind of power unit (tractor) best suited to their individual operation. By introducing a second factor, an overall vehicle length limit, the concept becomes badly distorted. S. 3431 contains this basic flaw. The ATA Executive Committee considered the general subject of

this legislation last year. Although the Committee endorsed in principle the idea of length limits that would allow truck operators to utilize power equipment of a size and type that is most practical for their respective operations, it voted to oppose implementing the concept. The Committee concluded among other things that it would be totally unrealistic to expect the 50 states plus the District of Columbia to give up controlling the overall length of vehicle combinations using their highways. ATA's Executive Committee was also concerned that the concept would be used to curtail industry utilization of cab-over-engine tractors.

The so-called grandfather clause in S. 3431 offers little protection to the industry. It applies only to present equipment and as the older equipment is phased out, the industry would be forced to buy shorter trailers. The trucking industry's rolling stock is replaced fairly rapidly so in a few years the ban would be virtually complete.

Perhaps the major point made by proponents of this legislation is that the weight increases contained in the 1974 Federal-Aid Highway Act fostered longer trailers at the expense of cab side. This is inaccurate. The trend toward purchases of trailers longer than 42½ feet began long before passage of the 1974 law. It resulted from the changing complexion of the traffic which the trucking industry was called upon to serve. With the rail embargo of less than car load traffic, particularly shipments of less than 15,000 pounds, the trucking industry became the major carrier of small shipments. The light bulky nature of these shipments created a situation where the carriers were cubing out before weighing out, hence the necessity of longer trailers. I have a chart in my full statement detailing this trend toward trailers longer than 42½ feet and the Federal-Aid Highway Act of 1974 had absolutely nothing to do with this trend.

While the bill implies that the conventional truck tractor is safer to drive than the cab-over-engine tractor, this is an extremely questionable proposition. Typical cab-over-engine tractors, moreover, are not getting smaller as Senator Kennedy has suggested. They are getting larger, and I have submitted data to that effect. A recent driver opinion survey found 58 percent of the long-distance drivers surveyed preferring cab-over-engine tractors to conventional units.

The bill would actually increase the amount of forward offset ahead of the drive axle for the fifth wheel—the device which connects the trailer to the tractor—although proponents of the bill hope to achieve the opposite effect. (See Attachment No. 6 in my full statement.) In any case, the bulk of engineering studies indicate it is important for vehicle control to have a certain amount of fifth wheel offset.

Proponents of this bill argue that the legislation will reduce front axle loading. Steering axle weights were recently studied thoroughly in the Section 210 Steering Axle Study called for by the Federal-Aid Highway Act of 1976. It found while only a small percentage of all present commercial vehicles have front axle loadings of 10,000 pounds or higher, equipment is available and being used which can safely carry that load and more. In addition, the National Highway Traffic Safety Administration and the Bureau of Motor Carrier Safety both have standards and regulations in force to eliminate unsafe axle loading practices and they also have the means to enforce them. These standards and regulations are applicable to the manufacturers and to the carriers.

Mr. Chairman, in addition, I would simply like to make just a few brief remarks concerning the citation of various government studies as endorsing this legislation. I have referred to these various studies extensively in my full statement. Suffice it to say that in each case the studies recommended limiting the state lengths to cargo-carrying units only. They do not discuss trailer length in the context of a state also maintaining an overall combination length limit. Also, Senator Kennedy, in a statement on the floor of the Senate, cited Fleet Owner Magazine as one who supports his legislation. I would like to introduce for the record a copy of an editorial denying any such endorsement.

In conclusion, Mr. Chairman, let me reiterate that the trucking industry is opposed to a legislative "solution" to this extremely technical and complex subject, particularly while it is still under study by the Bureau of Motor Carrier Safety in MC–79.

Thank you again for the opportunity to testify.

STATEMENT OF BENNETT C. WHITLOCK, JR., PRESIDENT, AMERICAN TRUCKING ASSOCIATIONS, INC.

Mr. Chairman and Members of the Committee: I am Bennett C. Whitlock Jr., president of the American Trucking Associations, Inc. (ATA). ATA, with head-

quarters in Washington, D.C., is the national organization of the motor carrier industry. Accompanying me today are Edward V. Kiley, my assistant for policy, planning and development, and Larry W. Strawhorn, director of ATA's Engineering Department.

We deeply appreciate the opportunity to appear before this committee on S. 3431, legislation which involves an extremely technical and complex subject, especially in its application to the diverse operations performed by the various specialized motor carriers within the trucking industry.

On August 18, Senator Kennedy introduced S. 3431 following a discussion of truck and trailer lengths during debate on the Federal-Aid Highway Act of 1978 (S. 3073). The Senator's bill, which we understand is primarily supported by the Teamsters Union, would withhold all federal-aid highway funds from states which do not apply vehicle length limits exclusively to semitrailers, full trailers or trailer combinations. It also mandates that where state laws limit overall truck lengths they must include the trailer length plus a minimum of 15 additional feet. A final proviso in the bill is that trailers in use at the time the legislation is passed may continue in service even if they exceed new state length limits, but all new trailers put in service must meet state limits.

Among the significant problems created by the bill is that what may be the correct dimension for a tractor-semitrailer used by a tank carrier may not, for example, be the right one for a general freight carrier, or a cattle hauler, or an automobile transporter, or any of the other specialized carriers in today's trucking industry.

Last year the ATA Executive Committee considered the general subject of this legislation. Although the Committee endorsed in principle the idea of length limits that would allow truck operators to utilize power equipment of a size and type that is most practical for their respective operations, it voted to oppose implementing the concept. The Committee concluded among other things that it would be totally unrealistic to expect the 50 states plus the District of Columbia to give up controlling the overall length of vehicle combinations using their highways. ATA's Executive Committee was also concerned that the concept would be used to curtail industry utilization of cab-over-engine tractors.

The idea of limiting the length of trailers, semitrailers or combinations of trailers has merit solely in the context of no overall limit on vehicle lengths. That permits a state to regulate the size of the cargo-carrying unit but still leaves truckers free to use the kind of tractor best suited to their operation. By introducing a second factor—a limit on overall vehicle length—the argument in favor of limiting only the cargo-carrying unit is badly distorted.

The legislation under consideration today contains this basic flaw. It provides that states may continue to set overall vehicle length limits so long as the overall length exceeds by a minimum of 15 feet the state length limit on trailers, semitrailers or trailer combinations. Saddled with that proscription, the legislation would have a devastating inflationary impact on the economy, set back the nation's efforts to conserve energy and create havoc for the thousands of shippers and communities served by the American trucking industry.

Therefore, the motor carrier industry represented by ATA is adamantly opposed to this legislation. Our opposition is threefold:

(1) *Inflationary impact on the U.S. economy.*—The legislation would have the effect of reducing the cargo-carrying capacity of trucks, thereby increasing the cost of trucking operations by almost 13 percent. This would add hundreds of millions of dollars to the cost of shipping goods and materials at a time when the nation is already struggling with extremely high rates of inflation. Although the ban would take effect gradually as older equipment is phased out and new trailers put in use, the trucking industry's rolling stock is replaced fairly rapidly. In a few years the ban would be virtually complete.

(2) *Increased fuel consumption.*—The legislation would also be at complete odds with the President's energy policy and the commitment of the trucking industry to reduce fuel consumption. It would force the motor carrier's industry to increase fuel use by 9.3 to 11.1 percent simply to haul the same amount of freight.

(3) *No positive impact on highway safety.*—Though its proponents allege that longer truck tractors are safer, the bill in no way prohibits continued use of shorter tractors. Proper cab dimensions, moreover, are now the subject of a rulemaking proceeding by the U.S. Department of Transportation. Until it's determined on a scientific and engineering basis what practical cab dimensions should be, it is premature to give this bill serious legislative consideration.

THE PRACTICAL EFFECT

The practical effect of the bill would be a reduction in the commonly used 45-foot semitrailer to 40 feet in 25 states plus D.C., unless those states are willing to extend their present vehicle length limits—an extension which, to be realistic, is highly unlikely. It would also effectively ban twin 27-foot trailer operations—the safest and most energy-efficient unit of production in current general use by the trucking industry—in 24 of the 31 states where such equipment is now permitted, unless those states are likewise willing to increase their present overall limits on truck lengths. It should be pointed out we have included in the seven states which allow lengths greater than 72 feet, Idaho, Montana, Nevada, Utah and Washington. These states permit the greater lengths by annual permit. It is not clear what effect this legislation would have on these special over length permits.

Senator Kennedy's legislation would, by threatening to withhold highway funds, incorporate vehicle length limits for the first time into the federal size and weight limits governing vehicles operating on the Interstate Highway System. In response to the bill a state would have three options. It could: (a) make no change in its law and forfeit all federal highway monies; (b) enact a length limit on trailers only; or (c) enact a length limit on trailers in conjunction with a maximum tractor-semitrailer combination length limit that must exceed the trailer length limit by 15 feet or more.

Option (c) is the only real choice, however, because *all* states now have in effect overall tractor-trailer combination length laws and it is unrealistic to believe these will be changed. If a state were to enact a semitrailer length limit of 45 feet, it could *not possibly* have an overall truck length limit of less than 60 feet, although 25 states and the District of Columbia currently do have lesser limits. Our experience in seeking increased lengths in state legislatures indicates that most of the affected states, when faced with having to exceed their present 55-foot overall truck length limit or with requiring shorter semitrailers, would obviously choose the latter and comply with the amendment by limiting semitrailers would obviously choose the latter and comply with the amendment by limiting semitrailers to 40 feet.

A similar situation applies to twin or combination semitrailers. A state could enact an overall combination length limit for twin trailers plus tractor, but again, it must be at least 15 feet longer than the limit on the twin trailers. The typical twin-trailer unit consists of two 27-foot trailers with a 3-foot drawbar connecting the units, giving the two trailers a total length of 57 feet. Adding another 15 feet for a tractor to pull the two trailers, as the bill would require, results in an overall length of 72 feet. Only 7 states permit twin-trailer combinations longer than 70 feet either by statute or special permit.

See Attachment No. 1 for diagrams indicating how the legislation would affect typical tractor-semitrailer combinations now in use.

STATE TRUCK SIZE LAWS

Attachment No. 2 shows the overall truck and trailer combination length limits in effect in all states today. It also shows these limits vary from state to state to meet local conditions, regional economic needs and states' own evaluation of their specific highway safety requirements. States clearly are not going to give up this historic right to control overall length limits even if the reason is solely to increase the size of the driver's compartment.

To avoid sacrificing their entire federal-aid highway funds, states will have little recourse but to reduce trailer length limits to conform to the bill. It is politically unrealistic and legislatively unfeasible to believe that states will *increase* their combination length limits.

Rather than tamper with their limits on overall vehicle length, they will simply mandate use of shorter, less productive truck trailers. Attachment No. 3 shows in which states truck trailer sizes would have to be reduced as a result of the bill's enactment.

ECONOMIC IMPACT

In general terms the economic impact of forcing the trucking industry to use smaller trailers would be extremely detrimental, causing a ripple effect throughout the economy. Trucking is the dominant mode of freight transportation in the country today. Any action which increases the cost of trucking operations will be reflected in the retail of consumer price of all commodities transported by truck. The effect would be especially harsh on food prices which are already a

principal component of our inflation. For example, trucks haul 88 percent of all fresh fruits and vegetables delivered to 41 major U.S. cities, over 90 percent of all agricultural products from farm to initial markets, 99 percent of all livestock, poultry and poultry products. In short, the legislation would create a tremendous cost-push inflationary pressure at a time when the nation is already struggling with a high rate of inflation.

In specific terms, substituting a 40-foot trailer for a 45-foot trailer means an increase of 12.9 percent in the number of truck trips necessary to haul the same amount of freight. Reducing the length of twin-trailer combinations results in an even larger jump in the number of extra trips required to haul the same amount of freight. By forcing motor carriers to substitute two 23½-foot twin trailers for the more commonly used 27-foot units, the legislation would cause a better-than-15-percent increase in additional truck trips. Attachment No. 4 shows the carrying capacity and fuel use for typical truck combinations hauling general commodity freight, and Attachment No. 5 indicates the increased number of trips required if carrying capacity is reduced.

In other words, to haul in smaller trailers the same amount of freight now being transported means more trailers, more tractors to pull them, more fuel consumed, larger terminals to load and service the increased number of vehicles . . . and more trucks on the road. It also means a freightening escalation in motor carrier operating costs roughly equal to the number of additional trips caused by the legislation. The cost of shipping freight in typical van trailers would rise about 13 percent—a cost increase which the industry will be forced to pass on the consumers in the form of higher freight rates.

LABOR FORCE IMPACT

More truck trips and more trucks on the highway also translates into a requirement for the motor carrier industry to employ more drivers. Unfortunately, the employment increase would not be the result of an expanding market for motor carrier services. Instead, it results from the need created by the legislation to hire more drivers simply to maintain existing production levels with less efficient equipment. This, in turn, means a marked drop in manhour productivity which is the vital component of today's trucking industry since labor costs account for almost two-thirds of total motor carrier operating expenses. Germane to any discussion of labor costs caused by the legislation is the revision proposed by the Bureau of Motor Carrier Safety for regulations governing the hours of service truck drivers put in on the job. The trucking industry is already bracing for increased labor costs should the proposed revisions become final because they will considerably lessen the driving time allowed under current practices.

AN EXAMPLE OF INCREASED COSTS

To illustrate more clearly the effect the bill would have on trucking industry operating costs, it is useful to look at a concrete example, in this case the heavily travelled truck corridor between New York and Atlanta, Ga. Since all the states in that corridor except Delaware have truck length limits below 60 feet, the effect of the legislation would be to force the trucking industry to use 40-foot semitrailers instead of the more common 45-foot units. As Attachment No. 6 shows, the non-productive operating costs generated by substituting 40-foot for 45-foot trailers hauling a million tons of general commodity freight in that corridor alone amounts to almost $10 million. In fact, it would result in more than 7,000 additional truck trips which in turn would consume an additional 698,879 gallons of fuel.

Since it's estimated that more than a million tons of general commodity freight are hauled by truck in the New York City-Atlanta corridor over the course of a year, the projected $10-million increase in trucking operation costs is not even an annual figure. And the New York City-Atlanta corridor is only one of several dozen major truck transport corridors. Operating cost increases proportionate to the amount of general commodity freight hauled in other corridors could be expected.

IMPACT ON FUEL CONSUMPTION

The bill is also completely at odds with the nation's energy policy and the commitment of the trucking industry to reduce fuel consumption. Quite simply, it would require 9 percent more fuel to transport in 40-foot trailers the same amount of freight currently carried in 45-foot trailers. The bill's impact on fuel

consumption by twin-trailer operations is even more marked. It would take 11.1 percent more fuel to haul the same amount of freight in twin 23½-foot trailers as is now carried in twin 27-foot units. Furthermore, because the fuel used in intercity operations is diesel—a middle distillate which can also be refined into home heating oil—the extra fuel burned as a result of the legislation will reduce the fuel supply available to heat homes and factories. Finally, the fuel penalties imposed by the bill would come just at the time the major fuel conservation effort now under way in the trucking industry is expected to shown significant results.

THE SAFETY QUESTION

In his July 10 Congressional Record remarks spelling out his reasons for proposing the bill, Senator Kennedy made frequent reference to the safety aspects of overall truck lengths as well as to truck tractor size and cab dimension. While the Senator is to be commended for his concern about highway safety and driver comfort, there is nothing in this legislation which might contribute to either of these concerns. ATA has always supported legitimate proposals whose implementation would result in higher levels of safety for both the truck driver and other highway users. We would also favor any realistic proposal to improve the driver's working environment. To believe, however, that these objectives might be achieved merely by specifying, in federal legislation, semitrailer dimensions is in our view an oversimplification fraught with fallacies and pitfalls.

As we pointed out, although the proponents of Senator Kennedy's proposal allege that longer tractors are somehow safer, the bill itself in no way prohibits continued use of shorter tractors. And while advocates of the bill also claim it is bad engineering to place the fifth wheel—the device which connects the trailer to the tractor—ahead of the drive axle, the bill wold actually cause an increase in the amount of forward offset required. Moreover, proper cab dimensions are now the subject of a rulemaking by the U.S. Department of Transportation's Bureau of Motor Carrier Safety. Until the BMCS can determine on a scientific and engineering basis what proper cab dimensions should be, it is premature for the Congress to give the bill serious legislative consideration.

TRUCK TRACTOR AND CAB SIZE

A major reason Senator Kennedy cited for proposing S. 3431 is the increasing concern of labor interest groups about the working conditions of drivers. The International Brotherhood of Teamsters (IBT) and the Professional Drivers Council (PROD) allege that equipment manufacturers have—at the request of motor carriers buying new truck equipment—shortened wheelbase and cab dimensions of power units in order to increase the cargo-carying portion of the vehicle, a change they claim has resulted in a number of safety problems. These problems can be summarized by implying that the conventional tractor is a safer vehicle to drive than the often shorter wheelbase cab-over-engine (COE) configuration. A correlative implication is that the driver is also subject to a more cramped environment in a COE vehicle.

With respect to the latter point, we have studied information available from truck manufacturers' data sheets and find this does not hold true for many of the significant dimensions. As the following chart shows, typical COE tractors compare favorably to or even exceed conventional cab tractors in a number of significant dimensions:

Conventional:			
Steering wheel to seat back	17.5	13 to 17	13.9
Steering wheel to seat top	8	6 to 8	7.6
Floor to seat top front	18.5	18	19.3
Seat to cab top	38.9	37.5	42.0
Cab-over-engine:			
Steering wheel to seat back	17.2 to 18.2	18	17.6
Steering wheel to seat top	9.2	8.3	7.2
Floor to seat top front	17.5	18.4	18.9
Seat to cab top	38.1	42	[1] 39.3

[1] Measurements in inches.

On the basis of interior cab space it is difficult to argue that the driver's safety and comfort have been sacrificed for longer truck trailers which require COE tractors. Over the years, moreover, the interior dimensions of COE tractors have

grown larger, not smaller. International Harvester, for example, some years ago offered a COE tractor measuring 48 inches from the front bumper to the back window. Its most recent model, released in January of this year, measures 59 inches from the front bumper to the back window, an indication that, instead of growing smaller, COEs are growing larger. Finally, COE tractors offer many advantages in their own right. They not only have a shorter turning radius, but also provide the driver better visibility on the road and the mechanic better access for maintenance in the shop.

RIDE CHARACTERISTICS

It is often assumed that because the driver in a COE cab configuration sits over the front axle, the ride is inherently worse than in a conventional cab layout. This is not necessarily so. In fact, some conventional configurations provide a poorer ride than COEs. Current COE design has overcome much of the pitching ('back slap') tendencies by improved cab mounting arrangements, the use of taper leaf spring suspensions, and frame stiffening. Driver seats have optional fore and aft isolator attachments that further improve the ride quality.

Truck ride is a very complex subject involving many interacting factors. They include the subjective and variable human response of the driver, the complicated mechanical suspension system of the cab and chassis, and the external forces which act upon the system. The one thing we can agree on is the need to provide the best feasible ride for the driver who may spend up to ten hours a day behind the wheel.

The Federal Highway Administration has planned much research related to truck ride quality. This work, which will look into the influence on ride by both the vehicle and road, has reached the contract stage for its first project. Bidders have been called for through RFP 417–8 "Significant Factors in Truck Ride Quality." Work will begin this fall. It is worth noting that a recent driver opinion survey—commissioned by Saunders Leasing System for private fleet operators and conducted by the independent research firm of Message Factors, Inc., of Memphis, Tenn.—found 58 percent of the long-distance drivers surveyed preferring cab-over-engine tractors to conventional units.

TRACTOR WHEELBASE AND FIFTH WHEEL PLACEMENT

The question of steering effort in relation to steering axle weight, placement of fifth wheel and length of cargo carrying body were all cited as factors which prompted introduction of S. 3431. These questions have been a matter of concern to the Congress in the past. The Federal-Aid Highway Act of 1976, for example, stipulated that a study be made of these factors. That study (Section 210 Steering Axle Study) was completed last July. It found that front axle loads increase as the fifth wheel is moved forward of the rear axle and that as the load increases so does understeer. It went on to say, however, that "this understeer characteristic is more desirable than oversteer." A further conclusion of the study is that no data are currently available to justify limiting the load on front axles to 10,000 pounds, a figure frequently suggested by Teamster spokesmen.

The same report makes a number of recommendations which in summary suggest that the inter-relationships between fifth wheel placement, front axle loads, vehicle stability and ride need much more study. It also recommends that changes in overall lengths by limiting the maximum length of the cargo-carrying body need to be studied to determine if there is any feasible way to limit fifth wheel placement in relation to rear axles.

There is, however, a wealth of literature and studies on the question of fifth wheel position, all of which indicate that a fifth wheel location ahead of the drive axle is necessary to assure safe handling. From the aspect of handling and stability, the degree of fifth wheel advance does not appear to be critical. Perhaps the best indication of this appeared during tests carried out to determine the effect of fifth wheel location on control and stability of tractor-semitrailer vehicles on ice as reported in the "1971 Winter Test Report" of the Committee on Winter Driving Hazards of the National Safety Council. The range of advance used for the test vehicles was from 1.5 to 38 inches, and the report concluded:

"In effect, the 1971 tests reconfirmed the findings of the Committees of 1951, 1953, and 1954. The older data showed there was no marked difference in the stability of combination vehicles on ice as related to fifth wheel position. Since the new data are not at variance with these earlier findings, it becomes significant that in four test programs with different vehicles, drivers, courses, locations, and report writers, and spanning a time period of twenty years, the conclusions are the same. It can, therefore, be concluded that the findings are valid."

Finally, an engineering analysis of Senator Kennedy's bill shows that its mechanical effect is to push fifth-wheel placement even further forward of the drive axles than is normally necessary on COE tractors. The ostensible purpose of the amendment is to encourage use of longer wheelbase tractors and to reduce the distance the fifth wheel is placed ahead of the drive axle. As Attachment No. 7 shows, however, using a conventional tractor to pull today's loads in today's trailers increases the need to advance the fifth wheel forward of the centerline by as much as 1.3 feet. Since federal law prohibits weights greater than 34,000 pounds on each tandem axle, the remaining weight must be carried by the front axle. The only way to achieve that is to advance fifth wheel placement, and the longer the wheelbase the more necessary the advancement.

STEERING AXLE WEIGHT

The only reliable measure of what constitutes excessive steering axle weight is loading a truck in excess of the rated capacity of the front axle system, including axle-beam, suspension system, wheels and tires. Over-loading beyond the capacity for which the vehicle has been designed cannot be condoned and should be treated as a potential safety problem. Both the National Highway Traffic Safety Administration and the Bureau of Motor Carrier Safety already have standards and regulations in force to eliminate such unsafe practices as well as the means to enforce them.

Claims of excessive steering axle weight have only become an issue in recent years and led, as we noted earlier, to the Section 210 Steering Axle Study. Among its conclusions and recommendations are the following:

"Tires and front ends must be selected to safely carry the load to which they are subject. Tires and front ends capable of bearing maximum legal axle weights are available.

"Data for 1974 indicate that a small percentage of all present commercial vehicles have a front axle weight of 10,000 pounds and a much smaller percentage have weights of over 12,000 pounds. These heavier axle loads are, however, found in significant numbers among vehicles used by specialized types of motor carriers."

The study then went on to recommend that "federal legislation should not be passed specifying front axle load limits but the tire loading requirements of the Federal Motor Carrier Safety Regulations should be a requirement for all commercial motor vehicles, whether in interstate or intrastate commerce."

STEERING AXLE TIRES AND ACCIDENTS

Despite writer Robert Sherrill's misleading assertion in a 1977 New York Times Magazine article as cited in the Congressional Record that tire failure was one of the top killers in truck accidents caused by mechanical failure, and two-thirds of these accidents are blowouts of the front tires, the 210 Steering Axle Study found: "Tire-failure-caused truck accidents are relatively rare and are usually single vehicle involvements."

In fact, a check of 1976 Bureau of Motor Carrier Safety data on fatalities in heavy truck accidents reveals that only 24 out of a total of 2,520 were caused by front-tire failure. In other words, front-tire blowout accounts for less than 1 percent of all fatalities. Clearly this confirms the finding of the 210 study—as do data from previous years. Moreover, mechanical failure of vehicles was cited as a cause in only 80 of the 2,520 accident fatalities reported to the Bureau of Motor Carrier Safety in 1976. Of those 80 mechanical failures, fewer than a third were caused by front-tire failures.

In any case, the National Highway Traffic Safety Administration requires (49 CFR 567.4 and .5) truck and trailer manufacturers to indicate on their products both the maximum vehicle load capacity and the heaviest load each individual axle can carry. Further, tire manufacturers (49 CFR 571.119) are required to show the tire's maximum capacity on its sidewall. The Bureau of Motor Carrier Safety, in turn, requires motor carriers to abide by those limits (49 CFR 393.75). In other words, adequate steering axle and tire capacities exist, and manufacturers legally have to certify and placard the gross weight for which the axle and vehicle are rated—incorporating those specific components.

THE LEGAL LOOPHOLE THEORY

In support of legislation to include vehicle length limits in federal law, it has been suggested that the 1974 highway bill, which provided for a modest increase

in permissible federal weight limits, somehow contained a legal "loophole" to promote use of short truck tractors. The increase in permissible gross weight from 73,280 to 80,000 pounds is alleged to be a major factor in the increased use of shorter truck tractors and longer semitrailers.

There is no substance to this allegation. There is no loophole.

The trend toward purchases of trailers longer than 42½ feet began long before passage of the 1974 law. It resulted from the changing complexion of the traffic which the trucking industry was called upon to serve. With the rail embargo of less than car load traffic, particularly shipments of less than 15,000 pounds, the trucking industry became the major carrier of small shipments. The light bulky nature of these shipments created a situation where the carriers were cubing out before weighing out, hence the necessity of longer trailers. See Attachment No. 8.

Additionally, and perhaps more importantly, the legislation raising permissible gross weight to 80,000 pounds was worded in such a way that it is not necessary to use a longer semitrailer to take advantage of the increased gross weight. Under the law's wording, it is equally possible to achieve the new gross weight on a 40-foot trailer as on a 45-foot trailer. All the permissible weight increase did was to allow heavier loadings on equipment already in operation; it did not create a "loophole" to encourage use of longer semitrailers. Also, as we have already pointed out, cab sizes are increasing as new models of tractors are introduced.

NO EDITORIAL ENDORSEMENT

Cited in the Congressional Record was an endorsement of trailer length restrictions by Fleet Owner magazine. In a recent editorial, however, the magazine denies any such endorsement. According to the editorial, the concept of trailer length restrictions was raised in one of the magazine's columns, but the magazine in no way endorsed it or recommended its implementation.

A CLOSER LOOK AT GOVERNMENT STUDIES

Also mentioned in the Congressional Record as supporting the "need to establish laws that allow trailer lengths and longer cabs" were three government studies or reports. A closer look at the studies, however, reveals that their endorsement of trailer length limits is severely circumscribed or merely a recommendation for more study.

The first one mentioned is the Interagency Study of Post-1980 Goals for Commercial Motor Vehicles, published in November of 1976. Although the study does recommend that "modified federal size and weight laws should set limits on trailer and truck cargo unit length, rather than overall vehicle length," it also recommends a semitrailer length of at least 45 feet and a twin-trailer length of 28 feet each.

More important, however, is that the study is nothing more than a DRAFT, the work of a task force representing seven federal agencies and departments. It specifically cautions that "this study is not, at this juncture, an official policy statement of any of the participating agencies, but rather it is to serve as a focus for policy development for all organizations. . . . Final actual recommendations will result from the ongoing debates, analyses, and discussions surrounding the potential improvements to commercial vehicles. . ." The authors of the study conclude by saying: "We hope this study provides a starting point to the coordinated decision making concerning the motor carrier industry which will benefit the nation as a whole."

Another document cited is the March 1977 Report on Vehicle Length Restrictions to the Secretary of Transportation by the National Highway Safety Advisory Committee. The report says DOT "should recommend to the appropriate State authorities that they establish length regulations that specifically limit the length of trailers rather than merely setting a single limit for the overall length of heavy trucks." In the cover letter transmitting the report to the Secretary of Transportation the committee notes it "is cognizant of the fact that vehicle length standards are established and administered by the individual states. Notwithstanding, your development of model regulations, consistent with the recommendations of the report, would be of considerable assistance to the states in embracing this highly desirable safety concept."

The point is that the recommendations of the Interagency Study and the Advisory Committee report are just that—recommendations. They need to be thor-

oughly aired so that all affected parties, particularly the states which would be subjected to Senator Kennedy's mandate, are allowed to address this important issue.

Also cited as a "study" is a research paper completed in March of 1977 by the University of Michigan Highway Safety Research Institute (HSRI). The paper does not purport to be a study. Instead, it involves an analysis of tests done by the National Highway Traffic Safety Administration's Safety Research Lab (SRL) as part of the Department of Transportation's Steering Axle Study, published in July 1977. ATA participated in and agrees with the findings of the DOT Steering Axle Study. We do not, however, accept the Institute's conclusions from its review of the SRL tests. The Institute extended the test data beyond the limits to which they should be applied, and failed to take into account that the SRL tests were at loads above the manufacturers' limit. Then the Institute assumes that motor carriers, by simply moving the fifth wheel forward, are using a front axle rated at 10,000 pounds to carry 12,000 pounds. But the deliberate use of overloaded steering axles is against DOT regulations and defies common sense. It isn't done in regular motor carrier operations.

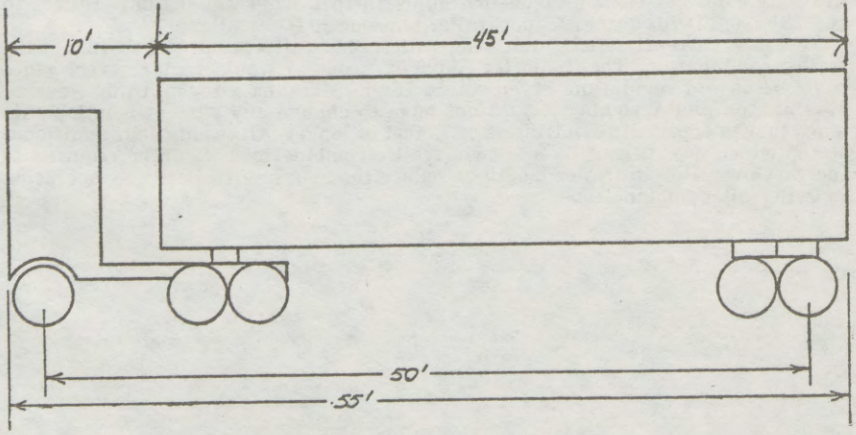
The interrelated issues of tractor cab dimensions, state vehicle length limits and safety of operations is currently the subject of a Department of Transportation Advance Notice of Proposed Rulemaking, Bureau of Motor Carrier Safety Docket No. MC–79, Minimum Cab Space Dimensions. Specifically, the notice states that "consideration is being given to adopting a safety regulation which would specify minimum size for the cab portion of the regulated commercial vehicles . . . There is a need to reassess the safety impact of present restrictions imposed by certain states on overall commercial vehicle length as they influence the driver's operation environment." DOT cites both the National Highway Safety Advisory Committee report and the Steering Axle Study as among the reasons for initiating the rulemaking.

In conclusion, let me reiterate that the trucking industry is opposed to a legislative "solution" to this extremely technical and complex subject, particularly while it is still under study by the Bureau of Motor Carrier Safety in MC–79.

ATTACHMENT No. 1

EFFECT OF S. 3431 ON TYPICAL VEHICLES

5 Axle Tractor-Semitrailer (55 feet)



Teamster—Kennedy proposal makes this combination illegal in all states with tractor-semitrailer length limit of less than 60 feet.

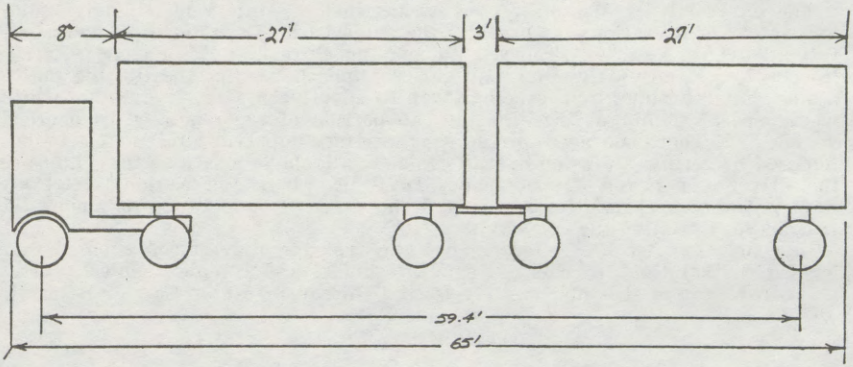
Teamster—Kennedy requires: (1) If semitrailer length limit is 45 feet, overall limit must be 15 feet more—60 feet—or (2) If state decides to retain its current limit of under 60 feet—let's say 55 feet—then the state *must* pass legislation limiting semitrailer length to 40 feet.

Twenty-five states and D.C. currently have length limits under 60 feet and would have to decide either to decrease permitted trailer length or increase overall length if this combination is to remain legal.

Only nine states now have semitrailer length limits in their statute, so the remaining forty-one states and D.C. must pass new law or regulation.

EFFECT OF S. 3431 ON TYPICAL VEHICLES

5 Axle Twin Trailer Combination (65 feet)



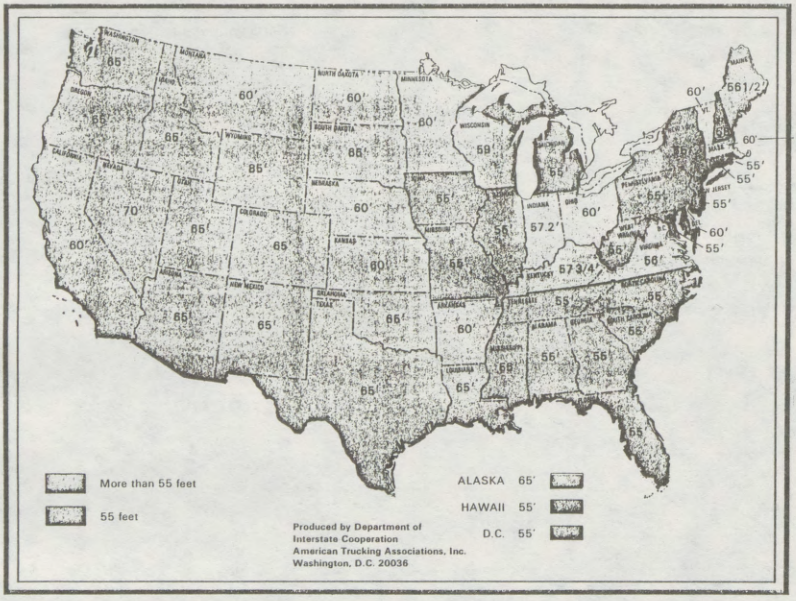
Teamster-Kennedy proposal makes this combination illegal in all states with twin trailer length limit of less than 72 feet.

Teamster-Kennedy requires: (1) If semitrailers and full trailer length limit set by the state is 57 feet, the total length of the two twin trailers plus the drawbar in the above example, then the state's overall twin trailer length limit must be 72 feet—57 feet plus 15 feet—or (2) If the state decides to retain its current 65 foot overall length limit, then the maximum length of the twin trailers plus drawbar must be set at 50 feet—65 minus 15 feet. This would limit trailers to two 23½ foot twins or one 27 foot trailer plus one 20 foot trailer.

No state currently limits the semitrailer plus full trailer length in a twin trailer combination. The Teamster-Kennedy proposal would require every state to pass a law or regulation. Seven states, Idaho, Montana, Oregon, Utah, Nevada, Washington and Wyoming, would not have to change any current length limits since they now permit twin trailers of 72 feet or longer. All twenty-four additional states which now permit 65-foot twin trailer combinations would be required to increase overall twin trailer length or reduce the length of trailers now operating in twin trailer combinations.

ATTACHMENT NO. 2

TRACTOR-SEMITRAILER LENGTH LIMITS (including Tolerances) AS OF JANUARY 1, 1978



STATUS OF TWIN TRAILER LAWS

The following states permit the operation of highway-type twin trailers at the lengths indicated:

Length of 65 feet and over

Alaska
Arizona
Arkansas
California
Colorado
Delaware
Hawaii
Idaho
Illinois [1]
Indiana
Kansas
Kentucky [1]
Louisiana [1]
Maryland [1]
Michigan [1]
Minnesota [1 2]
Missouri [1]
Montana [2]
Nebraska
Nevada
New Mexico
North Dakota [1]
Ohio
Oklahoma
Oregon [1]
South Dakota
Texas
Utah
Washington
Wisconsin [1 2]
Wyoming

(Total—31 States.)

Length of 60 feet

Iowa.

(Total—1 State.)

Length of 55 feet

Georgia
Mississippi
New York [1]
New Jersey

(Total—4 States.)

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[1] On designated highways.
[2] By annual permit.

ATTACHMENT NO. 3

TRACTOR-SEMITRAILER LENGTH LIMITS [1] JULY, 1978

	Tractor-semitrailer length		Semitrailer limits
	60 ft. and over	Under 60 ft [1]	
Alabama [2]		55	NL
Alaska	65		45
Arizona	65		NL
Arkansas	60		NL
California	60		[3] NL
Colorado	65		NL
Connecticut [2]		55	NL
Delaware	60		NL
District of Columbia [2]		55	NL
Florida [2]		55	NL
Georgia [2]		55	NL
Hawaii [2]		55	NL
Idaho	65		NL
Illinois [2]		55	45
Indiana [2]		57.2	NL
Iowa [2]		55	NL
Kansas	65		NL
Kentucky [2]		57.75	NL
Louisiana	65		NL
Maine [2]		56.5	45
Maryland [2]		55	NL
Massachusetts	60		45
Michigan [2]		55	NL
Minnesota	60		45
Mississippi [2]		55	NL
Missouri [2]		55	NL
Montana	60		NL
Nebraska	60		NL
Nevada	70		NL
New Hampshire [2]		55	NL
New Jersey [2]		55	NL
New Mexico	65		NL
New York [2]		55	NL
North Carolina [2]		55	NL
North Dakota	65		NL
Ohio	60		45
Oklahoma	65		NL
Oregon	60		[3] NL
Pennsylvania [2]		55	NL
Rhode Island [2]		55	NL
South Carolina [2]		55	NL
South Dakota	70		NL
Tennessee [2]		55	NL
Texas	65		NL
Utah	65		45
Vermont	60		NL
Virginia [2]		56	NL
Washington	65		45
West Virginia [2]		55	NL
Wisconsin [2]		59	45
Wyoming	85		NL

[1] Includes statutory tolerances.

[2] States which would be required to change present tractor-semitrailer length limits to continue operating 45-ft semitrailers.

[3] No limit if distance from kingpin to rearmost axle of semitrailer does not exceed 38 ft; otherwise 40 ft. No restriction in Oregon by annual permit.

NL—No statutory limit.

TWIN TRAILER LENGTH LIMITS[1] JULY 1978

	Twin trailer length	
	Over 65 ft	65 ft or less
Alabama		NP
Alaska[2]	70	
Arizona[2]		65
Arkansas[2]		65
California[2]		65
Colorado[2]		65
Connecticut		NP
Deleware[2]		65
District of Columbia		NP
Florida		NP
Georgia		[3] 55
Hawaii[2]		65
Idaho	105	
Illinois[2]		65
Indiana[2]		65
Iowa[2]		60
Kansas[2]		65
Kentucky[2]		65
Louisiana[2]		65
Maine		NP
Maryland[2]		65
Massachusetts		NP
Michigan[2]		65
Minnesota[2]		65
Mississippi		[3] 55
Missouri[2]		65
Montana	85	
Nebraksa[2]		65
Nevada	105	
New Hampshire		NP
New Jersey		[3] 55
New Mexico[2]		65
New York		[3] 55
North Carolina		NP
North Dakota[2]		65
Ohio[2]		65
Oklahoma[2]		65
Oregon	75	
Pennsylvania		NP
Rhode Island		NP
South Carolina		NP
South Dakota[2]	70	
Tennessee		NP
Texas[2]		65
Utah	83	
Vermont		NP
Virginia		NP
Washington	75	
West Virginia		NP
Wisconsin[2]		65
Wyoming	85	

[1] Includes lengths permitted by long-term permit and/or on designated highways.
[2] States which would be required to change present twin trailer length limits to continue operating 27- or 28-ft twin trailer combinations.
[3] Impractical, no twins operation.

NP—Not permitted.

ATTACHMENT No. 4

TABLE I.—CARRYING CAPACITIES AND FUEL USE FOR TYPICAL COMBINATIONS FOR GENERAL COMMODITY FREIGHT

	Gross combination weight (in pounds)	Payload per truck (in tons)	Trailers required to carry 1,000,000 tons of freight	Fuel consumption rate (gallons diesel fuel per mile)	Diesel fuel required to carry 1,000,000 tons 1 mi (gallons)	Cost of diese fuel required to haul 1,000,000 tons 1 mi
55-ft tractor semitrailer:						
With 40-ft semi-trailer	60,725	16.0605	62,265	0.156	9,713	$5,573
With 45-ft semi-trailer	65,250	18.1250	55,172	.161	8,883	5,099
65-ft twin trailer:						
With 23½-ft twins	70,442	20.633	48,466	.165	7,997	4,590
With 27-ft twins	76,677	23.7500	42,105	.171	7,200	4,133

Note: Gross weights based on typical vehicle configurations used in intercity service. Number of loads (or trucks) required to move 1,000,000 tons of freight computed by dividing payload (in tons) into 1,000,000. Fuel consumption rates obtained from Cummins Engine Co.'s vehicle simulator computer based on a typical intercity trip (405 mi) at a scheduled maximum speed of 55 mi/hr, utilizing current fuel saver equipment (engine, transmission, clutch fan, radial tires and air deflector). Average selling price No. 2 diesel fuel at truck stops, December 1977, 57.4c/gal. Latest figures available "Monthly Energy Review," U.S. Department of Energy, May 1978.

