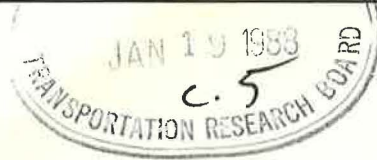


345

TRANSPORTATION
RESEARCH

Number 345, January 1989

CIRCULAR



Truck Research Profiles A Sample of Recent and Current U.S. and Canadian Projects

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The Transportation Research Board is a unit of the National Research Council, which serves as an independent advisor to the federal government on scientific and technical questions of national importance. The Research Council, jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory committees.

PREFACE

For multiple segments of the motor carrier industry and truck/highway related topics, the last decade has been characterized by significant events affecting size, weights, vehicle performance, safety, and highway operations. The interest in and rate of growth of research and technical studies concerning all aspects of truck operations on highways has increased dramatically. In order to remain abreast with developments, it was apparent that there was a demand for a periodic compendium listing the more recent and on-going research projects and information on the availability of pertinent publications. The members of TRB's Committee on Motor Vehicle Size and Weight (AlB04) undertook the task of developing such a compendium. This Circular represents the initial effort in what may become a periodic activity depending upon the acceptance of such a series and the level of continued research activity.

This Circular consists of responses received from a survey sent to U.S. state and Canadian provincial departments of transportation or governmental highway agencies. The objective was to identify from each state or provincial highway agency any significant related research activity since 1984. Further, respondents were asked to provide the study title, topic area, availability of reports, performing organization and abstract. The results of the survey were organized into four categories:

- o Safety
- o Pavement or Bridge Performance
- o Trucking Productivity, Transport Costs/Savings
- o Combination Vehicle Operations

It is hoped that this Circular can serve as a catalyst for identifying other timely research activities and assist in sharing information on research performed or underway by others. (Where information was made available on national studies, it has been included here; but there are, doubtless, additional national studies which were not identified through the survey process.) Recognition is given to Arthur J. Balek, FHWA, and Patricia Drake, Wilbur Smith Associates/BTML Division, for organizing, conducting, and compiling the materials contained herein.

If one cannot locate copies of any of the cited reports from the sources indicated, a record copy is maintained by Art Balek at FHWA. If one wishes to contribute to the next Circular, please provide information consistent with the listing contained in this volume including a single copy of each report to:

Arthur Balek
Chief, Industry and Economic Analysis Branch
Office of Policy Development, HPP-11
Federal Highway Administration
400 7th Street, S.W.
Washington, D.C. 20590
202/366-9234

We would welcome all contributions to this endeavor including suggestions for improvements or value of this effort.

C. Michael Walton
Chairman, Committee on Motor
Vehicle Size and Weight (AlB04)

CONTENTS

SAFETY	<u>Page</u>
A Background Report on Truck Safety, Revenue and Taxation, Truck Services, and Highway Facilities	9
Development of a Large Truck Safety Data Needs Study Plan	9
Development of Truck Characteristics for Use in Highway Design and Operation	9
Economic and Safety Consequences of Increased Truck Weights	10
Examination of Truck Accidents on Urban Freeways	10
Experimental Vehicle Program	11
Geometric Design Considerations for Separate Truck Lanes	11
Heavy Truck Safety in a Changing Highway Transportation Environment	12
Improving the Dynamic Performance of Multi-Trailer Vehicles: A Study of Innovative Dollies	12
Influence of Size and Weight Variables on the Stability and Control Properties of Heavy Trucks	13
Operation and Geometric Evaluation of Exclusive Truck Lanes	14
Potential Safety Aspects of the Use of Larger Trucks on North Carolina Highways	14
Safety and Operational Impacts of 53-foot Truck Trailers in Michigan	15
Safety Implications of Various Truck Configurations	16
Safety of Wider Trucks on Narrow Roadways	16
Some Measures of Accessibility of Large Trucks to the Texas Highway System	16
The Operation of Larger Trucks on Roads with Restrictive Geometry	17
Truck Accidents in Michigan 1978-1984	18
Truck Operations and Regulations on Urban Freeways	18
Truck Safety Data Needs	19

PAVEMENT OR BRIDGE PERFORMANCE

Page

A Methodology for the Assessment of Truck Lane Needs in the Texas Highway Network	19
Analysis of Pavement Damage Attributable to Overweight Trucks in New Jersey	20
An Assessment of the Load Potential for the Passage of Various Truck Configurations	20
Bridge Formula Development	21
Bridge Load Posting Policy Pilot Project	21
Calibration of Weigh-in-Motion (WIM) Systems	22
Characteristics of Axle Load Equivalence Relationships Associated with Truck Use of Highway Pavements	22
Critical Assessment of Tire Pressure Research	23
Design Loads for Future Bridges	23
Development of a Low-Cost Bridge Weigh-in-Motion System	24
Development of Guidelines for Plotting Load Limits on Pavements	24
Development of Traffic Data Collection Standards: Pavement Management Study	25
Distribution of Truck Tire Pressures in Pennsylvania	25
Effects of Different Tire Sizes and Pressures on Pavement Performance	26
Effects of Heavy Vehicle Characteristics on Pavement Response and Performance	26
Effects of Load Distributions and Axle and Tire Configurations on Pavement Fatigue	27
Effects of Tire Pressures on Flexible Pavements	27
Effects of Truck Tire Inflation Pressure and Axle Load on Pavement Performance	28
Effects of Truck Tire Pressures on Pavements	28
Effect of Truck Weights on Deterioration, Operation, and Design of Bridges and Pavements	29

	<u>Page</u>
Evaluation and Calibration Procedures for Weigh-in-Motion Systems	30
Evaluation of Increased Pavement Loading	30
Feasibility of a National Heavy Vehicle Monitoring System	31
Feasibility of Automatic Truck Tire Pressure Data Collection	31
Idaho Legal Loads Study	32
Impact of Truck Characteristics on Pavements - Load Equivalency Factors	32
Lane Distribution Factors for Design	33
Overload Bridge Analysis and Routing System	33
Overloading Behavior of Steel Multi-Girder Highway Bridges	34
Pavement Test Accelerated Loading Facility (ALF) - Phase II	34
Predictive Models to Evaluate Load Impact Factors	35
Premature Flexible Pavement Failure Analysis	35
Procedures for Controlling the Effect of Increased Tire Pressure on Asphalt Concrete Pavement Damage	35
Relationships between Vehicle Configuration and Highway Design	36
Simple Load Capacity Tests for Bridges to Determine Safe Load Posting Levels	37
Survey of Commercial Vehicle Weights - 1975 to 1982	37
Tandem Axle Research: Load Distribution of Tandem Axles at Roadway Speed	38
The Effects of Increased Truck Size and Weight in Illinois	38
The Effect of Ontario's Weight Regulations on Commercial Vehicle Design	39
The Truck Weight Study	39
Truck Axle Weight and Commodity Study	39
Truck Design and Usage Related to Highway Pavement Performance	40
Truck Tire Pressure in Florida	40

	<u>Page</u>
Truck Weights and Pavement Performance	41
Variable Amplitude Loading	41

TRUCKING PRODUCTIVITY, TRANSPORT COSTS/SAVINGS

A Rationale for Increasing Truck Gross and Axle Weights	42
Atlantic Provinces Motor Carrier Economic Benefit Study	42
Cost Allocation for Heavy Trucks: A Pavement and Bridge Evaluation	43
Final Report of the Truck Issues Advisory Committee	43
Highway Earnings	44
Study of Greater Gross weights for 90,000 Lb. General Commodity 6 and 7 Axle Vehicles	44
Truck Access Study	45

COMBINATION VEHICLE OPERATIONS

An Analysis of Truck Accident Involvement and Truck Accident Severities on the Texas Highway System	45
An Assessment of the Operational Impact of the Longer and Wider Combination Vehicles on the Geometry of Diamond Interchanges 1986	46
The Safety Experience of Large Trucks in Saskatchewan	46
Longer Combination Vehicles Operational Test Vehicle Operations	47
Off-Tracking Computer Model	47
Overlength Truck Combinations	48
Safety Criteria for Longer Combination Vehicles	48
Semi-Tractor Trailers and Other Large Trucks: Speeding Related to Traffic Accidents on the Interstate	49
Truck Accidents by Classification: Doubles vs. Semis Accident Rates	49
Twin Trailer Trucks	50

SAFETY

STUDY TITLE: A Background Report on Truck Safety, Revenue and Taxation, Truck Services, and Highway Facilities (1986)

TOPIC AREA: Safety

COPIES AVAILABLE FROM:

Motor Carrier Unit
Bureau of Transportation Planning
Michigan Department of Transportation
P. O. Box 30050
Lansing, Michigan 48909

PERFORMING ORGANIZATION:

Michigan Department of Transportation
Freight Transportation Planning Section
Lansing, Michigan 48909

ABSTRACT:

This report is intended to provide background material on the trucking industry in Michigan and to establish an agenda for future Department of Transportation activities. Chapter III of this report examines the involvement of Michigan State agencies in truck safety, truck accident studies, truck safety studies, and state trunkline accident trends.

STUDY TITLE: Development of a Large Truck Safety Data Needs Study Plan (1986)

TOPIC AREA: Safety

COPIES AVAILABLE FROM:

(Report number yet to be assigned)
National Technical Information Service
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Bellomo-McGee, Inc.
901 Follin Lane
Vienna, Virginia 22180

ABSTRACT:

A task force was formed within the FHWA to examine critical truck safety issues and prioritize these issues through discussions with FHWA operating offices. A study plan was recommended that would continue the voluntary participation of states to provide truck accident and exposure data on the National Truck Network.

