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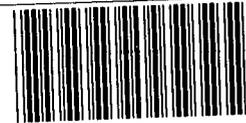
RELEASED

B-197216

JANUARY 14, 1980

The Honorable Sam M. Gibbons  
 Chairman, Subcommittee on Oversight  
 Committee on Ways and Means  
 House of Representatives

*HSE 04102*



111277

Dear Mr. Chairman:

Subject: [Improvements Needed In The Department Of Transportation's Truck Size And Weight Study] (CED-80-41)

As requested in your July 30, 1979, letter and modified by discussions with your office, we have reviewed the Department of Transportation's initial efforts to implement section 161 of the Federal-Aid Highway Act of 1978 requiring a truck size and weight study. Your letter also requested that we report on the Office of Management and Budget (OMB) response to the recommendation contained in our July 16, 1979, report entitled "Excessive Truck Weight: An Expensive Burden We Can No Longer Support" (CED-79-94). *AG C00029* *AG C00027*

Our review of the draft study design, which is the first phase of the section 161 study, indicated a number of areas where we believe modifications should be made. These modifications should improve the quality of the truck size and weight study. We discussed these concerns, which are explained in the enclosure, with Department officials responsible for the study. We recommend that the Secretary of Transportation adopt these suggested modifications in its truck size and weight study.

The Congress should be aware that the Department has expanded the study beyond the areas specifically mentioned in the act to provide a more comprehensive assessment of the issues. This expansion will require additional data and therefore may require more time than provided for in the act.

Our July 1979 report recommended that OMB develop a Government-wide policy to prevent overweight truck shipments by Federal agencies and their contractors. Although a response was due by September 14, 1979, OMB did not

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respond to this recommendation until December 28, 1979. OMB was in full agreement with the thesis of our recommendation. To address this problem, OMB stated that the Department of Transportation and OMB are preparing to begin discussions with all other Federal agencies.

#### TRUCK SIZE AND WEIGHT STUDY

Section 161 of the Federal-Aid Highway Act of 1978 (Public Law 95-599, 92 Stat. 2689) directs the Secretary of Transportation to study the desirability of uniformity in the maximum truck size and weight limits. The Secretary is required to report the study findings and to make recommendations no later than January 15, 1981, on how needed changes can be accomplished. The Department recently finalized a study design for the research effort.

The study will be directed by the Intermodal Studies Division within the Office of the Secretary. The Department also hired a research contractor to assist in directing the study, coordinating the Department's efforts, and performing most of the related research.

On April 19, 1979, the Department awarded a \$560,000 contract to System Design Concepts, Inc., of Washington, D.C. This firm, in addition to submitting the lowest contract bid, has the highest score on the Department's technical evaluation of the potential contractor's study proposals. The contractor is scheduled to submit a final report in November 1980 which will serve as the basis for the Department's report to the Congress in January 1981.

The draft study design outlines a general approach to the study but does not provide specific details on implementation. Our review indicated that a number of modifications to the study plan need to be considered, such as weight exemptions and permits, Federal-aid highways where the Federal limits do not apply, extent of enforcement and severity of penalties, reduction of Federal limits, availability of highway funds, relationship of costs and benefits to all involved, national energy considerations, weather conditions, and the impact on safety. These concerns have been discussed with Department officials. We recommend that the Secretary require these modifications to be included in the truck size and weight study. (More specific recommendations and more detailed explanations of our concerns are contained in the enclosure.)

The Department may have difficulty in meeting the January 1981 reporting date established by the 1978 act. The proposed study schedule requires timely submission of a large amount of data from Federal and State agencies and timely completion of numerous tasks. Because of the interdependence of certain steps and tasks, delays in one area will result in delays in several subsequent tasks with little opportunity to recover lost time.

The Department of Transportation has increased the scope of the section 161 study to include a variety of economic, energy, environmental, safety, and intermodal factors not specifically mentioned in the act. In a paper completed before the 1978 act was passed, the Department identified important truck size and weight issues. This additional work to provide a more comprehensive overview may delay the study report beyond the January 1981 due date.