ATTACHMENT No. 5

TABLE II.—ADDITIONAL TRUCK TRIPS AND DIESEL FUEL NEED TO HAUL 1,000,000 TONS OF FREIGHT 1 MI FOR GENERAL COMMODITY FREIGHT

	Percent of additional—	
	Truck trips	Diesel fuel
Substitute 40-ft for 45-ft semitrailers	12.9	9.3
Substitute 65-ft twin trailers with 2 23½-ft trailers for 2 27-ft trailers	15.1	11.1

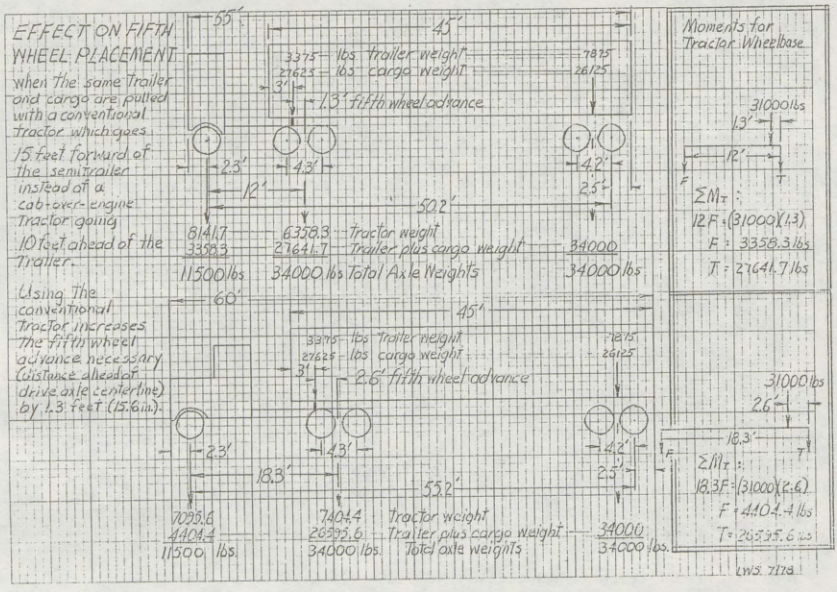
ATTACHMENT No. 6

TABLE III.—CARRYING CAPACITY AND FUEL USE FOR TRACTOR SEMITRAILER TRAVELING BETWEEN NEW YORK AND ATLANTA HAULING GENERAL COMMODITY FREIGHT

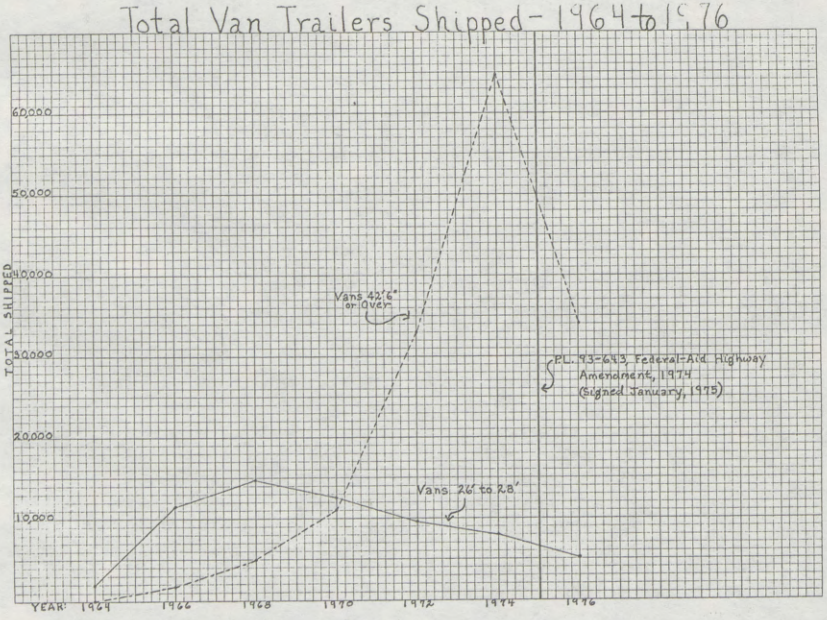
	40-ft semitrailer	45-ft semitrailer	Nonproductive operations and costs arising from substituting 40-ft trailers for 45-ft trailers
Loads required to move 1,000,000 tons	62,265	55,172	+7,093
Fuel consumption (gallons diesel fuel per mile)	0.156	0.161	
Diesel fuel per trip of 841 mi [1]	131.2	135.4	
Diesel fuel required to move 1,000,000 tons	8,169,168	7,470,289	+698,879
Cost of fuel at 57.4 cents [2]	$4,689,102	$4,287,946	+$401,156
Average cost per mile, $1.66 [3]	$86,925,676	$77,023,422	+$9,902,254

[1] Total miles New York to Atlanta, "Rand McNally Road Atlas," 1978.
[2] Average selling price No. 2 diesel fuel at truckstops, December 1977. Latest figures available "Monthly Energy Review," U.S. Department of Energy, May 1978.
[3] All class I and II I.C.C. regulated general freight carriers (Instruction 27), "Financial and Operating Statistics," full year 1977.

ATTACHMENT No. 7

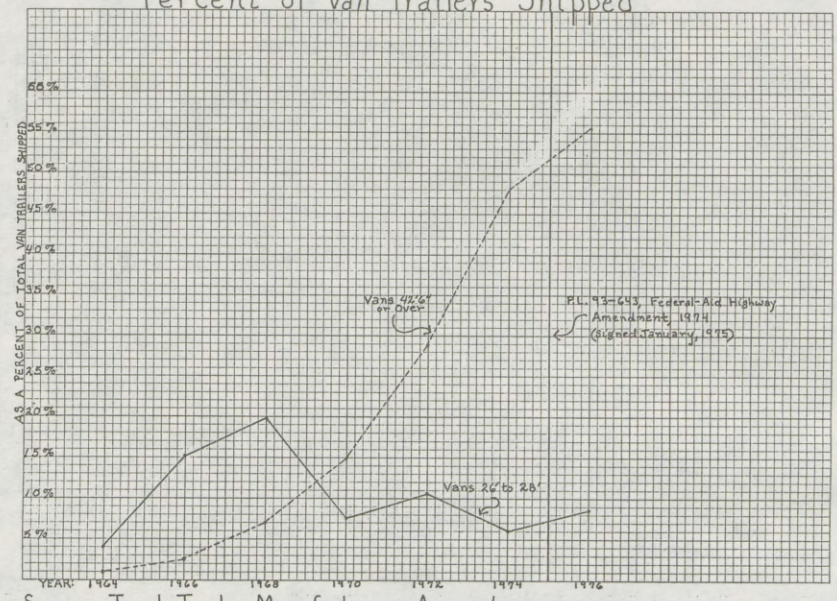


ATTACHMENT No. 8



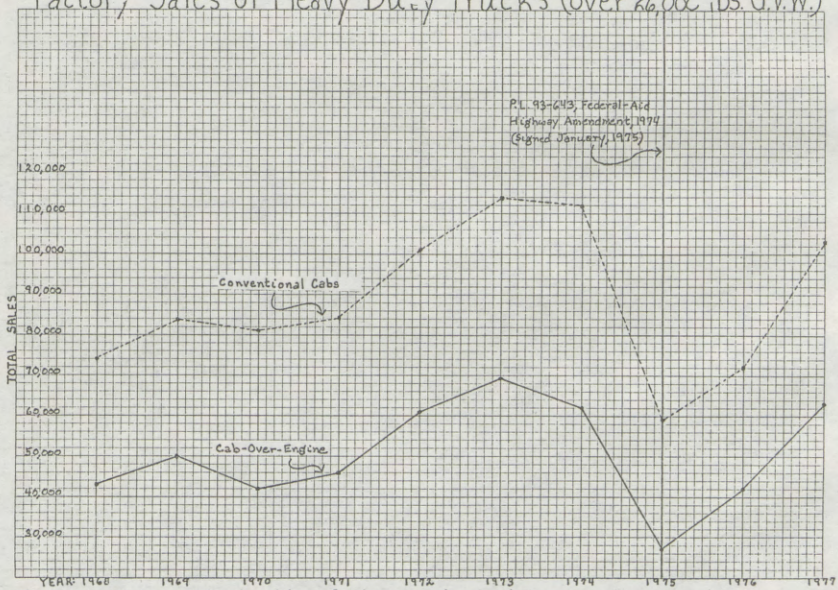
Source: Truck Trailer Manufacturers Association

Percent of Van Trailers Shipped

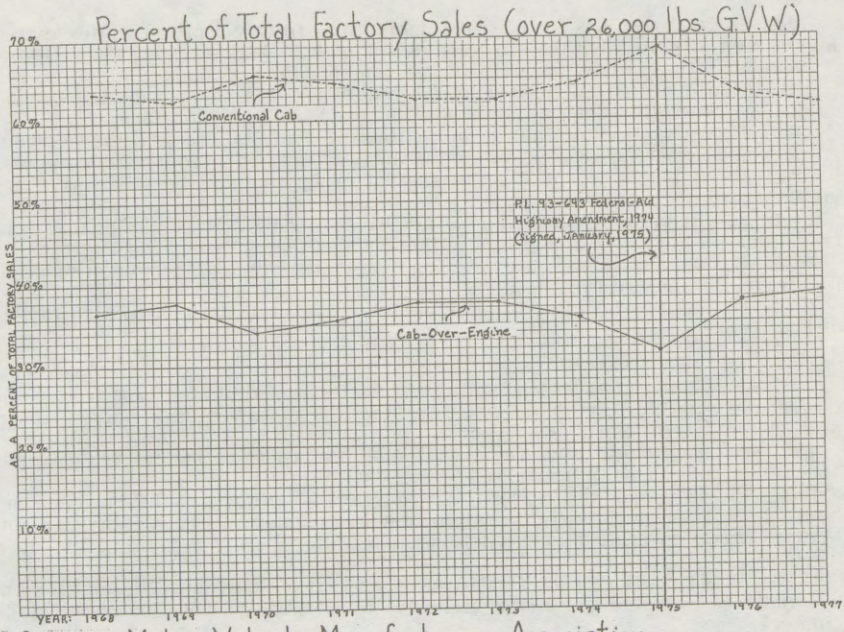


Source: Truck Trailer Manufacturers Association

Factory Sales of Heavy Duty Trucks (over 26,000 lbs. G.V.W.)



Source: Motor Vehicle Manufacturers Association



Source: Motor Vehicle Manufacturers Association

[The following information was referred to on p. 55:]

AMERICAN TRUCKING ASSOCIATIONS, INC.,
DEPARTMENT OF INTERSTATE COOPERATION,
Washington, D.C., September 1, 1978.

RECENT HISTORY OF LEGISLATION INTRODUCED IN STATE LEGISLATURES TO PERMIT 65-FOOT TWIN TRAILER COMBINATIONS

As of January 1, 1970, there were 28 states that permitted twin trailer combinations of at least 65 feet in length. Of the 22 states that did not allow this unit, legislation has been introduced in 18 states one or more times during the past 10 years. In four states; Florida, Georgia, New Hampshire, and Vermont, no record has been compiled of legislation to permit 65-foot twin trailers. Of the 18 states for which a record of bills introduced has been compiled in recent years, only two states, Louisiana and Minnesota have enacted laws permitting twin trailers. This unit is allowed in Wisconsin as the result of the U.S. Supreme Court decision in 1978.

Following is a state-by-state summary of the various bills introduced and the record of each bill. Also attached is a table which summarizes the effort in each of the 18 states during the period for which information is available. This listing was compiled from the "State Legislative Bulletin" published by the ATA Law Department until 1975. Recent years were assembled from various state reports. The listing may be incomplete, particularly for years 1975 to 1978.

ALABAMA

1967—H. 599 provides for use of 65-foot double-bottom combinations on all roads—vetoed.

1969—H. 31 provides for operation of combination having two or more vehicles (other than tractor-semitrailer) at an overall length limit of 65 feet—died in House.

CONNECTICUT

1965—H. 3439 provides for tractor-semitrailer-full trailer with length up to 65 feet, subject to certain restrictions—died in House.

1967—H. 3867 provides for 65-foot combinations to be permitted on designated highways and points within a 5 mile radius of said highways—died in House.

1969—S. 1416 provides for twin trailer combinations not exceeding 65 feet in length to be operated on limited access highways with the permission of and subject to regulations of the Highway Commissioner—died in Senate.

1969—H. 5640 provides that combinations of vehicles and trailers or semi-trailers not exceeding 65 feet shall be permitted on designated controlled access highways and points within 5 miles thereof designated by the Highway Commissioner—died in House.

1971—S. 379 permits combinations not exceeding 65 feet on designated controlled access highways and points within 5 miles thereof—died in Senate.

1973—H. 9164 and H. 8906 provides for twin trailers up to 65 feet on designated highways. Both bills died in House.

1974—H. 5717 provides for twin trailers up to 65 feet on designated highways—died in House.

IOWA

1967—H. 212 specifies length limits for vehicles and would increase from 60 to 65 feet the length of combinations made up of 3 or more vehicles—passed House and Senate—recalled from Governor.

1967—S. 284 provides that the overall length of combinations of vehicles, unladen or with load, shall not exceed 65 feet—withdrawn.

1969—H. 773 (S. 436) increases the permissible length of a double-bottom combination to 65 feet; restricts operation of such vehicles to 4 lane highways, but permits travel on other highways (5 miles leading to or from terminals)—died in House.

1971—S. 446 provides that combinations of vehicles may be 65 feet in length but must be operated on 4 lane highways by permit—passed Senate—died in House.

1973—H. 369 allows twin trailers up to 65 feet on highways of 4 or more lanes and other designated roads—died in House.

1974—H. 671 allows twin trailers up to 65 feet and limits trailers and semi-trailers in such units to a maximum of 30 feet—passed House and Senate—vetoed.

1976—H. 1426 prohibits the state from permitting vehicles in excess of 65 feet on state highways—died in House.

1976—H. 1536 provides for trip and annual permits to operate twin trailers in excess of 60 feet but not exceeding 65 feet—died in House.

1977—A resolution enacted in 1975 gave the Transportation Commission the authority to promulgate size and weight limits subject to a House or Senate veto within 60 days. The Commission voted to allow twin trailers, however, it was vetoed by the House.

LOUISIANA

1968—H. 384 provides that 65-foot combinations may consist of more than 2 units—passed House and Senate, died in Conference.

1970—H. 421 allows the use of double-bottom combinations; provided the length of the individual trailers does not exceed 27½ feet and the overall length of the combination does not exceed 65 feet—died in House.

1972—S. 340 twin trailers up to 65 feet permitted on highways which are 4 or more lanes in width. Passed both Houses and signed by Governor. Effective July 26, 1972.

MAINE

1967—S. 157 provides for the use of tractor-semitrailer and full trailer combinations not to exceed 65 feet in length to be used on limited access highways—withdrawn and substituted with S. 595.

1967—S. 595 provides for the operations of 65-foot double-bottom combinations which shall be limited in use to 4-lane divided controlled access highways, except for limited travel to and from terminals—died in Senate.

1969—H. 400 provides for the use of 65-foot double-bottom combinations on 4-lane divided, controlled access highways; also allows limited use of other roads leading to and from trucking terminals subject to approval of municipal officials—died in House.

1971—S. 515 authorizes tests to be run on the highways of Maine for 2 years to determine if twin trailers will be helpful to the state—passed Senate—died in House.

1974—H. 1789X provides that motor vehicles or combinations shall not exceed 65 feet. Bill also provided for greater weights on state highways—died in House.

1977—S. 269 provides for twin trailers up to 65 feet in length—died in Senate.

MASSACHUSETTS

1968—H. 1660 allows the use of double-bottom combinations not to exceed 65 feet—died in House.

1977—H. 4968 provides for twin trailers up to 65 feet with a 33-foot limit on trailers and semitrailers—died in House.

MINNESOTA

1965—S. 806 provides for 65-foot length for tractor-semitrailer-full trailer on highways designated by the State Highway Commissioner—died in Senate.

1967—H. 249 (S. 183) specifies length limits for vehicles and will allow use of double-bottoms not to exceed 65 feet in length—died in House and Senate.

1969—H. 760 provides for the use of 65–foot double-bottom combinations on all trunk highways having 4 or more lanes and other connecting trunk highways specifically designated for use by the Highway Commissioner—indefinitely postponed.

1971—H. 655 permits 65-foot combinations of truck-trailer, semi-trailer and full trailer to operate on 4-lane highways—died in both Houses.

1973—S. 342 provides for annual permits for the operation of twin trailers up to 65 feet on highways having 4 or more lanes. Passed both Houses and signed by Governor. Effective July 1, 1973.

MISSISSIPPI

1968—H. 736 increases length limit for vehicle combinations other than tractor-trailer to 65 feet—died in House.

1971—H. 634 permits a combination of truck tractor, semitrailer, and full trailer not to exceed 65 feet—died in House.

1972—H. 547 permits twin trailer length increase to 65 feet from 55 feet—died in House.

1973—H. 355 (S. 2055) allows a maximum length of 65 feet for twin trailers but only on highways of 4 or more lanes and certain designated roads—died in both Houses.

1974—H. 1278 increases length of tractor-semitrailer and other combinations, including twin trailers, from 55 to 65 feet—died in House.

1975—H. 459 allows twin trailers up to 65 feet on highways of 4 or more lanes and access roads to destinations up to 12 miles—died in House.

NEW JERSEY

1968—S. 895 authorizes the use of twin trailers having an overall length of 65 feet, inclusive of load, on all New Jersey highways having 4 or more lanes and on any access routes not disapproved by the Director—died in Senate.

1974—S. 1088 increases twin trailer length from 55 to 65 feet, width from 96 to 102 inches and tractor-semitrailer length from 55 to 56½ feet—died in Senate.

NEW YORK

1968—H. 4326 (S. 3483) authorizes, double-bottom combinations, and provides that the overall length limit for combinations, other than tractor-semitrailer shall be 65 feet on designated roads—passed House, died in Senate.

1969—S. 3974 provides for use of 65-foot twin trailer combinations on highways designated by the Commissioner of Transportation—died in Senate.

1970—H. 2047 provides for the use of 65-foot double-bottom combinations on any highway designated by the Commissioner of Transportation—died in House.

1971—S. 5846 (H. 6380) provides that on roads designated by Transportation Commissioner a tractor may tow one semitrailer and one semitrailer converted to full trailer, and provides that total length of combination of vehicles shall not be more than 65 feet—passed House—no action in Senate.

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1972—S. 8101 allows twin trailers up to 65 feet except in New York City and Nassau and Suffolk Counties—died in Senate.
1973—H. 7856 (S. 6188) allows twin trailers up to 65 feet except in New York City and Nassau and Suffolk counties—died in both Houses.
1977—H. 6606 (S. 4617) allows twin trailers up to 65 feet except in New York City and Nassau and Suffolk Counties—died in both Houses.
1978—H. 9772 allows twin trailers or truck and two trailers up to 65 feet except in New York City and Nassau and Suffolk Counties—died in House.

NORTH CAROLINA

1967—S. 321 (H. 730) provides no combination of more than 2 vehicles shall exceed a total length of 65 feet—passed House, died in Senate.
1977—S.B. 636 (H.B. 1107) provides for twin trailers up to 65 feet on designated highways—passed Senate—died in House.

PENNSYLVANIA

1967—H. 1349 provides for 65-foot double-bottom combinations; contains a "grandfather" clause permitting a maximum combination length limit of 70 feet, provided the tractor was registered in Pennsylvania prior to January 1, 1968—died in House.
1973—H. 740 permits 65-foot twin trailers on Interstate System and other highways having 4 or more lanes—died in House.

RHODE ISLAND

1974—H. 7592 allows for the use of 65-foot twin trailers—passed House and Senate—vetoed by Governor.

SOUTH CAROLINA

1968—H. 2320 increases the overall length limit for all trucks to 40 feet, combination of vehicles used in truckway service to 65 feet, and provides for the use of 65-foot double-bottom combinations on all designated 4-lane highways—died in House.
1969—H. 1016 establishes a 40-foot length limit for all trucks and provides for the use of 65-foot double-bottom units on all completed portions of the Interstate System and designated 4-lane roads—died in House.

TENNESSEE

1969—S. 711 provides for the use of twin trailer combinations having an overall length limit of 65 feet; also restricts the operations of such combinations to the Interstate System; highways having 4 or more lanes and other state highways and U.S. numbered highways for a distance of one mile, to and from terminals—died in Senate.
1971—H. 1025 authorizes use of tandem tractor-trailer trucks on Interstate highways and routes of ingress and egress there to for a distance of one mile—passed House and Senate Committees—died in Senate in 1972.
1972—S. 1525 provides for referendum on permitting twin trailers—no action.
1972—H.S.R. 357 House join resolution provides for a study concerning the use of twin trailers—no action.

VIRGINIA

1968—S. 11 provides for the use of 65-foot double-bottom combinations under permit on all highways having 4 or more traffic lanes, and roads which are the most direct route to and from a terminal of origin or destination—died in Senate.

WEST VIRGINIA

1967—S. 58 permits the operation of three-unit combination of vehicles, consisting of tractor, semitrailer and full trailer over such state highways as are specified and designated by order of the State Road Commission—died in Senate.
1974—H. 1225 provides for the operation of twin trailers no greater than 65 feet on designated highways—died in House.
1978—S.B. 477 provides for the operation of twin trailers on designated highways—died in Senate.

WISCONSIN

1963—H. 428 provides for 65-foot double-bottom combinations on Interstate and certain designated highways—died in House.

1965—H. 423 provides for double-bottoms on all highways—died in House.

1965—H. 424 provides for 65-foot double-bottom combinations on the Interstate System and other highways designated by the Highway Commission—died in House.

1965—H. 425 gives the State Highway Commission the right and power to fix size and weight provisions within the recommendations of the Bureau of Public Roads and the American Association of State Highway Officials. Also provides for 65-foot double-bottoms on the Interstate System and other highways designated by the Highway Department—died in House.

1969—H. 411 (S. 274) permits the use of 65-foot double-bottom combinations on the Interstate System and on 4-lane highways and allows the Highway Commission to designate intersecting highways for entering and exiting of vehicles. The combination shall also be allowed to operate within a radius of 900 yards of the 4-lane highway for the purpose of servicing and uncoupling the vehicles—died in House and Senate.

1971—H. 584 provides that a tractor-semitrailer combination may have one complete trailer without a permit if the combination does not exceed 65 feet in length, and if the combination is operated on Interstate and other 4-lane highway systems—died in House.

1971—H. 957 permits 65-foot vehicle combinations on all state trunk highways and connecting streets without requiring an annual or multiple permit—died in House.

1971—Resolution—A joint resolution introduced in the General Assembly would allow 65-foot twin trailers on the Interstate System and 4-lane divided highways on an annual permit basis. A 1929 law provides for such permits at the present time and the resolution would express only the will of the legislature and is not subject to the approval of the Governor—failed to pass.

1973—S.J.R. 69 allows for the use of twin trailers not exceeding 65 feet on designated highways by permit—no action.

1974—S.J.R. 115 (S.J.R. 100) would direct an advisory referendum on permitting 65-foot long vehicles on designated roads. S.J.R. 100 is similar, allowing these units on all roads—no action.

1978—On February 2, 1978, the United States Supreme Court handed down a decision which resulted in the State allowing the operation of twin trailers by annual permit on designated highways.

HISTORY OF LEGISLATION INTRODUCED THAT WOULD HAVE PERMITTED 65-FT TWIN TRAILERS IN THOSE STATES NOT ALLOWING THAT UNIT AS OF JAN. 1, 1970

[× indicates legislation defeated or died on calendar during years shown]

State	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Alabama	×		×									
Connecticut	×		×		×		×	×				
Iowa	×		×		×		×	×		×	×	
Louisiana		×		×		(1)						
Maine	×		×		×			×			×	
Massachusetts		×									×	
Minnesota	×		×		×		(2)					
Mississippi		×			×	×	×	×	×			
New Jersey		×						×				
New York		×	×	×	×	×	×				×	×
North Carolina	×										×	
Pennsylvania	×						×					
Rhode Island								×				
South Carolina		×	×									
Tennessee			×		×	×						
Virginia		×										
West Virginia	×							×				×
Wisconsin			×		×		×	×				(3)

[1] Approved July 26, 1972.
[2] Approved July 1973.
[3] Permitted Feb. 2, 1978, by decision of U.S. Supreme Court.

The CHAIRMAN. The next witness is William J. Morgan, Private Truck Council of America.

Mr. WHITE. My name is John White and I'm executive vice president of the Private Truck Council of America. With me is my director of operations, Richard Henderson, and testifying on behalf of the Private Truck Council of America is William J. Morgan of Frito-Lay.

The CHAIRMAN. All right, sir.

STATEMENT OF WILLIAM J. MORGAN, PRIVATE TRUCK COUNCIL OF AMERICA, INC.; ACCOMPANIED BY JOHN WHITE, EXECUTIVE VICE PRESIDENT; AND RICHARD D. HENDERSON, DIRECTOR OF OPERATIONS

Mr. MORGAN. My name is William J. Morgan. I am employed by Frito-Lay, Inc., and our statement is some 2½ pages. It's rather short but in the interest of time, Senator, I will not read it.

I would like to point out about three aspects of the statement if I may. The first one concerns the area of productivity and in this particular example this is a case study of one fleet operating 47-foot trailers in the States where they are legal some 40 million miles per year.

Now the purpose of S. 3431, if the trailers were reduced to 40 feet, this would be a 15-percent reduction in the usable cube of the trailer and in this particular fleet it would increase the annual mileage from 40 to 46 million miles, certainly not a very productive move. At 6.2 miles per gallon of fuel, this fleet would use an additional 967,742 gallons of fuel to deliver the same amount of goods. So from productivity this particular bill does not square.

The other one has to do with safety and I quote from a study conducted by the FHA of the DOT dated November 1977, in which they compared the safety records of seven large truck fleets over an 8-year period from 1969 to 1976. Now these comparisons were made to twin trailer operations with cab-over tractors compared with single trailer operations, and I'm not sure whether the tractors were cab-over or conventional, but the twin trailers operated 2.5 billion miles with an accident frequency rate of 0.652. On the other hand, the single-trailer units operated 1.3 billion miles with an accident frequency of 0.847. This indicates the twin-trailer situation in the 65-foot overall combinations were involved in 30 percent fewer accidents per million miles traveled. I don't know why, but I have a feeling that the bigger rigs are operated more safely, having to do with the attitude of the man operating the vehicle.

The CHAIRMAN. Well, now, if those statistics are correct, why haven't you really concentrated on trying to get these States which have the more restrictive provisions to change their limitations?

Mr. MORGAN. Senator, over the years, nearly some 30 years that I have been operating a private truck fleet, I have testified in behalf of increasing State lengths and weight laws in a number of State legislatures around the country and it's been a long uphill battle to get to where we are.

If S. 3431 goes in, I'm confident that the States are going to reduce the size of the trailer as opposed to increasing the overall length combination of the unit. That's the easy out for them.

The CHAIRMAN. Well, I think you would agree—and I meant to ask Mr. Whitlock this—that some of these truck cabs are certainly not adequate from the standpoint of space for a driver. Would you agree with that or not?

Mr. MORGAN. There are certain configurations where this is true.

The CHAIRMAN. I've been in them. I'm a medium-sized guy probably and I have been in a lot of these cabs and they are sure restrictive as far as I'm concerned in some of these cabs.

Mr. MORGAN. That's true in some cases. This particular case I cited here with 47-foot trailers, that fleet operates with 63-inch cabs and that allows room for the air-ride seat that's installed in this cab to be moved fore and aft or up and down and there's plenty of room in there.

The CHAIRMAN. Well, that may be, but I'm just talking about some of them that are obviously on the market and are in use today and they are pretty restrictive. You heard, I'm sure, some of these drivers this morning and you can go out—maybe we were shown some of the horror stories, I don't know, but some of them were pretty darned restrictive.

Mr. MORGAN. There are a number of cabs in the 48-, 50-, and 52-inch configuration that are on the road today. I believe originally these cabs were designed for city work as opposed to over-the-road operations and yet there are some people who do operate them over the road. However, I think that the trend is away from that. We have an addendum to our statement which the Private Truck Council sent to the Bureau of Motor Carrier Safety in connection with the MC–79 which addresses this particular question. It was the results of a survey made by the Private Truck Council of its membership and, in a nutshell, they are saying the survey indicated more and more of the people who are operating trucks are going to larger cab configurations in their cab-over-engine tractors.

If you will, Senator, I would like for that to be made a part of the record.

The CHAIRMAN. All right, sir.

Do either of you other gentlemen have anything to add?

Mr. WHITE. No, sir.

The CHAIRMAN. Thank you very much. We appreciate your being here and giving us your views.

Mr. MORGAN. Thank you, Senator.

[The statement and attachment referred to follow:]

STATEMENT OF WILLIAM J. MORGAN ON BEHALF OF THE PRIVATE TRUCK COUNCIL OF AMERICA

My name is William J. Morgan. I am employed by Frito-Lay, Inc. as Director of Traffic with National Headquarters in Dallas, Texas. Frito-Lay is a large manufacturer of snack foods with national distribution. As such it operates a significant fleet of tractor-trailer trucks. In this proceeding I am representing the Private Truck Council of America, Inc. whose headquarters' office is located here in Washington. The Private Truck Council of America is the only national independent organization representing non-transportation companies which operate trucks in furtherance of primary business other than for-hire transportation.

Our membership consists of many of the country's largest industrial firms and includes hundreds of smaller businesses, operating tens of thousands of trucks.

S. 3431 proposes to limit the length of trailers to 40 feet under the guise of highway safety. I will address this point, but first I want to look at productivity. More than 50 percent of the trailers in service are utilized in private truck operations. Many of these trailers are 45 to 50 feet in length depending on the specialized use for which they were purchased. Many products, produced from low density material fill the cubic capacity of trailers long before they approach the maximum gross weights allowed. A few examples are plastic pipe, styrofoam material, empty cans, and many food products—all reach maximum cube utilization before they reach maximum weight. The trend in consumer packaging contributes to this cube/density disparity. One typical example: A 47-foot trailer reduced to 40 feet under the proposed legislation, would be a 15-percent reduction in usable cube (3772 ft.^{3} vs. 3188 ft.^{3}). A fleet utilizing 47-foot trailers, operating 40 million miles per year would have to operate 46 million miles per year to deliver the same amount of goods. At 6.2 MPG of fuel, this fleet would use an additional 967,742 gallons of fuel—not a productive move when all of us are attempting to conserve fuel. This same fleet would spend $4.2 million additional to deliver the same amount of goods—costs which eventually get passed through in terms of higher prices, contributing to the ever increasing inflation.

S. 3431, in limiting trailer lengths, would add thousands of additional trucks on the highways, increasing the probability of accidents.

A study conducted by the Federal Highway Administration, U.S. Department of Transportation, dated November, 1977, entitled "Safety Comparison of Doubles vs. Tractor-Semitrailer Operation" compares seven large truck fleets over an eight year period 1969–1976. The doubles operated 2.5 billion miles with an accident frequency rate of 0.652. The single trailer units operated 1.3 billion miles with an accident frequency rate of 0.847. This indicates that double trailer rigs were involved in 30 percent fewer accidents per million miles traveled. This would indicate that the bigger rigs are operated more safely than are the smaller units. I'm not sure, but I think it has to do with the driver's attitude—the bigger the unit, the more alert the driver.

In summary, this legislation which would impose strict limits on truck lengths is extremely shortsighted. Because it compels a reduction in capacity, it harms productivity and therefore, is inflationary.

Although the intent of the measure is to promote highway safety, I feel that the reverse would occur because of the need for more vehicles on the highways to transport the same amount of goods that can be carried under the limitations imposed by existing rules.

Finally, we recognize that the issue precipitating the question of lengths in the first place is cab size and driver comfort.

We feel that the solution here, lies in extended and uniform truck lengths.

The Private Truck Council of America has addressed itself rather extensively to these matters in a recent filing with the Bureau of Motor Carrier Safety. We would like your permission to have this filing on Docket No. MC–79, No. 77–10 included in the record of these hearings as a part of our statement this morning.

Thank you, Mr. Chairman.

PRIVATE TRUCK COUNCIL OF AMERICA, INC.,
Washington, D.C., July 5, 1978.

DR. ROBERT A. KAYE,
Director, Bureau of Motor Carrier Safety,
Federal Highway Administration,
U.S. Department of Transportation, Washington, D.C.

DEAR DR. KAYE: These comments are filed on behalf of the Private Truck Council of America, Inc., the only national independent organization representing non-transportation companies which operate trucks in furtherance of primary businesses other than for-hire transportation. In response to this Advance Notice, we are offering the following comments.

The comments gathered from member companies have indicated that interior cab dimensions do not appear to be a significant problem in the vast majority of cab manufactured during the last three years (1975–1978) for use on vehicles in interstate commerce. In almost every case ample space is provided for the driver to operate the vehicle without experiencing any discomfort related to restrictive interior cab dimensions. In a small percentage of the cabs being used today, interior space is somewhat restricted, particularly if the driver is very tall or obese. These "tighter" cabs are generally COE models of 48 to 54 inches BBC.

certain short conventionals specifically designed to pull 45–48-foot trailers within states with overall length limits for tractor-trailer combinations of 55 feet. These COE cabs are utilized to provide maximum carrying capacity within the archaic 55-foot length limit.

Two changes can be implemented to improve driver comfort in those few tight cabs mentioned above. First, guidelines for minimum interior cab dimensions can be established for future production. Second, states with 55-foot length limits can increase those limits in order to permit operators to increase their transportation productivity and use slightly larger cabs.

In regard to the first change, many OEM's are working hard to improve the comfort of their cabs, particularly the short 48–54" BBC cab-over-engine models. Recent articles in trade magazines indicate that improvements in cab dimensions are included in present and future production which will increase driver comfort. We are sure that comments from OEM's on this Docket will support the point that they are working to improve driver comfort and ride on new production. Some OEM's have discontinued 48 and 50-inch BBC model cabs and are concentrating on producing 52 and 54 inch COE models with improved room for the driver's comfort.

We believe that minimum cab dimension guidelines, if developed, should be designed to accommodate a large but not obese driver. While manufacturers and employers have the obligation to provide safe and reliable equipment, drivers have the responsibility for maintaining a physical condition that is capable of functioning in their normal working environment. We do not believe that guidelines should be created that require cabs to be perfectly comfortable for obese drivers. In our opinion, cabs should be designed to accommodate 90 percent of the potential driver force.

We urge DOT to do everything possible to encourage states with 55 foot combination length laws applicable to interstate commerce to liberalize these limits. Longer length limits will permit significant improvements in productivity for companies which transport low density freight. In the 1977 St. Louis Fuel Economy Test sponsored by ATA, DOT and SAE, the carrying capacity of a 45-foot and a 48-foot trailer were compared. The test showed that a 48-foot trailer provided a 6 percent improvement in the cubic feet of cargo moved per gallon of fuel consumed. Greater trailer length is an excellent way to increase labor productivity in highway transportation.

We recognize two significant factors that work against states approving longer length limits. First, the emotional opinion held by many people that longer, "bigger" trucks are not safe. Second, union resistance to more liberal length laws that may result in lost jobs in the near term. Longer trailers not only reduce fuel costs but, even more important, significantly reduce the labor cost of transportation.

The PTCA strongly opposes states specifying trailer length limits. A few states have established limits of 45 feet on trailer length. Such limits are counter-productive and restrict the ability of transportation companies to increase their carrying capacity. We believe that states should specify overall combination length limits rather than specific trailer limits. Companies which operate private fleets over wide geographic areas must spend time to segregate their trailer fleets in order to avoid using 48-foot trailers in those states that have 45-foot limits. PTCA supports any DOT efforts to pursuade states to eliminate such trailer length limit restrictions and to encourage a uniform USA length limit of 65 feet for tractor/semi-trailer combinations.

It would be advantageous to encourage improvements in both interior cab dimension and more liberal length limits. These two changes should go hand in hand. One, to improve driver comfort for those few "large" drivers that are required to operate certain 48- to 54-inch COE cabs or short conventionals, and the other to help business reduce the overall costs of transportation.

In the Advance Notice, comments were requested on eight specific questions. Our members indicate that interior cab dimensions and related operating problems with short COE or conventional tractors were not considered to be a problem. Comments on the eight questions are noted below.

1. Whether any type or weight class of vehicle be exempted and why.

Comment.—For maximum effectiveness in interstate commerce we believe that any proposed model advisory for minimum cab dimensions should be limited to vehicles in class 7 and 8. Lighter weight vehicles would not normally be operated in long-distance transportation where drivers would be in the cab for extended periods.

2. Experience with shortened cab and its effect on driver performance.

Comment.—Comments from several companies with large private fleets indicated that they recognized no performance problems with drivers operating short BBC cab-over or conventional cabs. It is recognized, however, that some 48- to 54-inch COE are "tight" on interior room particularly for very large or obese drivers. Clearance for "belly" room seems to be a problem for the obese driver in some COE cabs.

Entry and exit from COE models is usually more difficult than with most conventional models. However, drivers using the proper procedure can enter and exit safety. During the past two years OEM has been working to improve the steps, handles and hand positions, particularly on their COE models.

In most cases, COE cabs do not ride as smoothly as conventional models. Improving the quality of the ride on COE's is another area OEM's have been actively pursuing. Air suspensions are offered as options now on a number of COE cabs. We do, however recognize that the COE design generally has a harder ride than the conventional style cab. Although the COE does not ride as well, we are not suggesting that the ride is poor enough to be a significant problem to the drivers.

3. Experience with shortened cab and vehicle controllability and maneuverability.

Comment.—Experiences with shorter cabs as they relate to vehicle controllability and maneuverability are good. In fact, several fleets noted that one advantage to the COE or short conventional cab designs is the improved maneuverability for these models. Both COE and short conventional models offer improved visibility in most cases when compared to long-nose conventionals, particularly in heavy traffic situations.

4. Cab over engines (COE) and their effect on steering axle weight.

Comment.—The COE configuration does often permit more weight to be carried by the steering axle. Greater front axle weight helps increase carrying capacity for a tractor-trailer combination within existing state length and weight limits and improves the tractor's front axle resistance to side sliding during stopping. With actual front axle of 9 to 12,000 pounds, no negative steering characteristics were reported by the drivers for members who commented. The PTCA can appreciate that loading a front axle or tires designed for 12,000 pounds to weights in excess of that amount is not a safe practice. We believe a front axle and tires designed to carry 12,000 to 16,000 pounds can do it safely, provided that the vehicle is not overloaded. Operating within a designed front axle weight limit of 12,000 pounds does not appear to present a problem with steering in either the COE or short conventional configuration.

5. Fifth wheel placement resulting from COE configurations and its effect on vehicle controllability.

Comment.—With normal fifth wheel settings, controllability of tractor-trailer combinations utilizing COE models with 48–52" cabs or short conventional models does not present any recognized controllability problems. It is true that a new driver on this type of configuration will need to drive for awhile to become familiar with the vehicle's handling characteristics. Several companies which operate many short conventional or COE tractors with fifth wheels 12-inch forward of center report no negative effectiveness on steering or controllability for fifth wheels in that position. As long as the fifth wheel position does not overload the front axle it is not believed to be incorrectly set. We note that there is an unproven belief that "high fifth wheel offsets are inherently unsafe." We do not support that belief.

6. Effect of COE placement on accessibility of engine for purposes of inspection and maintenance.

Comment.—The COE tractor design has an advantage over the conventional design when it comes to ease of maintenance. With the COE cab in the forward tilt position the engine and drive train are readily exposed for inspection or repair. In addition, most COE's provide access doors for drivers to check coolant, oil level and batteries without tilting the cab. It is true that a driver who wishes to visually see the engine must tilt the cab to do so. This is not normally required during drivers' pre-trip inspections. However, most fleets agree that the COE design offers significant advantages over the conventional for mechanics doing preventive maintenance or repairs.

7. Compatibility of differing sizes of tractor and trailer and the possible effect on safety.

Comment.—Private fleets normally do not capture their accident statistics based on vehicle cab design or overall trailer lengths. While it is true that a longer

tractor/trailer combination or tractors with two or more trailers take more skill to drive and maneuver, it is also true that companies employ professional drivers in their operation in order to handle this equipment responsibly.

Although accident statistics are not normally kept in relation to length of units, several members indicated that they did not recognize any relationship between longer trailer lengths and increased accidents. In fact, the improved field of vision with the COE cab caused several fleets to comment that they believed these models were safer than the conventional cab configuration. One fleet who has changed from 35- to 48-foot trailers during the past few years commented that their safety record continued to improve over the same period of time.

8. In addition, comments are specifically requested on the feasibility of proposing model advisory standards in lieu of regulations with respect to minimum cab space dimensions.

Comment.—If any formal guidelines or minimum cab dimensions are to be established, then model advisory standards are more desirable than regulations. Advisory standards would permit the OEM's greater flexibility in designing cab interiors. Regulation would be more restrictive and could block the normal improvements that OEM's might develop. Ample lead time should be provided for introducing any system of model advisory standards in order for OEM's to include these dimensions in their planned model changes.

CONCLUSION

In summary, PTCA does not believe that cab dimensions are a significant problem in interstate commerce. OEM's are working hard to improve cab dimensions and driver comfort on their shorter conventional and COE models in response to normal competition between manufacturers and comments from their users. PTCA does not oppose the establishment of advisory standards on minimum cab dimensions that are not overburdensome to the OEM. In addition, we strongly urge DOT to encourage states with restrictive weights or length limits (73,280 pounds or 55 feet) to liberalize these limits for greater productivity, with significant fuel and labor savings. We encourage your full support in persuading states to implement gross weight limits of 80,000 pounds or more and tractor/semi-trailer length limits of 65 feet or more throughout the USA. These limits would improve transportation productivity and help to control inflation.

Respectfully submitted.

JOHN C. WHITE,
Executive Vice President.

The CHAIRMAN. Our next witness is Peter Griskivich, vice president, Motor Truck Manufacturers Division, Motor Vehicle Manufacturers Association.

STATEMENT OF PETER GRISKIVICH, VICE PRESIDENT, MOTOR TRUCK MANUFACTURERS DIVISION, MOTOR VEHICLE MANUFACTURERS ASSOCIATION, WASHINGTON, D.C.; ACCOMPANIED BY FARREL KRALL; WALLY WHITMER; AND GARY ROSSOW

Mr. GRISKIVICH. Mr. Chairman, I'm Peter Griskivich, vice president, Motor Truck Manufacturers Division of the Motor Vehicle Manufacturers Association of the U.S., Inc. With me today are three technical experts: On my left, Wally Whitmer of GMC Truck and Coach, who's chairman of MVMA's Vehicle Safety Development Committee-Truck; and Farrel Krall of International Harvester, chairman of MVMA's Motor Truck Research Committee; and Gary Rossow on my right who is programs manager in our motor truck manufacturers division.

We commend you for initiating these hearings and hope that the presentations to your committee today will shed light on the impact on highway safety of motor carrier tractor and trailer lengths.

I'd like to read my written statement and ask that the attachments be made a part of the record.

The CHAIRMAN. It will be made a part of the record.

Mr. GRISKIVICH. Allegations have been made that restrictions on the overall length of truck tractors and trailers have given impetus to new truck designs resulting in safety problems on the road. Regrettably, these allegations are based on "fragmentary" evidence and, indeed, rarely can be proven. These are commented upon at length in the attachment to my statement. Furthermore, there is an understandable tendency to equate driver comfort problems with vehicle-related safety problems, even though a relationship between the two has not been established. A proposed remedy based on an incorrect diagnosis of the situation may not only fail to advance the cause of safety, but may also create new problems.

The purpose of our testimony is to present technical comments which we hope will help you make an accurate diagnosis. I will also state some practical reservations we have concerning S. 3431 and recommend what must be done before any new laws can be justified.

I'd like to summarize briefly several areas in our statement which we think important. First, the effect on weight changes on length and tractor configurations. The hypothesis has been advanced that truck tractors have been shortened to maximize trailer lengths within overall truck length limits to take advantage of the 80,000-pound gross weight limit which Congress legislated in 1974. This is not supported by the facts.

The CHAIRMAN. Well, why have they been shortened then? I'd like to know that. Because some of them have been shortened unreasonably it seems to me.

Mr. GRISKIVICH. Well, to the contrary. As we will point out in our statement, they have been lengthened. For example, one company has increased its minimum "COE" cab length "BBC" dimension from 50 to 59 inches. Another company has increased theirs from 48 to 54 inches in 1969. The new CL–9000 has a minimum BBC length of 54 inches, which is 2 inches longer than the COE model it replaced.

True, going back to the 1950's, when these COE's came in in large numbers, they were shorter, but gradually they have been lengthened made more spacious than models they replaced. It takes a long time in this business to replace the existing equipment.

The CHAIRMAN. Well, are you suggesting then that these short cab lengths are trucks that are many years old and ought to be replaced?

