

Analysis of the Truck Inventory and Use Survey
from the Truck Size and Weight Perspective
for Trucks with Five-Axles or More

U.S. Department of Transportation
Comprehensive Truck Size and Weight Study
Report No. 2

Activity I: Task B
Identify Market Segments—Competitive and Noncompetitive
TIUS Data Component

February, 1996

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The primary objectives of the U.S. Department of Transportation's Comprehensive Truck Size and Weight (TS&W) Study are to:

- assess the potential economic, safety, and environmental impacts of changing existing TS&W limits; and
- identify opportunities to increase the efficiency of freight transportation while preserving safety and highway infrastructure.

Reports which have been completed for the TS&W Study, to date, include the following:

- (1) Synthesis of Truck Size and Weight Studies and Issues
- (2) Analysis of the Truck Inventory and Use Survey from the Truck Size and Weight Perspective for Trucks with Five-Axles or More

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This document was prepared for use in the U.S. Department of Transportation's Comprehensive Truck Size and Weight Study. The views expressed are those of the author(s) and are not necessarily those of the U.S. Department of Transportation.

Executive Summary

This report, as part of the U.S. Department of Transportation (DOT) Comprehensive Truck Size and Weight (TS&W) Study, provides factual information about and analysis of the U.S. freight hauling truck fleet, and is based on the Truck Inventory and Use Survey (TIUS) data bases from 1992 and 1987. The Bureau of the Census collects truck data every five years with 1992 being the latest data available. The TIUS can be used to help understand the U.S. truck fleet make-up, size, uses, location, and type of commodities hauled at the national and regional levels. This information will be used to present a picture of the U.S. truck fleet and its uses as well as to evaluate the potential national/regional TS&W policy options.

The TIUS provides data on the physical and operational characteristics of the U.S. truck fleet. The survey contains a sample of privately- and commercially-owned trucks. The survey also covers trucks used for personal transportation and freight hauling. The survey sample is drawn from each state's registration records. For example, in 1992, the sample size was over 150,000 trucks which reflected a population of over 60 million commercially- and privately-owned trucks in the U.S.

Since this report supports the U.S. DOT TS&W Study, larger trucks hauling freight are the focus of the analysis. Specifically, trucks with 5-axles or more that contain three types of truck-trailer combinations were analyzed:

- straight truck with one trailer
- truck tractor with semitrailer
- truck tractor with two or more trailing units.

This Executive Summary provides highlights of these analyses of the TIUS data, however, it is not a summary of the entire report. First, some cautions are provided about the use of the TIUS data analyses. Second, information is provided about how the data are organized in the analyses with reference to the portions of the main report that are relevant to each topic area. Third, a brief set of highlights, based on the more detailed analyses and findings contained in the body of this report, provide a snapshot of the 1992 U.S. commercial truck fleet.

Cautionary Note

There are a number of cautionary notes in reviewing this analysis of the TIUS (see Section 1.4 for more detail), including:

- Data reported in the TIUS is based on State registration data and the potential for registration-bias exists.

- Survey and population estimates are by registration state and care needs to be taken in conducting analysis at the state level. For example, triples are reported in Minnesota where the use of such vehicles is not permitted. This may be due to ownership in one state and use in another state.

Vehicle Categorization

In this report, the trucks from the TIUS data base were categorized into vehicle configuration classes, vehicle groups, and state of registration. The vehicle configuration class identifies the way the truck is most often operated or used. Each truck was classified based on three factors:

- (1) Vehicle type: straight truck not pulling trailer, straight truck pulling trailer, tractor pulling trailer, tractor pulling two or more trailers
- (2) Number of axles on truck or tractor
- (3) Number of axles on each trailer.

Based on this categorization, the data were analyzed using five major vehicle configurations (truck, truck + trailer, tractor-semitrailer, tractor + doubles, and tractor + triples) and 31 subclasses (see Section 2.1 for detailed descriptions).

Vehicle Groups

In this report, the TIUS data for trucks with 5-axles or more were analyzed by dividing the data into eight vehicle groups, as follows (see Figure 2.2-1 in Section 2.2 for descriptions):

- Truck + trailer with 5-axles (2+3 and 3+2)
- Truck + trailer with 6-axles or more (3+3, 4+2, 4+3)
- 3-S2 tractor-semitrailer
- Tractor-semitrailer with tridem axles (2-S3, 3-S3, 4-S3)
- Other tractor-semitrailer (4-S1, 4-S2)
- STAA tractor + double trailers (2-S1-2)
- Tractor + double trailer combinations with 6-axles or more (all doubles except STAA as defined above).
- Tractor + triple trailers.