STUDY TITLE: Development of Truck Characteristics for Use in Highway Design and Operation (currently underway)

TOPIC AREA: Safety

PERFORMING ORGANIZATION:

Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

ABSTRACT:

The study examines current highway design and operational standards to determine how they meet the needs of the current truck population. Standards which are sensitive to vehicle performance characteristics were identified and examined in detail. Performance characteristics of large trucks were determined and used to assess the adequacy of the standards in question.

STUDY TITLE: Economic and Safety Consequences of Increased Truck Weights (1987)

TOPIC AREA: Safety

COPIES AVAILABLE FROM:

D. B. Beal
Civil Engineer, III
Engineering Research and Development Bureau
Technical Services Division
New York State Department of Transportation
State Campus Building 7-A, Room 600
1220 Washington Avenue
Albany, New York 12232
(518) 457-5826

PERFORMING ORGANIZATION:

New York State DOT and Cornell University
State Campus Building 7-A
1220 Washington Avenue
Albany, New York 12232

ABSTRACT:

The objective of this research is to provide the Permanent Advisory Committee on Truck Weights a comprehensive review of the state-of-the-art knowledge on the economic and safety aspects of allowing over-weight and over-dimension vehicles with divisible loads to travel under special permit. The study will consider:

1. the relative benefits of investments in increased load capacity for the bridge and highways of the state,
 2. new developments in truck design,
 3. the operational safety and economics of trucks,
 4. the manner in which trucks affect the safety of the traveling public, and
 5. the protection of the highways and other matters that would affect the use and operation of the highways of the State.
-

STUDY TITLE: Examination of Truck Accidents on Urban Freeways (to be completed February, 1989)

TOPIC AREA: Safety

COPIES TO BE AVAILABLE FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(John Fegan 703/285-2383)

PERFORMING ORGANIZATION:

Goodell-Grivas, Inc.
17320 W. Eight Mile Road
Southfield, Michigan 48075

ABSTRACT:

The study will document the truck accident problem on urban freeways. An in-depth analysis, in one urban area, of truck accidents and their consequences will be performed.

STUDY TITLE: Experimental Vehicle Program

TOPIC AREA: Safety

COPIES AVAILABLE FROM: On-going study, no projected completion date

PERFORMING ORGANIZATION:

Office of Policy Analysis
Maine Department of Transportation
Child Street
State House Station No. 16
Augusta, Maine 04333

ABSTRACT:

The program, administered by the Commissioner of Transportation, establishes an Experimental Vehicle Review Committee which evaluates proposed vehicles having length, width, height or weight conditions not presently permitted under Maine law. Temporary experimental vehicle permits may be issued on a limited basis if the Commissioner finds that a significant potential exists for increased productivity without undue compromise of safety. The review process includes committee evaluation of the vehicle, off-road and on-road testing, dimension and weight limits, routing, and reporting provisions. The Commissioner submits a biennial report to the legislature which discusses the progress of experimental vehicle evaluations and contains recommendations, if any, for legislation allowing general highway use of proposed vehicles.

STUDY TITLE: Geometric Design Considerations for Separate Truck Lanes (1986)

TOPIC AREA: Safety

COPIES AVAILABLE (\$14.95) FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
The Texas A & M University System
College Station, Texas 77843

ABSTRACT:

This report examines past truck-related research to determine the applicability of current design policies to special truck lane facilities. Recommendations are made to help fill the voids in existing design policy. The policies addressed include vehicle characteristics, sight distance, horizontal and vertical alignment, and cross section elements. The report describes special design elements, discusses their appropriateness to special truck lane facilities, and recommends alternative design criteria where past research warrants possible changes.

STUDY TITLE: Heavy Truck Safety in a Changing Highway Transportation Environment

TOPIC AREA: Safety

COPIES AVAILABLE (\$3.00) FROM:

University of North Carolina
Highway Safety Research Center
Chapel Hill, North Carolina 27514

PERFORMING ORGANIZATION:

University of North Carolina
Chapel Hill, North Carolina 27514

ABSTRACT:

The paper attempts to explain why heavy trucks are overrepresented in fatal crashes even when mileage is considered. Among the reasons cited for the overrepresentation of heavy trucks in fatal crashes are:

1. current programs for driver licensing and monitoring and for vehicle maintenance are inadequate;
2. the increasing numbers of smaller cars place the occupants of those vehicles at a disadvantage when involved in accidents with heavy trucks; and
3. roadside appurtenances and roadway surfaces are deteriorating and creating new problems for both cars and trucks.

The paper concludes that re-engineering both cars and heavy trucks to improve safety is the best solution to current safety problems.

STUDY TITLE: Improving the Dynamic Performance of Multi-Trailer Vehicles:
A Study of Innovative Dollies (1987)

TOPIC AREAS: Safety, Combination Vehicle Operations

COPIES AVAILABLE (\$24.95) FROM:

PB87 1940232
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Transportation Research Institute
University of Michigan
2901 Baxter Road
Ann Arbor, Michigan 48109

ABSTRACT:

Multiple trailer combinations have a tendency to become unstable under certain conditions which result in rollover of the second trailer. To eliminate this tendency and to improve the stability of multiple trailer vehicles, a number of concepts were evaluated for improving the coupling between trailers, commonly called a "dolly." A new dolly, the Controlled Steer B-dolly (CSB-dolly) has resulted.

STUDY TITLE: Influence of Size and Weight Variables on the Stability and Control Properties of Heavy Trucks

TOPIC AREAS: Safety, Combination Vehicle Operations

COPIES AVAILABLE FROM:

(Report number yet to be assigned)
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Transportation Research Institute
The University of Michigan
2901 Baxter Road
Ann Arbor, Michigan 48109

ABSTRACT:

This study has determined the influence of variations in truck size and weight constraints on the stability and control properties of heavy vehicles. The size and weight constraints of interest include axle load, gross vehicle weight, length, width, type of multiple trailer combinations, and bridge formula allowances. Variations in location of the center of gravity of the payload were also considered as a separate subject. The influence of these parametric variations on stability and control behavior was explored by means of both full-scale tests and computer simulations. For each size and weight "issue" the stability and control problem areas are addressed and the influence of size and weight variations is quantified. The results are then reviewed in light of their potential implications for traffic safety.

STUDY TITLE: Operation and Geometric Evaluation of Exclusive Truck Lanes (1986)

TOPIC AREA: Safety

COPIES AVAILABLE FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
The Texas A & M University System
College Station, Texas 78763

ABSTRACT:

This report describes the development of a computer program which can be used to identify candidate sections of highway which warrant the addition of exclusive truck lane facilities in the median area of existing interstate highways. The computer program uses accepted methodologies to determine operational improvements on a section of roadway. Volume-to-capacity ratios (with and without trucks) indicate the improvement in operation when trucks are separated from the mixed flow of traffic. The level of service for the two conditions is a resulting measure of the quality of traffic flow. The second major parameter considered by the program is effective median width. This is the width available in the median area after accounting for median obstructions and necessary longitudinal barriers. Future traffic growth scenarios were also examined. The results are presented as the length of time each segment of the freeway is expected to operate at an acceptable level of service.

STUDY TITLE: Potential Safety Aspects of the Use of Larger Trucks on North Carolina Highways (1984)

TOPIC AREA: Safety

COPIES AVAILABLE (\$7.00) FROM:

Publications Manager
University of North Carolina
Highway Safety Research Center
CTP-197A
Chapel Hill, N.C. 27514

PERFORMING ORGANIZATION:

Highway Safety Research Center
Chapel Hill, North Carolina 27514

ABSTRACT:

This study was undertaken to examine (a) potential problems arising from the passage of the Surface Transportation Assistance Act of 1982 (STAA) which allows the use of twin trailers, 48-foot trailers, and 102-inch wide trailers on the interstate system and certain designated routes, and (b) possible ways of

minimizing or avoiding these problems. Input was obtained from officials of motor carriers, truck drivers, and citizens' groups from North Carolina. About half of the trucking companies contacted were using both twins and 48-foot trailers, but at the time of the study they comprised only a small percentage of the overall fleet. It was projected that of all the trucks on the road, eventually 36 percent would be twins and 14 percent would be 48-foot trailers, and that both types would consist largely of 102-inch wide trailers. Both motor carriers and drivers were concerned with the stability of twin trailer configurations. Motor carriers were satisfied with training procedures for operating the larger dimensioned vehicles but drivers were not. Motor carrier firms also expressed concern about the lack of uniformity in State practices of designating routes and conditions in which these vehicles could be operated.