Mr. GRISKIVICH. This could be the result. We don't have a good fix. Believe me, there are problems that the drivers are having, but we don't have a good fix on really what the problem is. It may be a mismatch of equipment. Take that conventional up there on the shelf. It may be designed for a 9,000-pound axle. It may have been built in 1969. Now today it may be carrying 11,000 or 12,000 pounds on that front steering axle. That certainly is not a satisfactory condition. If that is the case, problems may be created as a result.

So when we examine industry sales of cab-over-engines and conventional tractors for those trucks having a gross vehicle weight rating of over 33,000 pounds—and these are the heavy class vehicles—the record shows that in 1972, before the higher weight limit was enacted, the

split was 43 percent cab-over-engines and 57 percent conventionals. In 1977 the relationship was identical.

Now this is explained in part by the fact that the variety of cab configurations, including COE's and conventionals, have long been required by truck operators going back to the 1950's to meet a wide range of vocational uses—city deliveries, for example—and have nothing to do with increased gross weights.

Generally, trailers are longer because States have enacted their overall length limits and not because the Federal limit was raised to 80,000 pounds.

Now turning to new truck designs and safety. There can be no argument that unsafe conditions on the road, whether caused by the driver, the vehicle, or the highway itself, must be identified and corrected. However remedial action must be based on solid evidence. The allegations that the 80,000 pound interstate weight limit resulted in unsafe conditions for the driver and that new truck designs created safety problems have not been substantiated. While problems may exist related to the safe operation of commercial vehicles on the Nation's highways, we are not aware of any data to support the assumption that a conventional cab configuration provides more safety and comfort than a cab-over-engine tractor, and that therefore restrictions on trailer lengths will improve road safety.

In fact, in an attempt to evaluate several hypotheses on truck safety suggested by a member of the National Motor Vehicle Safety Council in 1976, MVMA commissioned two separate studies by Calspan and Southwest Research Institute.

One hypothesis was that "the crashworthiness of tractors has decreased since the hood and extra distance between the driver and the front bumper are now gone." The first study reported that no representative data were available to effectively evaluate this statement. The second study found no difference in the severity of injuries sustained in accidents involving conventional tractors compared to cab-over-engine tractors. MVMA has continued to fund accident investigation research and is initiating another study to be completed by mid-1979 in a further search for any relationship between cab style and accident frequency and/or severity.

Now turning to fifth wheel position and steering axle loads. One of the recurring questions in this debate deals with the safety implications of fifth wheel position and steering axle loads. The position of the fifth wheel on the tractor determines the portion of the trailer load applied to the front axle.

A reduction of front axle loading can be accomplished by moving the fifth wheel rearward, provided overall length limits are not exceeded. While this change may improve ride quality under certain conditions, it may also result in adverse effects on steering and vehicle stability. In addition, the rearward movement of the fifth wheel, which increases the space between the cab and trailer, tends to increase the aerodynamic drag on the truck and consequently reduces fuel economy. It is important to note that for a given gross combination weight, the fifth wheel may be further forward on a long wheelbase conventional than on a short wheelbase cab-over to achieve equivalent axle system loading.

Forward movement of the fifth wheel does increase front axle loading. While some increase in steering wheel movement in negotiating a given turn may occur as a result, this is generally regarded as desirable. Some increase in manual steering effort may also occur, but this can be reduced by power assist.

In general, any appreciable movement of the fifth wheel on the vehicle frame should be very carefully considered so that proper steering, handling, and ride are maintained and to assure that neither the manufacturer's gross axle weight ratings nor State and Federal axle load regulations are exceeded.

Although MVMA is unaware of accident data which are sufficiently detailed to attempt to relate specific axle loads to accidents, from an engineering standpoint an axle system designed for heavier loads, say 12,000 pounds gross axle weight rating, is as safe as one designed for lesser load, say 10,000 pounds gross axle weight ratings, when both are loaded within their design capacity. A different situation exists, however, when an axle is loaded in excess of its design capacity, say a 10,000-pound rated axle is loaded to 12,000 pounds, because front end alinement may be altered and a decrease in component life may result. Overloading of front axle systems could result if tractors having GAWR's of less than 12,000 pounds—for example, those commonly used before Federal weight limits were increased—are operated at the 12,000-pound level which results when a typical five-axle combination is operated at 80,000 pounds.

Detailed accident statistics to evaluate if "overloaded" axles are a contributor to heavy truck accidents to the best of our knowledge unfortunately are not available. The point is, however, that the increase in Federal weight limits in 1974 has not mandated the overloading of front axles because truck manufacturers make available axles which are rated at 12,000 pounds and above. It is the responsibility of the operator to insure that the front axle is not loaded beyond its rated capacity.

Let me briefly review some of our practical reservations about S. 3431.

Of particular concern is the requirement that State overall length limits be amended so that overall length must exceed the trailer limit by 15 feet or more. We are not aware of any engineering rationale to justify the 15-foot allowance which apparently is arbitrary; safe, comfortable COE's are currently offered which require much less than 15 feet. Unless precluded from doing so, States with existing 55-foot overall limits in which 45-foot trailers are used may reduce their trailer limits to 40 feet. This would occur because most States would probably retain the present overall length limitations and deduct 15 feet to arrive at the maximum trailer length. The record of past attempts to increase truck length limits in many States demonstrates it is not realistic to expect them to increase their overall limits.

Similarly, in the case of States which allow twin trailers, combination trailer lengths would be reduced by 7 feet, from 54 to 47 feet. Should this happen, there would be substantial economic costs and adverse effects on the energy and economic situations. More tractors and trailers would be needed to haul the same amount of freight now being transported by longer trailers. Total fuel consumption and transportation costs would increase as a result.

It is our judgment that a new truck length restriction at this time would be premature; and perhaps counterproductive. There is no evidence that such a restriction would improve highway safety. For example, if in fact a safety problem exists because some operators are loading their front axles in excess of manufacturers' axle ratings, excluding tractors from length limits would have no effect on this problem.

The existence and the nature of any safety problem needs to be better clarified and defined; in particular, the relationship between vehicle safety and driver comfort needs to be determined before any relationship between the two is presumed. The viewpoints and expertise of all affected parties—manufacturers, carriers, and drivers—have to be collected, analyzed, and evaluated; investigative research must be conducted. Then we can address ourselves to correcting any problem identified.

Your hearings are an important step toward the kind of a comprehensive analysis that is needed. Such an analysis should consider the effects of different lengths on safety, economics, energy conservation, and driver environment based on well-founded criteria. Within these broad categories there is a need to examine specific effects of varying lengths of trucks, tractors, semitrailers, full trailers and combinations thereof on: handling, stability, and off-tracking; cargo capacity, pallet and container sizes; special vehicle configurations—including the use of tractors as cargo carrying elements—driver concerns for adequate space, sleeper width, and ride quality; fifth wheel location, axle loadings, and load distributions dictated by the "bridge formula"; the efficiency of transportation—that is, the number of trucks needed to carry a given amount of freight and factors affecting fuel economy.

These many complex and intertwining factors need to be examined comprehensively and systematically by bringing together the great body of existing data and conducting additional research where gaps exist, particularly in the areas of accident causation and the relationship between driver comfort and safety. We believe the research by DOT on the safety aspects of increased vehicle size and weight should be considered prior to enacting Federal legislation. We pledge our support to continue MVMA-sponsored accident investigation and analysis research which focuses on many of these issues.

We believe such a thorough review should be completed as quickly as possible and will insure against premature actions which may have significant detrimental side effects on the Nation's transportation system and energy resources without a demonstrable safety benefit.

Mr. Chairman, this concludes my presentation. I will be happy to answer any questions.

The CHAIRMAN. Thank you very much. We appreciate your very good statement here.

[The attachments referred to follow:]

SAFETY ALLEGATIONS FROM THE CONGRESSIONAL RECORD JULY 10, 1978

1. "When Congress allowed a weight increase to a gross total of 80,000 pounds . . . the change created a strong economic incentive to purchase the longest . . . trailers possible."

The 1974 changes to the Federal-aid Highway Act allowing 80,000-pound weight limits on Interstate Highways did not create a demand for longer trailers at the expense of cab length. Trailer lengths have been increasing principally because

states have been liberalizing length laws; the market share of COE's has been relatively static for more than 5 years.

Table 1 attached shows historical trends in trailer length. Between 1974 and 1976 demand for 42.5-foot trailers did increase from 5 to 18 percent of production. However, the percentage of 45-foot and longer trailers declined from 42 percent in 1974 to 37 percent in 1976. Table 2 illustrates the increasing number of states which permit longer tractor/trailer combinations. Currently, 27 states allow combinations more than 55 feet long, up from 21 in 1975.

Table 3 describes the past 10-year trend in sales of COE vs. conventional cabs. COEs historically account for about 40 percent of the market with a slight increase from 39 to 43 percent since 1974. It will be noted that in 1977 the COE share of the heavy truck market was identical to what it was in 1972—43 percent.

FROM:
Truck Trailer Manufacturers Association
2430 Pennsylvania Avenue, N. W.
Washington, D. C. 20037

TABLE 1
SEPTEMBER 1976

VAN TRAILER CUBE -- 1976

Following are results of TTMA's recent survey on Van Trailer Production, including a comparison of lengths over a period of years:

TRENDS IN VAN TRAILER LENGTHS

LENGTH IN FEET	% 1946	% 1948	% 1953	% 1956	% 1958	% 1960	% 1962	% 1964	% 1966	% 1968	% 1970	% 1972	% 1974	% 1976
45' or over	--	--	--	--	--	--	--	--	--	6.1	13.3	31.7	41.8	37.0
42'6" to 45'	--	--	--	--	--	--	--	--	.8	2.3	.9	2.0	3.1	5.3	18.5
40' to 42'6"	--	--	--	--	3.0	.1	3.2	1.1	2.3	64.6	70.8	50.2	41.4	28.2
*38' to 40'	--	--	--	--	10.0	60.0	81.8	82.4	73.0	1.7	1.3	.6	2.6	.8
36' to 38'	--	--	2.4	6.7	8.5	6.5	2.4	1.2	1.6	.4	.3	.1	.1	.4
34' to 36'	--	--	18.9	68.6	64.0	16.6	7.4	3.3	1.8	1.2	.8	.8	.3	.6
32' to 34'	4.3	16.6	58.7	14.8	5.5	2.8	.9	.7	.4	.3	.7	.1	.4	1.3
30' to 32'	4.1	23.9	10.4	2.0	3.0	2.0	.6	1.2	.8	.4	.9	1.0	.9	1.2
28' to 30'	17.9	27.5	3.2	.9	2.0	2.5	.6	1.7	.5	2.8	1.0	1.4	.6	.3
26' to 28'	23.5	18.8	1.1	.6	1.0	6.4	1.3	4.4	15.4	19.8	7.6	10.4	5.9	8.6
24' to 26'	24.3	6.5	1.8	1.0	.5	1.0	.9	2.9	1.3	1.5	1.2	.6	.6	2.4
22' to 24'	21.4	5.3	1.6	1.6	2.5	.5	.2	.2	.6	.2	.1	--	.1	.4
Under 22'	4.5	1.4	1.9	3.8	--	1.6	.7	.1	--	.1	--	--	--	.3

* - Through 1966 this figure included 40' units.

TTMA/9/76
DRJ

TABLE 2.—TRACTOR/SEMITRAILER LENGTH LIMIT HISTORICAL TRENDS

[Length in feet]

	Number of States					Total States permitting length over 55 ft
	30 to 50 ft	55 ft	56 to 60 ft	65 ft	70 ft plus	
1945	42	1	3	1	1	5
1955	36	2	7	2	1	10
1965	6	29	9	5	1	15
1975	0	29	10	9	2	21
1976	0	29	8	11	2	21
1977	0	24	12	12	2	26
1978	0	23	12	13	2	27

Note: Canada permits 65- to 70-ft length in all provinces and territories.

TABLE 3.—HISTORICAL TRENDS IN HEAVY TRUCK SALES BY TYPE OF CAB

[Percent of trucks over 33,000-lb gross vehicle weight]

Year	Cab over engine (COE)	Conventional
1968	38	62
1969	39	61
1970	39	61
1971	40	60
1972	43	57
1973	43	57
1974	39	61
1975	34	66
1976	41	59
1977	43	57

Source: Motor Vehicle Manufacturers Association of the United States, Inc.

2. "Overall length limitations . . . have forced tractor size to be sacrificed in the trade-off for . . . increased payloads . . . and have fostered a generation of truck designs which have quite literally squeezed truck cabs into the smallest configurations imaginable."

Many new cab designs offer increased space for the driver; for example, International Harvester has increased its minimum COE cab length "BBC" dimension from 50 to 59 inches. Likewise, General Motors Truck and Coach increased their minimum BBC from 48 to 54 inches in 1969. The new Ford CL–9000 COE has significantly increased space for the driver with BBC lengths available from 54 to 110 inches and regardless of BBC dimension, the driver space is identical.

All domestic manufacturers currently offer conventional truck tractors which can be used with 45-foot trailers in states with 55-foot overall length limits.

3. "New truck designs" reduce the ability to stay alert at the wheel and to avoid and survive accidents.

The allegation that "new truck designs" (presumably referring to COE tractors) are somehow less safe is unsupported. In 1976, MVMA asked Calspan Corporation and Southwest Research Institute to look into a similar allegation. Here are the findings from their reports:

Hypothesis: The crashworthiness of tractors has decreased since the hood and extra distance between the driver and the front bumper are now gone.

CALSPAN FINDINGS

Only one empirical study of this hypothesis could be found (Stern, 1966). This involved the comparison of 108 cabs with a 'conventional' configuration to 96 cab-over-engine power units. These 204 units were obtained from North Dakota and Oklahoma, the Interstate Commerce Commission (then), and members of the American Trucking Associations. Clearly, no particular population was represented by this sample. Stern presented the following table:

PERCENT DISTRIBUTION OF DRIVER'S DEGREE OF INJURY BY TYPE OF POWER UNIT

Power unit	Degree of injury					Total	Total cases
	None	Minor	Non-dangerous	Dangerous	Fatal		
Conventional	12.0	24.1	42.6	6.5	14.8	100	108
Cab-over-engine	7.3	35.4	36.4	8.3	12.5	100	96

$X^2(_4)=4.31$ N.S.

The results were not statistically significant, and a comparison of the injury proportions failed to show any kind of meaningful trend. This should not be taken to mean there is no difference between the two types of cabs. The sample was not large and no controls were provided for impact characteristics. Nonetheless, given 204 accidents, as they occurred in the real world, no differences were found.

SOUTHWEST RESEARCH INSTITUTE FINDINGS

Background.—This statement is difficult to evaluate since crashworthiness data are not generally available on tractor types for most accidents. In one reference (11),[1] however, it is reported without supporting data that a tremendous number of losses in lives and injuries in the last 5 or 6 years are directly associated with the design of the cab.

Data analysis.—There is no provision for data on tractor type in the Texas police accident reports. The limit on truck lengths is 45 feet for single-unit trucks and 65 feet for combination trucks, with longer units requiring special permits. With these length restrictions the relation between number of cab-over and conventional power units in operation would be interesting to compare.

Little additional information is attainable from the USC study. It is reported that 48.4 percent of the trucks in accidents included cab-over type power units while 51.6 percent were accounted for by conventional power units. Unfortunately no accident data was reported on these cab types.

Discussion.—The conclusion here is that there is potential data available, at least at USC, to effectively determine the crashworthiness of tractors of the cab-over-engine type versus conventional. The data currently released, however, only indicate both types are about equally involved in accidents in California. No information is available on crash severity comparisons.

4. Moving the fifth wheel forward "upsets the steering dynamics" and "critically hinders" steering control.

The location of the fifth wheel controls the distribution of the trailer kingpin load between the tractor front and rear axles. (See Figure 1 for an illustration of this effect.) From a design standpoint, and particularly with respect to vehicle stability and steering control, the fifth wheel should be located forward of the centerline of the rear axles so as to load both the front and rear axles of the tractor. This will provide good directional stability and maintain the front axle and wheel alignment parameters of caster, toe-in, and camber within the dimensions for which the vehicle is designed and will handle best.

Steering system geometrics (including alignment parameters, kingpin inclination and offset) are carefully determined from a multitude of considerations including proper vehicle handling, tire wear, stability, durability, etc. Vehicle manufacturers offer a wide variety of front axle capacities (gross axle weight ratings—GAWR). A 12,000-pound GAWR axle loaded to its capacity is as safe as a 10,000-pound GAWR axle loaded to its rating. Because important geometric relationship of the steering axle system (camber, caster, toe-in, kingpin inclination, etc.) vary as the axle is loaded, manufacturers are careful to assure these relationships are proper over the entire operating range of axle loadings. Loading in excess of the manufacturer's GAWR or unloading of an axle (by rearward movement of the fifth wheel) will result in less than optimum steering, vehicle handling, and stability.

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[1] Roley, R. W., "The Tragedy of 'Cab-Over' Tractors," American Association for Automotive Medicine Quarterly 4, p. 18, December 1973.

FRONT AXLE LOAD VERSUS 5th WHEEL LOCATION

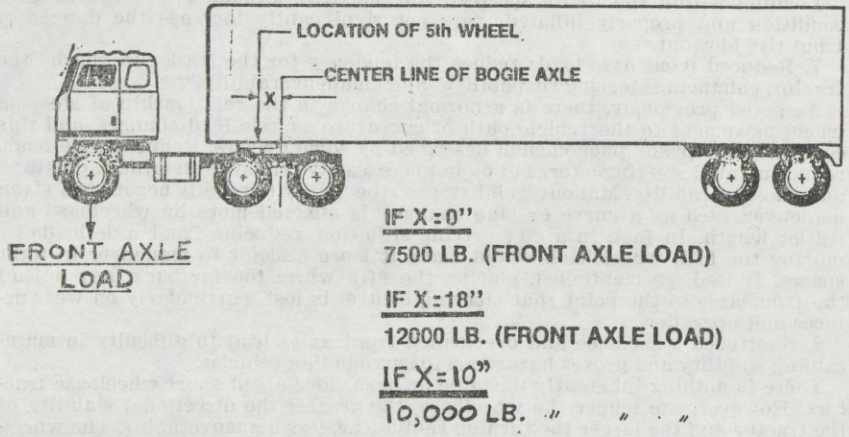


FIGURE 1

Steering effort will increase on tractors with manual steering as the fifth wheel is moved forward and front axle loading increases; however, excessive steering effort can be avoided by use of power assist.

5. The "safest tractor ride" is achieved when the fifth wheel is placed over the tractor rear axle.

This allegation apparently stems from a misinterpretation of a statement made by Highway Safety Research Institute personnel in a report dated March 24, 1977, prepared at the request of the Teamsters. Quoting from the report:

"The best tractor ride is achieved when the fifth wheel is placed over the tractor rear axle—This statement is true based on industry 'Rules of Thumb' and based on limited experimental data published on truck/tractor ride."

This conclusion has been distorted by assuming that the "best" and "safest" are synonymous. There is no established relationship between truck ride quality characteristics and safety. The following pertinent comments to the BMCS steering axle study on the relationship of fifth wheel location to vehicle control and ride were offered by Mack Trucks, Inc.:

". . . placement of the fifth wheel directly over the centerline of the rear axle, or axles, can result in a marked reduction in front axle loading when the vehicle is ascending a grade which permits the effect of the fifth wheel load to be applied to the rear of the rear axle(s) centerline. This results in a 'lifting' effect on the front axle and can be detrimental to vehicle controllability. This effect is described in an excerpt from U.S. Army Technical Manual TM9–8000 which is enclosed.

"Suspension systems are designed to function most efficiently at their design capacity. Thus the system will provide the driver and cargo with the best isolation from road irregularities when it is loaded to its design capacity. It is common practice to provide improved driver comfort through the use of optional suspension type seats."

6. Longer trailers tend to "push" tractors through curves, degrade ride quality, and increase the danger of front tire blowout because of "structural conditions."

Longer trailers by themselves have no adverse effect on tractor handling, ride quality or tire failures. If the fifth wheel is moved forward to accommodate a longer trailer within an overall length limit, and front axle loading thereby increased, then the increasing understeer coefficient causes the driver to increase the steering wheel movement for a given curve and he or she may perceive this as a "push." This is not a hazardous condition, so long as axle loads are not exceeded.

Ride quality is dependent on many factors including front axle loading. Ride quality may or may not be degraded by increased front axle loading. Longer trailers can, in fact, improve truck ride compared to shorter trailers with the same fifth wheel offset because of reduction in trailer pitching motion.

Loading within the limits specified for the tires, assuming they are in good condition and properly inflated, does not significantly increase the danger of front tire blowout.

7. Reduced front axle loads reduce the tendency for the trailer to "push" the tractor, enhancing steering "capability" and "maneuverability."

As noted previously, there is a normal change in the relationship of steering wheel movement to the vehicle path of curvature as axle load changes, and this could be the "push" phenomenon described by some drivers. Reduced axle loads reduce manual steering effort but do not necessarily "enhance steering capability" and maneuverability. Maneuverability (i.e., the ability to readily negotiate a given maneuver such as a curve or lane change) is affected more by wheelbase and trailer length. In fact, in a city driving situation, reducing front axle loads by moving the fifth wheel back would make it more difficult to maneuver in tight spaces. Indeed, as mentioned, placing the fifth wheel too far back may unload the front axle to the point that steering control is lost, particularly on wet surfaces and upgrades.

8. Shortened wheelbase and overloaded front axles lead to difficulty in maintaining stability and proves hazardous to surrounding vehicles.

There is nothing inherently unstable or hazardous about short wheelbase tractors. However, the longer the wheelbase, the greater the directional stability of the tractor and the larger the turning radius (i.e, less maneuverable). The wheelbase of either a 92-inch BBC conventional or a typical COE would be approximately the same (140–150 inches) when operating with a 45-foot trailer and a 55-foot overall length limit in order to provide for proper load distribution among the axles.

Overloading, i.e., exceeding the GAWR, is undesirable and may lead to premature component failure. Manufacturers strongly oppose such practices.

9. Longer cabs permit longer wheelbase, thus reducing jackknife.

Wheelbase and cab length are not directly related. Although a long cab may necessitate a long wheelbase to provide for fifth wheel placement ahead of the rear axles, a long wheelbase tractor may have a relatively short cab as is common in many Western states.

Jackknife can result from a variety of driver, road, environmental, and vehicle factors. Directional stability which is improved as wheelbase increases (all other things remaining equal) is but one of many factors which can influence the occurrence of jackknife.

10. A "less cramped cab" provides safer entry and egress, and greater ride comfort.

The space available within a cab has little to do with safe entry and egress, which relate primarily to the external steps and handholds. Significant improvements in provisions for safe entry and egress have been made by manufacturers. In addition, the BMCS has issued proposed rulemaking specifying numbers, location, and strengths of handholds and steps.

Cab space and ride quality in terms of vibration are unrelated. Manufacturers have done much to improve driver comfort and truck ride. In addition, truck ride is the subject of research within DOT where an extensive study of "Truck Ride Quality and the Impact on Driver Performance" has been initiated. This study will also address other factors affecting driver comfort.

It is important to recognize that trailer design, loading and road surface characteristics are other major factors affecting ride quality.

11. Improved ride improves highway safety for all motorists.

This conclusion presumes a relationship exists between truck ride and accident causation. No such relationship has been established. Indeed, the first step which would be to examine driver fatigue as it may be affected by truck ride has yet to be undertaken. NHTSA plans to examine "The Physiological and Psychological Effects on Truck Ride Quality" as part of the DOT ride research program. Until such research is satisfactorily completed and linkage between ride vibration and fatigue or direct impairment determined, it is premature to conclude that improvements in truck ride will have any beneficial safety effect.

12. There is no braking system to reduce jackknife.

Braking systems intended to reduce jackknife (i.e., anti-skid) have been required for more than three years under FMVSS–121. A properly maintained and

balanced brake system (even without antilock) with competent driver control can be effective in reducing the incidence of jackknife.

13. Tire failure is "one of the top killers" in truck accidents, accounting for two-thirds of those caused by mechanical failures.

According to Bureau of Motor Carrier Safety Accident Statistics for 1973 and 1976, tires were a factor in 19 (23 percent) of the 82 accidents attributed to mechanical defects. However, mechanical defects accounted for only about 8 percent of the more than 1,000 accidents investigated. Thus, of all the accidents investigated, tires were a factor in only 1.8 percent. Running on underinflated tires is generally regarded as a principal cause of premature tire failure. The specific reasons for tire failure were not reported in the BMCS study.

The CHAIRMAN. Mr. C. H. Fields, assistant director, American Farm Bureau Federation, has requested that his statement be included in the record. It will be made a part of the record in full.

Our next witness is Mike Parkhurst, publisher, "Overdrive Magazine."

STATEMENT OF MIKE PARKHURST, PUBLISHER, OVERDRIVE MAGAZINE, LOS ANGELES, CALIF.

Mr. PARKHURST. For the record, my name is Mike Parkhurst, publisher of "Overdrive Magazine", but also president of the Independent Truckers Association. I want to thank the committee and you, Senator Cannon, for the opportunity to present a wide variety of views.

Rather than read my prepared statement, which I'm loathe to do anyway, and which I'm sure would find a few people falling asleep, I'd rather get down to basics if I could and discusss in the first place what we're talking about because I think that some of the witnesses have not fully understood some of the implications of the legislation. But before I go into that, I'd like to simply offer for your files—and I'm sure some bureaucrat will be very happy that we designed it so big to fit into a big file cabinet so somebody can come along and spend more taxpayers money—in any case, this is a drawing of a conventional tractor which I'm sure you, Mr. Chairman, are familiar with, and this line above represents an approximation of the wind which is pushed away by the truck which is an important factor here, and in the cab-over design we see an approximation of what happens when this shoebox on the highway pushes the wind up and around. It does waste a lot of fuel and since the Federal Government is so interested in saving fuel I'm sure that one of the things hopefully that will come out of this will be the flexibility needed for the trucking industry to save the fuel that it can.

I don't think it takes an engineer, I don't think it takes a man with an engineering degree to see that if you put a driver directly over an axle, unless he's sitting in an air-ride truck which one of the manufacturers does make which does ride very smoothly, he's going to be bounced around. I don't think we need to go into that. I think it's been covered and I will submit for the record a few interviews with truckers that we recently did who have commented on their displeasure over being forced into a cab-over tractor.

I do agree with those gentlemen who said that not all cab-over tractors are rough. They can be made to ride smoothly, but that's not the real issue.

I think the real issue is we've got the wrong people on the witness stand here and what I'd like to do—I'm glad I have empty chairs here

because what I'd really like to do is somehow resurrect the ghosts of Thomas Paine and Thomas Jefferson and bring into this room the Governors and legislators of all those 25 or 26 States that in their either ignorance or deliberate design have forced this completely unnecessary burden on the entire trucking industry, which includes not only the large carriers but also the drivers who are forced into the kind of uncomfortable trucks sometimes that they have to drive. So the real blame shouldn't be, in my opinion, on the large carriers who take advantage—and I might add, full advantage—of the lengths law whenever possible.

And as my written statement indicated, I believe that if there's an option they will always opt on the side of profit rather than safety or driver comfort, but I don't think they really want to do that. I think if they have all of their options they could see the wisdom of having a more comfortable tractor, a better riding tractor, because it's not just dealing with the issue of personal safety but also cargo safety as well as highway safety.

I'm glad that Mr. Whitlock from the American Trucking Association in his remarks said he wanted to see the truckers be free in order to allow the trucking industry to operate at full optimum level. Of course, I don't think that the ATA goes so far as to suggest that the small independent truckers be free in order to compete with them and thus fill up empty trucks. We actually have on the highways right now enough trucks to carry the cargo for a couple of years at least without the manufacture of any new trailers. So those who would like to see more safety on the road, and I would certainly applaud any effort, as as indicated by that rather whimsical remark by Mr. Whitlock that the truckers be free. I'd like to see them be free because Mr. Whitlock also said there's an inflationary impact here. But all these statements that we have heard this morning and that you, Mr. Chairman, have been so patient in listening too, they all miss the mark, in my opinion, because they are discussing the length of the shoelaces when we should be really concerned with the comfort of the shoes.

Because, in my opinion, the opposition to Senator Kennedy's bill is based on a false assumption, and that assumption is that if the bill is passed the States will capriciously squeeze down the number or the size rather of the trailers and therefore the trucking industry will once again be put at a disadvantage.

On one hand, Mr. Whitlock complained about the States not enacting 65-foot length laws, for instance. Thirteen seconds later, he said he thought the States should be the ones to enact the laws. I disagree, therefore, with the ATA position that the States should enact the laws. I believe in States' rights but I think the States have operated in a very willful manner, such as Wisconsin which in order to keep out competition from other carriers coming into the State enacted a 59-foot length law instead of a 60-foot length law. Therefore, the carriers based in Wisconsin, those regulated carriers who have their own sort of monopoly, were able to carry the freight and make the profits.

It's obvious that the discussion here should really be based on commonsense and not whether one State is 55 feet and another is 60 feet. Therefore, I think that since Senator Kennedy is a reasonable man, that he would be glad when he returns from Russia to explain to the public and to this committee in particular the exact meaning of his

bill, because I interpret it a little differently, and in talking with those committee staff members from Senator Kennedy's office I don't have these great fears that if this legislation is passed that we are going to see shorter trailers and so forth and so on.

That, of course, says something for the legislative lobbying powers of the ATA in the States. But, in any case, the way I read it and the thing that everybody here who has objected to this legislation is afraid of, on line 13, page 3, the legislation, which is merely a suggestion—it's not a law—says "that no State may so limit trailer length of any such combination so as to make unlawful the continued use of semi-trailers, trailers or combinations thereof which were in use and within lawful length prior to the date of enactment of this proviso"; and therein lies their perhaps somewhat legitimate fear that if those existing trailers are phased out that they would then be squeezed down and you would have perhaps a longer length but you would also have shorter trailers which would make—and I would agree—the trucking industry much less productive.

So I don't see what the whole fuss is about. All we have to do is get Senator Kennedy to simply explain or rewrite. He's written and rewritten many bills I'm sure in his career, and I'm sure he would have no objection to explaining completely to the committee as well as to those witnesses who did raise those objections—and just simply rewrite that so that those words which raise the fear in those witnesses—so that those words are changed so that it doesn't deal with just the trailers but actually the law itself.

What they are really afraid of, if I read them correctly, is that if the trailer is consigned to the junkpile that the next trailer coming along will have to be 5 feet shorter or whatever, depending on the State law, and I don't think that was Senator Kennedy's intention. And so I would just suggest that we just get the Senator to explain it or rewrite it. It wouldn't take too much time I'm sure, and it would end all of these objections by these people who—none of them raised that point, but I thought I should.

I do, however, raise another point and I disagree again with the ATA's statement that no large carriers were interested in this monstrosity produced by the Strick Corp. There statement was that there was no interest, that only two tractors have been produced—fortunately, only two—and we were, by the way, for the record, the only publication in the trucking industry to raise the specter of this Frankenstein on wheels. None of them objected to it at all and there's about 25 trucking publications in the trucking industry. None of them said it was something that shouldn't be allowed on the road. We did. But it's interesting that in spite of Mr. Whitlock's statement that there was no interest, I see here the logo of a large regulated carrier on the side of that truck. So obviously there was a large regulated carrier quite interested in that truck and I don't want to put words into the ATA's mouth, but I think that to assume that the regulated carriers are not going to be interested in that is assuming too much because history shows us that they will buy the shortest wheelbased tractors, the smallest cabs, the cheapest trucks on the road, in order to pack in as much freight as possible.

Now you can't really blame them, but again it's not their fault. It's those State legislators, those Governors who sit there blindly, not

knowing, as this committee does, that the problems are costing the American consumer. So if the proper blame is to be laid, it ought to be right on the doorsteps of the State capitols down there in Atlanta and other States and let those people have their feet put to the fire instead of the trucking industry which has to shoulder the blame and come in here with long prepared statements and files and pictures and drawings and the whole rigmarole. All you have to do is look at this ridiculous conglomeration—summary of size and weight limits—and realize they are only talking about 50 States and there are literally thousands of combinations. You can't do this in one State and you can't do that in another and you've got sliding fifth wheels and so forth and so on in order to take advantage of the various length laws. I think it's just a classic example of misplaced blame and I think that the explanation by Senator Kennedy would end all of it because I have talked with the manufacturers, I have talked with Mack Trucks, I have talked to General Motors, and none of them have expressed any inclination not to build a more flexible truck, and if we get the flexibility by allowing longer tractors, you're not only going to save a few lives, a lot of kidneys and a lot of discs that may be pressing on a nerve, but you are also going to save a lot of money because, in spite of the fact that we have conventional tractors, what they call conventional—and one kind that was not really mentioned except by brand name is a cab-forward truck—I didn't illustrate that, but in spite of this, every truck in America still is built to conform to the arbitrary length laws of the various States.

Even the most modern conventional tractor, even if you put an aerodynamically designed windscreen on top, the front of that truck is still flat and it's still a shoebox going down the road. The manufacturers that I have talked to would like the flexibility to be able to add that.

I'd like to conclude these remarks with an excerpt from my written statement which also, in my opinion, goes to the heart of the matter. It seems to me that these various States have been given free reign for far too long to control not only the trucking industry but the price of tomatoes on the housewife's table every night because in the Constitution, in section 9, it says very clearly:

> No preference shall be given by any regulation of commerce or revenue to the ports of one state over those of another: nor shall vessels bound to, or from, one state, be obliged to enter, clear or pay duties in another.

That's right there is the Constitution for anybody to read, but those States that are disobeying that law of the land obviously don't understand what it means because it says that no preference shall be given by any regulation of commerce, and by having this mismash of laws there obviously is a preference. Obviously, when you limit the size of a truck, that is a hidden tax which the consumers have to pay but which they are unaware of because the trucking industry is complex so therefore we don't need all of these. All we need to do is go back to the Constitution and if some of us would perhaps we would be living in a much more and free society where we did have, as Mr. Whitlock suggested, a free economy in the trucking industry but which won't really come until we deregulate the trucking industry.

The CHAIRMAN. All right, Mr. Parkhurst. We thank you very much for your statement.

[The statement follows:]

STATEMENT OF MIKE PARKHURST, PRESIDENT, INDEPENDENT TRUCKERS ASSOCIATION

INTRODUCTION

It should not be too surprising to discover that, on September 7, 1978, that the United States Congress is taking a renewed interest in the problems of trucking, specifically in the area of arbitrary and unscientific length laws. It shouldn't be surprising that these many problems are not yet solved because, by the same token, the various state governments have seen fit to completely disregard the United States Constitution in the area of trucking.

For instance, even though a so-called independent trucker not even leased to a common carrier is allowed to pick up and deliver fresh produce with relatively little hindrance from the United States government, he still must—if he travels in the 48 continguous states—apply for and carry almost 200 different licenses and permits. No two licenses or permits have the exact same requirements, nor are their rules written in the same manner, nor are they printed on the same stock, color or quality of paper. That same so-called independent trucker must apply for various licenses and permits in virtually every state he travels in and in many states he must report data he collects in other states, so his bookkeeping problem is compounded tremendously. These seemingly irrelevant items—unrelated to the safety aspect in a direct way—are used as an introduction because these licenses and permits as well as the many existing Ports of Entry are, in the main, illegal, completely illegal according to the Constitution.

For the various states, even if they do not maintain a roadside shack manned with Port of Entry inspectors, still maintain an off-site or "invisible" Port of Entry which governs the commerce entering and clearing those states. Yet the United States Constitution in Article 1, Section 10, says: "No State shall, without the Consent of the Congress, lay any Imposts or Duties on Imports or Exports, except what may be absolutely necessary for executing its inspection Laws: and the net Produce of all Duties and Imposts, laid by any State on Imports or Exports, shall be for the Use of the Treasury of the United States . . . "

And the Constitution further states that: "No State shall, without the Consent of Congress, lay any duty of tonnage . . . "

And the Founding Fathers in their wisdom decided to further restrict the states in their potential avarice when, in Section 9, the Constitution spells out the following: "No Preference shall be given by any Regulation of Commerce or Revenue to the Ports of one State over those of another: nor shall Vessels bound to, or from, one State, be obliged to enter, clear or pay Duties in another."

Clearly, the Constitution bones in Sections 9 and 10 support the muscle of an arm that is supposed to salute absolute freedom in commerce, because it is obvious that there is a "preference" in regulations of commerce because there is no equality in trucking, and, additionally, the states are violating the law of the land every single year, every single month, every single week, day, hour and minute so long as there is one Port of Entry or any requirement which extracts duties from trucks, duties which are not even passed on to the government of the United States as is clearly spelled out in that noble document. But, to go a step further and deal with the spirit if not the letter of the law, it is easy to see that many states—perhaps half—are not only ignoring the Constitution but the spirit of more recent Congressional actions when they do not adopt a uniform length law. As a result, those states—and the Committee knows each and every one of them—are able to dictate the commerce for all other states. This tail wagging the dog is costing the American taxpayers billions of dollars annually because only the smallest truck is allowed to travel coast to coast, whereas the more economical and even safer trucks are consigned to certain states, to certain routes, to certain cargoes.

Although there may not be a specific tax collected by the various states on a cabover tractor compared to a conventional tractor, the net result is the same, because, to limit income through whatever means is in itself a tax, and by limiting

the ability of trucks to earn a living on an equal basis from one state to the next, the states that constrict lengths, are in effect, taxing their owners . . . a tax which is passed along to the American taxpayer on an invisible platter which is studiously shined by a well entrenched bureaucracy.

So the "tax" on trucks which is levied by restricting their size is yet an additional mockery of the law of the land, and that is why this introduction has tried to remind the Committee that the other problems—the situation of illegal taxation of trucks—are woven into the fabric of transportation, but woven so skillfully that the threads are all but invisible to the consumer.

SAFETY

Perhaps the first area of concern when discussing the difference between a cabover and a conventional tractor should be in the area of safety.

In the final analysis, of course, a good and careful driver can overcome many obstacles. Thus, a good driver in a cabover tractor may drive hundreds of thousands of accident-free miles whereas an unskilled or careless driver in a conventional might just as easily wind up in a ditch. But, if drivers are equal, they will be better drivers, safer drivers, if the wheelbase is allowed to be longer.

That is because a longer wheelbase tractor will cradle the driver between axles, rather than pile-driving him on top of a front axle which might be loaded too heavy in the first place.

The majority of one-truck accidents—and there aren't really that many of them considering the numbers of trucks and the numbers of miles driven annually—involve drivers who fall asleep at the wheel and simply run off the road. There is no guarantee nor can there ever be, that a driver who runs off the road in a tractor trailer will be saved, and no amount of seat belts, harnesses, exploding air bags or all the other so-called safety devices can guarantee a driver from being hurt or killed, but there is one obvious fact, and that is, if the Bureau of Motor Carrier Safety statistics are correct, then one of the best ways to protect such a driver in such a predicament is to put a lot of metal in front of him to absorb the energy transmitted in an accident.

The only way to do that is to allow or encourage longer wheelbase tractors, or "conventional" tractors, for there, five or six feet in front of the driver, cradled between heavy steel frames, is an engine weighing several thousand pounds. In front of that engine is a heavy radiator and a bumper, and behind that engine is a firewall of steel, usually. All of these components serve as a cushion before the driver gets squashed between the trailer and the offending bridge abutment, and in many cases, lives have been saved.

But restricting length limits forces many trucking companies to resort to using cabover tractors. They, in turn, allow longer trailers, or, if not longer, at least legal trailers, but what happens in the event of a collision?

In front of the driver there is a thin piece of aluminum, usually, about a quarter inch thick. It is merely a skin designed to hide the wiring, tubing and other necessities of manufacture, and has little or no inherent strength, and little or no resistance when that frequently fatal accident occurs. The difference, in a crash, could be likened to a person in a car, with the engine up front and surrounded by metal, or that same person with his head just six or seven inches behind the radiator. Try to imagine yourself strapped on the front of a car with no beams or engine to protect you, and see how secure you would feel on the freeways and highways of this nation.

However, there is some advantage in the event of a collision between a truck and a car, because, in the cabover, the driver's legs are usually above the top of the car, so there can be, sometimes, a life-saving effect when a cabover collides with a car. But, again, to discuss the merits of a cabover merely on the chance of an accident, is not really dealing with the major reasons for mandating or allowing longer wheelbase tractors.

Because, as noted, if one of the prime reasons for drivers' accidents is fatigue, then to eliminate a lot of that fatigue should be the prime purpose of legislation dealing with it.

It is obvious that a driver cushioned between axles gets a better ride than the average cabover tractor, where he is sitting almost directly on top of the front axle. A better ride gives a more refreshed driver, a more alert driver. In short, a driver less likely to make a mistake.

Company drivers, that is, those drivers who work for large trucking companies and have little or no say in the selection of tractors, have complained for many

years about their tractors because, for the most part, those companies have but one goal, and that goal is to haul as much freight as the law allows. And the only way those companies can do that is to use the longest trailer or trailers allowable, thus squeezing the driver into a short cab which not only rides rougher but is much more prone to jackknife accidents. Short wheelbases of 110 inches, with the fuel tanks riding just an inch away from the tires, are not only a ludicrous sight on today's highways but a dangerous habit of the nation's regulated truck lines or private fleets. The independent trucker, who has always devoted more time and money to safety and comfort, is not as likely to buy or operate the ultra-short wheelbase tractors. In fact, many independent truckers, in a recent survey by Overdrive Magazine, will actually sacrifice some revenue in order to have a more comfortable and safer tractor.

For instance, in a recent survey by the Independent Truckers Association in Texas and Florida, fully half of the produce haulers owned and operated long wheelbase conventional tractors, and of the other half who operated cabover tractors, their wheelbase was longer in order not only to give themselves but their cargoes a better ride, this in spite of the fact that they could have purchased much shorted wheelbase tractors and longer trailers. Yet a survey of large fleets in the regulated carrier market shows that the majority—well over 75 percent, in fact—of the regulated carriers used tractors with wheelbases which not only jarred the cargo but destroyed the driver, bounce by bounce, mile by mile.

Kidney problems and back problems are common among truckers, and one of the reasons is the rougher riding cabover tractors, mandated by the companies in order to comply with the whims of those states which do not want to have their laws exposed to the light of the twentieth century.

Just two days ago in Pittsburgh, Pennsylvania, a front page story illustrated yet another reason for allowing longer tractors. A driver had his foot severely burned because the exhaust manifold, just inches from his leg underneath the engine cover in the cabover, had burned a hole through the thin protective covering. That engine cover, in trucking terms, is called a "doghouse" but it is the drivers who are treated like dogs as they are forced to heel to the commands of the companies and the states.

Now it is the opinion of the writer that most companies would be happy to buy longer wheelbase tractors, whether conventional or cabover, because they know their drivers will be happier and safer, but history shows that if a freight company has a choice between extra profits or driver comfort, they will option for extra profits almost every time.

There are many other safety factors connected with allowing longer wheelbase tractors. In a cabover tractor, for instance, there is the noise created by the fan and engine, and that fan and engine (as well as the other moving parts which cause noise pollution, such as the turbocharger) is just inches from the driver. This means that the manufacturers must insulate more and that means that the cost goes up because manufacturers, too, are caught in a tremendous bind in having to comply not only with EPA standards but also the requirements of the fleets ordering the trucks. This forces the cost of the truck upward so that today, a typical over-the-road tractor costs well over $50,000 and some go as high as $82,000. Just four years ago the same tractors were selling for $30,000, and yet freight rates have not risen accordingly, and the trucking industry has absorbed much of the additional cost, especially in the field of independent truckers. This spiral cannot and should not go on forever.