Both the Department and the contractor confirmed our concern about meeting the scheduled reporting date. They both stated, however, that efforts to compress the study to compensate for schedule slippages would seriously detract from the quality of the final product.

#### OMB RESPONSE TO OUR REPORT RECOMMENDATIONS

Our report on excessive truck weight showed that Federal agencies receive and ship commodities by contractors' trucks which often exceed State weight limits. We found this practice at each of the six agencies we visited, which indicates this practice is widespread at the Federal level. Consequently, our report recommended that OMB formulate a Government-wide policy, including any needed implementing legislation, to stop this practice. OMB officials advised us in May 1979 that they would meet with Department of Transportation officials to determine how to improve Federal agency compliance with State weight laws.

Section 236 of the Legislative Reorganization Act of 1970 requires agencies to respond to our report recommendations not later than 60 days after the date of the report. We received the OMB response, dated December 28, 1979, on January 2, 1980. The letter stated that the hope of a positive report by OMB caused the delay in the response to GAO's recommendation. OMB stated that it agreed fully with the thesis of GAO's recommendation. However, the Department of Transportation and OMB had made only limited progress

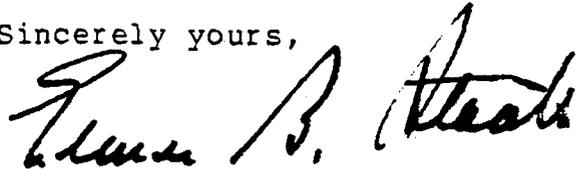
since May as OMB's response stated that the Department of Transportation and OMB are preparing to begin discussions with all other Federal agencies to address the problems associated with implementing GAO's recommendation.

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At your request, we did not obtain written agency comments. However, the matters covered in this letter were discussed with agency officials, and their comments were included in the report where appropriate.

As arranged with your office, we are sending copies of this report to the Senate Committee on Environment and Public Works and its Transportation Subcommittee; the Senate Committee on Commerce, Science and Transportation and its Surface Transportation Subcommittee; the House Committee on Public Works and Transportation and its Surface Transportation Subcommittee; and the House Committee on Ways and Means. In addition, copies are being sent to the Director, Office of Management and Budget, and the Secretary of Transportation. Copies will also be available to other interested parties who request them.

Sincerely yours,



Comptroller General  
of the United States

Enclosure

COMMENTS ON THE  
DEPARTMENT OF TRANSPORTATION'S  
DRAFT STUDY DESIGN FOR THE TRUCK  
SIZE AND WEIGHT STUDY

Our review of the Department of Transportation draft study plan for its truck size and weight study revealed several areas needing improvement to provide a more objective research effort. These issues need to be addressed to adequately consider important aspects of truck weight. We found that the draft plan did not:

- Discuss how the actual effect of specific changes in truck weight limits would be calculated.
- Consider the effect of permit and exemption policies, level of weight enforcement, or severity of fines.
- Consider earlier GAO recommendations for legislative changes to Federal weight limitations.
- Include an assumption for evaluating the maximum truck weights that would be allowable now in virtually all States.
- State whether additional highway funds would be available under any of the assumptions.
- State intentions to determine who will assume costs or receive benefits under various weight limits.
- Include a representative sample of all Federal-aid highways and bridges.
- Include obtaining data on overlay design.
- Include plans to consider the impact of pavement condition on fuel efficiency.
- Provide any indication of the relationship between weight and the cause of accidents.
- Consider the impact of weather.

THE STUDY DESIGN

*DLB* The study will be directed by the Intermodal Studies Division within the Office of the Secretary of Transportation. The Department has established an intradepartmental

task force for each of the seven major study areas. In addition to providing information for the studies, these groups will provide technical advice and assistance and have reviewed and commented on the draft study design. The Department also hired a research contractor, System Design Concepts, Inc., to assist in directing the study, coordinating the Department's efforts, and performing the majority of the related research.