Traffic Regions And States

The report organizes the TIUS truck data into five regions (North Central, North East, South Atlantic, South Gulf, and West) and for each of the 50 states and Washington, D.C. as shown in Figure ES-1 (see Section 2.3 of the report).

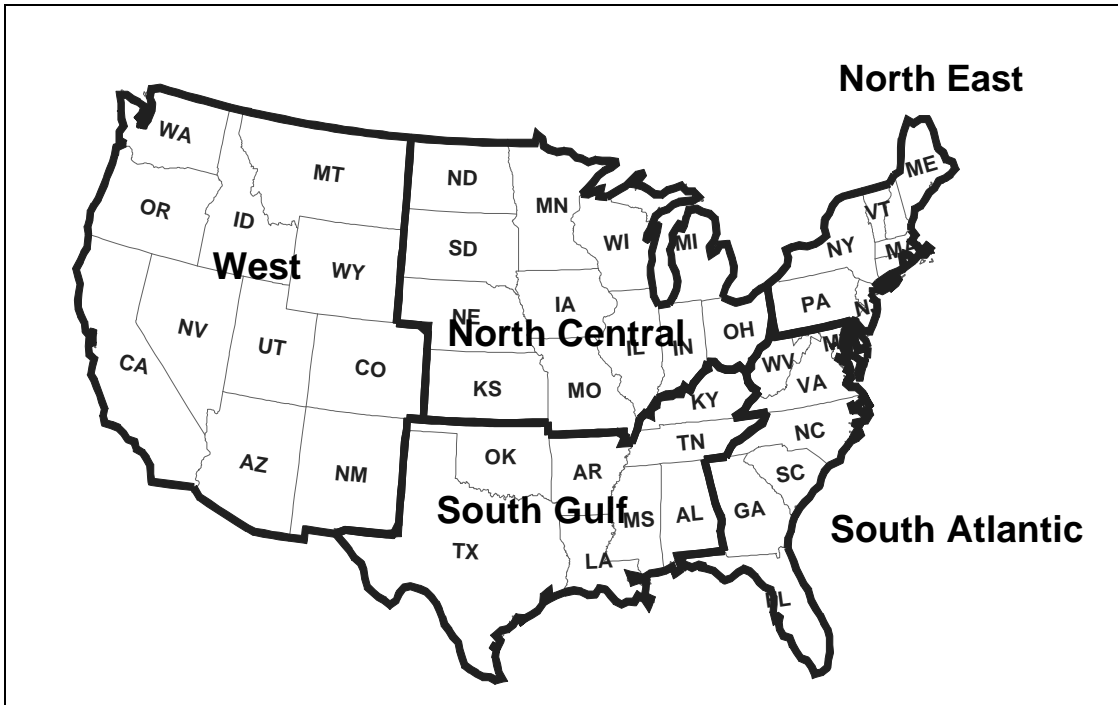


Figure ES-1. Five Regions For Analysis

Body Types

In this report, the TIUS data for trucks with 5-axles or more were analyzed by 11 major body types, as follows (see Section 4.0 for more details):

- Platform (which consists of low boys and basic platform types)
- Van (which includes multi-stop, basic enclosed, drop frame, insulated non-refrigerated, insulated refrigerated, and open top types)
- Auto transport
- Dump truck
- Grain bodies
- Garbage truck
- Livestock truck
- Pole, logging truck
- Tank truck, dry bulk

- Tank truck, liquids or gas
- Other (includes platforms with devices permanently mounted, beverage truck, utility truck, winch or crane truck, wrecker, service truck, yard tractor, oil field truck, concrete mixer, and other).

Commodities Hauled

For the above-mentioned vehicle groups and body types, the TIUS database was also analyzed by principal commodity types (see Section 6.0). There were 29 commodity types ranging from raw materials to manufactured goods.

Highlights of the U.S. Commercial Truck Fleet

The TIUS data provide a comprehensive factual base of U.S. commercial freight hauling trucks. The focus of this report is a selected subset of the U.S. truck fleet, trucks with 5-axles or more, that will most likely be influenced by Federal TS&W regulations and provides data/analysis of fleet size, location, vehicle configuration, body type, principal commodity products hauled, and vehicle operating statistics. Table ES-1 provides only a snapshot of the 5-axles or more truck fleet in 1992 and some changes since 1987.

TABLE ES-1 1992 U.S. COMMERCIAL FREIGHT TRUCK FLEET HIGHLIGHTS (Trucks with 5-axles or more, unless noted otherwise)
<p>Truck Population</p> <ul style="list-style-type: none"> ✓ 4.1 million total commercial trucks in 1992, a 4% increase from 1987.¹ ✓ Total U.S. commercial truck fleet distribution:¹ <ul style="list-style-type: none"> - 68% straight trucks - 4% straight trucks pulling trailer(s) - 26% tractor-semitrailer - 1% tractor with 2 or more trailers. ✓ 976,000 trucks with 5-axles or more (of most interest to truck size and weight analysis) in 1992, a 22% increase from 1987.