By jamming fuel tanks between axles, the hazard of fire or explosion is increased.

A conventional tractor with a sleeper mounted behind gives the driver not only front end protection but some protection from the trailer, too, in the event that it rips the fifth wheel off in a collision, but the cabover sleeper, usually smaller on the fleet trucks, provides little protection from the thirty-ton trailer hovering behind the driver's head.

There is a visibility advantage to most cabover tractors, however, and increased visibility in the trucking world is one of their long suits, and being able to see far down the road, thus anticipating trouble, is one of the reasons why truckers, generally, stay out of a lot of accidents and can maneuver their rigs to a halt before the typical car driver can. Yet many conventional tractors sit almost as high as cabovers, and they, too, have much better visibility than cars.

Another safety aspect of cabovers is in the area of wrenched backs and pulled muscles, for the typical cabover is usually mounted with many pounds of grab

handles and two or three steps. Getting in and out of a cabover is harder and thus creates more personal risk. Sharp door edges, too, create hazards in garages and many mechanics have permanent scars on their foreheads because they didn't notice a cabover's door edge when it was opened, and, being about five feet off the ground, is yet another weapon built into trucks which take their silent toll in minor agonies in garages from coast to coast. Most manufacturers have rounded off their door edges somewhat, but some of them have not, and they number in the tens of thousands.

On trucks where there are two drivers, almost unanimously, drivers interviewed by Overdrive Magazine claim they sleep much more soundly in a sleeper mounted on a longer wheelbase tractor and/or a conventional tractor. Thus, a two-man operation will be comprised of far safer drivers if they are getting a rest instead of a respite.

Exhaust fumes from idling engines are not nearly as likely to affect drivers of conventional tractors, because the engine is several feet in front of the driver. On cold nights when an engine might idle in order to provide heater warmth, there is always the danger that carbon monoxide poisoning will end the driver's worries in a cabover, for the fumes will have a tendency to rise straight up, right into any small hole—and there are many—that is in the floor of the cabover. So yet another safety factor is built into the conventional.

Even the common, every day (or sometimes four or five times a day) occurence of cleaning a truck's windshield is easier and less hazardous with a conventional tractor, because there are several places to stand, and you don't have to hang like a monkey on the front of the truck, or suffer a strained ankle because you slipped off the bumper as happens in dozens of cases of cabover drivers.

Additionally, since the cabover is more bouncy, mirrors vibrate more and thus rear visibility is curtailed. A cabover truck also has special engineering for tilting the cab—another cost factor which could be considered a hidden tax—and generally speaking, working on a cabover engine costs more money because it is slightly less accessible. But these are small cost factors compared to the overall comfort of the driver as well as the other safety features pointed out.

Senate Bill 3431 is a step in the right direction, but I question the necessity of once again dictating an arbitrary length for trucks. If the Senate finds the problem, as I hope it does, of sufficient interest to whip the states into line, then I hope the Senate also summons up the wisdom to simply draft the kind of legislation which would just exempt, from any length law, a tractor. To set an arbitrary figure for the length of a tractor might be providing a future bind on trucking which is just as onerous as today's. My recommendation would simply be to just exempt tractors from the overall length limit so that the states don't turn around to curtail trucking's efficiency through allowing longer tractors but shorter trailers. This would be a giant step backward, and I am sure the Senate would not want that to happen.

FUEL ECONOMY

The alleged fuel shortage has sparked a wide number of comments and suggestions, but the facts are, whether or not there is a real shortage, a cabover tractor will generally get worse fuel mileage than a conventional tractor. So here we are, almost five years after the oil embargo which forced long lines of cars and trucks, and we have virtual silence on the part of the U.S. Department of Transportation when it comes to *real* fuel economy. We have a semi-official policy of saving fuel, but we allow cabover tractors to push many square yards of air in front of them, like a cardboard shoe box, when the entire trucking industry knows that a more fuel efficient combination is a conventional tractor which is, while perhaps not as esoteric looking, more streamlined when it comes to fuel savings. As much as half a mile per gallon can be saved with some conventional tractors, and while that might not seem like a lot, it is when you consider that most trucks don't get but 4.5 miles per gallon to 5.5 miles per gallon. What kind of an "energy policy" do we have which encourages such a waste of fuel?

Of course, deregulation of trucking or at least re-regulation to allow the small truckers to compete on an equal basis, would save even more fuel, but in the area of cabover vs. conventional tractors, the fuel savings are considerable, and could amount to millions of gallons a day.

Deregulation of trucking, in one sense, can entail the change of very costly laws which force the trucking industry, in general, to adhere to laws that are unscientific and arbitrary.

It is my hope that the Senate will pass legislation that will not only provide safer trucks through more rested drivers, but also more fuel-efficient trucks through more streamlined configurations.

Several years ago, a representative of Ralph Nader approached our offices and asked us to help them get some truckers into Washington, truckers who were safety-conscious and wanted to air their legitimate gripes. We cooperated, and passed out flyers and helped to gather together a meeting of a couple hundred drivers at the Mayflower Hotel. That meeting was attended by the then Secretary of Transportation, John Volpe and, of course, Ralph Nader. During the course of the meeting someone jumped up and proposed a complete ban on all sleeper truck operations, and the mood of many of the truckers in that room was one of agreement. However, I was forced to ask the drivers present how many of them had ever driven a long-wheelbase conventional in their operations, and none of them had, so the chagrin was fortunately translated into a motion to table the recommendation.

It is my hope and desire that the Senate will act as it usually does—wisely—and consider all the pros and cons, all the advantages and disadvantages of conventional tractors and cabover tractors. There is a need for both, and it is not my intention to present an argument for banning cabovers. No! What I would like to see is the wheelbase lengthened through the exemption referred to. In that way, if a trucker wants to buy a cabover, he can, but he would, at least, have the option of getting a tractor that rode better, thus insulating him from some of the road vibrations as well as his cargo.

In my opinion, the route Senator Kennedy took by introducing Senate Bill 3431 is a good one in spirit, but I would go one step further and eliminate completely the tractor from all current and future length law considerations.

The public does not have to fear that some bizarre trucker will buy and operate a tractor that is one hundred feet long, for the marketplace determines practicality in the final analysis.

The FAA and the CAB does not determine the length or even size of airplanes. The marketplace does that, and no airline allows a lot of wasted space to be built into their craft, so I have sufficient faith in the trucking industry that their own particular needs could be and will be met if the marketplace is opened to them as it should be, once the old fashioned and arbitrary state laws are eliminated from the books.

The CHAIRMAN. Our next witness is Mr. Donald Kuster, chairman, Highway Transportation Committee, the National Industrial Traffic League.

STATEMENT OF DONALD F. KUSTER, CHAIRMAN, HIGHWAY TRANSPORTATION COMMITTEE, THE NATIONAL INDUSTRIAL TRAFFIC LEAGUE; ACCOMPANIED BY BYRON YASIEJKO, CHAIRMAN, HIGHWAY SIZE AND WEIGHT SUBCOMMITTEE

Mr. KUSTER. Thank you, Senator. I have with me Myron Yasiejko, who's appearing for the league's Highway Size and Weight Subcommittee.

The National Industrial Traffic League submits this statement in regard to S. 3431, a bill to amend certain provisions of title 23, United States Code, relating to commercial vehicle lengths and axle weight loads. My name is Donald F. Kuster and I appear today on behalf of the league as chairman of the Highway Transportation Committee. I am employed as general manager, traffic and distribution by the Continental Group, Inc. of Chicago, Ill. I am accompanied today by Mr. Myron Yasiejko, chairman of the league's highway size and weight subcommittee. Mr. Yasiejko is the associate director of traffic and distribution staff of The Continental Group, Inc., in Chicago, Ill. The league specifically wishes to address the proposed 15-foot minimum length established for tractors.

NITL BACKGROUND

The league is a voluntary organization of 1,800 shippers, shippers' associations, boards of trade, chambers of commerce, and other entities concerned with rates, traffic, and transportation services of all carrier modes. It is the only shipper organization which represents all types of shippers nationwide. Its members include large, medium, and small shippers who use all modes of transportation and who ship all types of commodities.

The league is not a panel or committee of a trade group nor a spokesman for a particular commodity or transportation point of view, and does not permit carrier membership. League members, directly or indirectly, represent an estimated 80 percent of the commercial traffic moving in the United States.

The league's primary concern is to provide for the Nation and all its shippers a sound, efficient, well-managed transportation system, privately owned and operated.

To arrive at positions reflective of the broad range of shipper interests within the league, the league membership at its annual and special meetings considers, debates, and votes on actions to be taken. During its more than 70 years of existence, the league has frequently been the spokesman for the Nation's shippers before Congress on proposed transportation and regulatory reform legislation.

NITL POLICY

At its 1975 annual meeting, the NIT League adopted policies on transportation safety applicable to the amendment proposed by Senators Kennedy, Percy, and Magnuson. The first, N–4, "Justification of Safety Rules," reads,

> The League favors the principle that all proposed transportation rules affecting safety be fully researched, documented, and technically sound and consistent with other existing regulations.

Second, N–5, "Transportation Safety Task Force," states,

> The League favors the task force approach to the formulation of proposed transportation rules affecting safety, prior to the publication of the proposed rule in the Federal Register. Such task force would, as appropriate, consist of carriers, shippers, transportation equipment manufacturers and personnel administrative agencies.

The league's long-standing policy E–9, "Safety Rules and Regulations," is also directly applicable to the proposed amendment of the three Senators. The policy reads,

> The League favors reasonable rules and regulations covering safety for all types of carriers. However, safety rules and regulations which place an uneconomic and unjustified burden on the carriers involved should be opposed.

Additionally, league policy M–2, "Productivity," is applicable to the amendment. It reads,

> Transportation must obtain greater productivity from its use of fuel including the minimization on fuel inefficiencies, of: economic regulations; consignor or consignee loading/unloading practices; and labor practices—and with due consideration to environmental and safety requirements.

SUMMARY

We believe this bill would drastically reduce productivity, feed inflation, and increase energy consumption. We urge your opposition to this bill not only because of its negative impact on our economy and energy conservation efforts, but we believe it to be a compromise that does not address the issue of the driver's comfort and safety.

Our findings indicate that if this bill is enacted, the commercial carrier industry would travel an additional 912.3 million miles, use an additional 194.1 million gallons of fuel, and increase the Nation's cost of commercial carrier transport by $1.4 billion.

This bill is being introduced at a time when our balance of trade deficit is at a record high and we are talking about the possibility of double digit inflation.

Imported oil makes up a considerable portion of the imports that cause our deficit. The added fuel that would be required does nothing to ease that deficit. Furthermore the $1.4 billion of added transportation costs that will ultimately be borne by the consumer will also be reflected in our inflation rate.

Now, the 194 million gallons of fuel, the added 912 million miles that have to be traveled and the $1.4 billion cost penalty represents only the commercial carrier industry. The Private Truck Council of America lists that over 50 percent of the tractor trailers in operation in the United States today are private carriers. In essence, then, we can double the numbers I mentioned to account for both commercial and private motor carriage. Gentlemen, I find those figures frightening.

To further highlight the negative impact of this restriction, I would like to perform some very basic mathematics. The regulated motor carriers average mileage per unit for five-axle combinations was 77,700 miles per year in 1974 and 88,200 miles in 1975. It would be safe and conservative to say that a five-axle over the road unit will travel an average 100,000 miles per year. If we divide the 912 million penalty miles by 100,000 we discover that 9,120 additional units are required to move the same amount of freight. That is not only unproductive; it adds an additional burden to our highways system and quite obviously wastes fuel and increases costs.

COMMENT AND PLEA

Over 30,000 communities in the United States are served exclusively by truck. Limiting the cargo-carrying unit through the proposed amendment places the motor carriers in a position where reduced productivity must invariably be passed on to the shipper through higher rates. Couple this with the productivity loss by restricting distance traveled in a 10-hour period and the motor carrier industry is placed under considerable strain to make ends meet.

The proposed bill S. 3431 reduces semitrailer lengths from 45 to 40 feet in the affected States and thus affects twin trailers as well. In the July 10 Congressional Record statement on the amendment, it was said, "We are offering the following amendment in an effort to alleviate the dangerous conditions caused by shortened cabs * * *."

The NITL is a strong advocate of safety on our highway. However, this proposed amendment appears arbitrary and without foundation. Specifying a 15-foot tractor does not necessarily result in any improvement in driver comfort and safety. Additionally, the subject of trucking safety should be fully investigated through hearings by the appropriate Senate and House committees before adopting legislation. Such hearings would allow comprehensive research, documentation, and make new regulations technically sound and consistent with other existing regulations.

The Federal Highway Administration Bureau of Motor Carrier Safety published an advance notice of rulemaking in the Federal Register on February 14, 1978 (43 F.R. 6274) regarding minimum cab space dimensions (BMCS Docket No. MC–79; Notice No. 77–10). Because of the concern voiced by the public, the original expiration date for comments was extended. It seems inappropriate that a general restriction of the tractor to 15 feet overall length be imposed without reviewing the findings and recommendations of the BMCS.

The league is greatly concerned that the provisions of the amendment would be inflationary and would impose unnecessary burdens on trucking companies handicapping them on their ability to compete with other modes.

The impact of this legislative action would be severely negative and backward affecting productivity, energy conservation, and transportation costs. Unless 25 States and the District of Columbia take immediate legislative action, the cargo-carrying unit will have to be reduced to 40 feet. The impact of such a step backward should be obvious. We reduce cubic carrying capacity by 12.5 percent from 45-foot trailers, require additional tractor trailers to move the same amount of goods, and consume additional precious fuel.

The National Classification Board of the American Trucking Associations conducted an analysis of freight bills of 100 carriers. Of the 112,603 trailers dispatched in 1 week, it was found that 26 percent dispatched under full weight limits, 44.8 percent released with maximum cube, and 28 percent released on service need.

If this is indicative of the commercial motor carriers movements, it should serve to highlight the importance of the cubic capacity of the cargo-carrying unit.

Using this ratio as a base we have taken the mileage traveled by commercial motor carriers and their revenue for 1977 and very simplistically, but conservatively, attempted to quantify the impact in added fuel consumption and added transportation costs. Our methodology and findings are as follows:

Added fuel consumption

Given class I and II common carrier mileage for 1977 was 16,290,479,532 (source: ATA) 44.8 percent of shipments cube out before reaching GVW.

Calculation: 16,290,479,532 miles times 44.8 percent trailer cubing out equals 7,298,134,592 miles affected.

Trailer size reduction (feet)		Percent reduction in cubic capacity	Increased mileage (percent reduction miles affected)	Additional gallons of fuel required increased mileage 4.7 mi/gal
From—	To—			
45	40	12.5	912,266,824	194,099,324
48	40	20.0	1,459,626,918	310,558,929
48	45	6.7	488,975,018	104,037,238

Added freight cost to consumer

Given total gross freight revenue for 1977 for the common motor carrier industry was $24,374,708,000 intercity and intracity—44.8 percent of shipments cube out before reaching GVW.

Calculation: $24,374,708,000 total gross freight revenue times 44.8 percent trailer cubing out equals $10,919,869,184 revenue affected.

Trailer size reduction (feet)		Percent reduction in cube	Added cost as a result of restriction [1] (revenue cube affected × percent reduction)
From—	To—		
45	40	12.5	$1,364,983,648
48	45	6.7	731,631,235
48	40	20.0	2,183,973,837

[1] This is predicated by the fact that additional truckloads will be required to move freight excluded due to cube reduction.

Note: This impact does not include the private carriers penalty. According to PTCA statistics, over 50 percent of the tractor trailers on the road today are private carriers.

Everyone today is aware of the inflationary spiral. The Government's concern over the impact of increasing transportation costs have on inflation was voiced by Council on Wage and Price Stability Director, Barry Bosworth, speaking before a meeting of Trucking Management, Inc.

He said:

> The Federal government does have a substantial interest in the economic developments in the transportation industry. Firms operating in this area have been granted special immunity from antitrust laws. The government must insure that its regulation of the industry represents the interests of the consumer, that rates are not too high and the operations of the industry are efficient and not wasteful. It must insure as well that costs in the industry are in line with the rest of the economy.

If Mr. Bosworth's concern over the inflationary impact of rising transportation costs truly reflects the administration's viewpoint, we should not accept the penalty this bill would impose on the consumer and our Nation's inflation rate.

In the Congressional Action newspaper remarks were made by Senator Dansforth, a member of the Commerce Committee regarding the serious need for capital formation to improve productivity. He was quoted as having said,

> American productivity, over a long period of time, grew about 3% a year—but now the rate is only 1%. Over the last decade, our productivity growth has been less than all major nations. When you realize we are now tied with the United Kingdom for last place, you understand all is not well.

We agree with, and applaud, the concern voiced by Senator Dansforth. The shipping public is vitally concerned and very active in devising methods to gain productivity in the transportation of its product to market. However, the proposed bill will not only stymie those gains, it will reduce productivity significantly and bar any future gains that could be made. The cargo-carrying unit offers efficiency and flexibility and is a primary reason the motor carriers exist today. Restrict that unit and you unnecessarily restrict that industry and ultimately penalize the consumer.

Our Government's concern with energy conservation is a well known and very real challenge to our Nation. This proposed bill is in direct contrast with our goals. Instead of conserving fuel, it will invariably require an additional 194 million gallons to move that same amount of

product. As the media described it, our incremental fuel supply is imported. So not only are we using more precious energy, we are getting it from a source that negatively impacts our balance of trade.

Limiting the cargo-carrying unit does not address the issue of driver comfort and safety. We urge you to oppose S. 3431 on the grounds that it is premature—due to BMCS study—does not address the issue, is inflationary, has a negative impact on productivity, and will foster increased fuel consumption rather than conservation.

Gentlemen, our Nation has grown due to foresight and ingenuity. We were renowned for our ability to accept and overcome challenges. This bill puts up a brick wall to any gains to be had in the transportation industry in the form of cargo-carrying capacity. It not only stymies it, but in effect, regresses and penalizes us.

It is time to use our ingenuity again to increase our productivity, conserve our energy and push back inflation. In order to do this in the transport industry, we should be looking to develop a unit capable of carrying the maximum amount of product to market in a safe operating environment.

Let us determine what is the safe overall length and the needed driver comfort and safety requirements and leave the shippers and carrier the flexibility they need in the cargo carrying unit to meet this challenge. Specifically, to produce low-cost fuel savings and safe highway transportation.

Thank you very much, Chairman Cannon, for allowing the league this opportunity to express its views. The league hopes this statement will be of use to the committee in reaching its conclusion. Either I or my colleague, Mr. Yasiejko will be pleased to answer any questions the committee or staff may have.

The CHAIRMAN. Well, thank you very much, Mr. Kuster.

I say that, in addition to the economic impact that you point out there, the one statement that you made, specifying that a 15-foot tractor does not, necessarily, result in any improvement in driver comfort and safety, is one that gives me a problem. Because it seems to me that that is really the problem that a lot of these drivers were talking about; the comfort in the cab, from the standpoint of safety and comfort both. And if you specify a 15-foot tractor and do nothing more, I'm not at all sure you're going to get that.

Mr. KUSTER. That is what I was saying. I don't think you are going to get the safe vehicle, the comfortable vehicle, for the driver.

I think it came out in testimony I heard here before your committee, Senator, that a tractor can be safe, it could be comfortable for a driver, if the engineers were allowed the opportunity to design that type of unit. There are many safety features that can be designed into a unit, as I understand it, and there are a lot of comforts that can be designed. And that is why we think, at this time, this bill is premature and arbitrary, and has a very detrimental effect on our economy.

The CHAIRMAN. Thank you very much, gentlemen.

Our next witness, Ms. Susan Baker, associate professor, school of hygiene and public health, Johns Hopkins University.

Ms. Baker.

STATEMENT OF SUSAN BAKER, ASSOCIATE PROFESSOR, SCHOOL OF HYGIENE AND PUBLIC HEALTH, JOHNS HOPKINS UNIVERSITY

Ms. BAKER. Mr. Chairman, I am Susan P. Baker. I will greatly abbreviate my testimony and have a few comments that were not included in the prepared testimony, but ask that the complete statement be introduced into the record.

The CHAIRMAN. It will be made part of the record.

Ms. BAKER. Along with several papers comprising the documenting of the kinds of consequences of America's profound neglect of heavy truck safety.

First, trucks are behind other vehicles in their ability to avoid crashes. Second, when crashes do occur they are much more likely to prove fatal when heavy trucks are involved. Third, truckdrivers are far behind other occupational groups in the degree to which they are protected against on-the-job injury and deaths.

As a result, a truckdriver is, roughly, 7 to 9 times as likely as an average worker in the United States to be killed on the job. That puts him somewhere in the same ballpark as a miner.

The need to reduce the risks to truck occupants is further underscored by the fact that the number of deaths among occupants of heavy trucks increased by 32 percent between 1975 and 1977. During the same period, when deaths went up by 32 percent, the actual number of heavy trucks went up by only about 10 percent. Furthermore, per 100,000 vehicles, heavy trucks now have about twice as many occupant deaths as other vehicles.

There are many solutions that may help to reduce deaths and injuries from heavy truck crashes, but for any solutions that involve changes in the truck, a major constraint is the lack of freedom to increase the length of the tractor. This not only means uncomfortable working conditions, it can relate to the likelihood of being involved in a crash and the likelihood of being killed or injured, either the truckdrivers or other road users, when crashes occur.

Some of the factors relating to likelihood of crashes are the truck's traction, stability, and handling characteristics. Others are the effect of small cabs on driver fatigue and discomfort, and difficulty of operating essential controls, such as the brake pedal, when the cab space is restricted. Obviously, this is not simply a case of comfort, but of crash prevention.

When crashes do occur, whether or not anyone is killed or injured is often determined by vehicle design. Reducing the risks to truck occupants requires designs to keep occupants from decelerating too abruptly, to prevent the intrusion of cargo, and to decrease the likelihood of fire and entrapment. The likelihood of fire is 2½ to 4 times as great for fatal crashes involving tractor trailers as for other fatal crashes.

A lot of drivers today have told you how fatigued they are when their stomach has been pushing up against the steering wheel. What they were not able to say was what happens in a crash, when a steering wheel can inflict a serious or fatal injury. Several studies, including

one that was done by myself and associates at the medical examiner's office in Baltimore, have shown that abdominal injuries, multiple abdominal injuries, fatal ones, are a very common cause of death among the truckdrivers involved in these crashes.

As pointed out by the report of the National Highway Safety Advisory Committee, written by a subcommittee I chaired, it is not necessary to know the ideal design characteristics of heavy trucks, nor even to know the relative safety of various present-day vehicles, in order to know that future vehicles may become less safe if there is continued economic pressure to sacrifice cab or tractor length in favor of payload. As long as States have overall length limitations without limiting trailer size, changes in truck design that would reduce crashes or injuries are not likely to be made if such changes wouuld increase the total length of the truck; because any such modifications would reduce the amount of cargo that could legally be carried.

Even the BMC's proposed rulemaking on minimum cab dimensions may not contribute to a solution until it is possible to increase cab dimensions without causing the use of existing trailers to violate State limits. Clearly, if the safety of truck operators and of other highway users is to be a major consideration in truck design, you must make it possible for designers to add a crucial inch to the cab or tractor without requiring the economically implausible; namely, subtracting that inch from the trailer.

The CHAIRMAN. Are you suggesting, from that, that perhaps Congress ought to preempt the field in this size of trucks and trailers?

Ms. BAKER. No, sir, I think the essence of the bill is telling the States that they must limit the trailer size. That will give the designer, then, the freedom, if he were to discover that in a crash better protection could be given to the occupant if there were certain design characteristics that required an inch or two be added to the overall dimension of the cab, they could do that. They can't do it at present because of the single, overall length dimension; that is, they can't do it without reducing a trailer length, which for economic reasons is very unlikely to happen.

Several drivers this morning mentioned the difficulty of drawing a 48-foot trailer in States with the 55-foot overall length limits. Very recently, the trend has been to introduce 48-foot trailers in the same States, such as Maryland, with 55-foot overall limits. Obviously, the only place to get that additional 3 feet is out of the operating end of the combination.

Use of this 48-foot trailer reflects the general trend toward longer trailers. Ten years ago only 7 percent of all trailers produced were more than 42½ feet long, and by 1976 this jumped from 7 percent to 55 percent.

S. 3431 will not, of itself, prevent crashes and deaths and injuries to truckdrivers and other road users. The bill itself will not give drivers room to reach controls, or improve truck handling characteristics, or give better crash protection to occupants, or insure that fuel systems are ideally located. It will, however, eliminate the reason behind an alarming trend in cab length and remove a major obstacle to optimizing truck design.

Thank you very much.

The CHAIRMAN. Thank you very much, Ms. Baker, for your fine statement.

[The statement follows:]

STATEMENT OF SUSAN P. BAKER, M.P.H.

Mr. Chairman, members of the committee, I am Susan P. Baker, an associate professor at the Johns Hopkins School of Public Health and a research scientist specializing in injury prevention. I am past president of the American Association for Automotive Medicine and serve on the Board of Directors of the American Trauma Society. In 1977, I was chairman of the National Highway Safety Advisory Committee's Vehicle Subcommittee when it prepared a report to the Secretary of Transportation addressing the need to set limits on the cargo-carrying portion of heavy trucks [1].

I appreciate the opportunity to testify on Senate Bill 3431, which would require each state to set maximum length limits on truck trailers, thereby removing a major impediment to improving the safety of heavy trucks.

I would like to submit for inclusion in the published record[1] several papers comprising the appendix to my testimony [1–6, 14]. They document the threefold consequences of America's profound neglect of heavy truck safety. First, trucks are far behind cars in their ability to avoid crashes. Even on toll roads, their accident rate per mile of travel is about forty percent greater than that of cars [7, 14]. Second, when crashes occur, they are much more likely to prove fatal when heavy trucks are involved: the ratio of fatal crashes to all crashes is about 5/1,000 for tractor trailers compared to only 2/1,000 for other vehicles [8, 14]. Third, truck drivers are far behind other occupational groups in the degree to which they are protected against on-the-job injury and deaths. As a result, a truck driver is roughly seven to nine times as likely as the average worker to be killed on the job [5, 9].

The need to reduce the risks to truck occupants is further underscored by the fact that the number of deaths among occupants of heavy trucks increased by 32 percent between 1975 and 1977 [13]. Per 100,000 vehicles, heavy trucks now have about twice as many occupant deaths as other vehicles [6].

There are many solutions that will help to reduce deaths and injuries from heavy truck crashes [14]. But for any solutions involving changes in the truck, a major constraint is the fact that most states now limit the overall length of combination vehicles without specifying a maximum length for the trailer. As a result, desire to carry more cargo has led to increases in trailer length at the expense of the tractor, which includes the truck driver's workplace. Lack of freedom to increase the length of the tractor not only means uncomfortable working conditions, but can adversely affect the truck's likelihood of being involved in a crash and the likelihood of death or injury to truck drivers and other road users.

The factors relating to likelihood of crashes include the truck's traction, stability, and handling characteristics; these are influenced by the length of the wheel base and the distribution of weight on the various axles, both of which have been adversely affected by overall length regulations combined with increases in permitted weights. Other design considerations related to crash involvement include the effect of smaller cabs on driver fatigue and discomfort, and the difficulty of operating essential controls such as the brake pedal when cab space is restricted [1].

When crashes do occur, whether or not people are killed or injured is often determined by vehicle design [10, 11]. Reducing the risks to truck occupants requires designs that attentuate crash forces, that keep occupants inside and prevent them from decelerating too abruptly, that prevent the intrusion of cargo, light poles, etc., and that decrease the likelihood of fire and entrapment. The likelihood of fire is 2½ to 4 times as great for fatal crashes involving tractor trailers as for other fatal crashes [2, 12].

As pointed out by the report of the National Highway Safety Advisory Committee, it is not necessary to know the ideal design characteristics of heavy trucks, nor even to know the relative safety of various present-day vehicles, in order to know that "future vehicles may become less safe if there is continued economic pressure to sacrifice cab or tractor length in favor of payload" [1]. As long as states have overall length limitations without limiting trailer

[1] Appendices 1 to 7 are in the committee files.

size, changes in truck design that would reduce crashes or injuries are not likely to be made if such changes would increase the total length of the truck—because any such modifications would reduce the amount of cargo that could legally be carried. Even the Bureau of Motor Carrier Safety's proposed rulemaking on minimum cab dimensions may not contribute to a solution until it is possible to increase cab dimensions without causing the use of existing trailers to violate state limits. Clearly, if the safety of truck operators and of other highway users is to be a major consideration in truck design, you must make it possible for designers to add a crucial inch to the cab or tractor without requiring the economically implausible—namely, subtracting that inch from the trailer.

Because of economic considerations, the bill—while permitting flexibility where there is need to increase cab or tractor length—is not likely to markedly increase the actual length of most tractors. This is true whether states decide to set no overall length limits, or to establish overall limits allowing at least 15 feet in addition to trailer length.

The essence of the bill is therefore not the required 15 foot difference where states choose to set overall limits, but the removal of powerful incentives to modify cab designs solely for economic reasons. I refer not only to shorten cabs but to designs such as the "cab under" [15], which by positioning the truck driver very close to the road, eliminates what has long been touted as a major safety factor for heavy trucks—namely, the driver's ability to see above the traffic ahead.

Therefore I am in favor of Senate Bill 3431, even though it will not, of itself, prevent crashes and deaths and injuries to truck drivers and other road users. The bill itself will not give drivers room to reach controls, or improve truck handling characteristics, or give better crash protection to occupants, or ensure that fuel systems are ideally located. It will, however, eliminate the reason behind an alarming trend in cab length and remove a major obstacle to optimizing truck design.

REFERENCES

1. National Highway Safety Advisory Committee. Vehicle Length Restrictions; A Report to the Secretary of Transportation, DOT HS 802 377. Washington: U.S. Dept. of Transportation, March, 1977.

2. Baker, S. P., Wong, J., and Masemore, W. C. Fatal tractor trailer crashes: considerations in setting relevant standards. Proceedings of the Fourth International Congress on Automotive Safety. Washington, D.C., U.S. Dept. of Transportation, NHTSA, 1975.

3. Baker, S. P., Wong, J., and Baron, R. D. Professional drivers: protection needed for a high-risk occupation. Am. J. Public Health 66:649, 1976.

4. Karlson, T., Baker, S. P., and Morton, B. Fatally injured truck drivers. Proceedings of the 31st conference of the AAAM, Morton Grove, Illinois, 1977, pp 367–378.

5. Karlson, T. A. and Baker, S. P. Fatal Occupational Injuries Associated With Motor Vehicles. Proceedings of the 22nd conference of the AAAM. Morton Grove, Ill. 1978, pp 229–241.

6. Baker, S. P. Submission to Docket #78–0, re NHTSA's Five Year Plan. June 9, 1970.

7. Parsons, G. G. Statistics on heavy truck accidents. Seminar on "Key Issues in Heavy Truck Safety." Washington: U.S. Dept. of Transportation. July 12, 1976.

8. National Safety Council. Accident Facts, 1976, Chicago.

9. California Department of Industrial Relations, Division of Labor Statistics and Research. Work injuries in trucking. San Francisco, 1975.

10. Haddon, W., Jr., and Baker, S. P. Injury Control, a chapter for Preventive Medicine, 2nd edition, edited by D. Clark and B. MacMahon. Boston, Little, Brown and Company, to be published.

11. Haddon, W., Jr. Reducing truck and bus losses—neglected countermeasures. Pub. 710409. Warrendale, Pa.: Society of Automotive Engineers, 1971.

12. U.S. Dept. of Transportation. Heavy Trucks, Special Report. DOT HS 803 259, Washington, May, 1978.

13. U.S. Dept. of Transportation. Data from Fatal Accident Reporting System (FARS).

14. Baker, S. P. Reducing injuries and deaths in crashes involving heavy trucks: ten strategies. Seminar on "Key Issues in Heavy Truck Safety." Washington: U.S. Dept. of Transportation. July 12, 1976.

15. An Evaluation of the Safety and Handling Properties of the Cab-Under Truck-Tractor Vehicle. UM–HSRI–78–13. Ann Arbor: Highway Safety Research Institute. June 1978.

The CHAIRMAN. The next witness, Howard W. Dickerson, traffic manager, Davies Can Co.

STATEMENT OF HOWARD W. DICKERSON, TRAFFIC MANAGER, DAVIES CAN CO., VAN DORN, INC., REPRESENTING THE CAN MANUFACTURERS INSTITUTE AND, COMPOSITE CAN AND TUBE INSTITUTE

Mr. DICKERSON. Senator Cannon, I want to thank you for the opportunity to appear before this committee. I am appearing here today for two trade associations, the Can Manufacturing Institute and, also, the Composite Can and Tube Institute.

The can manufacturers produce tin cans, aluminum cans, and composite cans, or composite can tubings.

I'm sorry, the members of these trade associations produce tin cans, aluminum cans, and composite can tubes.

Both of these groups of commodities are what is termed light and bulky commodities, but we will never load outgoing vehicles to where they begin to approach the gross vehicle weight; so that the weight problem does not appear for our industries.

Any change in the efficiency of carriers would directly affect consumer prices, because these products that both groups of members produce are used mostly by consumers, or are for consumer products.

The members of both of these associations are very much in favor of safety on the highway and also comfort of drivers. Some of it is selfish, because our customers work on low inventories, they need our products to keep production going. And one of the best ways to keep our customers happy is to be sure that the vehicles are operated as safely as possible, and the driver is comfortable so that he can make good traveltime.

In our attachment C we have tried to show the economic impact for the metal container industry. In 1977, there was 86.9 billion cans produced and approximately 90 percent of these moved by motor carrier, if these were all moved in 48-foot trailers and we were forced through this bill to go to 40-foot trailers, we would have approximately a 25-percent decrease in efficiency. And we have tried, in this attachment C, to show what that effect would be.

Going from 48-foot trailers, to 40-foot trailers, we would have to put about 162,917 additional units on the highway. If we went from 45- to 40-foot trailers, we would be talking about 90,500. This in itself is a safety hazard because of the exposure of these drivers for these additional units on the highway to the possibility of accidents.

Also, the cost, the increased transportation cost, going from a 48-foot to a 40-foot trailer would be approximately $43 million. It would require approximately 6,932,000 additional gallons of fuel; so that between the loss of efficiency and the cost, and the additional fuel, we do not feel that this Senate bill 3431 is in the public interest.

The COE tractor has been around with us since the 1930's; it is nothing new, as has been proved out.

There is some talk about the overloading, and the tire failures—blowouts or steering accidents. The Federal Highway Safety Regulations, in section 393.75(F), require that no vehicle shall be operated with tires on the front wheels which carry a greater weight than specified for the tire; and also specifies that this rating must be marked on the sidewall of the tire. If there is excessive weight on that drive axle, also the earlier testimony was that the axle is rated for weight.

If we have excessive weight on the steering axle, then the operator or whoever is violating the Federal regulations by exceeding the rating of the tire; and if the driver, the operator, whoever—I don't care what you do, if he is violating that Federal Code right now, it's still going to go up. So, it's not going to make any difference.

We feel that this bill is rather premature, with these studies that are being made by the DOT on minimum cab specifications. We feel that it would be better to hold off any action by Congress, and when these minimal dimensions are determined by these studies, that a paragraph or section be added to the 49 CFR, the same as they have done for sleeper cabs. They have minimum dimensions for sleeper cabs. The same can be done for minimum cab dimensions, and then allow any trailer length be used which would still conform to the overall State limits.

We feel that the Congress would be much better to work toward a uniform length laws, weight laws and licensing throughout the 48 States, so that that would be—you wouldn't be going from one State that's got 55 to another State that is different. It would be working much for better trucking all over.

I would like to conclude my remarks, Senator Cannon.

The CHAIRMAN. All right, we thank you very much, Mr. Dickerson for your statement.

[The statement follows:]

STATEMENT OF HOWARD DICKERSON, ON BEHALF OF CAN MANUFACTURERS INSTITUTE AND COMPOSITE CAN AND TUBE INSTITUTE

My name is Howard W. Dickerson, and I am the Traffic Specialist for the Van Dorn Company, 2700 E. 79th Street, Cleveland, Ohio, 44104. In my capacity as a member of the Transportation Committee of the Can Manufacturers Institute[1] (CMI) and Chairman of the Traffic Committee of the Composite Can and Tube Institute[2] (CCTI), I welcome this opportunity to express our views on S. 3431.

My statement reflects the views of the aforementioned trade associations, both of whom represent manufacturers of products commonly referred to as "light and bulky." CMI members produce tin, aluminum, and composite cans; CCTI members produce composite cans, as well as paper tubes and cores. Both metal and composite cans are used in packaging commodities used by other industries and by the consuming public. Any change in the transportation cost of these containers will have a direct effect on the prices of consumer products.

Our customers generally work on low inventories: therefore, it is important to us that the shipments arrive safely and on time. Consequently, producers of containers are keenly interested in the safe operation of the vehicle and the safety and comfort of the driver. To the best of our knowledge, however, there is no evidence to support the claim that conventional tractors are less accident prone than cab-over-engine (COE) tractors.

Senate Bill 3431 wouuld restrict the length of the trailer, or cargo space used in the tractor-trailer combination. The trailer length wouuld be the overall length allowed by the various states, less 15 feet. In many states, this would limit the trailer length to 40 feet. Since many carriers operate across state lines, they could not operate trailers longer than 40 feet in interstate commerce.

[1] See attachment A.
[2] See attachment B.

A reduction in trailer lengths from 48 or 45 feet to 40 feet would result in an increase in the number of shipments necessary to handle the same tonnage, and an ensuing increase in costs of 12 to 25 percent. At the same time, there would be a corresponding increase in fuel consumption.[3] By increasing the number of shipments, you would also increase driver exposure to traffic accidents.

The allegation that the development of the COE tractor evolved from the 1974 easing of gross weight limitation is false. The COE tractor has, in fact, been with us since the 1930's—hardly a new design. In addition, the COE tractor has been shown to be superior in many aspects to the conventional tractor.

COE tractors allow for better visibility and maneuverability because of a shorter turning radius. At the same time, they provide accessibility for inspection and/or repair of the engine, steering, front suspension, front brakes, transmission, and other safety-related components. This is not true of conventional tractors.

The Federal Motor Carrier Safety Regulations, 49 CFR 393.75(F), require that no motor vehicle shall be operated with tires on the front wheels which carry a greater weight than that specified for the tire. It also mandates that load ratings be marked on the side wall of the tire. Therefore, Federal regulations do not permit a driver to have excess weight on the steering axles. The steering axle on a conventional tractor can be as easily over-loaded, as on a COE, if the driver wants to haul additional weight. In either case, he is in violation of Section 393.75.

For the most part, CMI and CCTI members manufacture and ship empty containers. A truckload of these commodities will never exceed the gross vehicle weight, even in the largest trailer.

We maintain that S. 3431, introduced in the name of safety, is approaching the problem from the wrong direction.

The Department of Transportation is presently conducting studies to determine minimum cab dimensions to insure driver safety. When these studies are completed, the findings can be published as a new section in 49 CFR, as has been done with sleeper berths (49 CFR 393.76). In this way, the tractor would have to meet minimum requirements, whether it be a COE or conventional tractor. The trailer used as part of this combination could be of any length that would conform to the laws in the states where it would operate.

In a study by the Regulated Common Carriers Conference (RCCC) of the American Truckers Association (ATA) of the freight bills of one hundred carriers, 112,603 trailers were dispatched in one week.[4] Of these 44.8 percent were sent out with maximum cube utilized, while only 26 percent were sent out with maximum weight. Here, as with CMI and CCTI, a reduction in the cubic feet of cargo space available to carriers and shippers would result in a substantial increase in cost for over half of these loads. For carriers operating at around a 95 operating ratio, a reduction in efficiency of 12 to 25 percent with its increase in cost could force them into bankruptcy, unless this increased cost is passed on to the consumer.

Not only will the consumer be harmed, but the owner-operator, already caught in a desperate profit squeeze, will receive less revenue on many loads with no corresponding reduction in costs because of smaller payloads due to reduced cargo space.

Until studies substantiate the claim that the COE tractor and longer trailers are a safety hazard, there is no reason to enact a law that will add to the inflationary spiral. We maintain that it would be better to work towards uniform standards in all 48 states for overall length, weight and licensing of vehicles.

We are confident the Committee will examine carefully the material presented today and vote to defeat this unnecessary and inflationary legislation.

ATTACHMENT A

Can Manufacturers Institute, Inc. is not-for-profit membership corporation, representing manufacturers of metal cans in the United States. It is headquartered at 1625 Massachusetts Avenue, N.W., Washington, D.C. 20036.

In 1977, its membership was made up of 57 can manufacturers and 40 suppliers to the Can Industry. During 1977, the Can Industry received about 3.9

[3] See attachment C.
[4] See attachment D.

million tons of tin plate and over 1 million tons of aluminum for can manufacturing. From that material, the Can Industry produced and shipped over 86.9 billion cans.

Can Manufacturing members of C.M.I. account for about 85 per cent of the total metal cans shipped in 1977, or about 73.8 billion cans. In 1976, C.M.I. members operate about 345 manufacturing can plants in 276 municipalities in 40 states. The latest figures available show that they employ about 54,000 persons.

ATTACHMENT B

Composite Can and Tube Institute is a non-profit Trade Association that established in New York, N.Y. in 1933. Its offices were moved to Washington, D.C. in 1961. It is presently located at 1800 M Street, N.W., Washington, D.C. 20036. The organization represents manufacturers of composite cans, tubes, cores, and related items.

At the present time, the organization has fifty-nine member companies, who produce 85 to 90 percent of these items manufactured for commercial sales in the United States.

ATTCAHMENT C

Metal container shipments—trailer sizes and corresponding energy usage

Pallet size	44 in. by 56 in.
Average number cans per pallet	3,000.
Average haul	200 miles at a cost of $1.32 per mile.
Average fuel consumption	4.7 miles per gallon.
Capacity:	
48 ft. trailer	40 pallets.
45 ft. trailer	36 pallets.
40 ft. trailer	32 pallets.

Of the 86.9 billion cans produced in 1977, over 90 percent moved from the final point of distribution to customer location via motor carriage. Thus, over 78.2 billion cans moved via truck, requiring the following number of shipments: 48 foot trailers (40 pallets) 120,000 cans equals 651,666 shipments; 45 foot trailers (36 pallets) 108,000 cans equals 724,074 shipments; and 40 foot trailers (32 pallets) 96,000 cans equals 814,583 shipments.

If trailers are restricted to 40 feet, the number of shipments would be increased as follows: From 48 foot to 40 foot trailers—162,917 additional shipments; from 45 foot to 40 foot trailers—90,503 additional shipments.

From the above baseline figures, the cost in dollars and in increased fuel consumption can be calculated.

In feet		Increase in number of shipments	Increased mileage 1×200	Increased transportation cost 2×1.32	Additional fuel in gallons 2—4.7	Additional fuel cost 4×56.6¢
From—	To—					
48	40	162,917	32,583,400	$43,010,088.00	6,932,638	$3,923,873
45	40	90,503	18,100,600	23,892,792.00	3,851,191	2,179,774

ATTACHMENT C

SERVICE GETS TOP PRIORITY

Empty mileage? We call it freight imbalance.

The fact that empty backhaul of regulated carriers of general freight is about 12 percent does not reflect transportation inefficiency. No transport system can be 100 percent loaded in spite of the economic theorists.

Here's why:

Basically, transportation is a public service. The Interstate Commerce Commission is committed to guaranteeing that the public gets this service. Good service and full trailers are not alawys compatible.