STUDY TITLE: Safety and Operational Impacts of 53-foot Truck Trailers in Michigan (1986)

TOPIC AREAS: Safety, Combination Vehicle Operations

COPIES AVAILABLE (NO CHARGE) FROM:

Motor Carrier Unit
Bureau of Transportation Planning
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909

PERFORMING ORGANIZATION:

Transportation Research Institute
University of Michigan
2901 Baxter Road
Ann Arbor, Michigan 48109

ABSTRACT:

The report assesses the performance characteristics of 53-foot semitrailers to determine whether penalties in cost or safety would accompany their introduction. Operated with the tandem axles in the full-rearward position, the larger off-tracking of the 53-foot semitrailers is incompatible with the geometry of many intersections in Michigan. On this basis, a maximum wheelbase of 40.5 feet (measured from kingpin to center of the tandem axles) is recommended. At this wheelbase, dynamic behavior at high speeds is comparable to that of other trailers currently in use on the road system, although further decreases in the wheelbase can degrade dynamic performance. This 40.5 feet is also suggested as the minimum wheelbase. The use of 3 or more axles on the trailer is not recommended because of concerns about dynamic behavior of longer multi-axle trailers. Because the trailers would be operated with the rear axles in a forward position at all times, they represent a special case warranting use of rear underride guards. When loaded to its full volume capacity, the 53-foot semitrailer is expected to experience a slightly higher rollover frequency, but total rollover accidents would be unchanged due to the fewer number of trailers required to carry the same amount of cargo. The ability to operate at greater weights is estimated to produce a 20 percent increase in pavement damage.

STUDY TITLE: Safety Implications of Various Truck Configurations (to be completed early in 1989)

TOPIC AREAS: Safety, Combination Vehicle Operations

PERFORMING ORGANIZATION:

Transportation Research Institute
The University of Michigan
245 West Engineering Building
Ann Arbor, Michigan 48104-1092

ABSTRACT:

The study considers the impact of possible changes in truck weight limits on truck design and performance. Possible changes to the bridge formula, removal of the 80,000-pound gross weight limit, and the Turner Proposal are being analyzed for their safety implications.

STUDY TITLE: Safety of Wider Trucks on Narrow Roadways (currently underway)

TOPIC AREAS: Safety, Combination Vehicle Operations

PERFORMING ORGANIZATION:

Analysis Group, Inc.
600 East Moorehead Street
Suite 315
Charlotte, N.C. 28202

ABSTRACT:

The study assesses the safety of 102-inch wide trucks on various roadways. The primary geometric design variable is lane width; roadways with 10, 11, and 12-foot lanes are evaluated in the study. Other variables analyzed include horizontal alignment, traffic volume, percent trucks, lateral placement, and adjacent lane encroachments. The study developed guidelines for allowing the operation of wide trucks on various roadways.

STUDY TITLE: Some Measures of Accessibility of Large Trucks to the Texas Highway System (1985)

TOPIC AREA: Safety

COPIES AVAILABLE (\$14.95) FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
The Texas A & M University System
College Station, Texas 77843

ABSTRACT:

The Surface Transportation Assistance Act of 1982 established a nationally uniform limit for the length, width, and weight of certain commercial vehicles. In accordance with the act, a national network of routes that could safely and structurally accommodate the larger and heavier vehicles was established. The objective of this study was to develop procedures for identifying truck routes and for determining accessibility to the selected network.

This goal was accomplished in two stages. First, potential demand for access to the network was identified. Emphasis was placed on counties that have large economic and demographic bases and on areas that are currently small yet have exhibited recent growth trends.

The second stage focused on the network or the spatial structure of routes. A hierarchy of four coverage patterns was evaluated in terms of the amount of demand satisfied by the network. The four networks varied in degree of complexity.

STUDY TITLE: The Operation of Larger Trucks on Roads with Restrictive Geometry (1986)

TOPIC AREA: Safety

COPIES AVAILABLE FROM:

PB87 229977/AS
National Technical Information Service
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Goodell-Grivas, Inc.
17320 W. Eight Mile Road
Southfield, Michigan 48075

ABSTRACT:

The purpose of this study was to determine the effect of large truck configurations on traffic operations while negotiating roads and streets with restrictive geometry. Truck types of concern included truck-tractor-semitrailers with trailer lengths of 40, 45, and 48 feet with trailer widths of 96 and 102 inches. Twin trailer combinations with 28 foot trailers were also tested.

Double-trailer vehicles required additional time to complete right and left turns at intersections. Increased rates of encroachment over edgelines and adjacent lanes were also observed for the semi 48 compared to other truck types. The semi 48 and double resulted in some changes in operations of oncoming vehicles, particularly on narrow roadways. However, differences in lane placement of the trucks due to careful driving of the larger trucks may have partially compensated for operational differences in oncoming vehicles between truck types. Overall, driving behavior at urban and rural sites and site differences had more of an effect on operations than the effects of the different truck types tested.

STUDY TITLE: Truck Accidents in Michigan 1978-84 (1986)

TOPIC AREA: Safety

COPIES AVAILABLE (NO CHARGE) FROM:

Motor Carrier Unit
Bureau of Transportation Planning
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909

PERFORMING ORGANIZATION:

Transportation Research Institute
The University of Michigan
2901 Baxter Road
Ann Arbor, Michigan 48109

ABSTRACT:

The University of Michigan Transportation Research Institute (UMTRI) carried out an analysis of existing computerized traffic accident data from the State of Michigan, the NHTSA Fatal Accident Reporting System, the Bureau of Motor Carrier Safety, and the UMTRI Trucks Involved in Fatal Accidents Files to identify trends in the involvement of large trucks in traffic accidents in Michigan, and to examine the accident experience of trucks with larger trailers. In general, this period shows a sharp decrease in the involvement of trucks in traffic accidents in 1980, and an increase in 1983 and 1984. Examination of the safety impact of longer trailers resulted in a recommendation for adequate rear underride protection in order to mitigate the potential hazard posed by the substantial rear overhang of the proposed trailers to the occupants of passenger cars that may collide with the rear of these trailers.

STUDY TITLE: Truck Operations and Regulations on Urban Freeways (1984)

TOPIC AREA: Safety

COPIES AVAILABLE (\$19.95) FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
The Texas A&M University System
College Station, Texas 77843

ABSTRACT:

This study examines six general classes of truck regulations in terms of their impacts on urban freeway safety and traffic operations. The truck restrictions and regulatory practices were: 1) lane restrictions; 2) time-of-day restrictions; 3) speed restrictions; 4) route restrictions; 5) driver licensing and certification programs; and 6) increased enforcement of existing regulations. Of the six classes of regulations examined, only two appear capable

of producing any substantial improvement in the safety and operational aspects of truck usage of urban freeways in Texas. Reduced speed limits, either for all vehicles or trucks only, appear to merit consideration on a trial basis. In terms of long-term actions, the areas of driver licensing/training and incident management techniques should be emphasized.

STUDY TITLE: Truck Safety Data Needs (to be completed in late 1989)

TOPIC AREA: Safety

PERFORMING ORGANIZATION:

Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

ABSTRACT:

In a time of rising concern for truck safety, it is apparent that existing programs that collect information on truck accidents and travel are inadequate to assess the magnitude of the safety problem or to guide government or industry actions to improve safety. This study will identify ways to begin to close the gap in truck safety information. The study will define truck safety data needs, specify requirements of the system by defining its ideal characteristics and comparing these to the data available in existing programs, develop a proposal for an ongoing program to periodically collect or assemble the essential data, and facilitate implementation by assessing possible organizational arrangements for carrying out the program, presenting the proposal to administrators in the agencies that would have to conduct it, and seeking private and public sector support for the program.

PAVEMENT OR BRIDGE PERFORMANCE

STUDY TITLE: A Methodology for the Assessment of Truck Lane Needs in the Texas Highway Network (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$14.95) FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Center for Transportation Research
The University of Texas at Austin
Austin, Texas 78712-1075

ABSTRACT:

This report describes an integrated network modeling methodology for the study of truck lane needs in the Texas highway network. It consists of three major components for dealing with the increasing traffic of larger and heavier trucks: critical link programming, network traffic assignment, and optimal link selection/network design.

The critical link programs allow the user to diagnose and assess the adequacy of the links in a highway network for handling excessive truck traffic under specified conditions.

The traffic assignment model is essential for the prediction of link flow patterns and subsequent user costs calculation in response to improvements. The assignment problem addressed here allows the asymmetric interaction between cars and trucks sharing the roadway in the determination of link travel times.

The optimal link improvement selection problem is cast as a discrete network design problem with multiple improvement options per link. One of its main features is the definition of link improvement in terms of both lane addition (capacity expansion) and operating scheme (lane access restrictions to cars and trucks).

STUDY TITLE: Analysis of Pavement Damage Attributable to Overweight Trucks in New Jersey (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:
New Jersey Department of Transportation
CN 600
Trenton, New Jersey 08625

PERFORMING ORGANIZATION:
New Jersey Department of Transportation
CN 600
Trenton, New Jersey 08625

ABSTRACT:

A study was undertaken to quantify the magnitude of the pavement damage done by overweight trucks in New Jersey. It was found that detected overweight trucks cause a relatively small shortening of pavement life, and had they been successfully off-loaded a negligible savings would have resulted. However, there is serious concern that the number of overweight trucks actually detected represents only a small fraction of the total number of overweight violators. Attempts to estimate the total overweight truck population suggest that the total pavement damage attributable to all overweight trucks may approach \$20 million per year. It was, therefore, concluded that a substantial increase in the revenue generated by overweight trucks may be appropriate.

STUDY TITLE: An Assessment of the Load Potential for the Passage of Various Truck Configurations

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

American Trucking Associations
Information Center
2200 Mill Road
Alexandria, Virginia 22314

PERFORMING ORGANIZATION:

David R. Schelling
Transportation Studies Center
Department of Civil Engineering
College Park, Maryland 20742

ABSTRACT:

The study analyzed the effects of several different truck configurations on several hundred bridges, representing all major types of bridges now in use in a number of states, to determine the different impacts of each vehicle type and the differences in benefits derived by each type.

