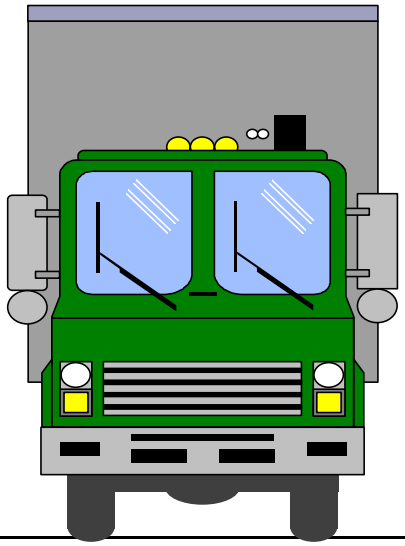
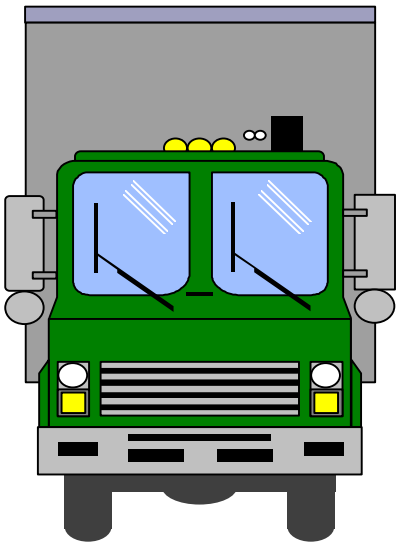
PART I

INTRODUCTION AND OVERVIEW



CHAPTER 1

Introduction



INTRODUCTION

The Federal government first became involved in truck size and weight (TS&W) regulation during the 1950s when truck axle and vehicle gross weight and width limits were established for the Interstate System.

Federal law now regulates TS&W limits by specifying basic standards and excepting certain situations from those standards by grandfather rights and/or provision of special permits. Federal laws governing truck weights apply to the Interstate System while Federal laws governing vehicle size apply to a designated National Network (NN) for Large Trucks which includes the Interstate System. Interstate weight limits are intended to prevent premature deterioration of the infrastructure, while minimum length limits are intended to enhance uniformity and productivity. (See sidebar for current Federal limits).

Underlying Federal regulation of TS&Ws are a myriad of State and local regulations. The size and weights of vehicles have been controlled by State and local law since the early part of this century. Today, while some State TS&W limits closely follow Federal limits on non-Interstate or non-NN highways, most have significantly different limits. Over the years, these limits have been changed many times in response to need and circumstances. Change continues—often without Federal involvement or influence.

The reader is referred to Volume II for a complete discussion of the Nation's TS&W laws, past and present. In addition, Chapter 3 of this Volume provides summary information regarding Federal- and State-level practices to control commercial vehicle sizes and weights.

TS&W limits directly impact motor carrier productivity because vehicle capacity determines the number and cost of trips required to transport a given amount of freight. Changes in this fundamental relationship may impact the size of the Nation's freight bill as well as international competitiveness.

CURRENT FEDERAL TRUCK SIZE AND WEIGHT LIMITS

Current Federal law includes the following limits:

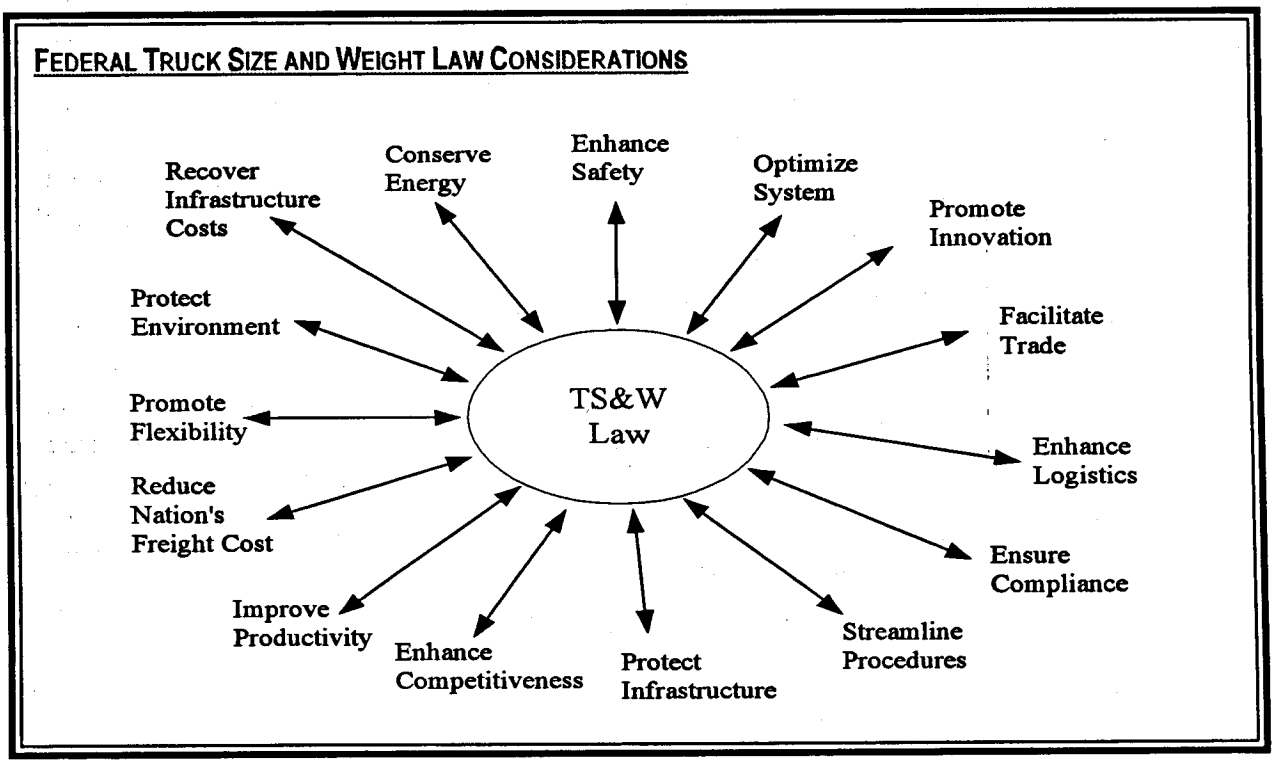
- 20,000 pounds for single axles on the Interstate System;
- 34,000 pounds for tandem axles on the Interstate;
- Application of the Federal Bridge Formula for other axle groups up to the maximum of 80,000 pounds gross vehicle weight on the Interstate;
- 102 inches for vehicle width on the National Network (NN) for large trucks;
- 48-foot (minimum) or longer, if grandfathered, for semitrailers in a semitrailer combination on the NN; and
- 28-foot (minimum) for trailers in a twin-trailer combination on the NN.

The relationship between TS&W and productivity extends beyond just transporting freight and influences the productivity of the goods production process. The ability of carriers to support advances in logistics practices and technologies, such as just-in-time delivery, depends, in part, on their capability to effectively and efficiently transport freight.

System reliability is an important determinant of the efficiency of the freight transportation system. Because of traffic congestion, the reliability of today's highway system is tenuous—particularly in major metropolitan areas. The future system will need to cope with increases in personal as well as truck travel. Projections indicate that truck traffic will increase 2.2 percent per year to the year 2000. Between 1994 (the Study's base year) and 2000 (the Study's analysis year), this would amount to an increase of over 16 percent.

All levels of government are interested in providing a transportation system that is responsive to the changing requirements of shippers and carriers. However, the optimal way of improving motor carrier productivity and system reliability is not immediately apparent. For example, increases in vehicle capacity, while potentially reducing the number of trucks, may have negative safety consequences. Changes in vehicle operating weights may increase rollover potential.

Also of concern are the fiscal implications of preserving and enhancing the condition of the highway infrastructure. Larger and heavier trucks can impose additional costs due to increased road wear and the need for new roadway geometry design



requirements, and revised bridge safety margins.