It's obvious that there is an imbalance of such need between a high consumption area and a high production area. Examples are numerous.

Refrigerated trucks coming out of Florida can hardly carry automobiles back from Detroit. Dry freight vans loaded with manufactured steel products at Pittsburgh will hardly find a full load in a return from Key West, Florida.

In an analysis of the freight bills of one hundred carriers it was found that 112,603 trailers were dispatched over one week's time; 26 percent of these were dispatched under full weight limits; 44.8 percent were released with maximum cube; and 28 percent were released on service need.

These 31,528 trailers were dispatched with service sensitive freight, that is, freight that had to reach its destination promptly. Delays in delivery would have interrupted some other aspect of commerce.

Examples

Automotive parts for a production line in Detroit;

Supplies for a high rise construction site, where men would have been laid off if the shipment had not been scheduled promptly;

Household appliances, heading for a weekend sale at a major department store. Delayed shipment would have affected literally hundreds of people—retailer, clerks, and of course, the consumers.

Less than full trailers are often dispatched simply to keep the pipelines full. Customers in other areas must be assured of equipment to meet their own schedules. Sometimes trailers must be dispatched to get a vehicle to a shipper's dock for his return load.

Transportation capacity simply cannot be stored.

The CHAIRMAN. That concludes the hearings today. The committee will now stand adjourned until 9 o'clock tomorrow morning.

The hearings tomorrow will be on truck safety.

[Whereupon, at 1:40 p.m., the hearing was adjourned, to reconvene at 9 a.m., on Friday, September 8, 1978.]

ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS

STATEMENT OF HON. EDWARD M. KENNEDY, U.S. SENATOR FROM MASSACHUSETTS

Mr. Chairman and members of the Committee, I want to thank you for this opportunity to offer testimony to this Committee on the increasingly critical relationship between truck design and highway safety. In particular, I want to express my appreciation to Chairman Cannon, both for the leadership he has shown on the issue of motor carrier safety and for his willingness to conduct hearings on this legislation in these closing days of the 95th Congress. I know he will probe the arguments to be presented by witnesses on every side of this issue with characteristic thoroughness and fairness.

I very much regret that I am unable to appear personally before the Committee this morning. Though a long-standing commitment to address an international health conference in the Soviet Union necessitates my absence from Washington this week, I was pleased to learn that the Committee intended to proceed with the hearing at the earliest possible date. It is an indication of Senator Cannon's appreciation of the seriousness of the problem and of his intention to move quickly to address it.

The witnesses from labor and other groups who will testify this morning can articulate far better than I the reasons why this legislation is so urgently needed. Theirs is the perspective of people who must confront the reality of unsafe trucks on a daily basis, and to their words I could hope to add little. I want, instead, to offer a more general perspective on the background of the legislation and to explain its general purposes and likely effects.

As many of the members of this Committee know, the Antitrust Subcommittee has been devoting a considerable amount of time during the last year to the question of the continuing need for extensive regulation of the interstate trucking industry. Opinions, as everyone knows, differ widely on this subject. One of the things that has struck me repeatedly during the course of the investigation, however, is the near unanimity of opinion that regulation of truck safety is vitally important, and that it is in need of substantial improvement.

The reasons for the increased concern with safety are not hard to find. According to the National Highway Traffic Safety Administration, between 1975 and 1977—the most recent years for which complete statistics are available—the number of deaths of occupants of heavy trucks (a figure which includes relief drivers) increased an astonishing 32 percent. This figure represents a marked acceleration in the rate of increase in such deaths over previous years. (By way of comparison, the number of deaths to passenger car occupants in the same two-year period increased by only 4 percent.)

The danger to the driver of a heavy truck on the highway is far greater than to operators of other vehicles. Indeed, he or she is about twice as likely to die in a traffic accident as other motorists. Approximately 4.8 heavy truck occupants are killed annually per 10,000 heavy trucks, as compared with 2.4 occupants per 10,000 vehicles of all other types, excluding motorcycles.

Yet, despite the obvious danger posed by heavy trucks—a danger more than obvious to anyone who has traveled on our nation's highways—surprisingly little research has been done on the nature and extent of the problems. NHTSA, for example, has until very recently been concerned primarily with the dangers posed to drivers and occupants of passenger cars by vehicle design. The National Transportation Safety Board has concentrated primarily on the causes of air and rail accidents. Little coordinated, sustained attention has been paid to the very real safety problems encountered by the over-the-road driver. Moreover, heavy trucks, which are the workplace for well over one million drivers, are excluded from OSHA standards and are even exempt from NHTSA's occupant protection standards.

The results of this lack of attention are profound. According to Professor Susan Baker, a scientist at Johns Hopkins University, the accident rate for trucks per mile of travel is about 40 percent greater than that of automobiles. Her research also indicates that a truck driver is roughly seven to nine times as likely to be killed on the job as the average American worker.

Accidental deaths of truck occupants reveal only a portion of the total problem. Truck safety has direct and disturbing implications for other motorists as well. According to data compiled by NHTSA, when heavy trucks collided with other vehicles, 91 percent of the fatalities were occupants in the other vehicles. In fatal accidents involving heavy trucks and passenger cars, 97 percent of the deaths were to occupants of the cars. And these statistics cannot be attributed to the relative lack of driving skills of motorists compared to that of professional truck drivers. In accidents involving heavy trucks and passenger cars, the truck struck the car 55 percent of the time. Thus, regardless of who is at fault, motorists are in far greater danger. This explains the mounting fears expressed by drivers of automobiles—which are becoming ever smaller and lighter—about heavier and longer trucks. They well understand that whether the stone hits the pitcher or the pitcher hits the stone, it's going to be pretty bad for the pitcher.

The statistics speak for themselves: truck safety has become a problem which the Congress, the Administration, and the American people can no longer afford to ignore. The most difficult aspect of the entire issue is determining why the accident rates have increased so markedly in recent years. While the opinions of knowledgeable people often differ, the answer appears to lie in the significant changes in truck designs that have occurred in the recent past.

For a number of years, the trucking industry had petitioned the Congress to raise the weight limits for trucks operating on the interstate highway system, arguing greater economies, increased efficiency, and no damage to existing roads. A coalition of motorists and state highway officials successfully opposed the industry's arguments. In 1974, however, following the Arab oil embargo of the previous year and the new national concern with energy conservation, Congress allowed states to increase allowable weights on the interstate highways from 73,250 to 80,000 pounds. Subsequently, most of the states raised their weight limits to the federal maximum.

In enacting this change in weight limits in the name of energy conservation, however, Congress overlooked other regulatory considerations affecting truck design. Specifically, it failed to recognize that the increased weight limits would put additional pressure on the widely varying state limitations on the length of trucks, something the federal government does not presently regulate.

The inevitable occurred. Determined to take maximum advantage of the increased weight limits yet constrained by length laws which most states refused to adjust, trucking firms sought new vehicles for their fleets with increased cargo space which would not violate existing state height and length limits. The increased space in the cargo-carrying portion of these newer vehicle designs came at the expense of tractor length and, many say, driver safety and comfort.

The new truck designs have—according to many in the industry—reduced the ability of drivers to control their vehicles, to remain alert at the wheel, and most importantly, to avoid and survive accidents. A longer trailer necessitates a shorter wheel base for the cab, and places increased loads on the critical front steering axle. A lengthened trailer also moves the tractor-trailer coupling device, known as the fifth wheel, as much as 10–12 inches forward of its ideal location. This move upsets the steering dynamics and critically hinders a driver's steering control. The combination of a shortened wheel base with an overloaded front steering axle has led to greater difficulty in maintaining vehicle stability, and proved hazardous to surrounding vehicles as well.

The tendency of longer trailers to "push" the tractor through curves, degrade ride quality and increase the frequency of dangerous front tire blow-out accidents all result from the structural conditions imposed by longer trailers and shortened cabs. In a November 1977 article in the New York Times Magazine, tire failure was cited as one of the top killers in truck accidents caused by mechanical failure, and two-thirds of these accidents are blow-outs of the front tires.

Senators Magnuson, Percy, Bumpers, and I have introduced S. 3431 in an effort to alleviate the dangerous conditions caused by some of the new truck designs while at the same time preserving the discretion of the states to establish and maintain their own length limits. The fundamental purpose of the legislation is to encourage states to gear their length limitations solely to the cargo-carrying portion of trucks. If, however, a state desires to set an overall length limit, then the

bill requires that the overall length of the vehicle must exceed by 15 feet or more the length of the cargo-carrying portion.

Let me also explain what the bill does not do:

(1) It does not prescribe, as some opponents have argued, federal regulations setting trailer lengths for trucks. In no sense does it mandate any particular truck or trailer length. The bill merely requires states to set trailer lengths alone, exclusive of tractor size. Eleven states have already adopted this practice, five of them within the past year. When a particular state wishes to set an overall truck length in addition to trailer length, however, then the bill requires that such overall length exceed by fifteen feet the length of the cargo-carrying portion.

(2) S. 3431 does not transfer the responsibility for setting trailer lengths for trucks from the states to the federal government. Under the bill, states fully retain their historic ability to set overall and/or trailer lengths. To remove the economic incentive for carriers to order and manufacturers to design longer trailers at the expense of tractor size and safety (in the context of overall length limits), however, the bill directs states to gear the length limits they deem desirable primarily to truck trailers.

(3) The problem cannot be addressed quickly and effectively by the Bureau of Motor Carrier Safety of the Department of Transportation. The present BMCS proceeding in which the issue is being considered deals solely with the question of optimal cab size. It does not address, nor is it intended to address, the relationship of cab size to overall truck safety design. A major aspect of this question involves the placement of the "fifth wheel," a fundamental safety issue which bears little relation to the question of optimal cab size.

The central concern is and must be the size of the trailer. This is what our bill requires the states to focus on. Tractors (which include the fifth wheel design mechanism as well as the driver's cab) should be designed and manufactured to specifications appropriate for hauling trailers of the lengths established by the states. Thus, cab size is only a part of the overall truck safety equation.

BMCS personnel recognize this limitation, and have been supportive of the bill. Aside from the length of time—probably several years—that would be required to develop such a regulation, there is no assurance that existing truck safety problems can be remedied by regulating cab size.

(4) Other objections to the legislation have also been raised, to which I want to pay brief attention. You will hear the argument that the bill would drastically reduce industry productivity, or that it will promote energy waste. There is simply no persuasive evidence to support these claims. The loss of trailer capacity which the industry says will result from adoption of this legislation is based on the assumption that trucks run fully loaded most of the time.

In fact, the reverse is true. If states choose to reduce allowable trailer sizes instead of increasing overall length, capacity loss would not approach anywhere near what the industry maintains. Most trucks gross out before they cube out; that is, they reach maximum weight before they run out of cargo space. Only the lowest density freight would be affected by reduced trailer size. As most trailers are already less than fully loaded, it is hard to see how reduced trailer size—in light of the very real safety advantages its affords—would sound the death knell for American trucking that the industry claims.

The testimony of the truck drivers here this morning is the most important you will receive. There is wide agreement among all drivers I have been in contact with—unionized, non-union, and independents—that the new truck designs are unsafe, and that drivers are being forced to pay for increased industry profits with their health and, sometimes, their lives. I urge the Committee to listen carefully to what they have to say.

Again, Mr. Chairman, my thanks to you and to the members of the Commerce Committee for conducting an expedited hearing on this legislation and for giving me this opportunity to explain its importance. Thank you.

STATEMENT OF C. H. FIELDS, ASSISTANT DIRECTOR, NATIONAL AFFAIRS, THE AMERICAN FARM BUREAU FEDERATION

Farm Bureau is a voluntary, nongovernmental organization of more than 2.8 million member families, representing farmers and ranchers who produce every commodity produced on a commercial basis in 49 states and Puerto Rico.

We are pleased that the Committee has scheduled this hearing to begin consideration of the matters raised in the proposed Kennedy-Percy-Magnuson-Bumpers amendment to the highway bill, now introduced as S. 3431.

As owners of several hundreds of thousands of tractor-trailers and as agricultural producers who are highly dependent upon motor carrier transportation, as residents and businessmen in some 30,0000 rural communities served exclusively by trucks, farmers have a vital interest in any proposal that threatens to increase the cost of truck transportation by 10 to 15 percent, increase fuel consumption, and reduce the availability of trucks when they are needed in critical periods of peak food production. Highly perishable farm commodities must be moved to market without delay.

Transportation now accounts for almost 10 percent of the food price spread between the producer and consumer. Any new restriction or requirement that adds to this cost adds to the inflationary spiral that already threatens the health of the economy.

As we understand S. 3431, it would require states to set trailer length independently of overall tractor-trailer length and require a minimum of 15 feet for tractor length. This means that in the 25 states that have maximum legal truck lengths of less than 60 feet the standard 45-foot trailer could not be used on the Interstate System unless the legislatures in those states acted to increase the overall length and, at the same time, allow at least 15 feet for the tractor. The penalty for inaction would be a loss of all federal aid for highways. Only nine states currently set separate trailer lengths; thus 41 states would have to enact such legislation if truck owners in those states are to continue to use 45-foot trailers. We know how difficult it would be to achieve increased lengths in the 25 states.

Additionally, the proposed legislation would ban typical twin-trailer operations—the safest and most energy-effiicient unit of production in the trucking business—in the states where such equipment is now permitted, since the typical twin-trailer unit consists of two 27-foot trailers with a 3-foot drawbar connecting the units—a total length of 57 feet.

We are concerned about truck and driver safety, but we do not believe the facts support the contention that this proposal would improve safety to any significant degree. The Bureau of Motor Carrier Safety is currently engaged in a wide-ranging study of cab size and other factors, such as trailer conditions (BMCS Docket No. MC–79; Notice No. 77–10). It would be premature for the Congress to act before the facts are ascertained in an unbiased and scientific manner.

The agricultural community of this nation is already faced with a seriously deteriorating transportation situation that is reducing the incomes of producers and escalating the costs that must be borne by consumers.

We are currently faced with a broad-scale attack on truck transportation, including many proposals that would affect truck weights annd lengths, unworkable braking devices, increased taxation and others. Unless and until it can be clearly demonstrated that the changes proposed in this bill are required for the health and safety of truck drivers and the motoring public, these proposed changes should be rejected.

We have one of the best truck transportation systems in the world and one of the safest and most economical. Instead of adopting measures that would hamper or cripple that system, we ought to be enhancing it by promoting a standard weight limit of 80,000 pounds throughout the Interstate System, along with 65-foot lengths, and by proceeding with reasonable regulatory reform.

We appreciate the opportunity to present Farm Bureau's views.

STATEMENT OF ROBERT O. ADERS ON BEHALF OF FOOD MARKETING INSTITUTE

I am Robert O. Aders, President of the Food Marketing Institute ("FMI"). FMI is a non-profit trade association whose almost 1,000 members are retailers and wholesalers of all sizes. The membership includes independent grocers, food chains, and voluntary and cooperative wholesalers. Many of FMI's members operate motor carrier fleets in private carriage, utilizing them in the transportation of goods from warehouse to store and, when possible, to "backhaul" products from a supplier to the warehouse. In addition, so much of the product offered for sale in food stores arrives at the warehouses by regulated and independent motor carriers that FMI members are individually and collectively among the largest receivers by truck in the country. Clearly then, legislation which would impact

the character, cost and productivity of transporting goods by motor carriage is of vital and direct interest to FMI. S. 3431 bears directly both upon the proprietary truck operations of food marketers and the regulated and independent truckers who serve them.

Particularly during these times of spiraling inflation and the energy crisis, maximizing productivity and conserving fuel have become national imperatives. This is uniquely so in our industry which is responsible for making the most basic necessity—food—available to the public in wholesome condition and at reasonable cost. Perhaps no other industry is so exposed to public scrutiny, yet I cannot conceive of an industry working more diligently to increase efficiency and conserve precious energy than the food industry. Similarly, FMI members are dedicated to the safe operation of their own trucks and they support reasonable efforts to improve truck safety generally.

Nevertheless, upon analysis of S. 3431, FMI is compelled to a position of strong opposition. While the announced purpose of S. 3431 is to improve truck safety, the result of effectuation of its provisions would dramatically reduce productivity, waste fuel, and perhaps even be inadvertently counter-productive from a safety standpoint. In juxtaposition, the safety claims underlying the bill appear speculative and unsupported.

As we understand the purpose of the bill, it is to compel the lengthening of the wheel base for tractors used in powering semi-trailers and twin-trailers. In doing so, the bill would retain state authority to set limits for trailer length alone, or would preclude state-imposed limits on overall truck length unless the state-mandated overall length limit requires the overall length to exceed the length of the trailer alone by at least 15 feet. Thus, S. 3431 contemplates, alternatively having states increase existing overall length limits or reducing presently permissible trailer lengths, compliance would be compelled under penalty of the "offending" state losing its federal highway funds.

While the bill embraces the two options for compliance as described above, the likelihood of states increasing their overall length law or eliminating altogether their limitations on overall length are miniscule indeed. As a practical matter, this bill would mandate shorter trailers so that the trailer length plus 15 feet would allow the overall tractor-trailer combination to remain within existing overall length laws. Many states now have overall limits of less than 60 feet for combinations of tractor and semi-trailer, and overall limits for less than 72 feet for tractor and twin-trailer combinations. The effect of this bill would be to make unlawful the use of 45-foot trailers and in many cases the use of 42- and 43-foot trailers. A similar result would obtain as to twin-trailer combinations.

While the bill would exempt existing equipment already in use, the effect on trucking operations be they private, regulated or exempt, would nevertheless be dramatic. By way of example, in the state of Illinois there is a 55-foot maximum overall length law. Given the state of the art for power requirement, this allows the use of 42-, 43-, and 45-foot semi-trailers, Because of the fuel savings, cost savings, and increased productivity inherent in the use of larger trailers, they are extensively used and distribution systems have been designed based upon them. Prior efforts before the Illinois legislature to increase the truck overall length limit to 60 feet were consistently doomed to failure. Enactment of S. 3431 then would, as a practical matter, require a rollback in truck trailer lengths in Illinois to 40 feet and would effectively prohibit most combinations of twin-trailers. The effect would be similar in many other states. This would be economically and operationally debilitating.

Many food marketing truck fleets are standardized on trailers in excess of 40 feet. Implementation of the bill would totally disrupt those operations, precluding standardization for many years into the future, and then compelling standardization on equipment which is no longer fully responsive to the needs, operations, and facilities of food marketers. Moreover, the effect of the bill would be to have many more trucks required to accomplish the transportation job now done with less equipment. This in turn will have a dramatic inflationary impact, will unnecessarily increase the amount of fuel needed to move a given volume of goods, clog the loading and unloading docks of shippers and receivers, and will increase food distribution costs.

Yet, given what we consider to be the dramatic, negative effects which attend the bill, we know of no objective information or study which supports the contention that the result of this bill would improve safety. It appears that any possible safety benefits are at best theoretical and in fact, because the bill would increase the number of trucks on the highway, it could result in increasing rather than decreasing the number of accidents. In any event, we understand

that the Bureau of Motor Carrier Safety of the U.S. Department of Transportation is presently undertaking a study of truck safety issues and it would appear appropriate to withhold legislative action until that study is completed.

By increasing the number of trucks on the road more fuel is used, more pollutants are dispersed, more wear and tear is placed upon our highways, and costs are substantially increased. S. 3431 does not appear to offer safety or other benefits to the American public which offset the burdens created. S. 3431 would undermine the efforts of the food industry in particular and the public in general to reduce costs, increase productivity, and conserve energy.

Thank you for this opportunity to appear and present the views of the Food Marketing Institute.

STATEMENT OF H. ERNEST FRANKLIN, EXECUTIVE VICE PRESIDENT, PUGET SOUND TRAFFIC ASSOCIATION

Mr. Chairman and members of the Senate Commerce Committee, thank you for the privilege of appearing here today to testify in opposition to S. 3431.

My name is H. E. Franklin, Jr. I am Executive Vice-President of Puget Sound Traffic Association, located in Suite 502, Sea-Tac Office Center, 18000 Pacific Highway South, Seattle, Washington, 98188.

I have held my present position for more than 15 years and prior to accepting this position. I served for more than five years as Traffic Manager of the Port of Tacoma and Tacoma Chamber of Commerce. Prior to that I held positions as an industrial traffic manager and in the traffic department of a large motor carrier. During the course of my employment I have appeared frequently before the Interstate Commerce Commission for more than 20 years, usually as the chief spokesman for the transportation user interests of the Puget Sound region.

The Puget Sound Traffic Association is a voluntary non-profit organization with its office and place of business at the above address. The Puget Sound Traffic Association embraces in its membership the ports of Bremerton, Seattle and Tacoma, Washington. The Chambers of Commerce of Auburn, Bellevue, Bremerton, Everett, Issaquah, Kent, Kirkland, Lakewood, Mercer Island, North Shore, Redmond and Seattle and the County of King, all of which are located within the Puget Sound area of the State of Washington, as well as over 175 of the larger manufacturers, wholesalers, jobbers, and other commercial enterprises located within these communities.

The general purpose of the Puget Sound Traffic Association is to do everything within its power to promote an efficient, stable transportation service for both passengers and freight for the Puget Sound area at the lowest possible cost.

Our concern with the economics of transportation is reinforced by our geographical location. While we have excellent facilities for marine transportation in the Puget Sound area, we are somewhat disadvantaged so far as surface transportation is concerned by our distance from the production centers and markets of the midwest and east, and we are therefore very sensitive to anything that would needlessly increase surface transportation costs. The resulting cost increases brought about by this proposed change will be felt the most by our shippers and receivers whole goods must be transported over these longer distances. We believe that S. 3431 would have that effect without producing any redeeming benefits.

Our area, the Pacific Northwest, is primarily a consumer of distribution area and the motor carrier industry that serves in our areas, serves primarily as a transporter within these particular fields.

Both as consumers and as users of truck transportation, both private and for hire, our needs are best served by the truck configuration that allows the greatest amount of cubic feet of space to be transported at one time with one driver and one power unit.

The effect of S. 3431 in the State of Washington would be to make obsolete certain motor carrier trailers that are now commonly used in twin trailer combinations in our state. Generally speaking, twin trailer combinations have become very common in our state and appear to be the most efficient method of truck transportation available for most purposes. They are operated at two overall lengths. The first length is the statutory limit of 65 feet. The use of 27 or 28 feet individual trailers in the 65 foot combination is the rule. The other combination that is becoming more and more common on our highways is at 75 feet which requires an annual permit from our Department of Transportation. The usual length of individual trailers used in this combination is 31 or 32 feet.

In all doubles combination there is a space between the trailers of not less than three feet to provide turning space. The attached diagram makes it apparent that if the truck operator is required to have 15 feet available for the power unit within the statutory limit of 65 feet or the limit allowable by permit of 75 feet, the trailers now in present use are too long and would become obsolete. This would result in a loss to the motor carrier operators of millions of dollars in existing equipment.

As serious as the impact would be on the owners of the trailers, the economic effects would be even greater to the general public, inasmuch as the net result of reducing the length of trailers would be to reduce cargo capacity. This would mean that more trips would be necessary at great additional expense and more fuel would be consumed at a time when the energy problem is one of our most serious concerns.

The reduction in cargo space that would result is even more serious than would be recognized by persons not familiar with transportation problems. One of the trends in transportation is for cargo to become of less density. It seems that technological and scientific developments result in products that are of lesser weight than their predecessors. For example, a 12 foot cubic capacity modern refrigerator weighs considerably less than a 6 foot cubic capacity refrigerator of 20 or 30 years ago. This same result has been achieved in many areas. For example, in the food products the proliferation of dried foods, frozen foods and various prepared foods such as dry cereal, bakery products, etc. has brought about a great reduction in the density of food products. All of this makes cubic capacity on the part of motor carrier combinations most important. A reduction in this cubic capacity would be a tremendous step backwards.

It should be noted that nothing in the bill would compel the motor carrier operators to carry out the announced objective of the bill, which I understand to be to bring about the use of longer tractors in motor carrier combinations. It simply requires an allowance of 15 feet for the power unit but does not require that this 15 feet be used.

The records of fleets which operate both doubles and conventional tractor semi-combinations do not reveal that doubles which generally operate with a short tractor have a poorer safety record than tractor semis which are usually operated with a longer power unit. In fact, the reverse is true. Anyone alleging facts to the contrary should bear the burden of producing convincing statistics. See attached sheet showing comparison of accident rate.

Some of the supporters of this measure have indicated that it would be very simple to have the states extend their length limit to a point where the 15 feet could be allowed for the power unit without reducing the length of the trailing units that are now in use. It should be noted that Washington would have to pass a law allowing for an annual permit for 85 foot to accommodate many of the trailers now in use. It has been my experience that the state legislature in Washington has been very reluctant to increase the length of trucks and the possibility of such legislative action is doubtful, to say the least.

In addition to the chart illustrating the effects of the proposed legislation on twin combinations in the State of Washington, I have also attached charts that were put into the Senate Congressional Record on August 18, 1978, by Senator Bartlett, which indicate the efficiency of twin trailer combinations as opposed to other combinations in common use and illustrate the desirability of not reducing their capacity in any way.

If there is a problem from the standpoint of safety, comfort, or hazards to the health of drivers insofar as short tractors are concerned, it would seem to me that the federal agencies that are concerned with such matters would properly investigate these problems and correct the same under their rule making authority. The approach that is taken in the bill, while no doubt motivated with the best of intentions, would be to require all of the states to alter their length laws in some respect unless they would be willing to forfeit federal aid or see a considerable number of their present commercial vehicle fleets be made obsolete.

The loss of equipment utilization, and the concurrent loss of motor common carrier productivity, would undoubtedly have to be recovered by the carriers by increasing our already inflated freight rates by as much as 25 to 30 percent. A still further increase in these freight rates could result from the initial capital expense required by the carriers to replace their present fleet with equipment needed to comply with this proposed amendment. These increased costs must be paid by the shipper and ultimately by the general public, resulting in further inflationary pressures.

On behalf of the transportation user interests that I represent, I recommend that you not approve this proposed legislation. Thank you for your consideration of these views.

TABLE VIII.—POSSIBLE PERCENTAGE SAVINGS IN TRUCK TRIPS AND FUEL CONSUMED IN HAULING 1,000,000 TONS OF HIGHWAY FREIGHT IN VARIOUS TRUCK COMBINATIONS

	Percent of truck trips saved	Percent of fuel saved
Light and bulky freight:		
Subsitute 45-ft for 40-ft semitrailers	14.4	8.5
Substitute 65-ft twin trailers for 40-ft semitrailers:		
At old twin trailer weight limit	27.2	22.0
At new twin trailer weight limit	32.4	25.9
Substitute 65-ft twin trailers for 45-ft semitrailers:		
At old twin trailer weight limit	17.8	14.7
At new twin trailer weight limit	23.7	18.9
Dense freight:		
Substitute new for old weight limits:		
With 40-ft semitrailers	11.3	7.7
With 45-ft semitrailers	11.4	7.8
With 65-ft trailers	13.2	9.1
Substitute 65-ft trailers at new limit for—		
40-ft semitrailer at old limit	12.1	9.0
45-ft semitrailer at old limit	12.9	9.8

Legal or maximum practical	Old limit	New limit
Light and bulky freight:		
40-ft semitrailer	60,725	60,725
45-ft semitrailer	65,250	65,250
65-ft twin trailer	73,280	76,677
Dense freight:		
40-ft semitrailer	73,280	79,000
45-ft semitrailer	73,280	79,000
65-twin trailer	73,280	80,000

TABLE X.—FUEL SAVINGS POSSIBLE IN STATES NOT PERMITTING GROSS VEHICLE WEIGHT OF 80,000 LB OR TWIN TRAILERS

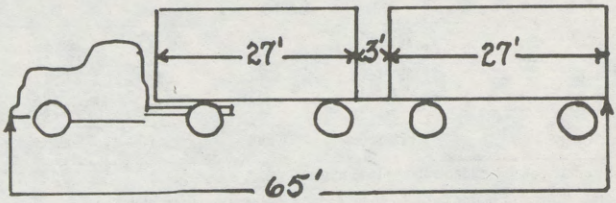
State	Possible gallons saved by—		
	Increased weight	Use of twin trailers	Total
Alabama	0	12,100,000	12,100,000
Arkansas	1,300,000	0	1,300,000
Connecticut	2,200,000	7,900,000	10,100,000
Florida	0	19,400,000	19,400,000
Georgia	0	17,900,000	17,900,000
Illinois	5,800,000	0	5,800,000
Indiana	7,100,000	0	7,100,000
Iowa	4,400,000	0	4,400,000
Maine	0	2,600,000	2,600,000
Maryland	6,900,000	0	6,900,000
Massachusetts	0	6,600,000	6,600,000
Minnesota	[1] 2,300,000	0	2,300,000
Mississippi	2,600,000	6,800,000	9,400,000
Missouri	2,700,000	0	2,700,000
New Hampshire	0	1,100,000	1,100,000
New Jersey	0	9,700,000	9,700,000
New York	0	13,300,000	13,300,000
North Carolina	0	16,400,000	16,400,000
Pennsylvania	10,400,000	20,000,000	30,400,000
Rhode Island	0	2,900,000	2,900,000
South Carolina	0	7,400,000	7,400,000
Tennessee	6,900,000	14,900,000	21,800,000
Vermont	0	1,000,000	1,000,000
Virginia	0	12,300,000	12,300,000
West Virginia	0	2,500,000	2,500,000
Wisconsin	[1] 4,200,000	6,500,000	10,700,000
Total	56,800,000	181,300,000	238,100,000

[1] 80,000 lb effective January 1978.

Source: Based on energy savings stated in Btu's in a 1976 Stanford research study for the Federal Energy Administration and converted to gallons at the rate of 136,000 Btu's per gallon of diesel fuel. Revised, August 1977.

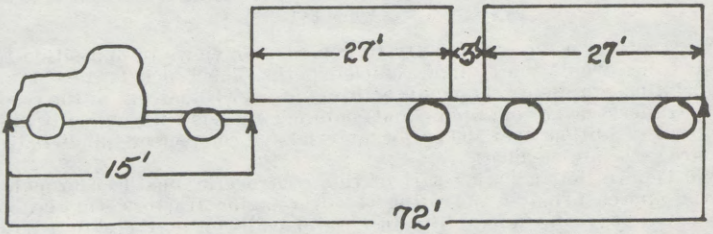
EFFECT OF AMENDMENT ON EXISTING DOUBLE COMBINATIONS IN WASHINGTON

Present Doubles Combination By Statute



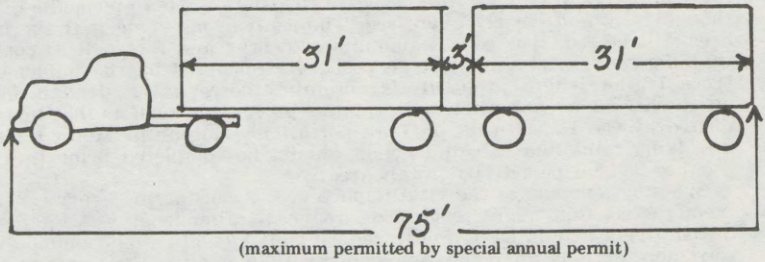
(maximum length allowed by law)

EFFECT OF AMENDMENT



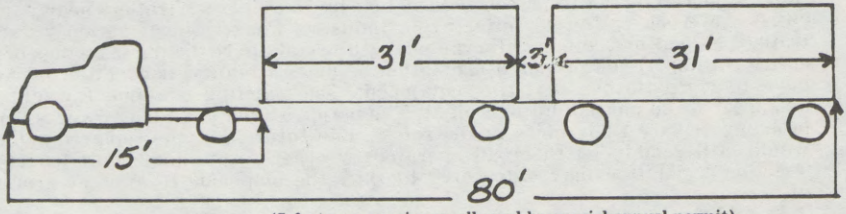
(7 feet over maximum by law)

Present Doubles Combination By Special Annual Permit



(maximum permitted by special annual permit)

EFFECT OF AMENDMENT



(5 feet over maximum allowed by special annual permit)

COMPARISON OF DOUBLE BOTTOMS VERSUS TRACTOR-SEMI ACCIDENT RATES

[Miles in thousands]

Year	Doubles			Tractor-semi		
	Miles	Accidents	Rate	Miles	Accidents	Rate
1973	461, 322	351	0.761	193, 552	182	0.940
1972	434, 580	287	.660	198, 646	158	.795
1971	392, 062	251	.640	202, 135	156	.772
1970	337, 911	211	.624	184, 872	178	.963
1969	204, 075	108	529	124, 329	105	.845
Total	1, 829, 950	1, 208	.660	903, 534	779	.826

Note: Rate equals accidents per million miles traveled.

Source: Bureau of Motor Carrier Safety, Federal Highway Administration.

STATEMENT OF CHARLES J. CALVIN, PRESIDENT, TRUCK TRAILER MANUFACTURERS ASSOCIATION

We appreciate the opportunity to express our views in opposition to any proposal which would limit single vehicle lengths. The Truck Trailer Manufacturers Association represents the manufacturers of over 90 percent of the truck trailers, tank trailers, cargo containers, and container chassis built annually in the United States. In addition, over 100 major materiel and component suppliers to the industry are associate members.

We believe that a major part of this controversy has been brought about by driver apprehension in operating cab-over-engine tractors. On the other hand, the psychology of vulnerability in case of collision may create a positive reaction by drivers, resulting in safer operation of vehicles.

We agree wholeheartedly with the statements made by the American Trucking Associations. Their treatment and discussions of the problems, which would inevitably result should this type of legislation be implemented, have been thoughtfully and clearly expressed. The contentions made that the inflationary fires will be fed, that excess amounts of energy and fuel will be consumed and that highway safety will not be positively impacted by the implementation of truck trailer length proposals is absolutely correct. We strongly endorse and agree with their contention that a major proceeding such as that now being conducted by the Department of Transportation's Bureau of Motor Carrier Safety involving minimum cab dimensions should be completed prior to any possible further legislative activity in this area.

We must emphasize the vital importance of considering every conceivable economic effect that might result from reduced trailer lengths. All across-the-board legislatively mandated action to reduce trailer length would undoubtedly have a far more serious affect on the economy than did the recently enacted Federal Motor Vehicle Safety Standard 121. In 1975, the added expense of equipment required by S. 121 combined with the economic downturn, inflation, and the continuing burden of the 10 percent Federal excise tax on truck trailers nearly inundated the truck trailer manufacturing industry. Congressional action reducing trailer payload by reducing allowable length would affect the purse strings of the entire Nation. If the proposed legislation becomes a reality, it would necessarily have to "grandfather" existing equipment. The existing equipment would not disappear or be phased out overnight. The major carriers and fleet owners would probably replace their units in the foreseeable future, but the replaced vehicles would still remain on the road operated by others. Any single unit length restriction legislation may only serve to shift the emphasis to another group of drivers.

In addition to being uneconomical, such a measure would waste precious energy. Naturally, the size of the trailer determines the degree of energy efficiency. Reducing trailer length will mean more trips by more carriers using more vehicles to transport the same amount of goods. Thus, our dwindling energy supply is reduced and inflationary fires fanned.

STATEMENT OF THE AMERICAN TEXTILE MANUFACTURERS INSTITUTE (ATMI)

ATMI is the central trade association for the U.S. spinning, weaving, knitting and finishing industry, with the member companies of ATMI accounting for about 80 percent of U.S. textile production.

We believe legislation proposed under S. 3431 would have a serious adverse affect on productivity in motor carrier transportation result in adding fuel to the fires of inflation rather than attempting to curb it as is so desperately needed, and needlessly increase energy consumption, the conservation of which is to vital to our nation.

Senate bill S. 3431 specifies a minimum federal standard of 15 feet for tractor length. Twenty-five states and the District of Columbia have overall length limitations for tractors and semi-trailers of less than 60 feet. In those instances semi-trailers of 45 foot length would be prohibited, thus reducing trailer length to 40 feet. This would result in a reduction in the cubic carrying capacity of 45 foot semi-trailers by 12.5 percent. Such a requirement would reverse the trend of increased productivity which is demanded by the high rate of inflation, which we have and continue to experience, not only in the transportation industry but in all facets of our economy.

The only possible result from reducing semi-trailer length from 45 feet to 40 feet would be increased operating expenses for not only regulated motor carriers, but for private carriers as well. Such increased expenses would not be absorbed by either type carriers, but would be passed on to the ultimate consumer, further increasing the already staggering rate of inflation.

Senate bill S. 3431 would require motor carriers to operate one additional truck for every nine now operating, resulting in an 11 percent increase above the present fuel consumption. Fuel consumption is a matter of vital importance to our nation, with the cost of fuel increasing almost daily and continuing reports from Washington of possible gas rationing.

In addition to the increased fuel consumption, the placing of thousands of needless trucks on the nation's already crowded highways would obviously have an adverse effect on driver safety, not only to truck drivers but the general public as well.

ATMI is a strong advocate of safety on our nation's highways for all drivers, however, we do not believe that specifying a 15 foot tractor would result in any solution to driver safety but rather would impose unnecessary burdens on the trucking industry and the consuming public as well.

We believe if the truckers adhere to existing safety regulations, concerning driving time, etc., and abide by the national speed limit of 55 miles per hour no safety problem should arise requiring legislative action.

ATMI is opposed to S. 3431.

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
Washington, D.C., August 24, 1978.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I would like to enclose a copy of a letter which I have received from the Illinois Motor Vehicle Laws Commission in opposition to the proposal mandating that truck tractors be at least 15 feet in length.

I understand that your Committee will be holding an oversight hearing on September 7 on the issue of truck tractor lengths. It would be appreciated if you would make this letter from Mr. Oren "Lou" Lowder, the Executive Director of the Commission, part of the hearing record.

Sincerely yours,

ROBERT MCCLORY,
Member of Congress.

Enclosure.

STATE OF ILLINOIS,
MOTOR VEHICLE LAWS COMMISSION,
Springfield, Ill., August 9, 1978.

Hon. ROBERT MCCLORY,
House of Representatives,
Rayburn House Office Building, Washington, D.C.

DEAR CONGRESSMAN: It has come to the attention of the Motor Vehicle Laws Commission that there will be a proposal offered on the Senate floor which will in effect mandate that all truck tractors be at least 15 feet in length. This proposal, if adopted, would have a tremendous negative effect in Illinois. It would eliminate the use of the 45-foot semitrailer as well as all "double bottom" move-

ments. The shipping and trucking industry would be placed in an untenable position. The fiscal impact imposed upon them to replace their 45-foot semitrailers and double bottoms would have to be absorbed by the consumer. In Illinois 42 percent of the communities (983) receive their commodities exclusively via the truck industry. They cannot afford any additional cost at this time.

This Commission sponsored state legislation which would have extended the maximum overall length of a truck tractor semitrailer combination from 55 feet to 60 feet. This proposal would have had no effect upon the maximum length of semitrailers in Illinois which is 45 feet. The purpose of this amendment was to permit the use of the conventional tractor instead of the "cab over" tractor which is presently required in order to stay within the 55-foot overall limitation. Some of the very arguments being used for justification of this porposal on the Federal level were used here in Illinois for justifying our proposal. It may appear ironic, but, due to the intensified efforts of the Teamsters' lobby, this proposal was defeated in Illinois.

Therefore, this Commission has taken an official stand opposing any proposal which would mandate that truck tractors be at least 15 feet long at this time. Such limitation would eliminate the use of the 45-foot semitrailer and double bottom movement in Illinois and impose an unreasonable and unwarranted imposition upon the Illinois consumer.

The Commission respectfully requests your assistance in defeating this proposal.

Sincerely,

OREN "LOU" LOWDER,
Executive Director.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS,
Washington, D.C., September 5, 1978.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation,
Russel Senate Office Building, Washington, D.C.

DEAR SENATOR CANNON: It is our understanding that hearings will be held by the Committee on Commerce, Science and Transportation on S. 3431 (by Senator Kennedy-Mass.) which would provide for withholding of federal-aid highway funds from states that fail to set specific length limits on truck trailers. Further, the bill specifies that overall truck lengths must include the trailer length plus at least 15 feet.

A special task force of the Subcommittee on Highway Transport of the American Association of State Highway and Transportation Officials has reviewed the bill and the impact they believe it may have upon the member states. Their review indicates that while the intent of the bill apparently is aimed at alleviating alleged driver discomfort and increased safety problems related to cab-over engine or cab-under truck tractors, the net effect of the bill—in their opinion, will be to cause all but five states to revise existing legislation pertaining to truck lengths. In addition, the bill would provide relief for one special class of highway users regarding highway safety as opposed to the safety of highway transport as a whole.

AASHTO's Recommended Policy on Maximum Dimensions and Weights of Motor Vehicles provides for a maximum trailer length of 40 feet and an overall length of 55 feet for truck tractor semi-trailers and 65 feet for double bottom units. However, most states only limit the overall vehicle length. In fact, 25 states follow AASHTO policy in limiting the maximum truck tractor semi-trailers to the AASHTO recommendation of 55 feet. Eighteen states have higher total length limitations, and seven states have higher length limitations with restrictions to only certain portions of their highway system. As a matter of record, an AASHTO Policy must be approved by at least two-thirds of the states prior to adoption.

Twenty-one states follow the AASHTO recommendation for double bottom units, and twenty-five states either do not permit such units or do not allow them to be as long as the AASHTO recommendations.

The AASHTO Policy on maximum dimensions and weights of motor vehicles was utilized in establishing the approved AASHTO design standards which have been adopted by the Federal Highway Administration for the Federal-aid System, and which are used generally by the states and local jurisdictions on all roads. The maximum length advocated under AASHTO Policy in conjunction with other highway vehicles was used to determine design standards for horizontal curves

of highway facilities, entrance/exit ramps, clover-leaf interchanges, and highway intersections with local streets. These design standards have been utilized in the construction of highways for many years with the attendant result that the present investment in highways is quite substantial. Drawings showing these standard design vehicles are attached. You will note that these vehicles conform to those recommended in our Policy as to length. As an example, in 1976, the total expenditure on highway, street, and road construction in the United States was $24.1 billion, of which the federal share was $6.5 billion. The total mileage of highways, streets, and roads in the United States is 3.9 million miles. Of this total, federal-aid, non-Interstate highways constitute 767,500 miles and the Interstate System, 42,500 miles. Thus, state and locally financed highways total 3.1 million miles.

AASHTO believes that only a state legislature can accurately assess the capacities of its highway system and needs of their constituents. In this connection, while S. 3431 relates only directly to the federal-aid system, it is obvious that origins and destinations of truck traffic will involve local streets and roads. Thus, if longer vehicles are to be permitted on the highway system, consideration must be given to the effects they will have in negotiating the existing facilities which have been constructed to AASHTO standards or to lesser standards. It would seem to be more economical to change the design of vehicles than to require states to incur substantial additional costs to provide facilities to accommodate the larger vehicles.

While the economic life of a trailer rarely exceeds five to seven years. the life of a highway may exceed fifty years. The surface of a highway will not last that long, but the geometrics will. In the case of city streets, the life of the geometrics far exceeds that life span.

According to the 1972 Census of Transportation, only 1,500,000 vehicles of over 26,000 lbs. were in use. This comprised 7.6% of the total truck fleet, and this percentage had remained unchanged since the 1967 census. Applied to the 1975 fleet of 25,775,000 trucks, it would indicate that there are slightly under 2 million vehicles in this class on the road today, this out of a total vehicle fleet of over 130 million. It is our understanding that over one-half of the tractor units sold in the United States last year were of the engine in front design.