STUDY TITLE: Bridge Formula Development (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

PB86 157575/AS (Final Report)
PB86 157567 (Executive Summary - \$9.95)
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
Texas A & M University
College Station, Texas 77843

ABSTRACT:

A bridge formula, independent of the number of included axles, was developed to more fully utilize the capacity of existing bridges without significantly shortening their service lives. As with the current formula, the new formula is applicable both to the overall wheelbase and to include all subgroups of axles. The maximum weights for single and tandem axles were assumed to be unchanged. The new formula reduced the maximum weight allowed on four more closely spaced axles, but for most practical lengths, the formula is less restrictive than the current law.

The study also considered the impacts of the new formula application on pavement fatigue. For most practical heavy vehicles, the formula would result in a greater number of equivalent axle loads per vehicle.

STUDY TITLE: Bridge Load Posting Policy Pilot Project (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Pennsylvania Department of Transportation
Technical Reference Center
903 T & S Building
Harrisburg, Pennsylvania 17120

PERFORMING ORGANIZATION:

Wilbur Smith Associates/BTML Division
2921 Telestar Court
Falls Church, Virginia 22042-1297

ABSTRACT:

This report assesses the economic impact of a proposed bridge load posting policy which was developed in previous research. Eight hundred sample bridges are used to establish owner costs, such as inspection, enforcement, and maintenance and user costs to detour posted structures. It was concluded that although the proposed bridge load posting policy will impose greater expense onto the public and the bridge owner, it will benefit everyone by providing a uniform, flexible, and objective decision-making tool for posting bridges while protecting the owner's capital investment and improving public safety.

STUDY TITLE: Calibration of Weigh-in-Motion (WIM) Systems (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

(Report number yet to be assigned)
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

SPARTA, Inc.
1055 Wall Street, Suite 200
La Jolla, California 92037

ABSTRACT:

The objective of this study is to develop low cost WIM devices, calibrate WIM systems for approach smoothness, suspension systems, and axle configurations, and improve prediction of equivalent axle loads.

STUDY TITLE: Characteristics of Axle Load Equivalence Relationships Associated with Truck Use of Highway Pavements (To be completed October 1988)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

American Trucking Associations Information Center
2200 Mill Road
Alexandria, Virginia 22314

PERFORMING ORGANIZATION:

Ron Hudson and Paul Irick
Austin Research Engineers
2600 Dellana Lane
Austin, Texas 78746

ABSTRACT:

The study will review the characteristics and effects of differing axle loads on highway pavements as determined by the AASHO Road Test and other studies to test current pavement models or develop new models.

STUDY TITLE: Critical Assessment of Tire Pressure Research (to be completed in late 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES WILL BE AVAILABLE FROM:

(NCHRP Project 20-7, Task 36)
National Cooperative Highway Research Program
Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

PERFORMING ORGANIZATION:

Harry A. Smith, P.E.
Consulting Engineer
3320 Lauriston Place
Fairfax, Virginia 22031

ABSTRACT:

The objective of this project is to develop a synopsis and critical evaluation of completed and ongoing research efforts pertaining to high pressure truck tires and to identify future research required to fill information gaps in this area.

STUDY TITLE: Design Loads for Future Bridges (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

(Report number yet to be assigned)
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

University of Michigan
Department of Engineering
2340 G. G. Brown Building
Ann Arbor, Michigan 48109-2125

ABSTRACT:

This research establishes an overall study approach to determine the application of probabilistic methods to project bridge loadings.

STUDY TITLE: Development of a Low-Cost Bridge Weigh-in-Motion System (to be completed in late 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES WILL BE AVAILABLE FROM:

(NCHRP Project 3-36)
National Cooperative Highway Research Program
Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

PERFORMING ORGANIZATION:

Bridge Weighing Systems, Inc.
University Circle Research Center No. 1
11000 Cedar Avenue
Cleveland, Ohio 44106

ABSTRACT:

Development of a low-cost bridge weigh-in-motion (WIM) system capable of providing the traffic data that are used in the design and maintenance of highways and bridges is the principal objective of this research. This system will be able to (a) record gross vehicle weights, (b) classify vehicles, and (c) record individual axle weights within the limits of the specific bridge and site characteristics. The system will use state-of-the-art technology and will have the following characteristics: (a) target purchase price of \$5,000 to \$10,000 per unit, (b) low life-cycle cost, (c) capability to interface with automatic vehicle identification equipment, and (d) capability to be deployed on bridges and large culverts.

STUDY TITLE: Development of Guidelines for Plotting Load Limits on Pavements (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Pennsylvania Department of Transportation
Technical Reference Center
903 T & S Building
Harrisburg, Pennsylvania 17120

PERFORMING ORGANIZATION:

The Pennsylvania Transportation Institute
The Pennsylvania State University
University Park, Pennsylvania 16802

ABSTRACT:

Research was conducted to develop rational guidelines for the posting of load limits. To evaluate the effect of axle loads under a variety of conditions, a theoretical analysis was conducted that considered various load magnitudes and configurations for different pavement thicknesses and material properties. It was found that axle configuration (i.e. single, tandem, and triple assemblies) did not significantly affect pavement response, provided that the load per tire remained the same. Following the analysis of axle loads, a microcomputer program was written that uses deflection measurements to predict pavement performance for a given level of traffic.

STUDY TITLE: Development of Traffic Data Collection Standards: Pavement Management Study (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES TO BE AVAILABLE (NO CHARGE) FROM:

Richard Reel, Jr.
Mail Station 27
Florida DOT
Haydon Burns Building
605 Suwannee Street
Tallahassee, Florida 32301-8064
(904) 488-4999

PERFORMING ORGANIZATION:

Texas Transportation Institute
Texas A & M University
College Station, Texas 77843

ABSTRACT:

The study developed statistically valid relationships between traffic count, vehicle classification, and truck weight data maintained in computer-readable form by FDOT. The report summarized current FDOT data and procedures and compared this with the data needed to support the 18 kip ESAL history and forecasts at the project level. A data prediction model was developed to provide future project level design traffic, truck percentage, and truck weight data considering project locations in urban, suburban, or rural areas. Procedures and software for calculating future traffic data for design, programming, and special projects were developed and recommended.

STUDY TITLE: Distribution of Truck Tire Pressures in Pennsylvania (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Pennsylvania Department of Transportation
Bureau of Bridge and Road Technology
903 T & S Building
Harrisburg, Pennsylvania 17120

PERFORMING ORGANIZATION:

Pennsylvania Department of Transportation
Bureau of Bridge and Road Technology
1009 T & S Building
Harrisburg, Pennsylvania 17120

ABSTRACT:

The Department of Transportation believes higher truck tire pressures significantly contribute to increased asphalt pavement rutting. A study was initiated to determine the average and ranges of truck tire pressures on various roadway networks in the State. The report contains the results of statistical analyses performed on approximately 25,000 samples obtained from truck weighing operations.

STUDY TITLE: Effects of Different Tire Sizes and Pressures on Pavement Performance (to be completed February 1989)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

Engineering Incorporated
41 Research Drive
Langley Research Park
Hampton, Virginia 23666

ABSTRACT:

The study will validate truck dynamic models by designing, constructing, and testing a loading system and wheel force transducers. A loading platform will be constructed to simulate dynamics of a road profile, then truck wheel force transducers capable of measuring wheel forces will be designed, constructed, and tested.

STUDY TITLE: Effects of Heavy Vehicle Characteristics on Pavement Response and Performance (to be completed in late 1991)

TOPIC AREA: Pavement or Bridge Performance

COPIES WILL BE AVAILABLE FROM:

(NCHRP Project 1-25)
National Cooperative Highway Research Program
Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

PERFORMING ORGANIZATION:

Transportation Research Institute
University of Michigan
2901 Baxter Road
Ann Arbor, Michigan 48109-2150

ABSTRACT:

The objective of this research is to analyze and evaluate the interaction between heavy vehicle characteristics and pavement performance for application in pavement management. Heavy vehicle (truck and bus) characteristics shall include tire types, tire pressures, tire contact, tire configuration, suspension systems, axle configuration, axle static loads, and operating conditions. Pavement factors to be considered shall include design, operating conditions, surface conditions, traffic mix, and geometrics. Both static and dynamic interactions between various heavy vehicle and pavement factors shall be analyzed and evaluated to determine their relationships and relative significance. Analytical and experimental procedures shall be used to investigate the effects of these interactions on pavement performance and to provide guidelines for use in pavement analysis and design applications.

STUDY TITLE: Effects of Load Distributions and Axle and Tire Configurations on Pavement Fatigue (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Kentucky Transportation Research Program
College of Engineering
University of Kentucky
Lexington, Kentucky 40506-0043

PERFORMING ORGANIZATION:

Kentucky Transportation Research Program
Lexington, Kentucky 40506-0043

ABSTRACT:

This study presents damage factor relationships for axle and tire configurations. Adjustment factors are provided to account for variations in load distributions within axle groups, distances between axles in a tandem, and variations in tire pressure for both dual and flotation tires.