The contractor's efforts are divided into two phases. The first phase--preparing a draft study design for the research effort--was completed at the end of August 1979. This draft study design defines the work to be accomplished during the second phase of the study. The work will be divided into ~~the following~~ seven separate tasks:

- Intermodal competition and traffic diversion.
- Impacts on the highway system.
- Nonuniformity in State truck size and weight laws.
- Impacts on highway and motor carrier safety.
- Impacts on energy use.
- Impacts on the environment.
- Policy analysis, development, and recommendations.

The Department's program manager and the seven individual task forces reviewed the draft study design. The Department offered Federal agencies, State highway departments, and other interested parties the opportunity to comment on the study design. These comments were due October 1, 1979, and the final study design was approved in mid-December.

*A/C*  
*AL* → In general, the study plan defines a framework for analyzing the impact of changes in truck weight laws. The impact of changes in truck weight laws will be assessed for each of the seven major tasks listed above. Each change, called a scenario, will be analyzed in such a way that the impact of individual scenarios (for example, Federal restrictions on State-issued permits) can be combined with other scenarios (such as, increased weight limits) to assess the combined changes. The result of these assessments will provide the basis for the report and policy recommendations to the Congress.

The overall study design is divided into numerous "subtasks" under each of the seven basic tasks. These subtasks serve as building blocks for subsequent tasks. For example, subtask 3.1 "Impacts on Truck, Rail, Air, and Water Carriers" uses data developed in task 1, "Intermodal Competition and Traffic Diversion." As a result of this approach, there will be little comprehensive and reliable data available until the first six tasks are completed. The seventh and last task is the one in which all data is analyzed and the report and recommendations are prepared.

*AC* → The study plan is based on correlation and analysis of existing highway data with little development of new information. This approach, dictated by time and budget restraints, will make the final study results sensitive to the limitations of existing data and the assumptions that are made when using it.

We reviewed the Department's preliminary study objectives, the contractor selection process, contract files, and other data relating to the truck size and weight study. We discussed the study with Department officials in the Office of Intermodal Studies, members of the truck size and weight study task forces, and other Department officials. We also reviewed the draft study design and related information and discussed the study design with contractor officials.

#### DRAFT STUDY DESIGN

The following discussion outlines our specific concerns and recommendations for improvement. To present the most concise format, we have placed our recommended improvements immediately after an outline of the issues.

#### Study assumptions

The draft study design outlines a general analysis framework for the study but does not discuss the specific assumptions and other matters that will be added during the course of the study. Because results of the study will be heavily influenced by the assumptions that are made, the contractor should clearly explain these assumptions and their implications in the report.

#### Recommendation

X We recommend that the Secretary ensure that these necessary explanations and assumptions are provided in the study report.

Weight limit scenarios

The single most important aspect of the study will be selection and definition of specific changes in truck weight laws. In the study these changes are called scenarios. Each scenario will be analyzed to determine the effect each change will have on actual truck weights. Once this has been done, each of the seven task areas will be analyzed to determine the effect of the projected change in vehicle weights on that area. The scenarios, therefore, will define the scope of the study. Any omissions or erroneous assumptions made in defining or analyzing the scenarios will be reflected throughout the study.

This methodology requires that great care be taken both in selecting the scenarios to be analyzed and in translating the truck weight law changes into actual effect on truck traffic. The study design does not discuss how specific scenarios will be translated into actual effect on truck weights. Our report (CED 79-94, dated July 16, 1979) showed that truck weight is dependent on variables such as permit and exemption policies, the level of weight law enforcement, severity of penalties, and other factors. The draft study design does not adequately consider these factors, which we discuss below. This omission could distort the projections of actual vehicle weight changes and conceivably could distort the analysis of all study areas.

Widespread use of permits and exemptions tends to negate the impact of normal weight limits because permits and exemptions are generally given to those vehicles that are most likely to exceed the limits. For this reason, changes in statutory weight limits without changes in permit policies may have little effect on heavy truck weights.