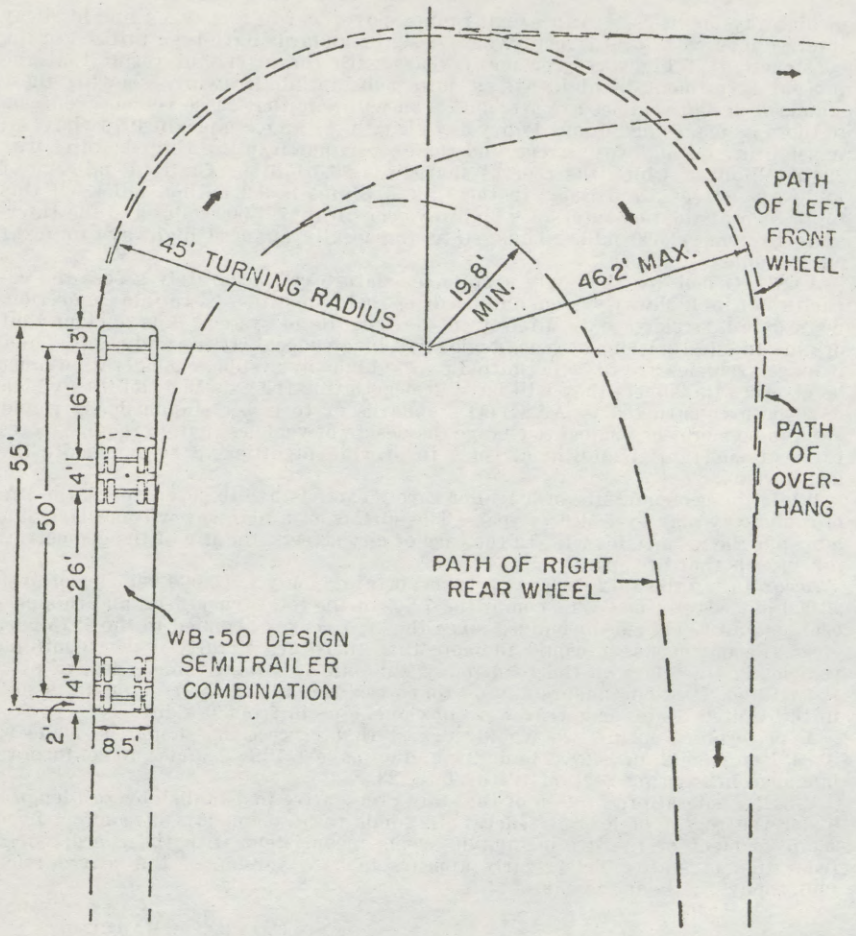
As a technical point, we would suggest that corrections should be made to S. 3431 on page 2, lines 21, 23 and 24, and on page 4, lines 1 and 2, to conform to language in existing Section 127 of Title 23.

Finally, federal preemption of the state prerogative to establish overall lengths under the threat of loss of federal-aid funds to accommodate discomfort by a small segment of the driving public seems inconsistent with the concept of a federation of states. This clearly appears to be a version of the "carrot-stick philosophy" without the carrot!

Sincerely,

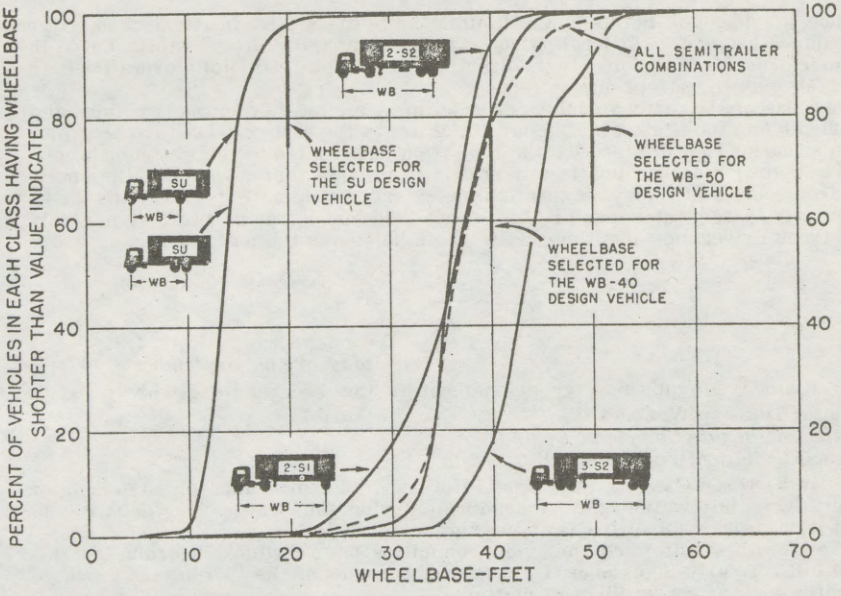
DARRELL V. MANNING,
President, AASHTO.

Enclosure.



WB-50 DESIGN VEHICLE

FIGURE II-12



DISTRIBUTION OF TRUCK WHEELBASES
MAIN RURAL HIGHWAYS - 1959

FIGURE II-13

NATIONAL TRANSPORTATION SAFETY BOARD,
Washington, D.C., September 6, 1978.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: Thank you for your letter inviting comments on S. 3431 concerning motor carrier length and axle weight loads.

S. 3431 addresses the issue of commercial vehicle space which has become increasingly important in the last few years. When gross vehicle weight on interstate highways were increased in 1974, carriers and owners were permitted to operate larger vehicles subject to the overall limits on total length of tractor and trailer prescribed by the individual States.

For the past 60 years, before overall length became an important limitation, tractors had been designed to meet the needs for power, safety, and driver environment. Now the tractor is competing against the trailer payload. Not surprisingly, the tractor has been losing. In the last few years, new tractors have been designed to be as short as possible to allow longer trailers and bigger payloads.

The Safety Board believes that increased attention needs to be paid to the tractor's design and its effects on drivers and safety. In commenting on the Federal Highway Administration Notice of Proposed Rulemaking on Minimum Cab Space Dimensions, the Safety Board noted that the primary emphasis should be placed on driver requirements, not a limitation on overall length.

One means to satisfy driver requirements is to remove the tractor from competition with the payload—to take the tractor out of the length equation. By removing the tractor from competition, the economic incentive to choose a bigger payload over a well-designed tractor would be eliminated. Design of the tractor could then, once again, be dictated by considerations of power plant, safety, and driver environment.

S. 3431 would require that States limit trailer length only, exclusive of overall length. All States now have some overall length limitation, but only a few limit trailer length.

The bill does not dictate length limitations to the States. It attempts to strike a balance between a Federal safety standard and the States' historical role in vehicle length limitations. In addition, a state could still limit overall length if it felt highway safety so required.

Because of the many variables of geography, highway type, road surface, and traffic among the States, individual States are in the best position to assess their own situation and to prescribe the limitation most suited to their circumstances.

The Safety Board supports any efforts to provide the driver with the space, environment, and cab configuration necessary for him to perform his tasks efficiently, safely, and comfortably. A well designed tractor protects not only the truck driver, but also those with whom he shares the nation's roads.

Sincerely,

JAMES B. KING, *Chairman.*

WOODLAND TRUCK LINE, INC.,
Woodland, Wash., September 6, 1978.

Re: Kennedy-Magnuson-Percy amendment to the Federal-aid Highway Act.

Senator HOWARD W. CANNON,
Chairman, Senate Commerce Committee,
Russell Building, Washington, D.C.

DEAR SENATOR CANNON: We were informed by Senator Jackson that Senator Kennedy withdrew the above amendment during the Senate floor debate, and that it has been resubmitted as an individual bill, S. 3431.

We were also informed that your committee has scheduled hearings on this new bill for early September. I am enclosing copies of the two letters I sent to Senator Jackson concerning this matter.

I hope that you will read and enter the enclosed into your hearings regarding this bill.

Yours truly,

JAMES M. JOHNSON, *President.*

Enclosures.

WOODLAND TRUCK LINE, INC.,
Woodland, Wash., August 8, 1978.

Senator HENRY M. JACKSON,
U.S. Senate,
Washington, D.C.

DEAR SENATOR JACKSON: We need your help again. This time in the area of legislation affecting our business. Darlene and I own Woodland Truck Line, Inc., which is a small common carrier serving Oregon and Washington. Most of our units are doubles, which would become unlawful if the Kennedy Amendment to the Federal Aid Highway Act of 1978 passes.

This type of equipment has been used for numerous years before we purchased the truck line in 1967. Since 1967 the only lost time injury accident was in 1977 with a driver turning a 5 axle tractor up on its side. The driver lost one day's work with a bruised leg. The ironies of this incident is that this type of unit would remain lawful under the Kennedy Amendment and yet would not be as safe or stable in handling this type of load as the proposed unlawful doubles combination. All other accidents during our 11 years existence were non injury accidents and were small fender benders. In fact our insurance agent tells us that we have, one of the most favorable accident ratios around. Our safety record shows that our units are not unsafe, in fact our record compares favorably with carriers not having doubles.

Veiled in the unfounded guise of safety, the Kennedy Amendment creates a severe negative impact on our country in the areas of inflation, energy conservation and productivity. Between 1967 and 1977 the United States productivity gain amounted to 24 percent while Japan experienced a 105 percent increase over the same time period. Kennedy's amendment is the kind of ill advised proposals that contributes to our country's inflationary and productivity problems.

Please oppose this amendment.

Additionally, we cannot understand why Senator Magnuson is co-sponsoring this bill, however we are writing him also. If you agree with us on the above, please discuss it with Senator Magnuson. I sometime wonder if Senator Magnuson reads or even if his staff really reads his mail.

Thank you for your consideration on the above.

JAMES M. JOHNSON, *President.*

P.S.—The Corps of Engineers indicate that they are right on schedule with the new study concerning the Woodland Flood plain. It is due to be completed sometime in September.

Enclosures.

WOODLAND TRUCK LINE, INC.,
Woodland, Wash., August 24, 1978.

Senator HENRY M. JACKSON,
Senate Office Building,
Washington, D.C.

DEAR SENATOR JACKSON: Thank you for your response of August 10, 1978. I especially appreciate the copy of Senator Kennedy's statement of July 10 on the Senate Floor.

I discovered in reading Senator Kennedy's statement some serious errors and inconsistencies. However in order for you to put any credence in what I have to say you must first be informed on what experience or knowledge I draw upon to form such opinions.

My wife and I purchased Woodland Truck Line, Inc., in 1967, however my truck line experience goes all the way back to my birth 38 years ago. My father owned Johnson Freight Lines, Inc. and I actively worked in his truck line from the age of 10 until he sold it in 1958. It was a struggling firm all of its existence, therefore I was exposed to all areas of trucking. From 1958 to 1962 I worked my way through the University of Washington by working as a driver for such firms as PIE and Puget Sound Truck Line. After graduation, I majored in statistics and transportation, I worked for Boeing and for about a four year period I was out of trucking. Then in 1967, we purchased Woodland Truck Line. Woodland Truck Line is a class III carrier with income ranging from $75,000 in 1967 to over $450,000 in 1977. All of the time I have been both blue collar and white collar worker. I drive almost every day. In my entire truck driving career, I have only had one accident and no one was hurt and the total amount of the property damage was only $40.00. I know trucks and I know what is safe. Therefore my comments on the Kennedy Amendment comes from first hand experience.

First and perhaps most serious is the Senator's contentions regarding 5th wheel placement. He indicated that the ideal location is not 10 to 12 inches forward because of the effect on "steering dynamics", riding comfort, and "the tendency for the trailer to 'push' the tractor". When you place the 5th wheel over the rear axle you may improve the ride, but you do not improve the steering control contrary to what the University of Michigan study says. On a skate board it is OK to stand over the rear axle and concentrate your weight because you can steer from there. But to concentrate your weight over a fixed axle while simultaneously removing weight from the front steering axle will allow "the trailer to 'push' the tractor". This is true because the 5th wheel acts as a pivot and weight transfer point, and its placement allocates weight between the steering axle and the rear axle(s). Too little weight on the front axle makes it easier to turn the steering wheel, but will cause it to understeer, reducing control, thereby creating a safety hazard. If the study is saying that forward 5th wheel placement makes it harder to turn the steering wheel, that is true and that is why more trucks have power steering. Power steering is not mandatory or necessary to steer the truck but it makes the driver's job easier. Additionally, I know of one incident of a heavily loaded truck having a front tire blow out and complete control was maintained—this unit had power steering.

Next is maneuverability. Woodland Truck Line is a general freight carrier and we pick up freight every day in Portland, Oregon. In fact we range from 2 to 3 rigs in the Portland area every work day. In 1967 we were using solo trucks to perform this function. Today most of our solo rigs have been replaced by short wheel base non-sleeper tractors pulling one 27 foot box. Why? Because of their maneuverability and capacity. Also because of their increased visibility. The turning radius of a short wheel base tractor with a 27-foot van is less than one-half that of a 24-foot solo truck. Visibility is better because the driver has windows to the front, side, and rear. Whereas the solo truck only has front and side windows. Both vehicles have good mirror visibility. Adding an additional 7 feet to our town rigs would do nothing for visibility and would actually hurt their maneuverability.

Next Senator Kennedy's statement that "no braking system for heavy trucks designed to aid in the prevention of jackknifes exists" is ironical. The National Highway Safety Advisory Committee of DOT attempted an antiskid truck brake system to prevent jackknifes. In 1975, S–121 was forced down the industry's throat without adequate testing and has caused too much loss of time, money,

effort, and yes, bloodshed, too. In my opinion the department realized S–121 was unsafe when they took the requirement off the buses and army trucks, however S–121 are still required on trucks. Because S–121 is so problematical, perhaps Senator Kennedy and his supporters chose to ignore it, or perhaps they are unaware of its existence. The teamster union supported S–121.

Additionally in the last paragraph of page S. 10351 he states "Cabs are being placed on top of their engines, adversely affecting both driver comfort and engine accessibility." The cab design he is referring to is the cab-over-engine or COE model. As to adverse driver comfort, you'll find that more COEs than conventional cabs are sold to owner-operators who make their living out of the truck cab with driver comfort a paramount consideration. I personally prefer the COE for comfort plus its advantages in visibility and maneuverability afforded by the absence of a six foot hood out front. The Senator implies that there has been no improvements made in the area of driver comfort and that he has been put into a tiny coffin. This simply is not true. First, if you measure the amount of driving room in a cab, that area from the windshield to the back of his seat, it is approximately the same whether you are in a 51-inch non-sleeper cab or 110-inch sleeper cab. Most of the extra room is behind the drivers seat which is nice when he is not driving, but does nothing to help him drive more safely. Also such things as power steering, air ride, and air seats are becoming more common place all the time. These features are strictly for driver comfort. Air conditioning is also becoming common place. Ingress and egress for the driver has also been improved with items like safety steps, longer safety handles, and non-skid decks. The driver has not been neglected!

As to engine accessibility, the Senator devulges his lack of knowledge, as the COE of cab-over-engine model has had a tilting capability since the early 1960s. Conventional models have since also used a tilt hood, but with less engine and transmission accessibility resulting.

Still another point of contention is when Senator Kennedy, his supporters and/or researchers imply that the trucking industry would choose profit by ignoring safety. It makes my butt ache to have to protect my industry against unwarranted accusations. In fact allowing unsafe conditions to exist goes contrary to the profit motive. Accidents cost everyone, especially the employer. Just look at the Industrial Insurance rate in Washington after a serious accident if you do not believe this, and look at your truck insurance premium following an accident.

The next phase of my argument against this amendment comes from my belief in the independence of the State. What right has the Federal Government to force all of the states to change or adapt their size and weight laws to suit this new notion of a few. Why is it that more and more of our Federal representatives begin to feel that the people back home are too ignorant to know what is best for them. States are different especially in terms of road systems, bridge heights, topography, population density, etc. Let the states decide what type of vehicles they want on their roads. Don't use that big club you old of denying money to any State that likes their own size and weight laws over the ones Kennedy suggests.

Also, this time as a business man that deals with the Teamsters I feel that you must recognize the difference between the Teamster Union and the driver. The teamster union favors this amendment because they see it as a chance to increase the number of teamster jobs. This has nothing to do with improving the position of the driver either in terms of safety or comfort.

In fact as stated above this amendment does neither, but it does have some additional negative effects that I have not yet mentioned. By reducing the payload of trucks you increase the number of trucks on the road. This hurts our energy conservation program and also increases congestion on our highways, a cause of accidents.

One last note, if Senator Kennedy is really interested in safety as he professes, then I feel that he should look into the area of defective equipment on the road. The Washington Utilities and Transportation Commission has some very interesting figures on who operates such equipment. These figures were contained in Mr. A. G. Duclos's testimony at the ICC hearing on deregulation. I feel that stricter enforcement of the laws and rules regarding defective equipment would do much toward increasing highway safety. I also feel that enforcing the current driving hours rules would also help. We should not change those rules either until we see what enforcing the current rules would do. An indication of the

poor status of DOT's enforcement of the current rules is contained in Professor Wyckoff's article contained in Traffic World, copy enclosed.

Again I want to thank you for your response on August 10, 1978, and to thank you for the request for additional information. It is very hard to write all that I know about the above subject, so if there is anything else you would like to know or would like some point in the above letter clarified please call me collect. My work hour phone number is 206–225–9433 and my home phone is [redacted]

Thank you very much for your interest in the above.

Yours truly,

JAMES M. JOHNSON, *President.*

[The following information was referred to on p. 11:]

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., December 20, 1978.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, D.C.

DEAR CHAIRMAN CANNON: I have enclosed additional information for the record of the September 7 hearing on truck lengths and the answers to the four questions you requested in your letter of September 28, 1978. The legal memorandum you requested on the extent of the Department's authority to regulate truck lengths on page 18 of the hearing transcript is supplied in the answer to the first question of your letter.

Sincerely,

JOAN CLAYBROOK.

Enclosure.

Question 1. What is the extent of the Department of Transportation's authority to regulate in the area of motor carrier vehicle lengths? Are there any situations in which safety considerations would preempt individual state length laws?

Answer follows:

MEMORANDUM CONCERNING THE DEPARTMENT OF TRANSPORTATION'S LEGAL AUTHORITY WITH RESPECT TO MOTOR CARRIER VEHICLE LENGTHS

INTRODUCTION

Three statutory provisions form a basis for considering the extent to which the Department of Transportation has authority to regulate motor carrier vehicle lengths. Two of these provisions, 49 U.S.C. 304(a)(1) and 23 U.S.C. 127, relate to the authority of the Federal Highway Administration (FHWA). The third, § 103 of the National Traffic and Motor Vehicle Safety Act of 1966, 15 U.S.C. 1392, concerns the authority of the National Highway Traffic Safety Administration (NHTSA). Analysis of these provisions reveals that authority to regulate motor carrier vehicle lengths directly remains with the States. However, the Department does have authority pursuant to 49 U.S.C. 304(a)(1) and 15 U.S.C. 1392 to regulate truck length indirectly if a valid connection with safety is made.

I. AUTHORITY OF THE FHWA UNDER 49 U.S.C. 304(A)(1)

Under 49 U.S.C. 304(a)(1), the FHWA has authority to establish reasonable requirements with respect to the "qualifications and maximum hours of service of employees [of common carriers by motor vehicle], and safety of operation and equipment [of common carries by motor vehicle]."[1] At the time of the original enactment of § 304(a)(1) in 1935 (the section was formerly 204(a)(1)), the operation of motor carrier vehicles by fatigued drivers was considered a major threat to highway safety, and Congress determined that there was no need to control "maximum hours of employment." H.R. Rep. No. 1645, 74th Cong., 1st Sess. 5 (1935). Since its enactment, regulations promulgated under

[1] This provision, originally § 204(a)(1) under the Motor Carrier Act of 1935, P.L. 74–225, was initially under the jurisdiction of the Interstate Commerce Commission. It became part of Title 49 as a result of a transfer of authority to the Secretary of Transportation when the Department was established in 1966, P.L. 89–670. See § 1655(e)(6)(c) of the DOT Act.

§ 304(a)(1) have emphasized the need to remedy conditions which must interfere with an employee's ability to safely operate a motor carrier vehicle.[2]

With regard to motor carrier vehicle performance, the authority under § 304(a)(1) to set standards for "safety of operation and equipment" manifested only a general concern that "run down" motor carrier vehicles not be operated on the Nation's highways. 79 Cong. Rec. 12209 (1935) (remarks of Senator Mapes). The legislative history leading to the adoption of § 304(a)(1) clearly shows that the direct regulation of sizes and weight of motor carrier vehicles, although considered, was specifically rejected.[3]

49 U.S.C. 325 (originally enacted as § 225 of the Motor Carrier Act of 1935),[4] authorized an investigation and report on the need for Federal control over the sizes and weight of motor carrier vehicles. In 1941 a report was issued[5] which concluded that the investigation had ". . . not clearly show[n] the need for Federal entrance into this field merely for the sake of reducing sizes and weights in the interest of safety." See p. 18 of "Federal Regulation of the Sizes and Weights of Motor Vehicles," H. Doc. 354, 77th Cong., 1st Sess. 10 (1941).

In *Maurer* v. *Hamilton*, 309 U.S. 598 (1938), the U.S. Supreme Court considered whether § 325 (then § 225) or § 304 (then § 204) vested authority in the ICC to regulate sizes and weight of motor carrier vehicles. In holding that such authority had not been vested in the ICC, the Court stated with respect to § 325 that:

> "It is evident that the purpose of § 225 is to reserve 'sizes and weight' from the regulatory powers of the Commission, quite as much when related to safety as when related to highway construction, pending . . . further consideration of the matter by Congress. Such has been the uniform construction of § 225 by courts having occasion to consider the subject." 309 U.S. at 609.

With respect to § 304(a)(1), the Court stated:

> "But even though the phrase 'operation and equipment' of motor cars [in § 204(a)(1)] could be taken, when standing alone, as including the weight and size of their loads, we think it plain that it cannot be so taken when read in conjunction with the reservation in § 225 of 'sizes and weights' from the regulatory power of the Commission." 309 U.S. at 612.

In summation, the Court held:

> "We conclude that the Pennsylvania statute now before us is a weight and size regulation within the meaning of § 225, and is within the regulatory authority of the state reserved by that section from the authority granted to the [Interstate Commerce] Commission by § 204." 309 U.S. at 617.

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[2] For example, 49 CFR 391 deals with general qualifications of drivers; 49 CFR 394 with notification, reporting and recording of accidents; 49 CFR 395 with hours of service of drivers; and 49 CFR 397 with transportation of hazardous materials and driving and parking rules. 49 CFR 392 deals generally with the driving of motor vehicles but also focuses upon such employee-oriented problems as safe driving procedures for crossing railroad grades, stopping and fueling. 49 CFR 393 and 49 CFR 396 are two regulations which most directly address the problem of safety from the standpoint of examining the motor vehicle to determine its safety qualifications. 49 CFR 393 sets forth parts and accessories necessary for safe operation and 49 CFR 396 discusses inspection and maintenance routines.

In February 1978, the FHWA published an Advance Notice of Proposed Rulemaking concerning the adoption of a safety regulation which would specify minimum interior cab dimensions for the cab portion of certain commercial vehicles. 43 FR 6274 (February 14, 1978). Such a regulation, if issued, could perhaps have an effect on commercial vehicle lengths by indirectly requiring larger exterior dimensions in the tractor cabs, *supra*. This rulemaking notice was prompted by concern over the ability of employees to safely operate motor carrier vehicles, *supra*.

[3] Prior to the 70th Congress, proposed legislation for Federal regulation of motor carrier vehicle dimensions contained no provisions relating to size and weight. Beginning with the 70th Congress, proposed legislation almost uniformly provided that interstate carriers should remain subject to state regulations relating to the maintenance, protection, safety, or use of the highways. The Couzens bill, S. 2793, § 2 (a)(1)(2), 72d Cong., 1st Sess., was the first to propose the establishment of reasonable requirements with respect to "safety of operation and equipment (including the weight, length, width and height of motor vehicles used by such carriers)." This recommendation was not adopted, but in the bill enacted as the Motor Carrier Act of 1935, P.L. 74-225, the parenthetical clause became § 225, which provided for an investigation and report on the need for restrictions on the sizes and weight of motor carrier vehicles, Federal regulation of which was to await the future action of Congress.

[4] See note No. 1.

[5] The report was rendered under § 226 of the Interstate Commerce Act, as amended, which was formerly § 225 of the Motor Carrier Act of 1935.

II. AUTHORITY OF THE FHWA UNDER 23 U.S.C. 127

23 U.S.C. 127 was enacted as § 108(j) of the Federal-Aid Highway Act of 1956, P.L. 84–627,[6] in an attempt to protect the Nation's highways from damage caused by vehicles hauling heavy loads. This provision, which was the first exercise of Federal statutory authority on the subject of motor carrier vehicle dimensions and weights, set restrictions solely on the weight and width of these vehicles. The legislative history reveals that any mention of length was intentionally omitted by Congress. Although overall weight, width, length, and height limitations were included in the Senate measure as introduced on the floor, Senator Kerr of Oklahoma proposed an amendment which modified the Senate version by omitting length and height limitations.[7] 102 Cong. Rec. 8337 (1956). The conferees adopted this language. Conference Report, H.R. Rep. No. 2436, 84th Cong., 2d Sess. 32 (1956).

Subsection 108(k) of this 1956 Act directed the Secretary of Commerce to expedite certain cooperative tests for the purpose of determining future maximum desirable standards for vehicles operating on the Federal-aid highway systems. A 1964 report entitled "Maximum Desirable Dimensions and Weights of Vehicles Operated on the Federal-Aid Systems." H. Doc. 354, 88th Cong., 2d Sess., was issued pursuant to the authority granted in this subsection. Although this report indicated that excessive vehicle length could, in some cases, pose safety problems, its recommendations (which were characterized as "tentative", H. Doc. 354, *supra* at page III) did not lead to any further congressional action.

Section 127 was amended by the Federal-Aid Highway Amendments of 1974, P.L. 93–643, in order to increase the maximum allowable vehicle weight and width. In its report on this amendment, the Senate Committee on Public Works emphasized that regulation of motor carrier vehicle length is a matter for State determination. The Committee stated:

> "Moreover, the Committee considered and rejected recommendations by the Administration and others to write into law for the first time a Federal guideline on the lengths of trucks. The Committee believes that truck lengths should remain, as they have been, a matter for State decision." S. Rep. No. 1111, 93rd Cong., 2d. Sess. 10 (1974).

The most recent congressional action concerning truck size and weight dimensions is contained in § 161 of the Surface Transportation Assistance Act of 1978, P.L. 95–599. Section 161 of this Act directs the Secretary of Transportation to study and investigate, among other things, "the need for, and desirability of, uniformity in maximum truck size and weight limits throughout the United States." This report is due January 15, 1981.

III. AUTHORITY OF THE NHTSA

Under the National Traffic and Motor Vehicle Safety Act of 1966 [the "Safety Act"], as amended, 15 U.S.C. 1381 *et seq.*, NHTSA has authority to deal with the problems of truck safety. The Safety Act directs, *inter alia*, that NHTSA[8] issue safety performance standards[9] for new motor vehicles, including trucks.

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[6] This provision, which was originally under the jurisdiction of the Department of Commerce, was transferred to the Secretary of Transportation when the Department was established in 1966, P.L. 89–670. See § 1655(a)(1)(a) of the DOT Act.

[7] In his explanation of this amendment, Senator Kerr indicated that one of the major reasons for the omission of length restrictions was a reluctance to interfere with existing State regulations on this subject:

> "However, the reason why I did not include a specification for lengths . . . is that in some of the Western States licenses are issued for the addition of another trailer to a truck where there are long stretches of open road and little congestion of traffic. The language of the amendment . . . would not prevent that being allowed by the regulatory bodies or authorities of the States . . . ." 102 Cong. Rec. 8337 (1956).

[8] The Original Safety Act conferred authority to issue safety standards on the Secretary of Commerce. By subsequent legislation creating the Department of Transportation, P.L. 89–670, Congress transferred all authority and functions under the original Act to the Secretary of Transportation, and the Secretary of Transportation has in turn delegated these powers to the Administrator of NHTSA (49 CFR 1.50(a) (1975)).

[9] The Safety Act defines a motor vehicle safety standard as "a minimum standard for motor vehicle performance, or motor vehicle equipment performance . . ." 15 U.S.C. 1391(2). NHTSA has discretion to establish the terms of the safety standards, subject to the statutory requirement that the standards "shall be practicable, shall meet the need for motor vehicle safety, and shall be stated in objective terms." 15 U.S.C. 1392(a).

15 U.S.C. 1392(a). NHTSA's rulemaking authority under the Safety Act can be used to regulate truck performance, e.g., the driver's view of the road or occupant protection from intrusions into the cab during collisions. The indirect consequence of such rulemaking could be a change in major vehicle dimensions such as length. No standard issued to date has had such an indirect effect.

The question of the agency's authority to regulate truck dimensions directly to secure a particular type of safety performance is more difficult. The Safety Act, as interpreted by the courts,[10] permits the agency to be as specific as it need be in setting standards to secure safe performance. If the agency could demonstrate a correlation between truck length and a particular safety problem and demonstrate the inadequacy of any less design specific standard directed at that problem, direct regulation of truck length would be permissible.

Two actions by Congress since the enactment of the Safety Act might be taken to indicate that the Act does not authorize direct regulation of length. First, Congress expressly rejected recommendations to preempt the States' authority to set motor carrier length limitations when Congress considered the Federal-Aid Highway Amendments of 1974.[11] To increase cargo capacity and thereby increase productivity, the Department of Transportation had sought to persuade Congress to set Federal length limits that would preempt more stringent State limits.[12] Second, in § 161 of the Surface Transportation Assistance Act of 1978, P.L. 95–599, Congress authorizes the Department to conduct a study regarding the desirability of Federal size limits. In both of these cases, non-safety considerations appear to have been controlling. Since authority to regulate length could reasonably be granted for some purposes and withheld for other purposes, the Department concludes that these congressional actions do not limit the broad grant of rulemaking authority under the Safety Act.

Under the § 103(d) "preemption" provision of the Safety Act, State motor vehicle safety standards not identical to corresponding Federal safety standards are preempted by the Federal standards. 15 U.S.C. 1392(d). Accordingly, if there were a Federal safety standard that indirectly (or directly) regulated truck length, any non-identical State standard that indirectly (or directly) regulated truck length and was justified on safety grounds would be preempted under § 103(d). However, if in enacting a truck length law, a State justified it on a valid non-safety basis, such as the preservation of its highways, NHTSA would regard the law as not being strictly a safety standard. Therefore, if the law did not conflict with a NHTSA standard, it would not be preempted under the Safety Act.

Question 2. The International Brotherhood of Teamsters, the Professional Drivers Council, and individual over-the-road drivers, have indicated their concerns over the so-called "cab-under" vehicles. Does the National Highway Traffic Safety Administration have any authority to regulate the use of these vehicles in interstate commerce? For purposes of S. 3431, how would the tractor and trailer portions of a "cab-under" motor carrier vehicle be measured? What is the likelihood, and safety implications thereof, of increased use of the "cab-under" tractors?

Answer. The National Highway Traffic Safety Administration can regulate aspects of vehicle performance, such as down-the-road visibility, that could preclude the "cab-under" design. Also, such a vehicle could be subject to a safety defect recall if certain aspects of vehicle performance were determined by the agency to be a hazard to safety.

S. 3431 would apply to vehicle length limitations of tractor and semitrailer combinations or tractor, semitrailer, and trailer combinations. Since the prototype cab-under is not a tractor but a truck that carries detachable containers and pulls a full trailer, the cab-under would not be affected by S. 3431. As we understand it, future plans for the cab-under include tractor versions. If the use of tractor-mounted cargo boxes (dromedaries) were specifically prohibited by S. 3431, the economic incentives to use such a vehicle would be removed.

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[10] In *Chrysler Corporation* v. *Department of Transportation*, 515 F. 2d 1053 (C.A. 6, 1975), the Sixth Circuit held that certain physical characteristics of safety equipment, such as the dimensional specifications of headlights, are integrally tied to safety performance. In the words of the court, "uniformity of headlamp size is an element of headlamp performance. Design freedom would inhibit safety, and certainly the Congressional purpose of encouraging safety-related competition among manufacturers is meaningless in this context." 515 F. 2d at 1058.

[11] S. Rep. No. 1111, 93rd Cong., 2d. Sess. 10 (1974); Hearings on Transportation and the New Energy Policies (Truck Sizes and Weights) before the Subcommittee on Transportation on the Senate Committee on Public Works, 93rd Cong., 2d. Sess. (1974).

[12] See Hearings on Transportation and the New Energy Policies (Truck Sizes and Weights), *supra.*, pp. 20–21.

We frankly view the cab-under as an improbable commercial success, even under current size and weight limitations. We hold this view because of the staunch opposition to the cab-under registered by the Teamsters and the equal lack of interest in this truck, or any other wide departure from the norm, by the trucking industry.

The Teamsters funded a study (copy attached) on the safety aspects of the cab-under design which has been forwarded to the NHTSA for review. The study concluded that this design has various positive and negative features relative to driving safety. Some of the negative features are correctable and some are inherent in the design. The three major deficiencies inherent in the design mentioned in the report are the relative lack of driver protection from intrusions into the cab during collisions, the relative lack of down-the-road visibility, and the relative lack of ability to indicate to the driver certain vehicle responses to driver steering inputs. The NHTSA would add to this list major concerns about the rear view mirror exposure to damage and road spray, impairment of visibility, headlight glare, and driving posture induced problems.

Report No. UM-HSRI-78-13

AN EVALUATION OF THE SAFETY AND HANDLING PROPERTIES OF THE CAB-UNDER TRUCK-TRACTOR VEHICLE

For:

Safety and Health Department
The International Brotherhood of Teamsters,
Chauffers, Warehousemen, and Helpers
Washington, D.C.

By:

Highway Safety Research Institute
The University of Michigan
Ann Arbor, Michigan

June 1978

Technical Report Documentation Page

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16. Abstract

A multidisciplinary team of HSRI researchers examined several safety aspects of a cab-under heavy duty truck-tractor manufactured by the Strick Corporation. The study team found that the cab-under vehicle examined has major safety deficiencies in the areas of (1) cab intrusion, (2) down-the-road visibility, and (3) vehicle roll and yaw sensing by the driver. Positive features are (1) rollover reduction potential, (2) safer ingress and egress, and (3) lower center of gravity. Because of time and funding limitations, the evaluation by the study team was judgmental and qualitative, rather than experimental and definitive.

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I. INTRODUCTION

A. OBJECTIVE OF THE STUDY

This study was made at the request of the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America (Teamsters).

Strick Corporation, Fort Washington, Pennsylvania has been developing a heavy-duty-cargo truck-tractor that is approximately four feet high. As a result of this low-slung configuration, the vehicle is capable of being placed completely under the cargo body. This truck configuration has been commonly called a "cab-under." The developmental effort has proceeded to the stage that prototype vehicles have been built, and some road evaluations have been performed. Additionally, discussions have been conducted with selected carriers in an effort to place prototype vehicles in actual field service on an experimental basis. Figure 1 is a side-view schematic of one of the possible trailer combinations that might be available in the cab-under configuration.

The purpose of this study was to evaluate the safety qualities of the "cab-under" heavy-duty truck-tractor-trailer system, and to estimate the changes that might occur in injury exposure to the driver and to the general driving public as a result of its introduction into the vehicle population.

B. METHOD OF APPROACH

The investigative team selected to perform the study consisted of:

Mr. Howard M. Bunch, Transportation Research Program Manager. Mr. Bunch served as overall project coordinator.

Dr. Richard G. Snyder, Research Scientist and Head of Biomedical. Dr. Snyder was responsible for evaluating those aspects of the vehicle's configuration relating to human anthropometry and occupant restraint and impact protection.

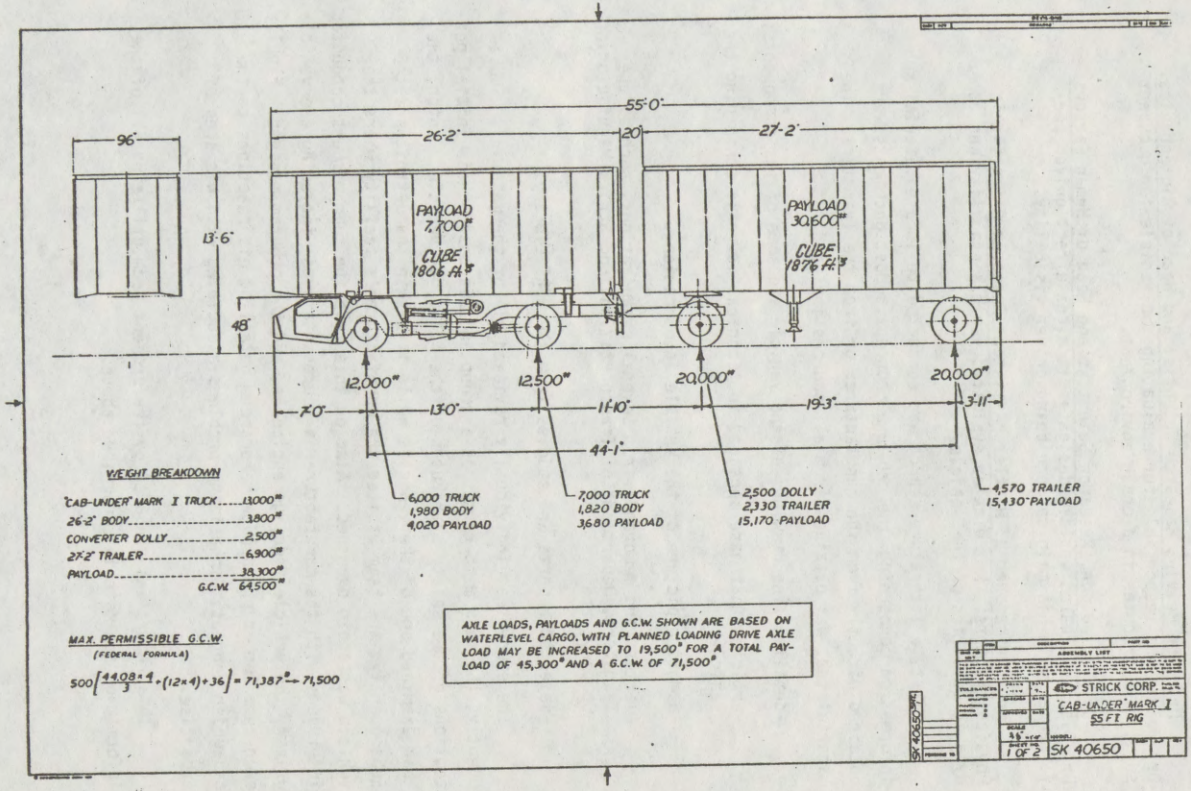


FIGURE 1. Cab-Under 55 Ft. Rig

Dr. John Melvin, Research Scientist and Head of Biomechanics. Dr. Melvin was responsible for evaluating the vehicle for occupant survival attributes in a crash environment.

Dr. Paul Olson, Research Scientist and Head of Human Factors. Dr. Olson evaluated vehicle design as it might affect driver performance, with his main concern being driver visibility.

Mr. Christopher B. Winkler, Assistant Research Scientist in Physical Factors. Mr. Winkler evaluated vehicle stability and other dynamic qualities of the vehicle.

First, a literature search was conducted to locate material and information concerning the cab-under concept. Most documents were obtained directly from the manufacturer or from the Teamsters. The material that was obtained from all sources included:

-detailed line drawings of the vehicle and some of its components;

-articles that have appeared in technical journals concerning the vehicle;

-a motion picture of the vehicle in operation;

-letters and memoranda from several organizations, such as the Teamsters, Department of Transportation, and Strick Manufacturing Company; and

-selected reports and studies from the HSRI Library.

The study team individually reviewed all of the material. Subsequently, the team members met as a group and discussed their initial perceptions of the safety attributes of the cab-under vehicle. Later, the team examined one of the vehicles while it was in the Detroit area. Subsequently, the team visited the manufacturer's facility where the vehicle was again examined. Also on this trip the team members conducted interviews with the manufacturer's representatives, including the vehicle driver, the vehicle's design engineers, and the program manager. Finally, each team member prepared a memorandum detailing his reactions to the cab-under concept, emphasizing problems associated with his area of expertise.

This report was prepared by the project team utilizing all of the information and material described above.

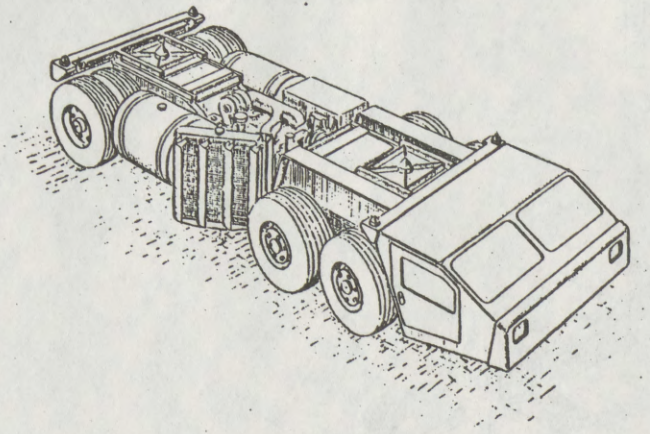
C. STUDY LIMITATIONS

The evaluation of a vehicle system is a complex and expensive undertaking. Because of the time and funding limitations of this study, it has not been possible to perform a definitive evaluation on the cab-under vehicle. Therefore, it must be understood by the reader that this report represents only judgmental and qualitative estimates of the safety attributes of the vehicle, based on available material. As more data are presented, the study team may revise, perhaps even reverse, conclusions and opinions expressed in this document.

II. VEHICLE DESCRIPTION

The cab-under vehicle assessed is manufactured by Strick Corporation, Fort Washington, Pennsylvania. To date, two prototypes have been built: the "Mark I," which is a 26-foot two-axle vehicle, and the three-axle "Mark II," which has 12,000-pound tandem steering axles. A third prototype is presently being designed, and will have several important changes over the Mark II. Among these are (1) reinforcing the doors to provide additional driver protection, and (2) increasing the cab height so that the driver may have better visibility and interior head room. This third prototype was not sufficiently advanced in its construction to permit any evaluations; therefore this evaluation will be confined almost exclusively to the Mark II configuration. (In instances where one of the other configurations is being discussed, it will be so stated.)

Figure 2 shows the general arrangement of the Mark II. Figure 3 shows the vehicle depositing its removable cargo body. Figure 4 gives the dimensions for the Mark II vehicle.



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TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL ± DECIMAL ± ANGULAR ±	DRAWN A.A.	DATE 5/9/77
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STRICK CORP.

"CAB-UNDER" TRUCK
GENERAL ARRANGEMENT

MODEL: MARK II (3 AXLES)

SK-33067

DASH | DUP.

