AN ASSESSMENT OF RECENT STATE TRUCK SIZE AND WEIGHT STUDIES

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SUMMARY REPORT 241-4(S)

SUMMARY OF
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Research Report 241-4 is a compilation of material from vehicle size and weight studies undertaken by separate states. It is part of a series of studies conducted by the Center for Transportation Research to assess the areas that are affected by the 1974 and 1976 amendments to the Federal Aid to Highways Act of 1956. This legislation increased size and weight limits on the Interstate highways to permit vehicles to be larger and heavier than many states allow on their highways.

Report Format

Research for this report included the collecting and analyzing of states' studies of the effects of increased vehicle size and weight on their highways. In addition, a questionnaire was sent to the appropriate department in each state to obtain information on its investigation of the effects of increasing vehicle size and weight.

The report documents the status of current legislation in each state on truck size and weight through figures, tables, and related explanations. For this study, emphasis was placed on laws pertinent to the operation of larger motor vehicles, such as large doubles and triples. Overall vehicle length, width, axle weight, and gross vehicle weight were analyzed in the study.

The studies conducted by the states were reviewed to determine the objective, scope, methodologies, data sources, findings, and conclusions. Most states used the American Association of State Highway and Transportation Officials (AASHTO) Interim Guide and available truck weight study data, and some states also used methodologies reported in the National Cooperative Highway Research Program (NCHRP) Report 141. Most states also incorporated local data. For this report, efforts were made to determine the national implications from the aggregated findings of the individual state studies.

Questions asked in the survey concerned the states' research efforts to determine the extent to which vehicle size and weight affected pavement wear, bridge damage, operating capability, energy/fuel consumption, vehicle operating costs, highway/motor carrier safety, air quality, noise level, and truck route systems. The opinions were solicited of the survey respondents concerning future changes in their state laws governing allowable size and weight on state roads.

Use of Published Reports of Various States

Of the ten states from which reports were available,[1] six estimated costs of increasing weight limits of vehicles to the current federal maximum limit.[2] The states of Arkansas, Illinois, and Mississippi were not in favor of the increase. The Tennessee study recommended that the decision be made after findings from the national "Highway Cost Allocation Study" were made available. The Iowa study made a positive statement in favor of the increased limits. The Indiana study, which was conducted by researchers from Purdue University, did not develop any policy statement but did provide an estimate of the cost of raising size and weight limits to current federal levels.

Both Utah and California studied the effects of triple trailer operations in their states. California found that triple operations could be allowed on interstate highways, but would create problems on local roads and metropolitan area freeways. The Utah study found that an increase in size for certain combinations does increase productivity and reduce fuel consumption without sacrificing pavement performance. That study recommended the operation of triples on interstate highways in Utah. The Kentucky study dealt with the me-

[1]Reports were available from Arkansas, California, Illinois, Indiana, Iowa, Kentucky, Mississippi, Tennessee, Texas, and Utah.

[2]The states that studied an increase in allowable weight were Arkansas, Indiana, Tennessee, Illinois, Mississippi, and Iowa.

chanics of weight distribution on highway pavement and made suggestions for reducing pavement damage due to truck loads. The Texas study evaluated the effects of four size and weight plans on the state highways. No recommendation was deemed appropriate until other important considerations, such as highway safety, can be more completely explored.

Reference Tables and Figures

The report contains tabular summaries of the information collected for this study. Listings of where, how, and when states conducted their research are given in the report. Tables in the report summarize the findings of the states' truck size and weight studies. The tables also compare the various estimated cost figures for increasing weight limits to current federal levels, contrast estimates of increased annual pavement maintenance costs, list unit bridge cost comparisons, and indicate projections concerning potential savings for truck operating costs and fuel costs over 20 years. In addition, maps show the types of research that have been conducted in each state and the most current legal size and weight of truck allowed on each state's highway system.

Report Conclusions

Conclusions drawn in the various state studies are discussed in the report. All studies performed conclude that an increase in truck weight will result in additional highway cost to the state. However, there is no uniform agreement as to the magnitude of the added cost or the procedure which should be used in determining the costs. As a group, pavement costs were given more attention and emphasis than bridge and other costs. This reflects the level of information and knowledge of analysis procedures and techniques for assessing these areas. Only three states considered bridge effects in any detail.

Some concerns with respect to change in truck size- and weight-related areas are in

- applying the AASHTO Road Test formulas to highway systems without local adjustments,
- dealing with the lack of detailed data and road life history information,
- developing analytical techniques for estimating bridge life effects, and
- applying load shifting procedures with respect to truck configurations, commodity flows, and amount of traffic taken from rail transport as a result of allowing the larger vehicles on the highways.

These concerns were not resolved in any of the state studies nor was any additional resolution offered in the responses to the survey conducted; however, insight into the activities surrounding these issues is gained through this study and reported in Report 241-4.

KEY WORDS: truck, size, weight, motor carrier, tractor/trailer, rural highways, intercity carriers, interstate commerce, truck laws and regulations.

The research reported here was conducted for the Texas State Department of Highways and Public Transportation.

The full text of Research Report 241-4 can be obtained from Mr. Phillip L. Wilson, State Transportation Planning Engineer; Transportation Planning Division, File D-10R; State Department of Highways and Public Transportation; P. O. Box 5051; Austin, Texas 78763.