STUDY TITLE: Effects of Tire Pressures on Flexible Pavements (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$25.95) FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
Texas A & M University
College Station, Texas 77843

ABSTRACT:

This study includes the results of (1) a field study to determine the tire inflation pressures currently being carried by Texas highways, (2) a literature

and analytical study to determine what tire contact pressures are actually being applied by modern tires to pavements, and (3) an analytical study to evaluate the effect of those contact pressures on the stresses and strains in typical Texas flexible pavements.

Descriptions of the analytical studies include discussions of the computer programs used to model the characteristics of both vehicle tires and flexible pavements. The tires included in the analytical study include both truck and passenger tires operated at typical loads and inflation pressures.

The field study showed that tire inflation pressures are much higher on the road than those typically used in design procedures or even in analysis. Truck tire pressures average between 95 and 100 psi on the road and 75 to 80 psi is typically used in design. However, these high truck tire inflation pressures translate to contact pressures in the range of 150 to 200 psi. The effect of these high contact pressures is especially detrimental for thin surfaced roads.

STUDY TITLE: Effects of Truck Tire Inflation Pressure and Axle Load on Pavement Performance (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$14.95) FROM:
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:
Center for Transportation Research
University of Texas at Austin
Austin, Texas 78712-1072

ABSTRACT:

This report presents the results of an investigation into the effect of truck tire inflation pressure and axle load on flexible and rigid pavement performance, as determined by computer analysis. The flexible pavement analysis was conducted with both a non-uniform pressure model and a uniform pressure model as input to the elastic layer program BISAR and the 3D finite element program TEXGAP-3D. The results show that (1) the uniform pressure model overestimated the increase in tensile strain at the bottom of the surface for overinflated tires, and underestimated the increase in tensile strain for overloaded tires, (2) both high inflation pressure and heavy load caused a high increase in tensile strain at the bottom of the surface and (3) the axle load (not the inflation pressure) played a major role in the subgrade rutting life. A rigid pavement analysis was conducted with both a non-uniform pressure model and a uniform pressure model as input to the program JSLAB. The difference between the results obtained for the non-uniform model and those for the uniform pressure model for the same axle load is insignificant.

STUDY TITLE: Effects of Truck Tire Pressures on Pavements (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Joint Study by Texas Transportation Institute at Texas A & M
University System and the Center for Transportation Research,
University of Texas at Austin

ABSTRACT:

Texas Transportation Institute conducted a survey of the truck tire inflation pressures that are currently being used on Texas highways, calculated tire contact pressure distributions using a computer program developed at Texas A & M, and predicted the effects of increasing tire inflation pressures on stresses, strains, rutting, cracking, and Present Serviceability Index for a variety of flexible pavements in the four different climatic zones that are found in Texas. The Center for Transportation Research measured the vertical contact pressure distributions of a variety of tires using layered elastic and three-dimensional finite element computer programs.

STUDY TITLE: Effect of Truck Weights on Deterioration, Operation, and Design of
Bridges and Pavements (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

D.B. Beal
Civil Engineer, III
Engineering Research and Development Bureau
Technical Services Division
New York State DOT
State Campus Building 7-A, Room 600
1220 Washington Avenue
Albany, New York 12232
(518) 457-5826

PERFORMING ORGANIZATION:

New York State DOT/Wilbur Smith Associates/BTML Division
2921 Telestar Court
Falls Church, Virginia 22042-1297

ABSTRACT:

The objective of this research was to provide the Permanent Advisory Committee on Truck Weights a comprehensive review of current knowledge regarding the effects of increased truck weight on the deterioration, operation, and design of highway bridges and pavements. The study considered the relative cost of investments in increased load capacity for the bridges and highways of the state, the useful life of bridges and highways, and the protection of the highways through maintenance.

STUDY TITLE: Evaluation and Calibration Procedures for Weigh-in-Motion
Systems (to be completed in late 1990)

TOPIC AREA: Pavement or Bridge Performance

COPIES WILL BE AVAILABLE FROM:
(NCHRP Project 3-39)
National Cooperative Highway Research Program
Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

PERFORMING ORGANIZATION:
Texas A & M Research Foundation
Texas A & M University
College Station, TX 77843

ABSTRACT:

The objective of this research is to develop procedures that cover all weigh-in-motion (WIM) system applications for acceptance testing, on-site calibration, and periodic verification of system performance. A number of states are currently installing WIM systems and are specifying and conducting independent acceptance and validation procedures. However, nationally recognized procedures for acceptance testing and on-site calibration of WIM systems do not exist. Developing such procedures will give WIM users confidence that WIM-estimated weight will meet specified tolerances. Widely accepted procedures will also benefit the manufacturers by providing more consistent testing requirements among their users.

STUDY TITLE: Evaluation of Increased Pavement Loading (To be completed late
in 1988)

TOPIC AREA: Pavement or Bridge Performance

COPIES TO BE AVAILABLE (NO CHARGE) FROM:
Frank McCullagh
Research Section
Arizona DOT
206 South Seventeenth Avenue
Phoenix, Arizona 85007
(602) 965-2370

PERFORMING ORGANIZATION:
Austin Research Engineers, Inc.
Austin, Texas

ABSTRACT:

The objective of this study is to analyze changes in the loading level, axle loads, tire loads, and tire inflation pressures and the effects of these factors on the design of asphalt concrete pavements. A comprehensive and

precise method will be developed to predict the number of 18 kip equivalent single axle loads to use in the design of these pavements. Model predictions will be compared to actual condition and a program will be developed to run on a microcomputer.

STUDY TITLE: Feasibility of a National Heavy Vehicle Monitoring System (to be completed in early 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES WILL BE AVAILABLE FROM:
 (NCHRP Project 3-34)
 National Cooperative Highway Research Program (in early 1989)
 Transportation Research Board
 National Research Council
 2101 Constitution Avenue, N. W.
 Washington, DC 20418

PERFORMING ORGANIZATION:
 Arthur D. Little, Inc.
 20/323 Acorn Park
 Cambridge, MA 02140

ABSTRACT:

This study is being conducted to identify and evaluate the needs, issues, requirements, and feasibility of using an automated system [automatic vehicle identification (AVI), automatic vehicle classification (AVC), weigh-in-motion (WIM)] as a cost-effective, statistically sound replacement for, or supplement to, existing heavy vehicle data collection systems. Although implementation of a single, national heavy vehicle monitoring (HVM) system does not appear to be feasible at this time, a portion of the study effort has been directed toward the development of guidelines for individual states or regions as they deploy various levels of HVM systems to meet their specific needs. A detailed cost-benefit analysis of a voluntary state system, which covers different levels of deployment, system designs, and types of data, has been completed.

STUDY TITLE: Feasibility of Automatic Truck Tire Pressure Data Collection (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$12.95) FROM:
 National Technical Information Service
 5285 Port Royal Road
 Springfield, Virginia 22161

PERFORMING ORGANIZATION:
 Texas Transportation Institute
 The Texas A & M University System
 College Station, Texas 77843

ABSTRACT:

This report presents the results of a study into the feasibility of automatically monitoring the contact tire pressures produced by trucks while they are in motion by monitoring tire footprint dimensions and weight. The work undertaken has included: a review of principles of tire contact pressure measurement and available sensor technology; an assessment of the feasibility for using each principle/technology for truck contact pressure measurements; and development of the concept for an independent tire contact pressure measurement system as well as options for operational truck weighing-in-motion systems.

STUDY TITLE: Idaho Legal Loads Study (1984)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Idaho Transportation Department
Division of Highways
3311 West State Street
Boise, Idaho 83707

PERFORMING ORGANIZATION:

Idaho Transportation Department
Division of Highways
3311 West State Street
Boise, Idaho 83707

ABSTRACT:

This study examines the overall effect upon Idaho's highway bridges of reducing the tandem axle loading of 37,800 lbs. to 34,000 lbs., and removing the maximum gross vehicle load cap of 105,500 lbs. to allow load limits produced by the Bridge Formula for vehicles up to 9 axles and 101 feet in length.

STUDY TITLE: Impact of Truck Characteristics on Pavements - Load Equivalency Factors (currently underway)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

Austin Research Engineers, Inc.
2600 Dellana Lane
Austin, Texas 78746

ABSTRACT:

Using the results of a Canadian pavement study, additional research will be conducted to measure pavement stress, strain, and deflection caused by trucks with different axle configurations and tire pressures. Study findings can be directly applied to current pavement design procedures.

STUDY TITLE: Lane Distribution Factors for Design (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
The Texas A & M University System
College Station, Texas 77843

ABSTRACT:

This report, based upon observed traffic patterns in Texas, presents a method of estimating the percentage of trucks that will be found in each lane of a multi-lane highway facility. The results are compared with the percent trucks that are currently assumed in the Texas FPS method of pavement design, as well as with the percent trucks that are recommended in the 1986 AASHTO pavement design guide, and that are calculated using the predictive equations in NCHRP Report No. 277.

It is shown that the NCHRP Report No. 277 equations are conservative when compared with the observed data, although both the NCHRP equations and the observed data show the same trends. Also, differences in the directional split of travel, and the percentage of trucks in the traffic stream appear to alter the truck lane distributions. The number of sites observed were not numerous enough to warrant the development of new predictive equations for Texas conditions, but the indications are that these conditions are sufficiently distinctive as to require a new set of predictive equations.