SK-33067

PERTAINS TO

FIGURE 2. Cab-Under Truck, General Arrangement

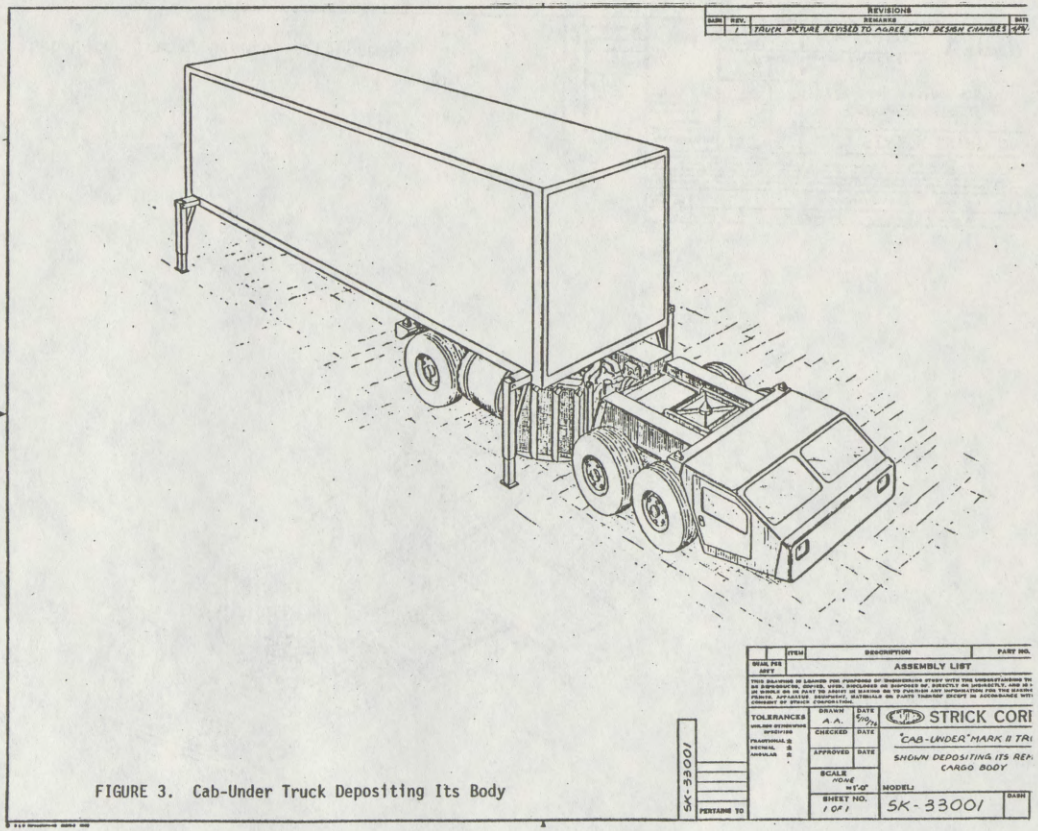


FIGURE 3. Cab-Under Truck Depositing Its Body

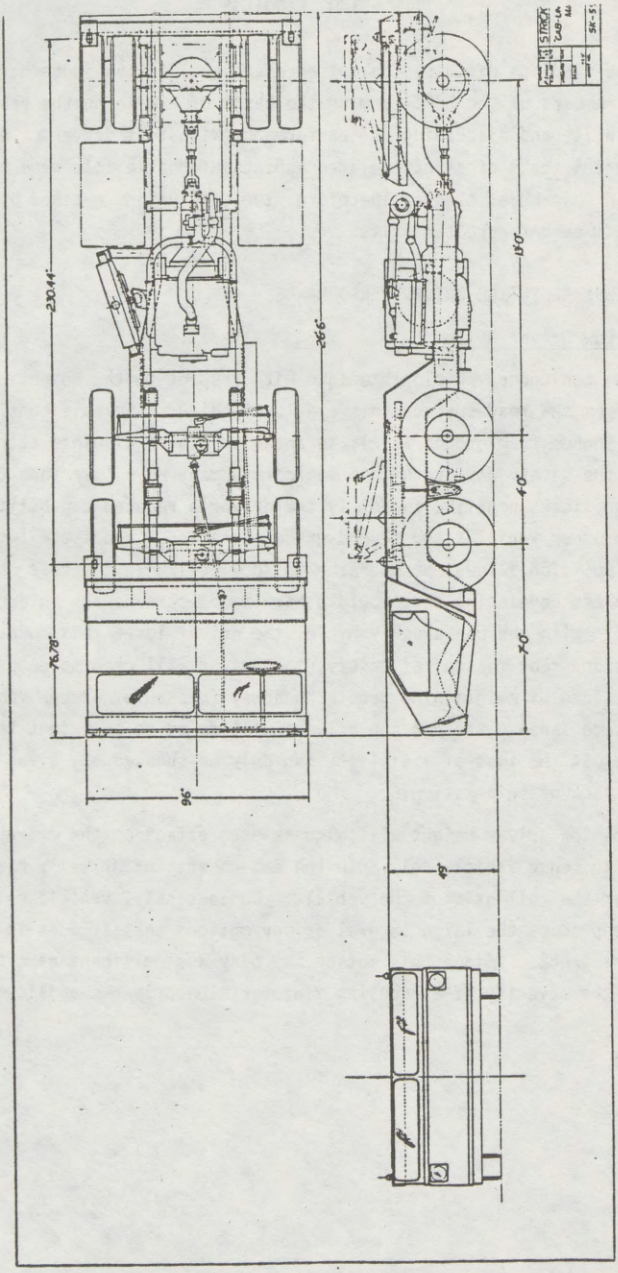


FIGURE 4. Cab-Under Truck, Dimension Details

III. STUDY FINDINGS

The findings discussed below represent qualitative judgments made by members of the HSRI team on the basis of examining the vehicle, riding in it, and discussing its performance with test drivers. No experimental tests of safety-related aspects of the vehicle were conducted in this brief study. Therefore, the conclusions reached by study team members are tentative.

A. FACTORS AFFECTING DRIVER PERFORMANCE

1. Low Driver Height

The cab-under vehicle is unique with respect to the height of the driver from the road surface: his eye-level height is significantly less than 49 inches from ground level, as shown in Figure 4. This attribute affects the safety aspects of the vehicle in many ways. Perhaps the most significant negative aspect is the driver's reduced capability to see over other vehicles and beyond grade obstacles. The typical truck driving position allows the operator to look well down the road and to see problems developing that would otherwise be screened by intervening vehicles. With the cab-under vehicle, the driver loses this down-the-road vision. For reasons of safety, the driver will need to compensate for this loss by maintaining greater headway (distance between vehicles in the same lane). Whether the drivers will do so to an extent that balances out the loss of visibility can only be guessed at, given the present lack of information.

The low driver height will also have an effect on the driver's ability to sense vehicle roll. In the cab-under, the driver's head is very near the roll axis of the vehicle. Consequently, vehicle roll does not produce the large lateral driver motions that it does in conventional trucks. Since this motion may play a significant part in sensing the severity of a handling maneuver, the driver's ability to

sense an impending handling performance limit condition may be reduced. This rationale was confirmed in conversations with the cab-under test driver.

In addition to the down-the-road visibility problems, there might be other difficulties of visibility resulting from body overhang. Depending on the seated height of the driver, the maximum visual-up angle is about 10 degrees. This means that a sign or signal suspended 23 feet above the road could not be seen if it is less than 115 feet in front of the truck. This restriction may be an inconvenience at times but the impressions of the team members when they rode in the vehicle was that visibility in all directions was generally adequate. But loss of direct sight of an overhead signal would be a problem if the truck were moving very slowly (e.g., 10-20 mph) with no traffic in front (to provide a signal cue) as it approached an intersection. In this case its speed would be such that it could enter the intersection after the signal had changed. It is also true that an individual operating the truck would not be able to directly determine when a signal changes, if he stops closer than 75-100 feet from it. The project team concluded that this would not result in a significant safety problem. The most serious potential hazard would be caused by the vehicle being stopped at an unexpected point (100 feet from the normal stopping point, for example), but even this hazard is believed to be relatively unimportant because of the vehicle speeds that would be occurring at the time.

The low cab, which can be easily stepped into without a step, is a significantly safer configuration from the point of view of driver injuries from falls. Presently falls from cab steps and rails account for about three percent of all injuries sustained by drivers. It would appear that the low configuration could reduce such injuries.

2. Driver Comfort, Fatigue, and Morale

Although there has been a great deal of research on driver comfort and fatigue, predictions concerning the effect of a specific vehicular configuration on either of these areas are difficult to make.

Based on their inspection, the investigative team agreed that there was no reason to believe that the cab-under provided any special problems or benefits in comfort and fatigue. In all likelihood, matters such as the seats selected, the placement of controls and displays, etc., will have more effect than the vehicle configuration.

There were some problems with the Mark II vehicle which could cause problems if not corrected. First, there does not appear to be sufficient head room for the taller (sitting height) driver. One person in the investigative team who is in the 95th percentile for the sitting height measurement indicated that his head touched the ceiling in an erect driving position. The Strick people plan to increase this dimension by 2.5 inches in the next version.

The Mark II cab is equipped with two Recaro seats featuring back adjustment, headrest, vertical and forward adjustments, and fore-aft adjustments of the forward edge of the seat cushion. Under all adjustments, however, the forward edge of the seat (popliteal) thigh tuck-up is ineffective and leaves the occupant with no (vertical) under leg support. The leg angle appears satisfactory, but this could also present problems under long-trip conditions.

Several members of the team were driven at about 45 mph over some large bumps, equivalent to a small section of Belgian Block road, which produced high vertical motions on the body. They indicated there was little real energy absorption from the seat pan (cushion), and definite jolts occurred.

The altered driver position of the cab-under has had a direct effect on the nature of the ride problem. In other trucks, the high driver position results in large fore-aft motions of the seat due to vertical pitch. This effect has been called "backslap." In the cab-under, the low position has all but eliminated this problem. However, the extreme forward position, ahead of the front axle, now results in very large vertical motions of the seat which are also quite uncomfortable. The condition is worse with the vehicle empty. (Air suspension

is to be used on the third prototype; this should significantly reduce the vertical motion problem.)

It is believed that the low driver position, and unusual appearance of the vehicle will result in problems with driver acceptance. Poor acceptance in turn will cause other driver-morale-related problems, including complaints about matters pertaining to the vehicle which might be ignored under other circumstances. The driver of the prototype vehicle indicated that in his conversations with other drivers at truck stops, etc., there were always strong opinions expressed concerning the vehicle, and many were negative.

The ability of the driver to sense vehicle roll response has already been discussed in the previous section. A companion topic is the ability to sense yaw reaction of the vehicle. The very forward position of the driver alters the combination of yaw and lateral accleration which he experiences during turning. This will, in turn, alter his overall perception of vehicle yaw. Further, the limited vehicle structure within the driver's field of view may reduce the visual cues available to him for sensing yaw. (The contrast with yaw perception is primarily with the conventional truck, not the cab-over, since the cab-over driver also sits well forward of the vehicle's wheelbase.)

It is difficult to judge whether the changes in driver cue mechanism can or will be compensated for through experience and resulting re-education of the driver. It would appear that there is potential for degradation of performance.

3. Conspicuity

The cab-under configuration represents a drastic change from truck configurations normally observed on the highway. People are used to seeing a tractor in front of the trailer and when they don't (and can't readily see the cab) the impression is that the trailer is going backwards. This visual impression is enhanced by the large frontal area observed.

The driver related two instances where mis-identification of direction occurred. In one instance a driver ahead of him at a toll gate bolted ahead in panic when he saw what appeared to be a runaway trailer coming up behind him. Providing unique lighting or paint design would possible reduce the operational problems of mis-identification.

4. Lighting

The lower driving position places the trucker much closer to his or her own headlamps than when driving other vehicles. As a result, drivers will experience higher levels of glare from oncoming headlamps than they have been accustomed to. This will certainly be annoying (although no more than to many automobile drivers) and will probably add to the fatigue problem in night driving.

Being closer to one's own headlamps will increase the backscatter effect associated with fog and snow. Auxiliary lamps projecting little illumination above the horizon would be helpful under such conditions.

On the other hand, being closer to one's own headlamps will cause reflectorized signs to appear much brighter and more easily read. The distance between the driver's eyes and headlamps on a cab-over truck may be six feet or more. When viewing a sign at 800 feet, for example, this represents an angle of about 0.5 degree. In the cab-under design, at the same viewing distance, the angle between the driver's eyes and headlamps is less than 0.2 degree. Because the brightness of retro-reflective materials drops off very fast as this angle increases, signs will appear two to four times brighter to the driver of a cab-under truck.

5. Rear View Mirrors

The lower driver position of a cab-under results in better mirror coverage, in that the substantial blind stops to the sides and just behind the driver associated with the typical cab configuration are virtually eliminated. On the other hand, the mirrors may be more vulnerable to damage because they are close to the ground. Indeed, one of

the most serious problems with the Mark II (from the standpoint of visibility) is that the mirrors are virtually useless in wet weather because of spray thrown forward by the front wheels.

B. FACTORS AFFECTING VEHICLE PERFORMANCE

The general cab-under design would appear to influence other vehicle properties, most importantly, center of gravity height. The low drive train, frame, and cab of this vehicle make it appear to have a center of gravity location significantly lower than that of other heavy highway unit vehicles. Other things being equal (height of the center of gravity of the cargo, track width) this property would tend to reduce the rollover potential of this vehicle relative to conventional or cab-over trucks.

Other properties, whose effects are more difficult to assess, are (1) the use of two steering and one non-steering axle, and (2) the generally more forward location of cargo area, which may result in a more forward location of the vehicle center of gravity. Since the ultimate effect of this property is intrinsically tied to the properties of tires and suspensions used on the vehicle, there can be no sure conclusion. Number (1) above might be expected to have mixed results. The lack of non-steering tandem axles will remove the rigid-body aligning moment which such arrangements produce. This could improve the low speed maneuverability of the vehicle. However, more tires forward and less rearward could increase the relative front cornering stiffness which is generally a destabilizing effect. With respect to (2) above, a more forward center of gravity position can be expected to increase yaw stability.

There appears to be no strong reason to expect the cab-under design to alter the particular handling properties of articulated vehicles. The cab-under that was examined has been operated as a truck pulling a full trailer. When compared to other trucks pulling full trailers (assuming similar wheelbases, etc.), it is difficult to see

any additional effects other than those discussed above. Plans are being made by Strick to construct cab-under vehicles which will be used as tractors in tractor-semitrailer vehicles. Since the planned wheelbase of this vehicle is comparable to more conventional tractor-semitrailer combinations, no major change in open-loop handling response is expected. Possibly, the yaw moment of inertia of the cab-under could be larger than that of other tractors. This might tend to reduce the severity of jackknife instability, although it will also tend to make cornering responses more sluggish.

Taken as a whole, the open-loop response qualities of the cab-under could be somewhat, but not greatly, improved relative to more conventional heavy trucks and tractors.

C. CRASHWORTHINESS

1. General Occupant Protection

The study team found significant problems relating to protection of occupants in the current versions of the cab-under vehicle. Specific areas of concern are:

-major contact areas, e.g., the panel, the door, the A-pillar, the roof, have unacceptable contact profiles because of inadequate energy absorbing padding.

-the heavy metal protrusions of the door latch and window control offer potential hazards.

-the header material is inadequate to offer head protection in roof contact, such as a vertical jolt where head contact is made.

-the present lap belt will not prevent torso jack-knifing and upper body structural contact.

-the overhang of the cargo container body, coupled with the wide expanse of windshield, could result in a driver-cab intrusion problem. The overhead container would serve as a deflector, directing objects toward the windshield.

The investigative team concluded that the deficiencies found in the cab interior could be solved with more efficient design, and are not

inherent with the cab-under concept. In fact, most of the cited deficiencies are also found in trucks presently on the highways. The only possible exception is the problem of cargo body overhang serving as a deflector into the driver cab. In this case the low height of the driver windshield results in greater deflection exposure.

2. Specific Crash Scenarios

Specific crash situations for the cab-under vehicle were evaluated, and comparisons were made relative to other conventional designs. The scenarios were:

a) a frontal collision with an equally massive and agressive vehicle or obstacle, such as another truck or large roadside object;

b) a frontal or lateral collision with a passenger vehicle;

c) a single-vehicle accident, such as a rollover or jackknife; and

d) shifting loads.

a) Frontal Collision With an Equally Massive Object. In a frontal collision with a massive or immovable object there would seem to be very little basic difference between this design and conventional designs, since there is no attempt in any truck design to manage the enormous energy of such a collision through crushable structure. Any differences in expected performance would depend upon the specific nature of the object being struck. If a cab-under tractor struck the rear of a flat-bed trailer or low roadside obstacle, this could be more dangerous for the cab-under driver; however, he would be below any cargo shifts which could more seriously jeopardize the driver of a conventional truck. But, ignoring the effects of shifting load, the risk to the cab-under driver is greater in crash involvements with low-profile fixed objects (e.g., bridge abutments). In any case, a severe frontal collision of a truck into another truck or a solid roadside obstacle is a serious threat to the survival of the truck occupant, regardless of where he is located vertically.

b) A Frontal or Lateral Collision With a Passenger Vehicle, or Smaller Objects. Collisions with passenger vehicles and other relatively small objects on the highway would present some special problems with the cab-under design that are not generally a problem with conventional designs. The problems are intrusions through the windshield and/or the door of the cab by the object being struck. The low placement of the cab puts it down where a car colliding with the side of the cab could intrude if sufficient side structure is not there to prevent it. Similarly, a frontal impact with a car, road debris, or an animal on the road could result in intrusion of the debris through the windshield. But the effect of this type of penetration could be minimized by innovative design efforts to improve windshield retention. Regardless of windshield design, however, there is greater risk exposure with the cab-under if for no other reason than increased frequency of potential intrusion encounters.

The problem of driver safety when the cab-under vehicle is subjected to a lateral collision is compounded by the fact that the driver location is at a height where the penetration force generally occurs. And, because of the greater mass of the cab-under vehicle relative to a car or small truck, the cab-under will not move to any significant extent. The lack of movement can be directly translated into greater injury exposure for the occupant, because the intruding object will penetrate further into the vehicle. The only possible deterrent is to increase the vehicle's side structure to the point that the structure totally prevents the penetration. A critical design requirement for a cab-under configuration would be providing this protection.

c) A Single-Vehicle Accident. Single-vehicle accidents such as running off the road and rolling over appear to be an area where the low placement of the driver in a cab-under may be an advantage over conventional configurations. In such accidents the driver is surrounded by strong structures and would be relatively immune to entrapment and

injury due to structural collapse. Likewise, in a jackknifing situation the low placement of the driver would also be to his benefit.

d) Shifting Loads. In accidents resulting from shifting loads, a person in a cab-under vehicle would have better protection than a person in a conventional or cab-over vehicle. This feature is a positive safety feature for the cab-under, and would have a positive effect on injury statistics.

D. SUMMARY OF VEHICLE ATTRIBUTES

A summary of the positive and negative features of the cab-under vehicle when compared with a conventional vehicle is presented in Table 1. Those deficiencies inherent in the vehicle design do have significant safety implications. Of particular concern are problems associated with down-the-road visibility and with intrusion from the side and front. Several of the deficiencies found in the vehicle's safety attributes are correctable, or at least can be improved over their present condition. In the event the manufacturer proceeds with other prototypes he would be well-advised to seek professional advice on ways to improve the vehicle's correctable safety deficiencies.

On the positive side are (1) the ingress and egress features of the vehicle, (2) the reduced roll-over potential, and (3) the protection from the shifting load.

TABLE 1

Summary of Safety Feature Differences for the Cab-Under Truck

Feature	Magnitude
Positive	
1. Rollover advantage--shifting load potential	Major
2. Compartment ingress and egress	Major
3. Lower Center of Gravity	Major
4. Sign visibility	Moderate
5. Mirror coverage	Moderate
6. Removal of rigid body aligning moment	Moderate
Negative - Inherent	
1. Cab intrusion	Major
2. Down-the-road visibility	Major
3. Vehicle roll and yaw sensing by driver	Major
4. Cornering stiffness	Moderate
5. Conspicuity	Moderate
6. Upper vision limitations	Moderate
7. Glare and backscatter	Moderate
8. Mirror exposure to damage and spray	Moderate
Negative - Correctable	
1. Interior contact areas	All are moderate in magnitude and can be significantly reduced or eliminated
2. Metal protrusions	
3. Header material	
4. Restraint system	
5. Head room	

Question 3. Opponents of S. 3431 have argued that states with 55 feet overall length limitations would more likely mandate a reduction in trailer sizes rather than increase overall length limitations in order to comply with the legislation. Opponents further argue that this reduction in trailer size would necessitate an increase in the number of trucks on the road in order to maintain present service levels. Assuming for the moment that these states would decrease trailer sizes what would be the safety trade-off with respect to increasing driver safety along with increasing the number of vehicles on the road?

Answer. We disagree with the opponents of S. 3431 who claim that the bill's enactment would result in the States retaining present overall vehicle length limits and reducing trailer length by the amount required to accept a 15-foot tractor within the overall limit.

First, it should be emphasized that the average length of the current trailer population is about 40 feet (excluding doubles trailers and short utility trailers). On this basis, the bill's enactment would merely curtail the continued production of longer trailers for use in the regions where State law may limit operation to 40-foot trailers. Thus, the nationwide growth in average trailer length would be restrained.

Recent trends have been toward increased trailer lengths for low-density commodity shipments. In the past 10 years, some 300,000 van trailers have been sold which are significantly longer than 40 feet. This constitutes about 16 percent of the current van trailer population. Statistics from the ATA indicate that 46 percent of all truck ton-miles are generated by low-density commodities which may be transported in longer trailers without exceeding current weight limits. However, since only 20 States currently have 55-foot overall length limits, only about 23 percent of the total nationwide truck ton-miles would be affected by the bill's enactment.

If 55-foot overall length limits were for some reason retained and all trucks are fully loaded, we would expect 9 trucks with 40-foot trailers to replace 8 trucks with 45 foot trailers. Projecting this data and the above factors for the 20 States that have 55-foot overall length limits would lead to an increase in truck mileage of about 3 percent. Although it could be the case that such an increase in the number of truck miles would generate an increase in truck accidents, this does not necessarily have to follow.

On the positive side, the improvement in tractors would be realized on a nationwide basis, regardless of individual State decisions. Some of the areas of potential benefit that could be expected to result from tractor length increases were discussed in our testimony. These include: improved braking, handling and stability; improved driver comfort and safety; improved ride quality; improved ingress to and egress from the cab; a wider berth in cabs that have sleeping compartments; improved aerodynamics; and improved fuel tank locations.

Question 4. Proponents of S. 3431 have expressed concern over the effects that placement of a fifth wheel coupling device may have on highway safety and driver comfort. Specifically, it has been stated that with cab-over-engine tractors, the fifth wheel is moved forward, placing greater weight on the front axle tires. This in turn results in steering difficulties—the so-called "under steering" problem—as well as increasing the likelihood of front tire blow-outs. Has the National Highway Traffic Safety Administration ever evaluated whether there is a greater tendency to overload front axles on cab-over-engines than conventional tractors? What causes the phenomenon of "under steering"? Is "under steering" a safety problem? In the event of a front tire blow-out, is it more difficult to control a cab-over-engine tractor than a conventional tractor (assuming similar loads and axle weight distributions)?

Answer. The statements regarding fifth wheel offsets have often been confusing and misleading. Problems of understeer, tire failure, and ride quality are usually ascribed to fifth wheel offset, but are, in fact, related to front axle loading which is affected by fifth wheel offset and other parameters. In order to carry the same loads, both the conventional and the cab-over-engine tractors must have the same front axle loading. Because of the longer wheelbase of conventional tractors it should be realized that fifth wheel offsets for these vehicles are, and must be, greater than for cab-over-engine tractors of comparable payload weights. The question of understeer, tire failures, and ride quality are not related solely to truck cab type or the claimed high fifth wheel offsets of cab-over-engine tractors, but are separate problems which will not be solved by some limitation of fifth wheel offset.

There should be no reason for a greater tendency to overload front tires or to experience front tire failures with one truck cab type or another. The Bureau of Motor Carrier Safety performed a study of front axle loading in 1977. This study discussed factors that influenced front axle loading, including fifth wheel offset. It did not, however, contrast cab-over-engine loading and dynamics with cab-behind-engine loading and dynamics.

The phenomenon of understeer is caused by differing cornering capabilities of front and rear tires on a vehicle resulting from tire properties, tire loading, and vehicle properties such as suspension system design. Understeer is aggravated by increased tire loading but some understeer is considered desirable from a safety standpoint. The phenomena of understeer and oversteer are exhibited in a vehicle when more or less steering wheel turn respectively is needed to negotiate a given curve at a higher speed than at a lower speed. Obvious stability and control problems result from oversteer and control problems result from too much understeer.

Since the loading of tires affects understeer and since more load is transferred to the front tires of short wheelbase tractors during braking than for long wheelbase tractors, short wheelbase tractors will experience a greater increase in understeer during braking and turning. This could cause a hazard in some instances but the extent of the hazard has not been quantified because the disadvantages of understeer are obscured by its advantages.

The final question regarding the relative stability of the two truck types under front tire blow-out conditions probably has no sure answer. There are countervailing forces at work under such conditions which may suggest one cab type is better than the other, but clearly the random factors of tire blow-out and recovery are more important. Steering ratios, front suspension, tire retention on the rim, truck maneuvering at the time of blow-out, and most importantly, whether the drive is attentive and has a firm grip on the steering wheel, are the determinants of safe recovery.

SEPTEMBER 27, 1978, REVISED OCTOBER 12, 1978

The effect of overall truck length limitations imposed by the various States is not as obvious as it may appear on the surface. Numerous factors enter into the picture, but the following will, in general, describe the process by which trucking companies have reacted to these overall length limits and the resultant cab lengths which have been offered by manufacturers.

In the illustrations of Figures 1, 2, and 3, three representative vehicles are shown with appropriate dimensions. The first illustration is a tractor-semitrailer combination meeting current 55 foot overall length limits in force in 20 States and the District of Columbia. It can be seen that the separation between the tractor cab and the front of the trailer must be sufficient to permit the trailer corners to clear the back of the cab in a sharp turn, as illustrated in the top half of Figure 1. With the pivot point (trailer king pin) 36 inches from the nose of the trailer, the minimum clearance between the back of the cab and the front of the trailer (CT) for each of three trailers (square corners, 6-inch radius corners, and 10-inch radius corners) is given below.

Minimum back of cab to trailer clearance (36" king pin set back)

Trailer corner radius:	*Inches*
Square	28
6 in	28
10 in	24

Thus, if a square cornered 45 foot semitrailer is operated with a minimum clearance from the cab, a cab 7 foot, 8 inches long (bumper to back of cab BBC) can be operated within the 55 foot overall combination vehicle length limit.

In practice, more clearance between the trailer and the cab is generally sought to permit flexibility in load distribution by varying the tractor pivot point location (fifth wheel offset). Also, aerodynamic drag is minimized when the tractor cab is as close as possible to the trailer. Thus, differing practices are observed

within this 55 foot tractor/semitrailer configuration and different tractors are offered to meet this range of practices as summarized below:

Maximum bumper to back of cab dimensions, 45-ft semitrailer, with 55-ft overall length

Trailer corner radius:	Inches
Square	92
6 in	94
10 in	96

Bumper to back of cab dimension of present tractor offerings[1]

(COE) Cab over engine (non-sleeper) (average 58 in)	50.5 to 66 .
(COE/S) Cab over engine-sleeper (average 85 in)	72 to 110 .
(SCBE) Short nose cab behind engine (non-sleeper) (average 92 in)	90 to 93.3.
(CBE) Cab behind engine (non-sleeper) (average 114 in)	105.3 to 125.8.
(CBE/S) Cab behind engine (sleeper) (average 152 in)	142 to 165 .

[1] Dimensions and averages obtained from listings in October 1977, Fleet Owner magazine. Averages are sums of listed tractor dimensions divided by number of tractors listed. These do not represent an average of vehicles in services or a sales weighted average.

From the comparison of allowed length and tractor offerings, it can be seen that any non-sleeper cab-over-engine tractor can be used to pull any 45-foot trailer in a State with a 55-foot overall length limit. Most of the sleeper cab-overs can also operate under these conditions. Obviously, the short nose cab-behind-engine tractor has been designed for such operation, being just short enough to meet the overall length requirement.

It is also obvious that all conventional cab-behind-engine tractors are too long to meet the 55 foot overall length limits with a 45 foot trailer. Within a 55-foot overall length limit, a non-sleeper cab behind engine tractor could be used to pull trailers from 42 to 44 feet, while the same tractors with a sleeper berth would be limited to trailer lengths of 39 to 41 feet.

If, however, the proposed amendment to the Federal Aid Highway Act were enacted, all but the very longest few conventional, cab-behind-engine tractors with sleeper cabs would be permitted to pull whatever length trailer the State elected to permit, if the State also elected to restrict tractor-to-trailer length to 15 feet. If no such tractor length limit were imposed, all present tractor offerings would be legal.

Looking at the possibilities from the point of view of the resultant overall vehicle length, there would be no change if the States presently enforcing 55-foot limits choose to establish 40-foot trailer limits. If these same States established 45-foot trailer length limits, the allowable overall vehicle lengths would be increased by 5 feet. Or, if no overall length limit were established, the maximum overall length increase with present tractor offerings would be on the order of 7 to 8 feet, assuming the relatively close coupling of tractor and trailer to gain aerodynamic advantage. In light of the long sleeper versions of conventional tractors offered today and the propensity of drivers to slide the tractor pivot point (fifth wheel) rearward to improve ride quality, the actual overall length of the combination could be increased by another foot or two.

Similar scenarios can be drawn for 48 foot semitrailers, as shown below and in Figure 3.

48-ft. semitrailer (maximum bumper to back of cab)

Trailer corner radius:	Inches
Square	56
6 in	58
10 in	60

By comparing the allowable BBC dimensions above with the present tractor offerings, it can be seen that average to below average length cab-over-engine tractors are needed to pull such long trailers under the present 55 foot overall length limits. The operation of 48 foot semitrailers still doesn't fully explain the offering of tractors with such bumper to back of cab dimensions as 50.5 inches.

Such short cabs are too short to encompass the length of the most popular diesel engines used in these same tractors. In such cases, the length from the front bumper to the back of the upper part of the engine sets the limit on trailer length, not the bumper to back of cab dimensions. Other items located in the critical area behind the center of the cab and elsewhere behind the cab, such as vertical exhaust and air intake pipes reduce either the cab length perhaps to 50.5 inches-or the length of trailer that can be legally pulled by the tractor.

The engine/radiator establish. an absolute minimum length for cab-over-engine tractors. Typically the grille/radiator/fan shroud/fan can be fitted into a 12-inch length of the tractor and the bumper can be fitted directly under this unit (i.e., requiring no additional length). A variety of diesel engines are available for line haul tractors with power ratings from 250 to 450 horsepower. These engines are configured as in-line six-cylinder models which require 53-inches of length, V–8's which require from 44 to 55-inches of length and more recently V–6's which require only 38 inches of length. Thus, as little as 50 inches or as much as 67-inches in vehicle length is required to house these essential components.

Thus, we can see that 50-inch bumper to back of cab tractors can be configured to fully contain the shortest engines, but the popular six-cylinder and long V–8 engines will extend beyond this short cab by as much as 17 inches. Nominally, truck components can be specified in a complete array of "mix and match" so that the short cab and the long engine can be specified without any cost penalty. Each manufacturer has some variation in cab lengths offered, but usually non-sleeper cabs will be offered only in one or two lengths. Hence, if a trucker prefers to buy from a particular manufacturer, he has a limited choice of cab designs and interior space dimensions.

There are also a number of examples of poor engineering which results in shortened tractor cabs; for example, the short cab-over-engine displayed on Capitol Hill for the Committee in July 1978, had the engine extending behind the cab and the battery box located behind the engine such that approximately three feet of length was consumed behind the cab which provided no driver space. In this case a tractor which could have been approxmately 90 inches from bumper to back of cab was, unexplainedly, only 55 inches from bumper to back of cab.

Finally the scenario for tractor plus semitrailer, plus full trailer, (commonly referred to as "doubles") is shown below and in Figure 2. Here we have typically 27-foot long trailers with various nose radii, plus a variation with a chamfered corner.

Double 27-ft trailers with 65 ft overall length (maximum bumper to back of cab)

Trailer corners:	*Inches*
Square	68
68 in	70
70 in	72
72 in	76

From this it is evident that all non-sleeper cab-over-engine tractors could pull 27-foot doubles, but only the shortest cab-over sleepers could pull only the 10-inch radius or chamfered corner doubles. Some doubles operators, however use 28-foot trailers. Thus maximum BBC dimensions come out 52 inches for chamfered corner trailers which now fully explains the shortest BBC cab-over-engine tractors.

Should the proposed amendment be enacted, and States adopt the twin 27-foot trailers, overall vehicle length would increase from 65 feet to 72 feet (two 27-foot trailers .15-foot tractor, 3-foot trailer to trailer gap). Should States adopt 28-foot doubles, overall lengths would increase from 65 feet to 74 feet. If on the other hand, States opted to keep the 65-foot overall length limit, cargo length would be reduced to 50-feet, or two 23½-foot trailers.

The question, of course, is what effect do these various tractor length requirements have on the performance and human factors of current trucks and those which we might expect to see in the relatively near future, should the Amendment be enacted? Below is a list of such factors with qualitative rank ordering of characteristics for each of the generic cab types i.e., cab-over-engine (COE), cab-over-engine sleeper (COE/S), short conventional cab behind engine (SCBE), conventional cab-behind-engine (CBE), and cab-behind-engine sleeper (CBE/S). These qualitative rankings have been made recognizing wide variations among

various vehicles offered within each generic cab type. Low numbers signify best or least costly or easiest to maintain. In some cases generally factual information makes up the basis for these rankings. In other cases such factual information does not provide a firm basis for such rankings but common perceptions exist, rightly or wrongly, which form a basis for general belief. The latter type of ranking is denoted by asterisks.

Characteristic/CAB type	COE	COE/S	SCBE	CBE	CBE/S
1. Initial cost (including average options)	2	4	1	3	5
2. Ease of maintenance (cost)	1	1	5	3	3
3. Productivity (with overall present length limits)	1	2	2	4	5
4. Tare weight (lowest best productivity in high density freight)	1	3	1	3	5
5. Maneuverability/short-turn radius	1	2	2	4	5
6. Accident involvement statistics (not seen to be a function of cab type)					
7. Driver/crew slips and falls (i.e., ease and safety of cab entry)	5	4	3	1	1
8. Driver visibility	1	1	3	3	5
9. Ride quality[1]	5	4	3	2	1
10. 5th wheel offset (least-best?)	1	2	3	4	5
11. Steering effort (manual steering)[1]	5	4	3	1	1
12. Driver space[1]	4	1	5	1	1
13. Sleeper berth		1			2
14. Interior cab noise	2	1	5	3	3
15. Interior cab temperature[1]	4	3	5	1	1
16. Interior cab fumes[1]	4	3	5	1	1

[1] Common perception—varies more with optional equipment and/or maintenace than generic type.

From this qualitative ranking of current beliefs, a number of apparent contradictions can be noted. For example, the cab-over-engine configuration provides greater ease of access to all driveline components, despite the fact that the cab sits atop the engine. The dichotomy occurs because the cab is designed to be easily tilted away for maintenance while the cab-behind-engine configuration requires the mechanic to work under the vehicle for transmission servicing and to lean in between the cab and front fenders/wheels for engine servicing.

Ride quality and fifth wheel offset which are often cited as being directly parallel, show on this Table as directly opposing factors. This points out a problem of oversimplification in much of the discussion on this subject. That is to say that drivers of a given truck observe the ride qualities to be degraded as the fifth wheel offset is increased, but on a type-to-type comparison of tractors it is obvious that greater fifth wheel offset is required to fully distribute the trailer weight to the front axle of a cab-behind-engine type (which is commonly believed to be the better riding configuration) than for a cab-over-engine type. The steering effort is indicated more as a perceived ranking than as a factual or necessary ranking since given a fixed load, equal load distribution and equal steering ratios, the steering effort should be relatively similar for all truck types. It is believed that improper use of sliding fifth wheels on the road to lighten front axle load leads to this steering effort perception and the ride quality perception.

Driver space is also listed as a common perception ranking rather than a more definitive ranking. This factor varies more from manufacturer to manufacturer than from cab type to cab type.

The short nose conventional, however, is made short by allowing the rear of the engine to protrude well into the center of the cab yet the driver is not positioned high above ground. Access to the rear of the engine for maintenance is through the cab via a removable fiberglass cover (referred to as the dog house). This engine protrusion and the cover over the engine take up quite a bit of room in the cab and in some cases force placement of accelerator and brake pedals somewhat to the left of normal pedal locations. Depending upon the initial quality and subsequent maintenance of the "dog house" and its seals, heat, noise, and fumes can easily enter the cab through this area (see Figure 4).

In any truck cab type there may be some restrictions of driver space observed. Common driver complaints of restricted space are:

Backaches and strains;

Restricted right leg room in COE's and SCBE's;

Restricted left leg room under the steering wheel or between the wheel and the interior door panel when depressing the clutch pedal;
Inadequate "belly" room behind the steering wheel;
Inadequate hand room between the steering wheel and windshield;
And, occasionally, insufficient head room (under rough road conditions).
Some representative cab interior dimensions are shown on Figures 5, 6, 7, 8, and 9. The range of key dimensions are shown below:

EXAMPLE CAB INTERIOR DIMENSIONS

[inches]

	COE	SCBE	CBE
Maximum belly room	18.2, 17.2, 18.2.18	14.25, 17, 14	17.5
Maximum thigh room	9.2, 9.2, 9.2, 8.25	8, 6, 13.12	7.5
Maximum head room	38, 38, 38, 42	35, 37.5, 42.75	38.9

Comparison of these dimensions to anthropometric measurements of adult males and randomly sampled truckdrivers indicates that 95th percentile males have the following unclothed dimensions, in inches:

[In inches]

	General males	Truck drivers
Abdomen	No data base	
Thigh	6.9	6.7
Erect sitting height	38.0	38.6

Surprisingly, anthropometric measurements have not included abdominal depth, but Figure 10 clearly shows the reality of the problem in some trucks. Comparison of the cab space and anthropometric data indicate that two of the three SCBE cabs above and the conventional CBE present limited thigh clearance. Only two cabs—a COE and a SCBE—provide excess static sitting height and one SCBE is apparently inadequate for larger drivers. It should be noted, however, that the "dynamic" sitting height of the same truck driver population is 32.8 inches. This reflects normal "slumping" tendencies of seated subjects. Against this dimension, all the cabs are "adequate."

Another important cab space consideration is the length and width of the bed and design factors of the sleeper cabs.

The sleeper berth used for conventional, cab-behind-engine tractors is usually a complete "bolt-on box" which attaches behind the non-sleeper cab. Transit from the cab to the sleeper box is through the rear window. The sleeping driver is thus in a box (see Figure 11). Typical berth widths for these vehicles are between 30 and 36 inches. For cab-over-engine sleepers, the berth is an integral part of the cab. Access to the berth is fully open from side to side and an occupant of the berth can freely converse with others in the truck and can see the road, etc. Curtains provide darkening and privacy, if desired; and restraint netting is standard equipment. Frequently, manufacturers offer two widths of sleeper berths in the COE/S category (see previous Figures 5 and 6).

Federal standards issued by the Bureau of Motor Carrier Safety require sleeper berths installed after September 30, 1975, to be at least 75 inches long, 24 inches wide, and 24 inches high (above the mattress). Further anthropometric measurements of drivers in several sleeping postures indicates a 95th percentile width requirement of nearly 34 inches. Only the 86 inch BBC cab in Figure 5 and the 88 inch BBC cab in Figure 6 and the wider CBE/S "boxes" fulfill this width requirement. It should also be noted that both the 86 and 88 inch BBC, COE/S tractors could pull 45 foot trailers under current 55 foot length limits.

Ride quality has been left to this point for discussion because it is a colloquial term, that includes driver space, temperature, fumes, noise, steering force, and sleeper berth size, as well as the more precisely defined factors of long period oscillations, vibrations, and shocks created by passage of the vehicle over road irregularities and by reactions to same from the trailer which are fed back to the

tractor. The subjective evaluation of ride quality by drivers is also influenced by driver fatigue, be it induced by long hours of service and/or combinations of the factors noted above.

Investigations into fatigue, driver space, sleeper berth space, cab temperatures, fumes, noise, and steering forces have been performed and are ongoing. In-depth scientific studies of the very complex issues associated with vehicle motions, vibrations, and shock are moving concurrently on two fronts: the engineering parameters of truck ride quality and the physiological effects of prolonged occupational exposure to the poor ride quality of commercial motor vehicles.

Commercial vehicle driver health profiles have been obtained which show definite health degradation trends increasing with time on the job. These findings cannot separate the cause(s) from among the various factors which compose the broader term of ride quality, but a number of the ailments which are overrepresented in the driver population have logical connections with the combined effects of forced body posture, postural fatigue, forced dietary irregularities, and whole-body vibration. Among the occupational disorders which must be considered in this list are vertebragenic pain syndromes, spine deformities, stomach troubles, and hemorrhoids, Research into the cause-effect relationships of body vibration as a function of hours of driving per year have shown very high frequency of disorders in the case of agricultural tractor drivers. Here, for example, exposures of 700 to 1,200 hours per year yielded 67.5 percent X-ray evidence of skeletal disorders, 52 percent of vertebral column disorders, and 23 percent gastro-intestinal disorders. Direct relationships of increasing frequency of such disorders are shown as annual exposure is increased. While truck ride quality is far better than agricultural tractor ride quality, the annual exposure is much greater—reaching 3,200 hours per year under present interstate hours of service regulations which we know are exceeded all too often. (Note for comparison that an 8 hour day per day, 50 week per year office or factory job encompasses only 2,000 hours per year on the job.)

Union leadership in this country has long recognized these problems, but only in a qualitative sense. Nonetheless, they have bargained for improvements which has resulted in the broad adoption of complex (and costly) air suspension seats for road drivers. These seats isolate a good deal of the vertical vibrations and in some installations also reduce the fore and aft vibrations to which humans are most sensitive. The fore and aft vibrations and shocks are most pronounced in cab-over engine vehicles because of the greater driver height over the center of gravity of the tractor. Manufacturers of such tractors are, in general, very active at this time trying to improve the cab isolation and suspension response characteristics, but there is still a long way to go before we can determine and achieve reasonable goals to protect against the chronic health effects which have been medically observed in the driver population.

Similarly, the whole array of driver environmental factors plays a role in safety of operation of the vehicle. Studies have been underway for a number of years and rulemaking is underway in the Bureau of Motor Carrier Safety on hours of service, minimum driver space, toxic gases in truck cabs and ambient temperatures in truck cabs. Jointly, with the BMCS, NHTSA has provided and is continuing to provide research support for these regulatory initiatives, as well as possible future regulations on the vibration and shock factors of the commercial vehicle driver environment. We are presently working with the International Brotherhood of Teamsters, the Professional Drivers Council, and the American Trucking Associations to analyze the results of a broad survey they are undertaking of drivers regarding the subjective or perceived ride quality problems. We are also undertaking an epidemiological study of the short-term and long-term health effects of truck ride quality to provide detailed scientific evidence of driver morbidity as related to exposure to extremes of current and past truck ride characteristics, i.e., subjects whose work experience was principally within better riding trucks versus subjects whose work experience was principally within vehicles identified as harsh riding. (Note the term "harsh riding" also must pertain to the trailers that are usually pulled.)

Concurrent with this health research, task performance research and physical engineering research of truck ride parameters are underway. Extensive measurements of the actual whole body vibrations and shock will be acquired to add to our present general data base.

Vibration and shock data acquired in a variety of trucks operating on actual cargo hauls over real highways are needed to complement the health studies. Additionally, this physical research program will provide a more solid data base for Government and the truck designer defining road interaction parameters,

as well as identifying the combinations of current design practices which achieve more acceptable ride qualities. Ultimately, as the health studies and developing international standards for human tolerance to vibration and shock feed back into this part of the program, it is planned to demonstrate modified trucks which will provide wholly acceptable ride qualities while still meeting the traditional design objectives of maximum productivity and minimum cost.

