

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

U.S. Department of Transportation
Comprehensive Truck Size and Weight Study
Report No. 6

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

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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
- (3) Truck Size and Weight Modeling Workshop
- (4) Truck Size and Weight Performance-Based Workshop
- (5) Western U.S.-Canada Crossborder Case Study.
- (6) Analysis of the Truck Inventory and Use Survey from the Truck Size and Weight Perspective for Trucks with Four-Axles or Less

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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 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 U.S. 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 makeup, size, uses, location, and type of commodities hauled at the national, regional, and local 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 sample is drawn from each state's registration records. The sample contains privately- and commercially-owned trucks, as well as, trucks used for personal transportation and freight hauling. In 1992, the sample size was approximately 150,000 trucks which reflected a population of 60 million commercially- and privately-owned trucks in the U.S.

This report on the 4-axles or less truck fleet compliments an earlier U.S. DOT TS&W Study (Report #2) of the 5-axles or more commercial freight hauling fleet. Specific 4-axles or less truck types analyzed:

- single unit straight truck
- single unit straight truck with trailer
- tractor with semitrailer.

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, provides a snapshot of the 1992 U.S. 4-axles or less 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 a trailer, straight truck pulling a trailer, tractor pulling a trailer
- (2) Number of axles on truck or tractor
- (3) Number of axles on a trailer.

Vehicle Groups

In this report, the TIUS data for trucks with 4-axles or less were analyzed by dividing the data into seven vehicle groups, as follows (see Figure 2.2-1 in Section 2.2 for descriptions):

- 2-axle Straight Truck
- 3-axle Straight Truck
- 4-axle Straight Truck
- 2-axle Straight Truck pulling a 2-axle trailer
- 2-axle Tractor pulling a 1-axle semitrailer
- 2-axle Tractor pulling a 2-axle semitrailer
- 3-axle Tractor pulling a 1-axle semitrailer

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).

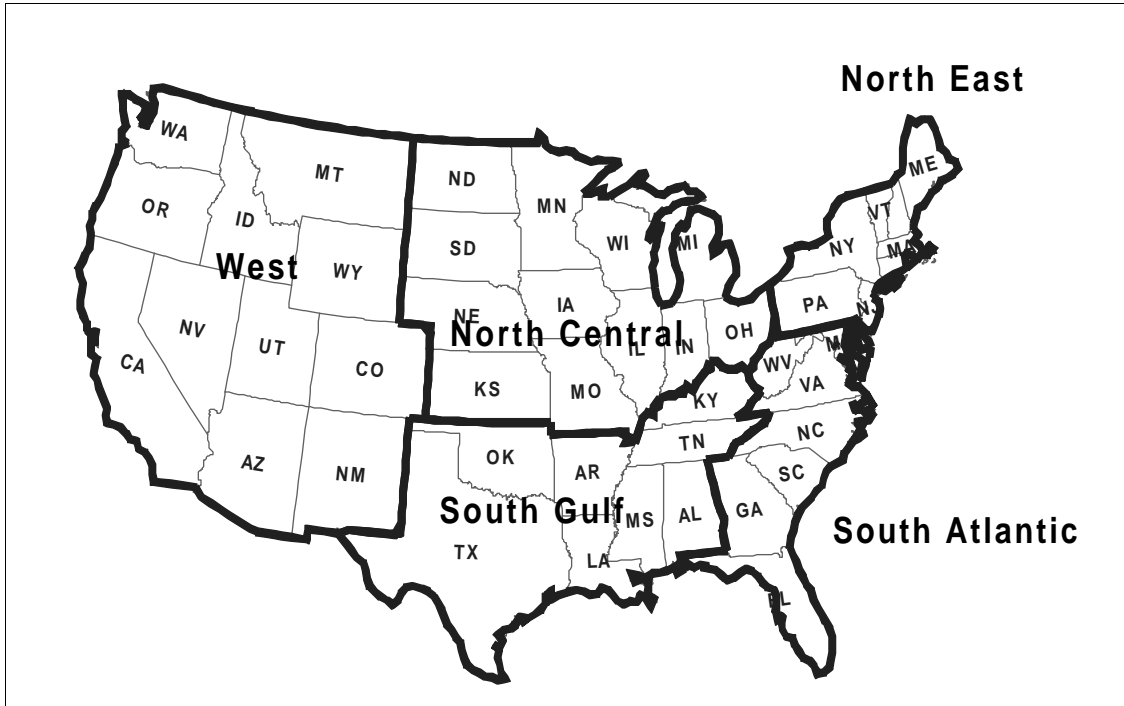


Figure ES-1. Five Regions For Analysis

Body Types

In this report, the TIUS data for trucks with 4-axles or less were analyzed by the various body types which include platforms, vans, tank trucks, etc. (see Section 4.0 for more details).

Commodities Hauled

For the above-mentioned vehicle groups and body types, the TIUS database was also analyzed by principal commodity types (see Sections 6.0 and 7.0). There were 29 commodity types ranging from raw materials to manufactured goods.

Highlights of the U.S. 4-Axles or Less 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 4-axles or less. Table ES-1 provides only a snapshot of the 4-axles or less truck fleet in 1992 and some changes since 1987.