STUDY TITLE: Overload Bridge Analysis and Routing System (1988)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Research Section
Arizona Department of Transportation
206 South Seventeenth Avenue
Phoenix, Arizona 85007
Attention: Frank McCullagh

PERFORMING ORGANIZATION:

Engineering Computer Corporation
Sacramento, California

ABSTRACT:

The objective of this study is to develop an interactive computer program which enables bridge engineers to quickly provide route selections for permitted overweight vehicles. The program will utilize existing bridge inventory data files.

STUDY TITLE: Overloading Behavior of Steel Multi-Girder Highway Bridges
(1987) (4 volumes)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE FROM:

Office of Research and Special Studies
Pennsylvania Department of Transportation
1220 Commonwealth and Forster Streets
Transportation and Safety Building
Harrisburg, Pennsylvania 17120

PERFORMING ORGANIZATION:

Fritz Engineering Laboratory
Lehigh University
Bethlehem, Pennsylvania

ABSTRACT:

Four volumes present the results of a research program to predict the overload response of steel multigirder highway bridges with reinforced concrete decks. Analytical developments and parametric studies are presented in three technical reports, and an executive summary presents the highlights of the observations made in different phases of the research.

STUDY TITLE: Pavement Test Accelerated Loading Facility (ALF)-Phase II (1988)

NOTE: Product is a machine, not a report.

TOPIC AREA: Pavement or Bridge Performance

INFORMATION AVAILABLE FROM:

Charlie Chirillo
Office of Research
Federal Highway Administration
HNR-20
Turner-Fairbanks
6300 Old Georgetown Pike
McLean, Virginia 22101

PERFORMING ORGANIZATION:

Engineering Incorporated
41 Research Drive
Langley Research Park
Hampton, Virginia 23666

ABSTRACT:

The effects of different tire configurations and pressures will be tested on the new ALF pavement test facility to verify damage prediction functions and load equivalency factors.

STUDY TITLE: Predictive Models to Evaluate Load Impact Factors
(to be completed early in 1989)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

Department of Mechanical Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 03129

ABSTRACT:

This project is developing equations to predict dynamic axle loads for given axle configurations, suspension types, tire types, pavement types, and pavement conditions in order to predict the rate of pavement deterioration. Then new load equivalency factors for particular truck/pavement combinations will be determined.

STUDY TITLE: Premature Flexible Pavement Failure Analysis (To be completed summer 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES TO BE AVAILABLE FROM:

Florida Department of Transportation
Haydon Burns Building
605 Suwannee Street
Tallahassee, Florida 32301-8064

PERFORMING ORGANIZATION:

Texas Transportation Institute
Texas A & M University
College Station, Texas 77843

ABSTRACT:

The study will assess the impact of changing truck types and loads, axle loads and configurations, the suspension system, and particularly tire type and pressure on flexible pavement performance. The report will include procedures/models which will permit the optimization of pavement design, and will include procedures that incorporate future changes in tire pressures in the pavement design and mix design processes.

STUDY TITLE: Procedures for Controlling the Effect of Increased Tire Pressure on Asphalt Concrete Pavement Damage (1987)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$10.00) FROM:

Transportation Research Institute
Oregon State University
Corvallis, Oregon 97331

PERFORMING ORGANIZATION:

Oregon State University
Department of Civil Engineering
Corvallis, Oregon 97331

ABSTRACT:

A survey was carried out at a weigh station on I-5 in Oregon during the summer of 1986 which showed that 87% of the tires surveyed were of radial construction and had tire pressures of 102 psi as opposed to the 82 psi of bias tires. The study used elastic layer analysis to examine the influence of increased tire pressures on the fatigue and rutting performance (in terms of vertical compressive stress, tensile strain and compressive strain) of asphalt surfaced pavements. The study analysis shows that the effect of increased tire pressure on vertical compressive stress is significant in the asphalt wearing layer, and as the pressure increases, the maximum tensile strain at the bottom of the asphalt layer increases. Study results indicate that a 20% increase in tire pressure could result in a 40 to 60 percent increase in equivalency for dual-tire single axles of 18 kips and tandem axles of 34 kips.

STUDY TITLE: Relationships between Vehicle Configuration and Highway Design
(Turner truck study) (to be completed in 1990)

TOPIC AREAS: Pavement or Bridge Performance and Trucking Productivity,
Transport Costs/Savings

PERFORMING ORGANIZATION:

Transportation Research Board
National Research Council
2101 Constitution Avenue, N. W.
Washington, DC 20418

ABSTRACT:

This study grew out of a proposal in 1984 by former FHWA Administrator Francis C. Turner to allow higher gross vehicle weights to be transported by trucks equipped with additional axles that would result in lower axle loads than are allowed today. The benefits of the proposed configuration would include reduced pavement and bridge damage, but also include productivity gains for motor carriers. The study is examining several different vehicle configurations that could potentially achieve these benefits. The study is also examining most closely a version of the proposal under which truck operators would have the choice of complying with the new weight regulations or continuing to follow existing regulations. Major elements of the study include: (1) estimating potential use of the new truck configurations by motor carriers and associated productivity gains; (2) evaluating effects of the new truck configurations on bridges; (3) evaluating effects on pavements; (4) analyzing the safety of the new trucks versus existing configurations; and (5) providing guidance to state and federal government agencies on the costs and benefits associated with alternative truck size and weight regulations.

STUDY TITLE: Simple Load Capacity Tests for Bridges to Determine Safe Load Posting Levels (To be completed fall 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (\$10.00) FROM:

Pennsylvania Department of Transportation
 Technical Reference Center
 903 T & S Building
 Harrisburg, Pennsylvania 17120

PERFORMING ORGANIZATION:

University of Colorado
 Department of Civil, Environmental, and Architectural
 Engineering
 Campus Box 428
 Boulder, Colorado 80309-0428

ABSTRACT:

The primary objective of this research is to develop a simple load capacity test to determine actual inventory rating and precise prediction of operating and ultimate load ratings of steel, concrete, and prestressed concrete bridges without endangering the service life. This simple load test may be based upon a structure's elastic (static or dynamic) response and utilize sophisticated instrumentation which allows simple applications of test procedures.

STUDY TITLE: Survey of Commercial Vehicle Weights - 1975 - 1982 (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

The Editor
 Technical Publications
 Central Building, Room 320
 Ministry of Transportation and Communications
 1201 Wilson Avenue
 Downsview, Ontario, Canada M3M 1J8

PERFORMING ORGANIZATION:

Ministry of Transportation and Communications
 1201 Wilson Avenue
 Downsview, Ontario Canada M3M 1J8

ABSTRACT:

Four Ontario surveys of commercial vehicle weights, inter-axle spacings, or their equivalent base lengths, were conducted to determine the potential effect of changes in vehicle dimensions on highway structure. The report indicates there is no significant evidence to suggest that the heaviest trucks in Ontario (top one percent) increased in weight from 1975 to 1982. There were indications that trucks with equivalent base lengths between 8 and 18 meters are occasionally considerably overloaded in urban areas.

STUDY TITLE: Tandem Axle Research: Load Distribution of Tandem Axles at Roadway Speed (To be completed January 1989)

TOPIC AREA: Pavement or Bridge Performance

COPIES TO BE MADE AVAILABLE (NO CHARGE) FROM:
 John Van Berkel
 Division of Transportation Operations
 Caltrans
 1120 N Street
 Sacramento, California 95814

PERFORMING ORGANIZATION:
 Caltrans Truck Operations Branch
 Caltrans
 1120 N Street
 Sacramento, California 95814

ABSTRACT:

Caltrans has placed a parallel series of five WIM sensors at the entrance to a weigh station. Readings are being made for each individual axle end at each of the WIM sensors and compared to the static weight while noting the type of tandem axle suspension. The analysis is to show (1) the average weight across the five WIMs for each axle and a comparison of the average weight for the first and second axle in a tandem set by suspension type, and (2) the dynamic variation for each axle as recorded by each WIM, again by suspension type.

STUDY TITLE: The Effects of Increased Truck Size and Weight in Illinois (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:
 Illinois Department of Transportation
 Administration Building
 2300 South Dirksen Parkway
 Springfield, Illinois 62764

PERFORMING ORGANIZATION:
 Illinois Department of Transportation
 Administration Building
 2300 South Dirksen Parkway
 Springfield, Illinois 62764

ABSTRACT:

Illinois Public Act 83-12, effective July 1, 1983, increased Illinois highway user fees, permissible truck size and weight limits, and provided revenue increases to compensate for increased damage to highways and bridges. This Act also directed the Illinois DOT to study the effects of the increased size and weight limits and the adequacy of the compensatory fees. This report is the first of a series of tri-annual reports to the Governor of Illinois. The report presents initial efforts to study a complex and dynamic problem and points to specific areas which need more study, in particular safety and taxation.

STUDY TITLE: The Effect of Ontario's Weight Regulations on Commercial Vehicle Design (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Ministry of Transportation and Communications
Research and Development Branch
1201 Wilson Avenue
Downsview, Ontario Canada M3M 1J8

PERFORMING ORGANIZATION:

Ministry of Transportation and Communications
Research and Development Branch
1201 Wilson Avenue
Downsview, Ontario Canada M3M 1J8

ABSTRACT:

This paper describes the background and theoretical development of the Ontario bridge formula, which gives significantly higher weights than the bridge formula used in the U.S. It describes the program of bridge testing that has been conducted over the last 15 years, which has demonstrated that bridges have considerable reserves of strength relative to conventional methods of analysis. The paper summarizes a survey of provincial weight configurations, as a consequence of the Ontario regulations, as industry has striven to improve the productivity of its equipment.