The prospects for injecting these research findings directly into truck designs are dimmed by the current overall vehicle length limits and economic pressures which have combined to yield current design practices. We believe that a 12- to 15-foot allowance from front bumper to the trailer front will provide the latitude in truck cab and chassis design needed for rapid introduction of these evolving technologies which are leading to humane and safe work places for our nation's commercial vehicle drivers, and which will allow for incorporation of innovative designs to improve the aerodynamics of truck cabs which will conserve energy.

Productivity

Many opponents contend that the proposed amendment will result in drastic reductions in productivity and hence will add to inflation. It must be noted that the proposed amendment does not in any way reduce productivity, but that subsequent decisions made by the individual States will be the determining factor for productivity. We have, however, assessed the impact of a range of possible options open to the States and will discuss these below.

Most costs are directly related to truck-miles within a given fleet operation of over-the-road trucks. That is to say, labor, capital equipment, maintenance insurance, etc., are essentially insensitive to the size of trailer or the volume and weight of the load carried (within reasonable bounds). Fuel consumption is mildly influenced by the volume or weight of load carried. Thus, if smaller trailers are required as a result of States' decisions, all cost factors will increase in direct proportion to the number of trucks required to carry the freight. If, on the other hand, introduction of longer trailers continues, relative costs can be reduced per ton-mile of cargo shipped.

The simplest way to view the productivity question is to examine the capacities of the various lengths of trailers and then to examine the cost variables of State legislative options.

Trailers are manufactured to a wide variety of specifications as to type of trailer (e.g., dry van, refrigerated van, flat bed, dump, livestock van, liquid tanker, compressed gas tanker, cryogenic tanker, dry bulk tanker, auto carrier, heavy hauler long boy, etc.); height of trailer (up to 13 feet 6 inches high); and length (doubles trailers at 27 to 28 feet long and semitrailers from 30 to 48 feet long and longer). Dry and refrigerated van trailers are by far the predominant trailer type, representing 65.4 percent of all trailers registered in 1976, with platform or flat-bed representing the second most prevalent trailer type at 16.7 percent of total registrations. Overall, there were 2.7 million trailers and semitrailers registered in 1976.

Average semitrailer length in 1976 was somewhat less than 40 feet (excluding doubles trailers, and other short utility trailers). In the past 10 years, some 300,000 trailers have been manufactured with lengths in excess of 40 feet.

To illustrate capacities of the various trailers, we will use four van trailer types—48, 45, 40, and 28 feet long, all 13 feet 6 inches high, and 96 inches wide. The approximate cubic capacities of these trailers are listed below.

CUBIC CAPACITIES OF SAMPLE TRAILERS

	Trailer length (feet)			
	48	45	40	[1] 28
Cubic capacity (cubic feet)	3,154	2,956	2,628	3,679
Capacity relative to 40-ft trailer	1.2	1.125	1	1.4

[1] 28-ft trailers used as doubles combinations; figures represent capacity of 2 trailers.

Thus, we can see that five 48 foot trailers can haul the cubic load of six 40 foot trailers; eight 45 foot trailer loads equals nine 40 foot trailer loads, and five 28 foot doubles loads equals seven 40 foot semi-trailer loads. These com-

parisons depend upon the full cubic capacity of the trailers being used without exceeding existing weight limitations.

It should be recognized that there is a lack of uniformity in axle weight or gross combination vehicle weight limits among the various States and that the various commodities shipped by truck are affected in varying ways by weight limits and by the cubic capacities of trucks which can operate within the present array of State overall length limits. High density commodities, such as steel and numerous bulk commodities are, in fact, controlled by the weight limits and do not need longer than 40 foot semi-trailers. These shipments would not be affected by the most severe State length limits envisioned by the opponents of the proposed amendment.

Low density commodity shipments, however, have motivated carriers to use longer trailers. In Texas, for example, where length limitations of 65 feet are directed at "combinations vehicles" at least one private carrier (a manufacturer of food and drink containers) finds it profitable to operate a fleet of 57.5 foot long semi-trailers (seven of which can carry the load of ten 40-foot trailers).

Since 1966, some 300,000 trailers have been manufactured with lengths in excess of 40 feet which reflects the response to low-density commodity shipments. The trend toward greater use of these longer trailers can be seen in the statistics provided by the Truck Trailer Manufacturers Association, Figure 12. If any of the twenty States currently exercising 55 foot overall length limits were to retain the 55 foot overall length limit, allow 15 feet for the tractor and mandate maximum trailer lengths of 40 feet, there would be some reduction of productivity in the shipment of low-density commodities.

The twenty States in question are principally located in the eastern half of the country and essentially form a solid area (See Figure 13). Operation of long vehicles is permitted by three States in the region, but provides for intrastate productivity increases only.

"The 1977 Financial Analysis of the Motor Carrier Industry" by ATA indicates that roughly half the annual ton-miles are realized in this eastern region. This source also indicates that approximately 46 percent of the national ton-mile production is in the shipment of low-density commodities. Hence, we can presume that 23 percent of truck shipments could be affected by trailer length decisions of the eastern block of States.

Obviously, if all or most of these States decided upon 45 foot trailer length limits only the shipment of the very lightest commodities, such as food and drink containers, would be restricted by the resultant cubic capacity limit. If, on the other hand, most of the States adopted 40 foot trailer length limits, approximately half of the Nation's low-density highway shipments would be restricted below currently achievable levels of productivity.

If trailer lengths were set at 45 feet, productivity losses would be negligible for the very low-density commodities because they represent a very small portion of all shipments. Such trailer length limits would produce gains in productivity for carriers of general merchandise who have opted to use conventional tractors in the east and owner-operators with conventional trucks and longer cab-over-engine sleepers. There are no known data to support objective estimates of these pluses and minuses, but intuitively we believe the 45 foot trailer length limit would provide for a small net increase in productivity.

If trailer lengths were set at 40 feet in most of the eastern States, productivity would clearly decline. Numerous assumptions have to be made to estimate the extent of such decline. One estimate would assume merely that the present trailer population in excess of 40 feet long would be replaced by attrition with an increased number of 40 foot trailers. Thus, 150,000, or half of the current fleet of trailers in excess of 40 feet (assumed to be 45 feet long for this example), would be replaced over a ten year period by 168,750 new, 40-foot trailers (nine new trailers for every eight retired).

This would constitute an increase of less than 0.7 percent in the 1976 trailer population, or an increase in annual trailer production of about one percent over the ten year period.

Maximum impact would be estimated, assuming that all low-density shippers and carriers over the next few years would totally convert to 45 foot trailers and then be subjected to a trailer length limit of 40 feet. In this case, about 23 percent of all ton miles would be affected by the eastern States' limits of 40 feet for trailers. Conversion back to 40 foot trailers would take up to 10 years. During that conversion, nine new trailers would have to be substituted for every

eight larger trailers phased out of low density commodity service. This would result in about a three (3) percent increase in the national fleet of trailers.

Probably, the effect of a general eastern restriction to 40 foot trailers would be less than the three percent estimate above because of the number of owner-operators who would not likely give up their conventional tractors regardless of the economic disadvantage of excess length of these cabs under present overall length limits.

Thus, one could postulate a slight increase in productivity for broad adoption of 45 foot trailers or a decrease in productivity of from 0.6 to 3 percent if all eastern States adopted 40 foot trailers. No one knows just how the various eastern States would decide on this issue or what corridors would develop through the eastern region where longer trailers could be used.

Truck Safety

Numerous statistical studies of highway safety have revealed a wealth of information about accident involvement,, fatalities, and injuries on our Nation's highways. One fatality in every eleven on the highway results from an accident involving a heavy truck. In 1976, there were 4,034 fatalities involving heavy truck accidents. This is a 15 percent increase over 1975. These statistics do not attribute blame to the trucks involved, but do point out that 19 percent of the fatal accidents involved collisions with fixed objects, overturns, or other accidents not involving other motor vehicles. Nine percent involved pedestrians or bicyclists. Seventy-two percent of the fatal accidents were multi-vehicle collisions of which the truck was classified as the striking vehicle in 55 percent of the cases.

One quarter of the fatal accidents occurred in the urban area, while the remaining 75 percent occurred in rural areas. Sixty-four percent of the truck-involved fatal accidents occur on U.S. or State routes, while only 16 percent occur on interstate highways and 18 percent occur on city streets and other secondary roads.

In 1976, 770 occupants of tractor-semitrailer trucks were killed in such accidents and 82 more were killed in other types of heavy trucks.

Closer studies of smaller sets of accident and fatality data provide more insight into the rates per vehicle mile of accident occurrence. Toll road studies of mileage and accidents in Ohio, New York, and Pennsylvania during 1973 and 1974, showed the aggregate involvement rate for heavy trucks and automobiles before and after the Arab oil embargo as follows:

	Accident involvement per 100,000,000 vehicle miles	
	1973	1974
Passenger cars	147.7	99.1
Heavy trucks	137.6	112.9

Preliminary analysis of 1976 and 1977 Bureau of Motor Carrier Safety (BMCS) reported accidents show a rate of 43.3 injury accidents and 5.3 fatal accidents per hundred million vehicle miles traveled by the vehicles in the regulated and private fleets reporting to the BMCS. Analyses of the more detailed BMCS reports have shown that a large percentage (up to 87 percent in one analysis) of the accidents were attributable to driver actions. Inattentiveness, dozing, or momentary distraction was cited in 42 percent, excessive speed was cited in 27 percent, drinking or drugs was cited in 12 percent, and poor judgment was cited in 16 percent of the driver-action caused accidents.

While mechanical defects were cited in 13 percent of the accidents analyzed in this case, it is impossible to hypothesize how many of the accidents could have been avoided or significantly mitigated if the truck had been designed or maintained differently. Analysis of the effect of truck weight on accidents has not revealed correlation between truck weight and fatal accidents on rural roads, but has shown a weak relationship with weight exists for fatal accidents in urban streets. A strong relationship does exist between the odds of a fatality and district (rural/urban) roadway (2 lane, 4 lane) classification (See Figure 14). It can be seen from this study that rural, 2-lane roads have nearly double

the odds of a fatal accident than rural, 4-lane roads, and neither are significantly related to truck weight. Urban, business/residential, 2 and 4-lane roads have still lower odds by nearly another factor of two, but exhibit an increase in the odds as truck weight increases.

While the data on Figure 14 were obtained and are plotted as a function of truck weight, inferences can be made from these data as to truck length. It is clear that the trucks weighing 20,000 pounds could not likely be doubles or long tractor-semitrailer combinations because the empty weight of such vehicles is greater than 20,000 pounds. At the other end of the weight range, 80,000 pound gross weights are not feasible for the shorter tractor-semitrailer combinations. Thus, the accident data shown in Figure 14 also alludes to the effect of truck length and support the point that longer trucks on the highway do not raise the odds of fatalities. As there is an increase in the odds of a fatality in the urban area as truck weight (and presumably length) is increased, weight, length, or some combination of the two factors appear to be causal factors.

The more precise determination of safety variables, such as overall length, trailer length, cab-type, weight, etc., is confounded by the extremely difficult task of determining the exposure to accidents of each truck type. Only in the case of the toll road studies, do we have precise mileage data for all vehicles traversing the roadways under study. Efforts to develop reliable exposure data for commercial vehicle safety analyses have been given high priority, but to date much uncertainty exists in estimates of accident and fatality rates because of the uncertainty in commercial vehicle mileage, and, indeed, in the number of trucks produced which have given attributes such as cab type. (It should be noted that the statistics available on cab type do not differentiate between trucks and tractors. This differentiation is important because tractors generally travel 2 to 3 times more miles in a year than do straight trucks.)

While much is known regarding the safe operation of commercial motor vehicles, much more needs to be determined. The high percentage of driver-action caused accidents cannot be attributed solely to the driver, absent contributing factors of truck design which, for example, contribute to fatigue, to visibility problems, to limitations of avoidance maneuvers, to speed control, etc. The lack of fully-definitive accident causal data should not serve as a major impediment to the advancement of truck safety, since clearly it will take many years of priority research to provide all of the desired answers. In the meantime, the safety improvements which can be demonstrated should be applied to lessen the carnage on our Nation's highways.

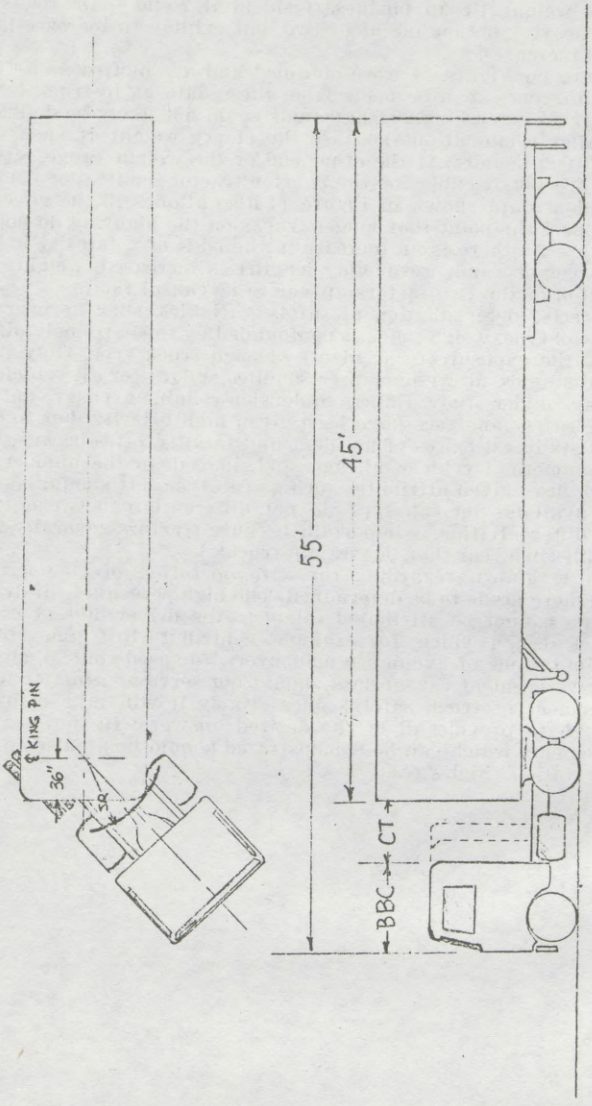


Figure 1. Cab-over-engine tractor with 45-foot semitrailer - 55-foot overall length.

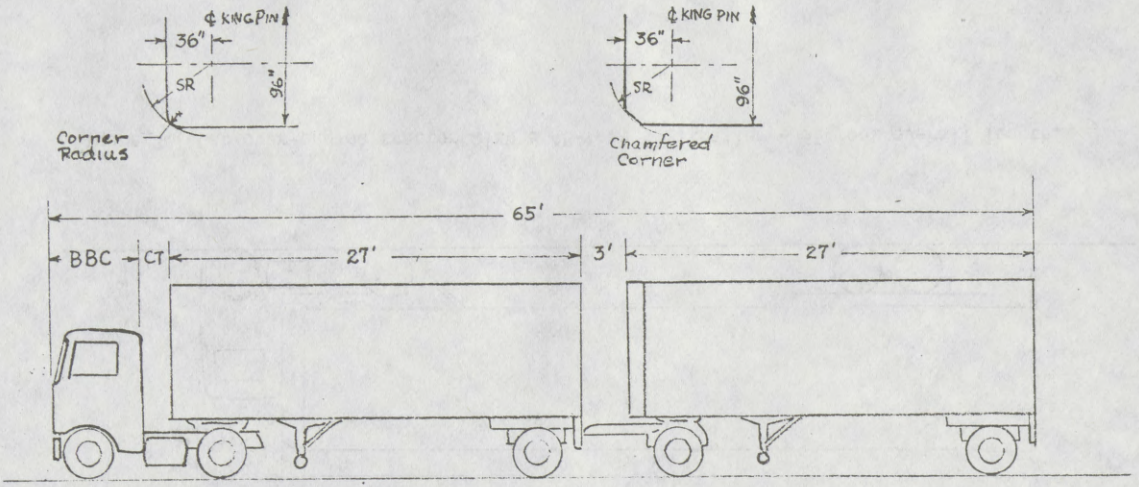


Figure 2. Cab-over-engine tractor with a 27-foot semitrailer and a 27-foot trailer - 65-foot overall length.

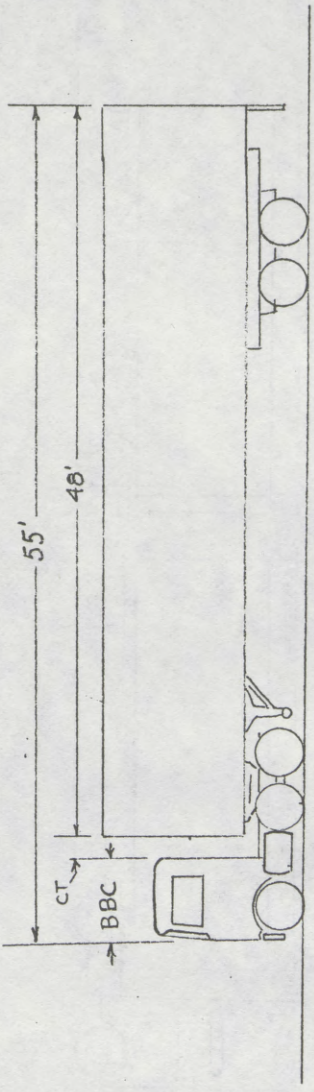


Figure 3. Cab-over-engine tractor with a 48-foot semitrailer - 55 foot overall length.

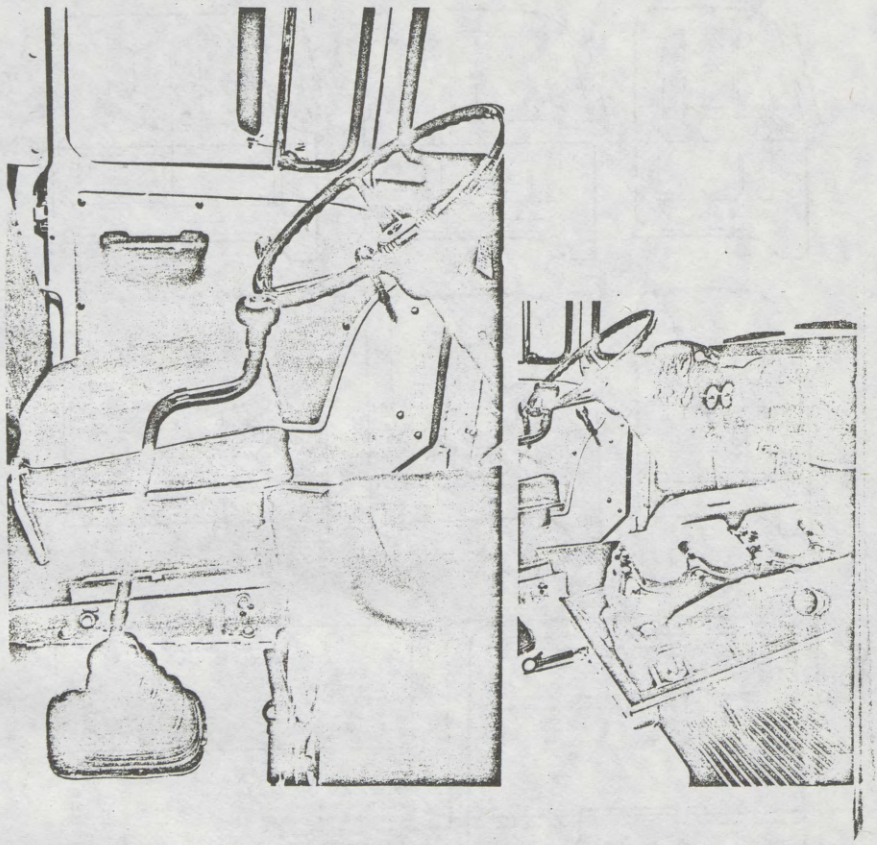
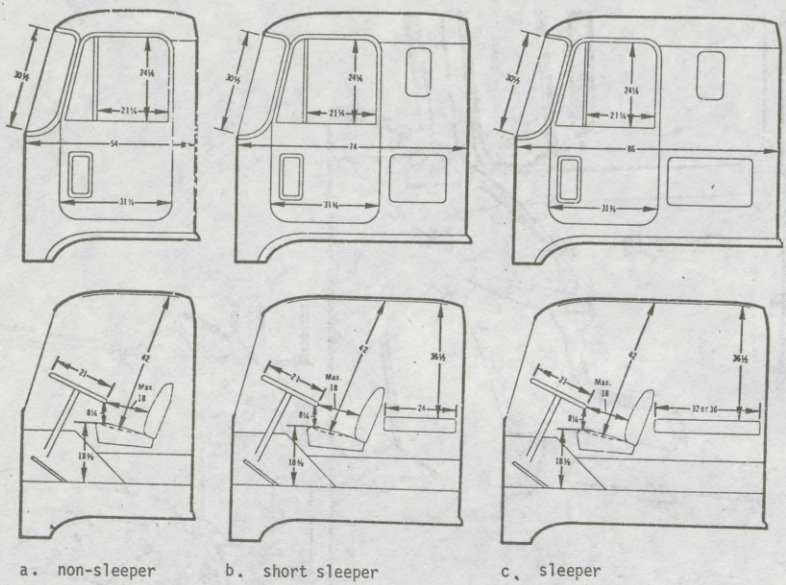
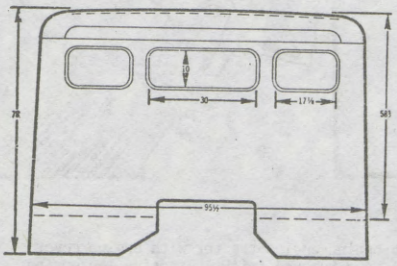


Figure 4. Interior view of a short-cab-behind-engine tractor with engine cover (dog house) installed (left), and removed (right) exposing the engine to full view.



a. non-sleeper b. short sleeper c. sleeper



GLASS AREA (SQ. IN.) DAYLIGHT OPENING	
Windshield	2821
Side windows and vents	1302
Small L.H. door window	81
Rear center window	298
Rear side windows	338

DIMENSIONS	
Maximum tilt angle	78°
Width hip room (in.)	88
Width shoulder room (in.)	83
Width of door opening at belt line (in.)	31⅛
Width of driver's seat (in.)	21
Height, chassis frame to top of cab (in.)	79¼
Height, chassis frame to top of floor (in.)	21⅛
Height inside, cab floor to top (in.)	56¼
Depth of driver's seat (in.)	17
Height of door opening from floor (in.)	49

Figure 5. Interior dimensions - Family of cab-over-engine tractors

OPTIONAL EQUIPMENT

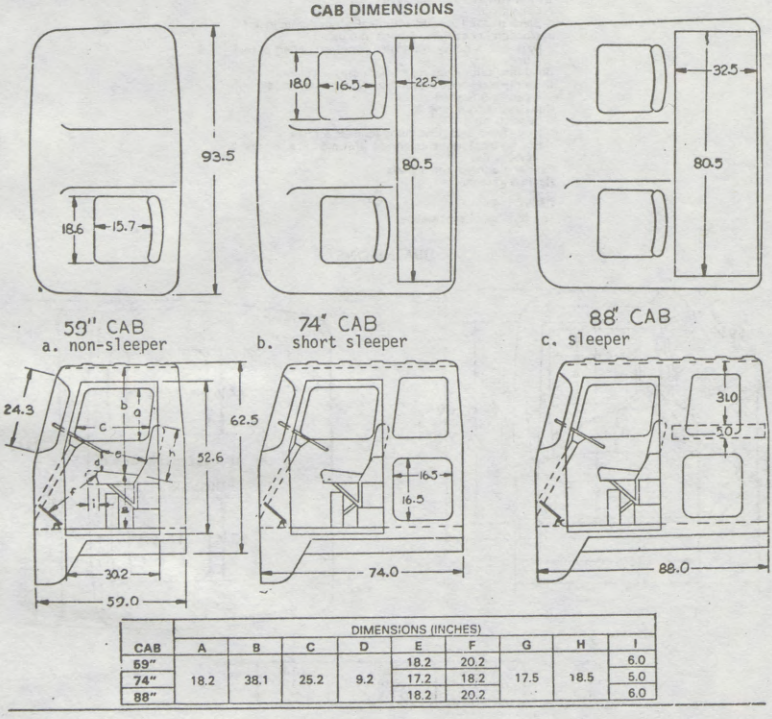
59" or 74" BBC w/passenger seat & bunk curtains
Sleeper cab mattress
Defroster fan
Passenger seat for 59" cab
Electric operated rt. door window regulator
IH Blend-Air heater/air conditioner w/front mounted condensor
Dual roof mounted grab handles
22" padded steering wheel w/satin finished spokes
Recording tachographs, RPM/MPH 24 hr or multiday
Water temperature and low oil pressure warning lights
Transmission & rear axle temperature gauges
AM or AM/FM radio & antenna
Dual speakers w/volume control for bunk area
Air assisted 90° cab tilt
Dual stainless steel mirrors w/or w/o heating element
Bostrom Levelaire driver's seat
National Cush-N-Aire driver's seat w/chugger snubber
Isolator for passengers seat
Isolator for sleeper bunk
Multiple license plate holders, single or dual
Chrome grille insert
Two or three tone paint schematics
Brackets for air shield

LEASE LEVEL INTERIOR TRIM PACKAGE*

CUSTOM INTERIOR TRIM PACKAGE*

EAGLE INTERIOR TRIM*

* See PL for package contents



CAB	DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	I
59"	18.2	38.1	25.2	9.2	18.2	20.2	17.5	18.5	6.0
74"					17.2	18.2			5.0
88"					18.2	20.2			6.0

Figure 6. Interior dimensions - Family of cab-over-engine tractors.

OPTIONAL EQUIPMENT

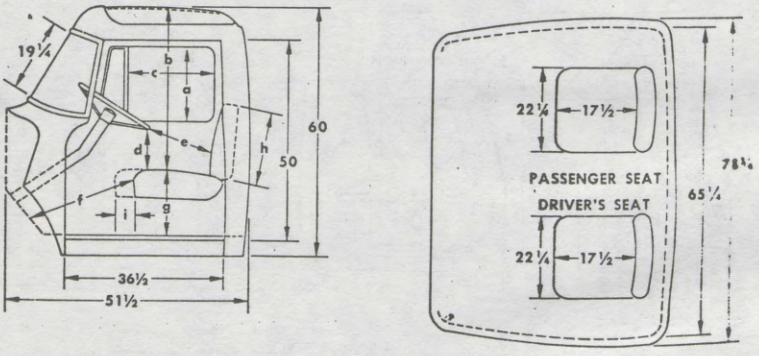
SEATS
National Cush-N-Aire drivers seat
Bostrom Viking T-bar drivers seat
McInerney drivers seat
Full width sponge rubber seat & back cushion

MIRRORS
Inside rear view mirror
Extension type mirror, passenger side
King size mirrors, aluminum air foil head
16" x 7" king size mirrors w/clearance lights
King size mirrors w/convex section

MISCELLANEOUS
Steel haulers cab
Sliding rear window
Tinted glass
Air conditioner
Custom interior trim package
  Consists of:
  Black padded instrument panel w/woodgrain insert
  Woodgrain headliner & back trim panel
  Dark brown heavy grain vinyl door trim panels & seat upholstery
Solid rear cab mount for off-highway operations
Butterfly steel hood & fenders w/removable splash panels & fenders
Constructor front end
  Consists of:
  New styled fiberglass tilting fenders & grille
  Bolt on front frame extension w/swept back bumper & towing pin
Fender mounted turn signals
Radio & antenna

PAINT
Two tone paint schematics

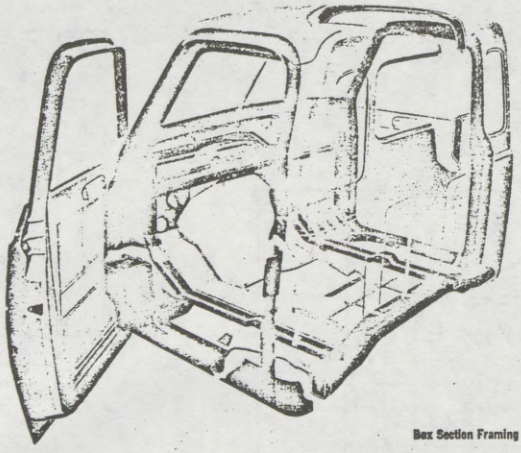
DIMENSIONS



A-16¾" B-34" C-17½"	D-8" E-14¼" F-44½"	G-16" H-18" I-4"

Figure 7. Interior dimensions - short-cab-behind-engine tractor.

CAB CONSTRUCTION



Box Section Framing

Glass Area (Sq. in.) Daylight Opening	
Windshield	1375
Side windows and vents	818
Rear window (center)	330
Rear corner window, RPO A24	207

Dimensions

	7500	9500
Width of cab		
Hip room (in.)	70	70
Shoulder room (in.)	63¼	63¼
Height of cab, Chassis frame to top (in.)		
HE/HV/HY-7500; HI-9500	58⅛	58⅛
JE/JV/JY-7500; JI-9500	57¼	57¼
HC/HH-9500	—	62½
JC/JH-9500	—	61⅝
Height inside (in.)	53½	53½
A—Seat back to steering wheel (in.)	13-17	7½—14
B—Seat to steering wheel (in.)	6-8	6—13⅛
C—Seat to floor (in.)	18	12¾
D—Seat to roof (in.)	37½	42¾
Width of door opening		
At seat line (in.)	31⅜	31⅜
At belt line (in.)	31¼	31¼
Width of seat (in.)	20	20
Height of door opening		
Floor to top (in.)	47½	47½
Tilting steering column	—	12°

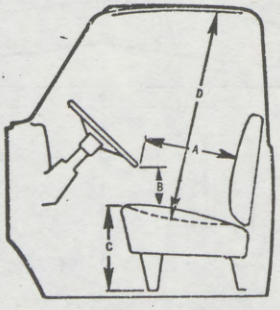
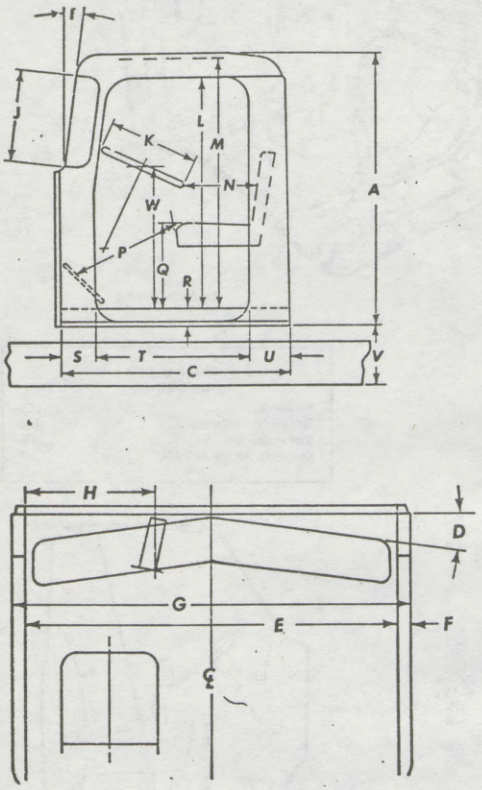


Figure 8. Interior dimensions - short-cab-behind-engine tractor

CAB DIMENSIONS



A	62.4	M	57.4
B	8°	N	17.5
C	53.0	P	26.5
D	7°30′	Q	18.5
E	69.52	R	4.0
F	2.75	S	8.5
G	76.0	T	35.0
H	25.0	U	8.5
J	20.0	V	13.5
K	21.0	W	32.5
L	52.75		

PANEL MATERIAL & THICKNESS		
Panel	Std. Steel Cab	Opt. Alum. Cab
Underbody	Steel .060	Alum. .063
Roof	Steel .047	Alum. .050
Back	Steel .042	Alum. .050
Dash	Steel .060	Alum. .063
Door, Outer and Inner	Aluminum .050	
Splash	Fiberglass Reinf. Plastic	
Outer Cowl	Fiberglass Reinf. Plastic	

GLASS AREA	
Windshield	1371 sq. in.
Doors and Wing Vents	1098
Rear	648
Right door visibility window	104
Total	3221 sq. in.

Figure 9. Interior dimensions - cab-behind-engine tractor

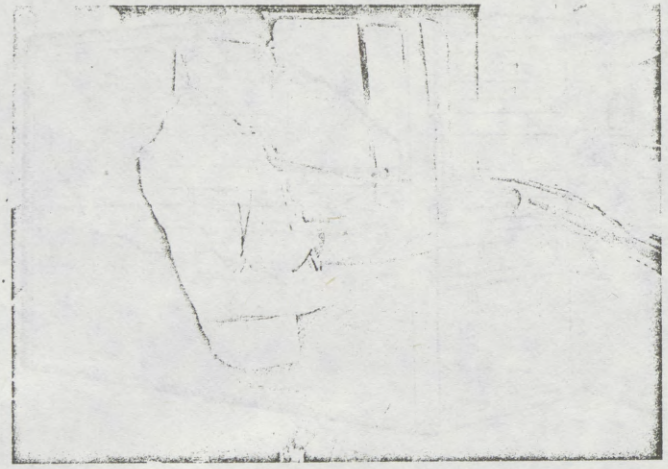
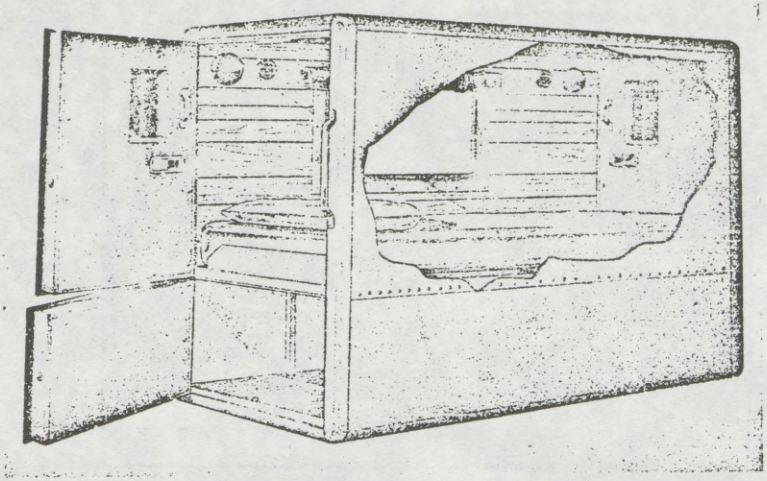
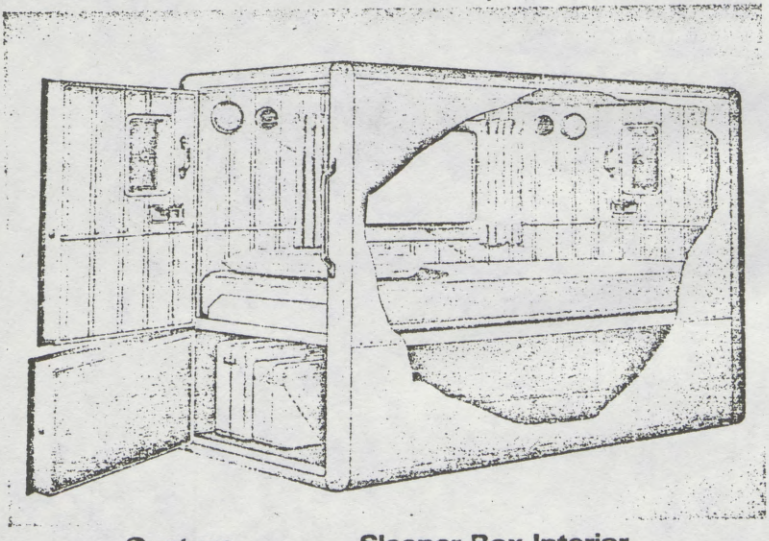


Figure 10A (above) and Figure 10B (below) show restricted leg and "belly" room in truck cab, resulting from pressure to obtain the maximum possible cargo space within a regulated overall length limit.

Figure 10B. (Photos 10A and 10B courtesy of PROD).



Standard Sleeper Box Interior



Custom Sleeper Box Interior

Figure 11. Cut-away views of Standard and Custom sleeper box options for cab-behind-engine tractors.

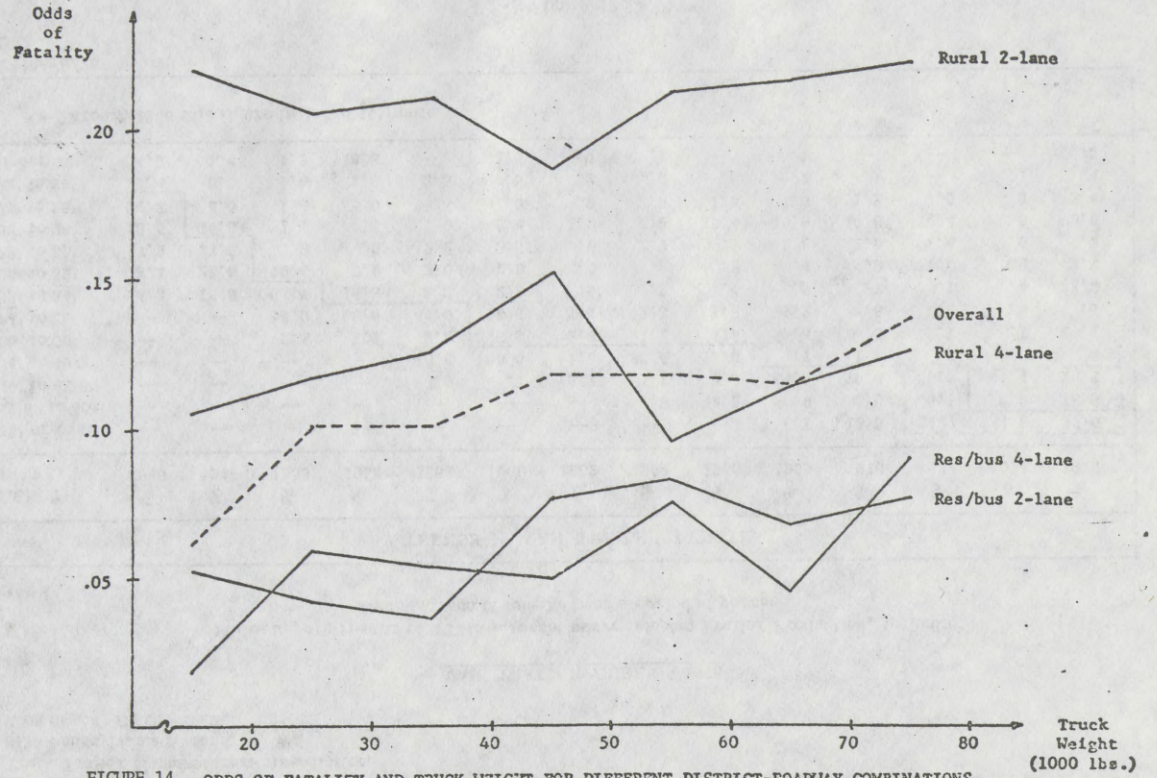


FIGURE 14. ODDS OF FATALITY AND TRUCK WEIGHT FOR DIFFERENT DISTRICT-ROADWAY COMBINATIONS.

FROM:
Truck Trailer Manufacturers Association
2430 Pennsylvania Avenue, N. W.
Washington, D. C. 20037

SEPTEMBER 1976

VAN TRAILER CUBE -- 1976

Following are results of TTMA's recent survey on Van Trailer Production, including a comparison of lengths over a period of years:

TRENDS IN VAN TRAILER LENGTHS

LENGTH IN FEET	% 1946	% 1948	% 1953	% 1956	% 1958	% 1960	% 1962	% 1964	% 1966	% 1968	% 1970	% 1972	% 1974	% 1976
45' or over	--	--	--	--	--	--	--	--	--	6.1	13.3	31.7	41.8	37.0
42'6" to 45'	--	--	--	--	--	--	--	.8	2.3	.9	2.0	3.1	5.3	18.5
40' to 42'6"	--	--	--	--	3.0	.1	3.2	1.1	2.3	64.6	70.8	50.2	41.4	28.2
*38' to 40'	--	--	--	--	10.0	60.0	81.8	82.4	73.0	1.7	1.3	.6	2.6	.8
36' to 38'	--	--	2.4	6.7	8.5	6.5	2.4	1.2	1.6	.4	.3	.1	.1	.4
34' to 36'	--	--	18.9	68.6	64.0	16.6	7.4	3.3	1.8	1.2	.8	.8	.3	.6
32' to 34'	4.3	16.6	58.7	14.8	5.5	2.8	.9	.7	.4	.3	.7	.1	.4	1.3
30' to 32'	4.1	23.9	10.4	2.0	3.0	2.0	.6	1.2	.8	.4	.9	1.0	.9	1.2
28' to 30'	17.9	27.5	3.2	.9	2.0	2.5	.6	1.7	.5	2.8	1.0	1.4	.6	.3
26' to 28'	23.5	18.8	1.1	.6	1.0	6.4	1.3	4.4	15.4	19.8	7.6	10.4	5.9	8.6
24' to 26'	24.3	6.5	1.8	1.0	.5	1.0	.9	2.9	1.3	1.5	1.2	.6	.6	2.4
22' to 24'	21.4	5.3	1.6	1.6	2.5	.5	.2	.2	.6	.2	.1	--	.1	.4
Under 22'	4.5	1.4	1.9	3.8	--	1.6	.7	.1	--	.1	--	--	--	.3

* - Through 1966 this figure included 40' units.

TTMA/9/76
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Figure 12.

Figure 13
TRACTOR-SEMITRAILER LENGTH LIMITS 1/
JULY , 1978

	TRACTOR-SEMITRAILER LENGTH		SEMITRAILER
	60' & over	Under 60'	LIMITS
Alabama*	--	55	NL
Alaska	65	--	45
Arizona	65	--	NL
Arkansas	60	--	NL
California	60	--	NL
Colorado	65	--	NL
Connecticut*	--	55	NL
Delaware	60	--	NL
D. C.*	--	55	NL
Florida*	--	55	NL
Georgia*	--	55	NL
Hawaii*	--	55	NL
Idaho	65	--	NL
Illinois*	--	55	45
Indiana*	--	57.3	NL
Iowa*	--	55	NL
Kansas	65	--	NL
Kentucky*	--	57.9	NL
Louisiana	65	--	NL
Maine*	--	56.6	45
Maryland*	--	55	NL
Massachusetts	60	--	45
Michigan*	--	55	NL
Minnesota	60	--	45
Mississippi*	--	55	NL
Missouri*	--	55	NL
Montana	60	--	NL
Nebraska	60	--	NL
Nevada	70	--	NL
New Hampshire*	--	55	NL
New Jersey*	--	55	NL
New Mexico	65	--	NL
New York*	--	55	NL
North Carolina*	--	55	NL
North Dakota	65	--	NL
Ohio	60	--	45
Oklahoma	65	--	NL
Oregon	60	--	NL
Pennsylvania*	--	55	NL
Rhode Island*	--	55	NL
South Carolina*	--	55	NL
South Dakota	70	--	NL
Tennessee*	--	55	NL
Texas	65	--	NL
Utah	65	--	45
Vermont	60	--	NL
Virginia*	--	56	NL
Washington	65	--	45
West Virginia*	--	55	NL
Wisconsin*	--	59	45
Wyoming	85	--	NL

1/ Includes Statutory Tolerances
NL-No Statutory Limit