¹The data reflect the total commercial truck fleet including trucks with 5-axles or more, but excludes personal trucks.

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 5-axles or more, unless noted otherwise)

- ✓ 3-S2 (3-axle tractor with 2-axle semitrailer) trucks
 - Most common freight hauling truck
 - 19% of total truck fleet¹
 - 78% of trucks with 5-axles or more
 - 21% growth in number of trucks between 1987/1992.
- ✓ Truck + trailers [straight trucks pulling a trailer(s)]
 - 4% of total truck fleet¹
 - 7% of trucks with 5-axles or more, little change from 1987.
- ✓ Tractor-semitrailers with tridem axles (2-S3, 3-S3, 4-S3)
 - 2% of total truck fleet¹
 - 7% of trucks with 5-axles or more
 - 20% growth in the number of trucks between 1987/1992.
- ✓ STAA (2-axle tractor with 2-28' trailing units) trucks
 - Less than 1% of total truck fleet¹
 - Only 3% of trucks with 5-axles or more, little change from 1987.
- ✓ Double (2 or 3-axle tractor with 2 trailing units with 3+ axles) trucks
 - Less than 1% of total truck fleet¹
 - 2% of trucks with 5-axles or more.
- ✓ Triple (2 or 3-axle tractor with 3-28' trailing units) trucks
 - Less than 1% of total truck fleet¹
 - Less than 1% of trucks with 5-axles or more.

Regional Differences

- ✓ West Region had 53% increase in trucks with 5-axles or more versus the national average of a 22% increase between 1987/1992.
- ✓ North Central Region contains the largest number of trucks with 5-axles or more with 38%, while the other four regions have about 15% each.

¹The data reflect the total commercial truck fleet including trucks with 5-axles or more, but excludes personal trucks.

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 5-axles or more, unless noted otherwise)

- ✓ Illinois, California, Texas, Pennsylvania, and Ohio account for 36% of trucks with 5-axles or more.

Trailer Types

- ✓ 3-S2 Van is the preferred freight hauling truck configuration accounting for 40% of all trucks with 5-axles or more.
- ✓ Van is the preferred trailer body type, used for 45% of all trucks with 5-axles or more—a 31% growth in the number of trailers with this body type was experienced between 1987 and 1992.
- ✓ Platform is second preferred trailer type with 22% of all trailers, but no growth from 1987.
- ✓ Van and Platform trailers comprise about 67% of all body types used to haul freight.

Commodities Hauled

- ✓ Top 7 carried commodities are: Processed Foods, Mixed Cargo, Building Material, Farm Products, Paper Products, Primary Metal, and Chemicals, respectively [as measured by total fleet vehicle miles of travel (VMT)].
- ✓ STAA vehicles (2-S1-2) predominately carry Mixed Cargo products (as measured by VMT).
- ✓ Tridem axle semitrailers predominately carry Building products and Machinery products (as measured by VMT).

Trailer Width

- ✓ 102" trailer width gaining favor in all major trailer body types (e.g., 65% of 3-S2 Basic Enclosed Vans use 102").
- ✓ 96" trailer width still preferred with several trailer body types on 3-S2s (platform, grain, liquid tank, and dry tank).

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 5-axles or more, unless noted otherwise)

Trailer Lengths

- ✓ 3-S2 Basic Enclosed Van increased use of 53 foot trailer from about 17% in 1987 to 29% in 1992.²
- ✓ 3-S2 Reefer Van increased use of 53 foot trailer from about 27% in 1987 to 36% in 1992.²
- ✓ 3-S2 Liquid Tank, Dry Tank and Dump have little or no use of 53 foot trailers (less than 7%).²

Truck Weights

- ✓ Average tare weight increased about 1,000 to 2,000 lbs., for trucks with 5-axles or more between 1987/1992 (e.g., 3-S2 Basic Enclosed Vans increased from 29,300 to 30,500 lbs.).
- ✓ Average payload weight decreased, about 1,000 to 3,000 lbs., for trucks with 5-axles or more between 1987/1992 (e.g., 3-S2 Basic Enclosed Vans decreased from 37,500 to 36,200 lbs.).

Truck VMT

- ✓ Average annual VMT increased, 5 to 6 percent, for trucks with 5-axles or more between 1987/1992 (e.g., 3-S2 Basic Enclosed Vans VMT increased from 76,300 to 79,700).

²An overall vehicle (tractor-semitrailer) length of 65 feet or more was used as a measure of the use of 53 foot trailers for tractor-semitrailer combinations.

Source: 1992 and 1987 TIUS data base.