STUDY TITLE: The Truck Weight Study (currently underway)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

National Academy of Sciences
Transportation Research Board
2101 Constitution Avenue
Washington, D.C. 20418

ABSTRACT:

Section 158 of the Surface Transportation and Uniform Relocation Assistance Act of 1987 directs the Transportation Research Board to analyze the impacts of:

- 1) changes to the Federal bridge formula; and
- 2) elimination of existing grandfathered weight limits.

STUDY TITLE: Truck Axle Weight and Commodity Study (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Saskatchewan Highways and Transportation
1855 Victoria Avenue
Regina, Saskatchewan, Canada S4P-3V5

PERFORMING ORGANIZATION:

John Wyatt
Saskatchewan Highways and Transportation
1855 Victoria Avenue
Regina, Saskatchewan, Canada S4P-3V5

ABSTRACT:

A truck commodity and axle weight study was conducted during the summer of 1986 using portable weigh scales and permanent weigh stations. Information was obtained on truck type, truck axle weight, commodity hauled, origin-destination and other related information. Truck combination units (A, B, and C trains) are becoming a significant portion of the truck population in Saskatchewan. Nine percent of trucks sample were overweight on gross vehicle weight.

STUDY TITLE: Truck Design and Usage Related to Highway Pavement Performance (1985)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Kentucky Transportation Research Program
College of Engineering
University of Kentucky
Lexington, Kentucky 40506-0043

PERFORMING ORGANIZATION:

Kentucky Transportation Research Program
College of Engineering
University of Kentucky
Lexington, Kentucky 40506-0043

ABSTRACT:

The impact of elements of truck design and usage (such as suspension systems, floating axles, axle configurations, uniformity of loading, payloads, etc.) on fatigue damage are illustrated. The effects of increasing vehicle loadings and increased tire pressures are related to potential for rutting of asphaltic concrete pavements. Mechanism for implementation of vehicle damage factors and accumulated pavement fatigue in the assessment and allocation of costs to highway users also are presented.

STUDY TITLE: Truck Tire Pressure in Florida (1986)

TOPIC AREA: Pavement or Bridge Performance

COPIES AVAILABLE (NO CHARGE) FROM:

Bureau of Transportation Statistics
Florida Department of Transportation
Burns Building
Tallahassee, Florida 32399

PERFORMING ORGANIZATION:

Pavement Management Section
 Bureau of Transportation Statistics
 Florida Department of Transportation
 Burns Building
 Tallahassee, Florida 32399

ABSTRACT:

Recent research efforts in Texas and Kentucky have indicated that average truck tire pressure is about 20 psi higher than the 75 to 80 psi that it assumed in current pavement design standards and may produce severe pavement distress. This report on surveys of truck tire pressures in Florida revealed tire pressures in the same range reported by Kentucky and Texas. Over 90 percent of truck tires sampled had inflation pressures above those incorporated in road design standards. The authors recommend that pavement design standards be modified to accommodate higher tire pressures.

STUDY TITLE: Truck Weights and Pavement Performance (To be completed in 1991)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

New York State Department of Transportation
 Engineering R & D Bureau
 State Campus Building 7-A
 Room 600
 1220 Washington Avenue
 Albany, New York 12232

ABSTRACT:

A number of roads where truck loadings vary will be selected for study. These roadways will include those with an obvious point of entry and exit of heavy vehicles, multi-lane roads where heavy vehicular traffic is different. The study will gather appropriate truck weight and pavement performance data to estimate deterioration rates and accompanying maintenance needs, assess pavement type selection and design needs, establish road-user tax schedules, adjust load limits, and route vehicles that are granted overload permits.

STUDY TITLE: Variable Amplitude Loading (currently underway)

TOPIC AREA: Pavement or Bridge Performance

PERFORMING ORGANIZATION:

University of Pittsburgh
 Department of Engineering
 936 Benedum Hall
 Pittsburgh, Pennsylvania 15261

ABSTRACT:

This study will evaluate the effects of variable loading cycles and maximum amplitude changes on fatigue behavior of steel bridges.

TRUCKING PRODUCTIVITY, TRANSPORT COSTS/SAVINGS

STUDY TITLE: A Rationale for Increasing Truck Gross and Axle Weights (1986)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE (NO CHARGE) FROM:

Saskatchewan Highways and Transportation
1855 Victoria Avenue
Regina, Saskatchewan, Canada S4P 3V5

PERFORMING ORGANIZATION:

Jon Watt, Masood Hassan and R. Couturier
Saskatchewan Highways and Transportation

ABSTRACT:

This paper describes the analysis (of costs, benefits and various technical and non-technical factors) and the decision-making process leading to the more than doubling of the primary highway length in 1985. Trucks operating on primary highways are permitted payloads 15 percent greater than those allowed on secondary highways. The paper describes the method of estimating incremental costs to the highway agency resulting from the 15 percent increase in payload. It also discusses the present benefits in terms of reduced unit cost of transportation and in terms of fuel savings.

STUDY TITLE: Atlantic Provinces Motor Carrier Economic Benefit Study (1985)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE (NO CHARGE) FROM:

Fiander-Good Associates Ltd.
Suite 200, 335 Queen Street
P.O. Box 207
Fredericton, New Brunswick, Canada E3B 1B1

PERFORMING ORGANIZATION:

Fiander-Good Associates Ltd.
Fredericton, N.B., Canada E3B 1B1

ABSTRACT:

The Study evaluates the benefits accruing to the trucking industry of the region as a result of infrastructure improvements and an increase in the allowable gross vehicle weight for trucks. The study considers:

1. link-specific benefits associated with reduced travel time, accident rate reduction and vehicle operating costs as a result of geometric and surface highway improvements.
2. system benefits directly attributable to the increase in gross vehicle mass limits (greater payloads, resulting in reduced vehicle hours, vehicle operating costs and fuel consumption).

3. benefits received by the shipper resulting from reduced freight rates because of larger truck payloads. These benefits are some percentage of the increase in gross vehicle mass limit benefits.
4. benefits to the trucking industry such as increased utilization of equipment, reduction in rehandling of goods, slowing of demand for new highway facilities, increased intermodal competition, and an increase in profits and expanded markets.

STUDY TITLE: Cost Allocation for Heavy Trucks: A Pavement and Bridge Evaluation (1986)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE (NO CHARGE) FROM:

Indiana Department of Highways, Permit Section
Room 1108, State Office Building
100 N. Senate Avenue
Indianapolis, Indiana 46260

PERFORMING ORGANIZATION:

Clyde E. Williams and Associates, Inc.
8925 N. Meridian Street
Indianapolis, Indiana 46260

ABSTRACT:

The study was conducted to assess competitive advantages of the steel industry in northwest Indiana as strategic to the economic well-being of the entire state.

The study analyzes a designated heavy-truck route covering 62 miles of Indiana State highways (including 23 highway bridges) used for transporting overweight loads of steel into Michigan where such loadings are presently permitted.

The study contains both pavement and bridge evaluations and outlines the methodology, procedures, and calculations to determine the user fee.

STUDY TITLE: Final Report of the Truck Issues Advisory Committee (1986)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE (NO CHARGE) FROM:

Office of Policy Analysis
Maine Department of Transportation
State House Station No. 16
Augusta, Maine 04333

PERFORMING ORGANIZATION:

Maine Department of Transportation
Augusta, Maine 04333

ABSTRACT:

The study, directed by the Governor, was undertaken in part to alleviate confusion surrounding size and weight laws and overweight fine policies in the State of Maine. The study also considers issues concerning vehicle configurations, the economic use of the highway system, easing administrative burdens of the trucking industry and encouraging truck productivity and safety.

Some of the study recommendations include: support IRP entry and a Single Point of Contact Plan; develop an experimental vehicle policy; promote greater use of the 6-axle combination in forest products; explore the possibility of a terminal inspection program; support a national driver's license; remove the fine cap on overweight violations; and reduce the allowable triaxle weight for the forest product's 4-axle single unit truck.

STUDY TITLE: Highway Earnings

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE FROM:

American Trucking Associations Information Center
2200 Mill Road
Alexandria, Virginia 22314

PERFORMING ORGANIZATION:

James L. Covil, P.E.
Wilbur Smith Associates
NCNB Tower
Columbia, South Carolina 29202

ABSTRACT:

The study included a series of highway earnings analyses which examine the monies expended for construction, maintenance and repair on specific highway sections and their relationship to the highway user taxes paid by the various vehicle classes actually traveling the specific highway.

STUDY TITLE: Study of Greater Gross Weights for 90,000 Lb. General Commodity 6 and 7 Axle Vehicles (1988)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings

COPIES AVAILABLE (NO CHARGE) FROM:

Mr. Gedeon Picher
Office of Policy Analysis
Maine Department of Transportation
State House Station No. 16
Augusta, Maine 04333
(207) 289-2829

PERFORMING ORGANIZATION:

Office of Policy Analysis
 Maine Department of Transportation
 State House Station No. 16
 Augusta, Maine 04333

ABSTRACT:

This study explores the trade-offs associated with heavier 6-axle and 7-axle vehicles. Effects on highway consumption, bridge damage, and productivity are evaluated using simple models. Gross weights, axle spacing, and axle weights are varied in an attempt to provide a more appropriate operating point, if feasible, for the subject vehicles. Changes in ESAL's, change in bridge stress ratios for the main carrying members of simple steel bridges of varying length, and fatigue considerations are being evaluated. Incentives for change to more productive vehicles are being considered, recognizing that some configurations would require legislative revisions.