Government officials, as well as interest groups and the general public, are interested in the environmental impacts of changes to the Nation's TS&W limits. Further, competing modes concerned about inequitable operating conditions and potential loss of market share are important stakeholders in this issue. Finally, the TS&W issue includes an international dimension. For example, the flow of North American continental trade is constrained by differences in allowable limits imposed by the United States, Mexico and Canada.

The competing economic and social dimensions of the TS&W issue challenge policy makers to find a reasonable balance. This has proven very difficult in the past as some of the issues are not readily quantifiable. For example, the ability to assess the historical accident and safety patterns of various types and specific configurations of trucks is very limited. There are simply too few operations in many cases to establish such a record. Further complicating the discussions are the very different perspectives of those participating in the debate.

In an effort to better understand the effects of TS&W policy changes on the wide range of possible impacts, the Department of Transportation (DOT) has undertaken this *Comprehensive TS&W (CTS&W) Study*.

The last such study conducted by the DOT was completed in 1981. The Transportation Research Board (TRB) and the General Accounting Office conducted studies looking at specific aspects of the TS&W issue in the late 1980s and 1990s. (See "Federal Truck Size and Weight Studies Since the 1980's" box, on page 1-4.)

STUDY PURPOSE

The purpose of this Study is to provide a policy architecture within which the Nation's current body of TS&W laws may be assessed. The Study tools can be used to estimate the impacts of alternative TS&W laws on safety, intermodal competition, infrastructure performance, economic productivity, traffic flow, environmental quality and energy consumption. However, limitations in data and analytical methods preclude precise answers.

The Study is not intended to provide specific policy recommendations. Rather, it will provide a fact-based framework within which to consider policy alternatives to the current Federal TS&W regulations.

STUDY APPROACH

The Study was conducted in a unique way within the Department. First, multimodal policy and technical oversight groups guided its development. Second, the *1997 Federal Highway Cost Allocation (HCA) Study* was coordinated with this Study to ensure internally consistent analytical procedures. Third, the Study was designed to establish an ongoing TS&W analysis capability within the Department. And, fourth, the Study approach included an extensive outreach activity.

FEDERAL TRUCK SIZE AND WEIGHT STUDIES SINCE THE 1980s

U.S. Department of Transportation

1981 ***An Investigation of Truck Size and Weight Limits***: This study examined--among other issues--the requirement for, and desirability of, uniformity in maximum truck size and weight (TS&W) limits throughout the United States.

1985 ***Feasibility of a Nationwide Network for Longer Combination Vehicles:*** This study addressed the potential benefits and costs that could be anticipated from the establishment of a nationwide network for Longer Combination Vehicles (LCVs).

1986 ***Longer Combination Vehicle Operations in Western States***: In 1985, the Senate Appropriations Committee called for a study of LCV operations in the western States.

Transportation Research Board

1986 ***Twin Trailer Trucks (Special Report 211)***: This study addressed the safety and infrastructure impacts of vehicles with twin short trailers.

1989 ***Providing Access for Large Trucks (Special Report 223)***: This report defined reasonable access for the longer semitrailer and double-trailer combinations which were allowed by the Surface Transportation Assistance Act of 1982.

1990 ***Truck Weight Limits: Issues and Options (Special Report 225)***: This study focused primarily on the grandfather rights issue.

1990 ***New Trucks for Greater Productivity and Less Road Wear: An Evaluation of the Turner Proposal (Special Report 227)***: This study evaluated a TS&W proposal which provided increased truck weights when additional axles were added.

General Accounting Office

1992 ***Truck Safety: The Safety of Longer Combination Vehicles is Unknown***

1993 ***Longer Combination Trucks: Driver Controls and Equipment Inspections Should be Improved***

1994 ***Longer Combination Trucks: Potential Infrastructure Impacts, Productivity Benefits, and Safety Concerns***

INTERNAL DEPARTMENTAL COORDINATION

Policy oversight and direction was provided by a Departmental Policy Oversight Group (POG). The POG is comprised of executives from throughout the Department including representatives from the Office of the Secretary of Transportation, FHWA, the Federal Railroad Administration, the National Highway Traffic Safety Administration and the Maritime Administration. The POG is chaired by the Assistant Secretary for Transportation Policy.