The effectiveness of weight limit enforcement and the severity of penalties must be considered in determining the practical effect of weight limit changes. Minimum weight enforcement efforts result in minimum compliance and negate the effect of weight limit changes. Likewise, low penalties will not act as a deterrent and will simply be considered as a cost of doing business. Similarly, the weight limit changes proposed in two study design scenarios may be counterproductive due to enforcement problems.

--One scenario proposes extending the Federal weight limits to Federal-aid primary roads but not to Federal-aid secondary roads. Authorities currently

have difficulty enforcing weight limits on the interstate system that differ from limits on other roads. These difficulties would be multiplied by having different limits within the noninterstate system.

- Another scenario projects removing specific gross vehicle weight limits. Even if axle weights were reduced, removing weight limits could result in increased damage to some bridges because the formula for testing weight impact on bridges may not be enforceable on the highway. The numerous weights, measurements, and calculations needed to apply the bridge formula may make it impractical for routine weight enforcement.

Our July 16, 1979, report contains legislative recommendations for Federal control of permits, revocation of the grandfather weight limit clause, and extension of Federal weight limits to the entire Federal-aid system. The contractor should carefully consider the details of those proposed legislative provisions, and our rationale for proposing them, when drawing up the scenarios for the study. In addition, a scenario to analyze the impact of a reduction in weight limits to the pre-1975 levels of 18,000 pounds single axle, 32,000 pounds tandem axle, and 73,280 pounds gross vehicle weight should be included. This scenario would approximate the original concept and design of the interstate system and would provide a more appropriate basis for analyzing the relative impact of various other scenarios and establishing reliable trends. It also provides immediate uniformity in State weight limits, as no State has a gross limit much less than 73,280 pounds.

#### Recommendation

X We recommend that the Secretary of Transportation require that the study:

- Describe how specific scenarios were analyzed to determine the actual effect on truck weight.
- Consider important determinants of truck weight, including permit and exemption policies, State weight enforcement efforts, and the severity of penalties for overweight violations.
- Include as a scenario the three legislative recommendations in our July 16, 1979, report.

--Include as a scenario the pre-1975 Federal weight limits of 18,000 pounds for a single axle, 32,000 pounds for a tandem axle, and 73,280 pounds gross vehicle weight.

#### Funding availability

One of the study's central tasks is to analyze the impact of changes in truck weights on pavements and bridges. The analysis framework in the study design proposes that these impacts be expressed in terms of dollar savings or costs. The study design, however, does not consider whether additional highway funds will be available.

Currently there is a shortage of highway funds across the Nation. This problem is reflected in increasing maintenance and resurfacing backlogs and problems in matching available Federal construction funds by highway agencies at State and local levels. Lack of funds for timely maintenance and replacement of existing highway facilities leads to accelerated deterioration and increases funding needs even further. The impact of higher weights will be considerably more severe in the current fund shortage situation than it would be if adequate funds were available.

Previous studies of truck weight impact have assumed that needed funding will be provided to offset increased highway deterioration and have projected on that basis. Such an unrealistic basis for subsequent assumptions has naturally resulted in conclusions that have little relationship to the existing situation. This study should consider the reality of limited funds in its analysis of individual scenarios and in determining the feasibility of various policy options.

Whenever possible, the availability of funds must be treated as a variable in analysis of weight changes, particularly in analyzing the impact on the highway system (task 2). Similarly, availability of funds should be considered as a barrier to uniformity in weight laws under task 6.

#### Recommendation

We recommend that the Secretary of Transportation clearly identify all assumptions concerning availability of funds and explain the sensitivity of different funding levels in the study report.

Cost and benefit analysis

Any analysis of the impact of weight limit changes must invariably address the benefits and costs that will result from each change. The draft study design provides for measuring various costs and benefits resulting from weight change scenarios but does not assure that the recipient of these costs and benefits will be clearly identified.