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 4-axles or less, unless noted otherwise)

Truck Population

- ✓ 4.1 million total commercial trucks in 1992, a 4% increase from 1987.¹
- ✓ Total U.S. commercial truck fleet distribution:¹
 - 68% straight trucks
 - 4% straight trucks pulling trailer(s)
 - 26% tractor-semitrailer
 - 1% tractor with 2 or more trailers.
- ✓ 2,773,000 trucks with 4-axles or less in 1992, no growth from 1987.
- ✓ 2-axle straight trucks
 - 49% of total truck fleet¹
 - 71% of trucks with 4-axles or less
 - 6% decline in number of trucks between 1987/1992.
- ✓ 3-axle straight trucks
 - 10% of total truck fleet¹
 - 15% of trucks with 4-axles or less
 - 7% growth in number of trucks between 1987/1992.
- ✓ 4-axle straight trucks
 - 2% of total truck fleet¹
 - 3% of trucks with 4-axles or less
 - 44% growth in the number of trucks between 1987/1992.
- ✓ Truck + trailer (2-axle truck + 2-axle trailer)
 - 3% of total truck fleet¹
 - Only 4% of trucks with 4-axles or less
 - 30% growth in the number of trucks between 1987/1992.

¹The data reflect the total commercial truck fleet including trucks with 4-axles or less and trucks with 5-axles or more, but excludes personal trucks.

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 4-axles or less, unless noted otherwise)

- ✓ 2-S (2-axle tractor with 1-axle semitrailer) trucks
 - 2% of total truck fleet¹
 - 2% of trucks with 4-axles or less, little change from 1987.
- ✓ 2-S2 (2-axle tractor with 2-axle semitrailer) trucks
 - 3% of total truck fleet¹
 - 5% of trucks with 4-axles or less, decrease of 9% from 1987.
- ✓ 3-S1 (3-axle tractor with 1-axle semitrailer) trucks
 - less than 1% of total truck fleet
 - less than 4% of trucks with 4-axles or less, with a notable decrease from 1987.

Regional Differences

- ✓ North Central Region contains the largest number of trucks with 4-axles or less with 33%, while the other four regions have about 16% each.
- ✓ California, Illinois, Texas, Pennsylvania, and Ohio account for 31% of trucks with 4-axles or less.

Body Types

- ✓ Platforms (i.e., Platform with Devices, Basic Platform, and Low Boy) accounted for 30% of the fleet with the Basic Platforms being the most prevalent type (21%) but a notable decrease from 1987.
- ✓ Van body type (i.e., Van, Multi-Stop Van, Insulated Non-Refrigerated, Insulated Refrigerated, Drop Frame, Open Top, and Basic Enclosed Van) accounted for 25% of the fleet with Basic Enclosed Vans being the most common (13%).
- ✓ Dump trucks accounted for 14% of the fleet.
- ✓ Grain Bodies accounted for 8.0% of the fleet.
- ✓ Each of the remaining body types accounted for less than 5% of the fleet.
- ✓ Garbage, Service, and Utility trucks had the largest increase between 1987/1992 with 38%, 31%, and 22%, respectively.

Commodities Hauled

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 4-axles or less, unless noted otherwise)

- ✓ Top 7 carried commodities are: Building Material, Processed Foods, Mixed Cargo, Craftsman's Equipment, Farm Products, Refuse, and Transport Equipment, respectively [as measured by total fleet vehicle miles of travel (VMT)].
- ✓ 2-axle trucks carry 59% (as measured by VMT) of all commodities, predominately processed food products.
- ✓ 3-axle and 2-S2 carry about 15%, each, of all commodities, predominately Building, Refuse, Processed Foods, and Mix Cargo commodities as measured by VMT.

Vehicle Configuration Shifts

- ✓ Beverage trucks shifted (as a percent of configuration types) from 2-axle to 2-S2 between 1987/1992.
- ✓ Basic Platform trucks, still the largest (count) body type, decreased 25% between 1987/1992 predominately in the 2-axle configuration.
- ✓ Auto Transport trucks shifted from 2-axle to 2-S2 between 1987/1992.
- ✓ Grain Bodies trucks shifted from 2-axle to 3-axle between 1987/1992.
- ✓ Garbage trucks shifted from 2-axle to 3- and 4-axle trucks between 1987/1992.
- ✓ Dump and Concrete trucks shifted from 2- and 3- axle to 4-axle trucks between 1987/1992.

Trailer Width

- ✓ 102" trailer width not gaining favor in all major trailer body types for 2-S1 and 2-S2 except for the Basic Enclosed Vans.
- ✓ 96" trailer width still preferred by all major body for 2-S1 and 2-S2 types except for Basic Enclosed Van.

Truck Weights

TABLE ES-1
1992 U.S. COMMERCIAL FREIGHT
TRUCK FLEET HIGHLIGHTS
(Trucks with 4-axles or less, unless noted otherwise)

- ✓ Average tare weight increased about 1,000 lbs., for trucks with 4-axles or less between 1987/1992 (e.g., 2-axle Basic Platform increasing from 9,300 to 9,500 lbs.).
- ✓ Average payload weight decreased, about 2,000 lbs., for trucks with 4-axles or less between 1987/1992 (e.g., 2-axle Basic Platform decreased from 8,060 to 6,080 lbs.).
- ✓ Garbage and Concrete Mixer 3-axle trucks typically weight-out, under maximum loaded weights.

Truck VMT

- ✓ Almost all trucks travel intra-state and short-haul.
- ✓ Average annual VMT increased, 2 to 3 percent, for trucks with 4-axles or less between 1987/1992 (e.g., 2-axle Basic Platform VMT increased from 8,050 to 9,300).

Source: 1992 and 1987 TIUS data base.