STUDY TITLE: Truck Access Study (to be completed in mid-1989)

TOPIC AREAS: Trucking Productivity, Transport Costs/Savings, and Safety

PERFORMING ORGANIZATION:

Transportation Research Board
 National Research Council
 2101 Constitution Avenue, N. W.
 Washington, DC 20418

ABSTRACT:

Section 158 of the Surface Transportation and Uniform Relocation Assistance Act of 1987 requests that the Transportation Research Board (TRB) conduct a study of various issues regarding motor vehicle size and weight regulation. This study will address the specific issue of the establishment of a nationwide policy for access to the National Network for longer and wider combination vehicles. The study process involves three tasks: (1) a review of access policies, practices, and problems; (2) an analysis of the impacts of STAA vehicles operating on access routes; and (3) a summary assessment of alternative access policies and impacts to develop recommendations for a national policy for improved access. The impacts of STAA vehicles operating on access routes that will be analyzed include transportation costs, safety, highway design, traffic operations, and highway condition.

COMBINATION VEHICLE OPERATIONS

STUDY TITLE: An Analysis of Truck Accident Involvement and Truck Accident Severities on Texas Highway System (1987)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE FROM:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Texas Transportation Institute
Texas A&M University System
College Station, Texas 77843

ABSTRACT:

This report is an addendum to a study of longer and wider trucks on the Texas Highway System. This addendum provides a summary of truck accident statistics on the Texas highway system which includes the reported frequency of truck accident involvements; distribution of truck accident involvements truck accidents. The data source, methodology, and results are presented. These accident statistics are useful as preliminary information for further sensitivity tests of policy analyses concerning truck usage and routing. Such sensitivity tests or policy analyses are not part of this addendum.

STUDY TITLE: An Assessment of the Operational Impact of the Longer and Wider Combination Vehicles on the Geometry of Diamond Interchanges (1986) (Preliminary report)

TOPIC AREA: Combination Vehicle Operations

PERFORMING ORGANIZATION:

Center for Transportation Research
Bureau of Engineering Research
The University of Texas at Austin
Austin, Texas 78705-2650

ABSTRACT:

The objective of the research in this report is to assess the operational impact of longer combination vehicles (LCVs) authorized by the Surface Transportation Assistance Act of 1982 on the geometry of diamond interchanges located along interstate highways in Texas. The assessment randomly sampled diamond interchanges and simulated all possible turn measurements of LCVs at their terminals. The movements were simulated with the computer Truck Off-tracking Model (TOM). Results include the data collected on all interchanges located along interstate highways in Texas and interval estimates of the proportion of diamonds with inadequate geometry, i.e., pavement widths at ramp terminals inadequate to accommodate the LCVs. Ninety-nine percent confidence intervals were also estimated for the extra pavement width required to prevent the LCVs from damaging pavement edges and other roadside appurtenances at the ramp terminals.

STUDY TITLE: The Safety Experience of Large Trucks in Saskatchewan (Summer 1988)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (NO CHARGE) FROM:

George Stamatinos
 Technical Research Branch
 Saskatchewan Highways and Transportation
 1855 Victoria Avenue
 Regina, Saskatchewan, Canada S4P 3V5

PERFORMING ORGANIZATION:

Dr. Gordon A. Sparks
 Saskatchewan Highways and Transportation
 1855 Victoria Avenue
 Regina, Saskatchewan, Canada S4P 3V5

ABSTRACT:

The study will quantify the exposure (vehicle kilometers traveled) of each of the major configurations of trucks weighing over 5000 kg. in Saskatchewan over the last 5 years. The study will compile an accident profile of selected data elements representing drive, vehicle, highway, and environmental factors which may be related to the accident experience, frequency and severity of large articulated trucks. Detailed on-site and/or post-accident investigations will be conducted on accidents involving double-trailer units, with particular attention being given to factors involving stability and hitch design.

STUDY TITLE: Longer Combination Vehicles Operational Test Vehicle Operations (1984)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (NO COST) FROM:

Caltrans Truck Operations Branch
 1120 N Street
 Sacramento, California 95814

PERFORMING ORGANIZATION:

Caltrans
 1120 N Street
 Sacramento, California 95814

ABSTRACT:

This report describes the Caltrans observations of the operational tests of Triple Trailers, Rocky Mountain Doubles, and Turnpike Doubles. Each combination was operated over essentially the same 1,200-mile route, allowing both observations of each combination and a direct comparison between the combinations. The report contains observations of operations over freeway interchanges, open-road travel, urban traffic (including arterials and interchanges), narrow lanes, two-lane roads, other freeway facilities such as rest areas and scales, off-tracking, speed on grades, braking, acceleration, travel during rain and wind, noise generation, and fuel economy.

STUDY TITLE: Off-Tracking Computer Model

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE FROM:

Caltrans Truck Operations Branch
Caltrans
1120 N Street
Sacramento, California 95814

PERFORMING ORGANIZATION:

Caltrans
1120 N Street
Sacramento, California 95814

ABSTRACT:

Caltrans took the off-tracking computer model developed by the University of Michigan Transportation Research Institute, enhanced it, placed it on its IBM mainframe computer, and connected it to large table plotters. The model can determine and plot the path of any point of any vehicle through any curve. It has been used to develop truck turn templates, the operating characteristics of special permit loads, the ability of various vehicles to traverse state highway routes, and to develop vehicle size legislation.

STUDY TITLE: Overlength Truck Combinations (1985)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (NO CHARGE) FROM:

Alberta Transportation
Research and Development
Twin Atria Building, First Floor
4999 98th Avenue
Edmonton, Alberta, Canada T6B 2X3

PERFORMING ORGANIZATION:

Transportation Safety Branch
Alberta Transportation

ABSTRACT:

Turnpike doubles, Rocky Mountain doubles, and triple trailer combinations were tested for critical vehicle and operational characteristics such as speed, acceleration, passing, stability and maneuverability. A literature review examined information on additional areas including braking, dynamic stability, traffic collisions, and permit practices. The study recommended that Turnpike Doubles with B-dollies should be allowed on divided highways and Rocky Mountain Doubles could operate on undivided highways with high geometric standards.

STUDY TITLE: Safety Criteria for Longer Combination Vehicles (1987)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE FROM:

(Report number yet to be assigned)
National Technical Information Service
Springfield, Virginia 22161

PERFORMING ORGANIZATION:

Analysis Group, Inc.
 Transportation Engineering Division
 500 E. Morehead Street, Suite 315
 Charlotte, N.C. 28207

ABSTRACT:

This research study examined the safety problems associated with Longer Combination Vehicles (LCVs) as well as the safety regulations used to govern their operation. A comparison between the identified safety problems and the existing safety regulations was used to develop a candidate set of model regulations to aid states with the development of their own LCV regulations. A tradeoff analysis of local access options (staging areas versus direct access) was also conducted to determine the best way for LCVs to reach terminals and food, fuel, repairs, and rest facilities. The study concluded that insufficient data exist at present to conclusively define the operational or safety problems of LCVs or to quantitatively evaluate the effects of current regulations. Further research is recommended as better data becomes available.

STUDY TITLE: Semi-Tractor Trailers and Other Large Trucks: Speeding Related to Traffic Accidents on the Interstate (1985)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (NO CHARGE) FROM:

Research Coordination, Materials and Tests Division
 Nebraska Department of Roads
 P.O. Box 94755
 Lincoln, Nebraska 68509-4759

PERFORMING ORGANIZATION:

Highway Safety Division
 Nebraska Department of Roads

ABSTRACT:

This study examined data from 1983, 1984, and 1985 to determine whether tractor-semitrailers were over- or under-represented in speed-related accidents on Nebraska's Interstate Highway System.

STUDY TITLE: Truck Accidents by Classification:
 Doubles vs. Semis Accidents Rates (1985)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (NO CHARGE) FROM:

Caltrans Truck Operations Branch
 1120 N Street
 Sacramento, California 95814

PERFORMING ORGANIZATION:

Caltrans
1120 N Street
Sacramento, California 95814

ABSTRACT:

The truck census data and classification data from the State of California were used to develop the vehicle miles of truck travel, and accident statistics were developed for a comparable period of time. Results of the study showed that single-trailer trucks and double-trailer trucks are involved in more accidents than all other vehicles and their rates are similar enough to be a single classification, large trucks. Single-unit trucks have the lowest rate of accident involvement, even lower than automobiles.

STUDY TITLE: Twin Trailer Trucks (1986)

TOPIC AREA: Combination Vehicle Operations

COPIES AVAILABLE (\$25.00) FROM:

Transportation Research Board
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

PERFORMING ORGANIZATION:

Transportation Research Board
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

ABSTRACT:

The Twin Trailer Truck Monitoring Study examined the potential safety effects of the new federal truck size rules contained in the Surface Transportation Assistance Act of 1982. The study also addressed other important effects of the new rules on the following aspects of highway transportation: trucking industry use of twins; safety consequences of using twins; pavement wear and other highway features affected by twins; and safety and pavement wear affected by 48-foot long semitrailers and 102-inch wide trucks. The study also made recommendations for further monitoring of truck activity and for continued safety improvement.