Previous studies have tended to lump all costs and benefits together, regardless of who receives the benefits and who pays the costs. However, there may be major differences in policy implications of such changes, depending on who receives the benefit or cost. Savings to the truck industry resulting from a weight limit increase, for example, would have substantially different policy implications than similar highway maintenance savings resulting from a weight limit decrease.

Recommendation

X We recommend that the Secretary of Transportation require that the study report clearly identify who will pay the costs and who will receive the benefits as determined by analysis of the benefits and costs associated with specific weight limit scenarios. While this is particularly true for financial considerations, it is also important for safety, energy, and environmental issues.

Interstate emphasis

As currently envisioned, the study will be heavily influenced by rural interstate highway considerations. Because of the nature of the Federal investment and high volume of traffic on the interstate system, much of the data to be supplied by the Federal Highway Administration will be dominated by interstate statistics or limited to the Federal-aid highway system. At the same time, data gathered by the States for the Federal Highway Administration often pertains only to State-controlled highways and does not address other jurisdictions such as urban areas.

This heavy emphasis on the interstate system is reflected in the study design. For example, 50 percent of the sample highway sections that will provide the basis for analyzing weight impact on pavement will be interstate highways. The other 50 percent will be a variety of non-interstate highways. Interstate highways make up only

5 percent of the Federal-aid highway miles and 1 percent of the Nation's highway miles. Detailed analysis of weight impact on bridges will be restricted to those bridges which predominate on the interstate system and were designed for heavier loads than many noninterstate bridges. Restricting the detailed analysis of bridges to those of the strongest design will make it extremely difficult to project realistically the cost of replacing and strengthening existing bridges because the majority of the replacing and strengthening costs will apply to bridges excluded from the sample.

Although the dominance of rural interstate data should have little impact on intermodal studies of intercity freight movements, it will have significant effect on other areas. Concentration on the small (42,000 of 3,800,000 total highway miles) but better designed interstate system for weight impact data may distort the actual impact on the highway system as a whole--especially the urban noninterstate highways.

#### Recommendation

X We recommend that the Secretary of Transportation remove excessive reliance on interstate highway statistics and clearly explain in the study report the effect of any data limitations.

#### Overlay design

Although the study design calls for a survey of State highway design practices, the survey does not include overlay (resurfacing) design. Our visits to 10 States indicated that there is a considerable difference in how overlays are designed and the frequency with which they are actually applied. Discussion with Federal Highway Administration pavement design engineers confirmed this and indicated that overlay design varies a great deal from State to State. Further, resurfacing is an increasingly important part of State highway programs, particularly on the interstate system.

#### Recommendation

X We recommend that the Secretary of Transportation require that the report include data on State overlay design and policies and that the data is used in analyzing the impact of weight on pavement.

Energy, safety, and weather

The research plan should also be modified to consider energy consumption, highway safety, and the effects of weather.

The study does not consider the impact of pavement conditions on energy consumption by vehicles using the highway systems.

The safety portion of the contractor's study design is based strictly on correlation of existing statistical data. The statistical data available on accident involvement, exposure, and severity has no concrete relationship to the cause of the accident. Analysis of available statistics will be hypothetical and not necessarily related to increased truck weight. Discussions with the contractor indicated that the available statistical data predates the last increase in truck weight limits in 1975. Out-of-date statistics will further hamper a meaningful projection of the impact of weight changes on safety.

The analysis of highway segments does not specifically consider the impact of weather; however, weather would be extremely difficult to factor into the analysis.

Recommendations

X We recommend that the Secretary of Transportation require the study to:

- Include all direct and indirect energy consumption in the energy model analysis.
- Supplement the contractor's highway safety efforts with a survey of current knowledge about the relationship of weight to safety features (such as, truck braking and handling) and a summary of ongoing and planned research.
- Consider, to the extent possible, the impact of weather factors on pavements, especially freeze-thaw cycles.

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We discussed these matters with the Department and contract officials responsible for the study. Both organizations agreed with our comments and assured us that they would be considered in finalizing the study design.