In addition to POG oversight, a Multimodal Advisory Group (MAG) was established to ensure that major technical decisions shaping the Study would be made on an intermodal basis. The MAG provided ongoing guidance and early review of draft documents associated with the final Study.

In 1997, these two groups collaborated to publish a Departmental National Freight Policy Statement. This statement guided development of the Study's analytical framework, particularly the selection of relevant impact areas. It establishes the most important principles to guide Federal decisions affecting freight transportation across all modes. The guiding principles appear in the "National Freight Transportation Policy Statement" box, below.

NATIONAL FREIGHT TRANSPORTATION POLICY STATEMENT (JANUARY 1997)

The Department of Transportation established eight principles to guide freight transport policy development:

- Provide funding and a planning framework that establishes priorities for allocation of Federal resources to cost-effective infrastructure investments that support broad National goals;
- Promote economic growth by removing unwise or unnecessary regulation and through the efficient pricing of publicly financed transportation infrastructure;
- Ensure a safe transportation system;
- Protect the environment and conserve energy;
- Use advances in transportation technology to promote transportation efficiency and safety;
- Effectively meet our defense and emergency transportation requirements;
- Facilitate international trade and commerce; and
- Promote effective and equitable joint utilization of transportation infrastructure for freight and passenger service.

FEDERAL HIGHWAY COST ALLOCATION STUDY

Production of this Federal *CTS&W Study* was coordinated closely with production of the *Federal HCA Study* issued in October 1997. The 1997 *HCA Study* also benefitted from POG input and guidance. The *HCA Study* provides information on how changes in the Federal highway program could affect the relative share of infrastructure and other highway-related costs attributable to different vehicle classes. These two studies when taken together, provide information on how alternative TS&W limits might affect highway infrastructure and social costs and what impact these changes would have on assignment of cost responsibility and user fees to different truck configurations.

Exhibit 1-1 displays (1) the estimated responsibility for Federal highway-related program costs funded from the Highway Trust Fund in 2000; (2) the Federal highway user fees projected to be paid in 2000 assuming the Federal highway user fee structure remains unchanged; and (3) estimated Federal

EXHIBIT 1-1
2000 FEDERAL COST RESPONSIBILITY AND USER FEES BY VEHICLE CLASS

Vehicle Class/ Registered Weight	Cost Responsibility cents-per-mile	User Fee Payments cents-per-mile	Ratio of User Charges to Occasioned Costs
Autos	0.65	0.64	1.0
Pickups/Vans	0.65	0.89	1.4
Buses	2.57	0.27	0.1
All Passenger vehicles	0.66	0.70	1.1
Single Unit Trucks			
≤ 25,000 pounds	1.75	2.66	1.5
25,001 - 50,000 pounds	4.38	3.18	0.7
> 50,000 pounds	14.60	6.57	0.5
All Single Units	3.51	3.13	0.9
Combination Trucks			
≤ 50,000 pounds	2.78	4.53	1.6
50,001-70,000 pounds	4.25	4.72	1.1
70,001-75,000 pounds	6.25	6.24	1.0
75,001-80,000 pounds	7.08	6.41	0.9
80,001-100,000 pounds	12.50	7.18	0.6
> 100,000 pounds	16.60	8.30	0.5
All Combinations	6.90	6.30	0.9
All Trucks	5.48	4.92	1.0

Source: 1997 Federal Highway Cost Allocation Study Summary Report

equity ratios in 2000 which assume the current highway user charge structure and the same highway program composition as during the base period (defined as the Intermodal Surface Transportation Efficiency Act of 1991 time frame).

ONGOING TRUCK SIZE AND WEIGHT RESEARCH EFFORT

The current *CTS&W Study* effort establishes an ongoing TS&W research activity within DOT. In the future, there will be updates of the Study every three years. As required, new analytical approaches will be developed and existing ones refined. This will allow the Department to more fully address the impacts of current Federal laws and regulations and examine policy alternatives.

This Study should be viewed as initiating a longer-term effort where the analytical approaches will be updated and refined as research funds and time permit.

The FHWA arranged for the TRB to organize a peer review panel which will provide input to the DOT's long-term TS&W research agenda. The *CTS&W Study* will be used as a point of departure for exploration of future research activities. The panel will address the following questions: (1) What information is needed to formulate efficient, effective and equitable TS&W laws; (2) What information is available with respect to TS&W issues; and (3) What data and analytical tools are required to bridge the gap between what is available and what is required?

PUBLIC OUTREACH

An unprecedented level of outreach was undertaken in conducting the Study. Outreach activities included: (1) a Federal Register notice requesting initial public comment, (2) public meetings with representatives of large and small carriers, trucking industry associations, safety advocates, and representatives from State and local governments; (3) regional focus sessions focused on securing input from major constituencies and experts; (4) special teleconference sessions addressing issues of importance with our State partners; and (5) external review of draft documents by Congress, State representatives and other interested parties, prior to finalization.

STUDY PRESENTATION

OVERVIEW

The *1998 CTS&W Study* is provided in four volumes. Volume I, "Executive Summary," synthesizes the findings presented in Volume II and Volume III. Volume II, "Background and Issues," summarizes the information developed during the course of the Study in the following areas: (1) TS&W regulations; (2) motor carrier operations and industry structure; (3) truck-rail competition, (4) shipper concerns; (5) highway safety and traffic operations, (6) highway infrastructure, and (7) enforcement.

Volume III, "Scenario Analysis," is described in the following section. Volume IV, "Guide to Documentation," presents a listing of the technical reports where methodological details related to analytical aspects of the Study may be found.

ORGANIZATION OF VOLUME III

Volume III presents a broad assessment of the impacts that could be expected as a result of changes in TS&W limits. Part I (Chapter 1 - Chapter 3) provides background information required to understand the analytical findings. The first chapter includes the motivation for the Study, the Study's purpose and the Department's approach. Chapter 2 provides an overview of the analytical framework. Chapter 3 offers descriptions of the illustrative TS&W policy scenarios evaluated for the Study.

Part II (Chapter 4) presents a key component of the TS&W analysis: the freight distribution model. The methodology for estimating diversion from rail boxcar to truck, from rail intermodal to truck and from one truck configuration to another is provided. The chapter concludes with a presentation of the travel (vehicle miles and car-miles) expected for each of the illustrative scenarios.

Part III - Part V (Chapter 5 - Chapter 11) is organized by impact area. Each impact area discussion includes a brief description of the issue and analytical approach, the sources of data and any relevant caveats. Within the context of the impact area discussions, analytical findings for each scenario are provided.

Part III (Chapter 5 - Chapter 7) deals with the relationship between commercial vehicle sizes and weights and highway agency costs associated with pavements, bridges and roadway geometry.

Part IV (Chapter 8 - Chapter 10) provides a discussion of the projected external costs (or benefits) associated with a new mix of commercial vehicles in terms of configurations, sizes and weights. Externalities included are safety, traffic flow, energy consumption and environmental quality.

Part V (Chapter 11 - Chapter 12) offers information on the change in shipper transportation costs that could result from each of the illustrative scenarios. Specifically, post scenario costs to truck and rail customers are provided.

The Volume concludes with a summary chapter in Part VI (Chapter 13) where the illustrative scenarios are discussed and guiding principles, based on the analysis, are provided. (Note: This chapter is not included in the draft version of Volume III.)

It should be noted that this volume is a draft work in progress and will be revised before the final report is released in late 1998.

The analytical results presented in this document will be subject to further Department review, and of course, where appropriate will be revised as recommended by external reviewers. Therefore, the findings in this draft should not be construed as final.