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

Prepared by

Alan Clayton
Phil Blow
Karen White
Mark Dielman
Carina Tornow
Mohammed Alam
Jessie Yeow
Christine Marksbury
Luis Escobar
Ansari Khan
Ben Ritchey
Harry Cohen

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

For more information, call Karen E. White, FHWA, 202-366-9474, 202-366-7696 (FAX), or e:mail: kewhite@intergate.dot.gov

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).

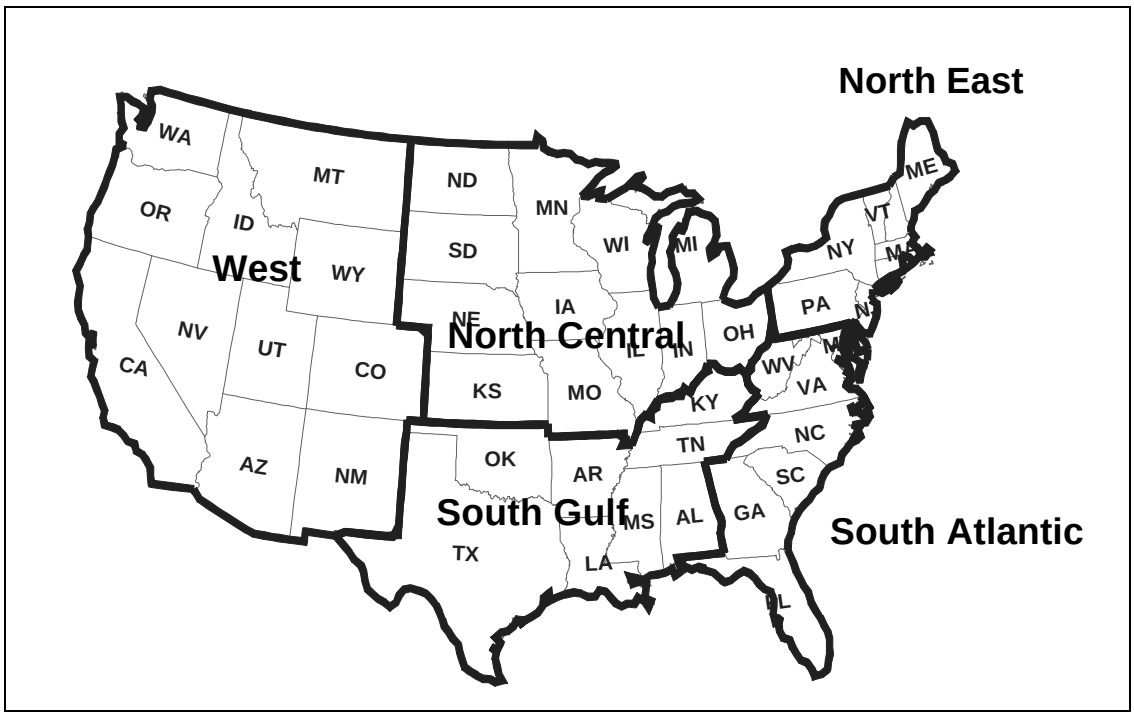

Figure ES-1. Five Regions For Analysis

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)

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.

✔ 976,000 trucks with 5-axles or more (of most interest to truck size and weight analysis) in 1992, a 22% increase from 1987.

[1]The 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 fleet[1]
- 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 fleet[1]
- 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 fleet[1]
- 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 fleet[1]
- 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 fleet[1]
- 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 fleet[1]
- 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.

[1]The 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).

[2]An 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.

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1.0 Introduction

1.1 Purpose and Scope

The purpose of Task B, Identify Market Segments, of the United States Department of Transportation (U.S. DOT) Comprehensive Truck Size and Weight (TS&W) Study is to better understand the relative size and location of freight markets in the U.S. These freight markets are segmented by length of haul, freight density, value, commodities, corridors, service quality, volume of freight by highway system, and back-haul. Understanding the important market segments will provide insight into the extent of impact of Federal TS&W regulation on freight; will help in the analysis of case studies; and ultimately will simplify the analysis of the policy options. A topology of market segments is being developed which will indicate the relative likelihood of various commodities being shipped by different modes or different truck types based upon a review of previous studies, including results of the Commodity Flow Survey (CFS), the Truck Inventory and Use Survey, the Truck Size and Weight case studies, and other databases.

The focus of this report, as part of the U.S. DOT TS&W Study, is to provide factual information and analysis of the U.S. freight hauling trucking industry using the U.S. Bureau of the Census Truck Inventory and Use Survey (TIUS) databases for 1992 and 1987. The TIUS is collected every five years with 1992 being the latest data base collected. The TIUS can be used to provide a better understanding of the U.S. truck fleet make-up, size, uses, location, and type of commodities hauled. This report provides data and analysis utilizing this truck fleet database and provides a picture of the U.S. national and regional truck fleets (see Section 1.3 for more details). The truck fleet of interest in this report is the freight-hauling larger trucks, specifically trucks with 5-axles or more.

1.2 Truck Inventory and Use Survey (TIUS)

The Bureau of the Census conducts the Truck Inventory and Use Survey (TIUS) every 5 years. TIUS provides data on the physical and operational characteristics of the United State's truck population for that survey year. It is based on a sample of private and commercial trucks registered (or licensed) in each State. In 1992, a sample of over 150,000 trucks were surveyed to measure the universe of over 60 million trucks. The U.S. recipients of the survey were required by law to answer the questionnaire.

For a given year, there are two versions of the TIUS survey. Based on registration information, vehicles were given either the short form or the long form of the survey. In general, the long form was given to owners of large trucks (i.e., straight trucks and truck-tractors). The short form was given to owners of small trucks (i.e., pick-ups, vans, station wagons on truck chassis). The major difference between the two forms is that the long form has more questions relevant to commercial vehicles.

1.3 The Truck Fleet

The TIUS database contains information on trucks used for personal transportation and/or freight movement. This report focusses on the freight market and analyzes larger, freight-hauling trucks which would most likely be used in the movement of commodities. Specifically, data on the following types of trucks were excluded in this analysis: (1) any truck whose body type was pick-up, mini-van, sport utility, or station wagon on a truck chassis; (2) any 2-axle truck or tractor with a total of 4 tires; and (3) any truck which hauled a 1-axle trailer or 1-axle utility trailer. Removal of these vehicles creates a data set referred to in this analysis as the "1992/1987 Total Fleet."

For most of this analysis, the 5-axles or more truck/tractor-trailer combinations were evaluated which are a subset of the "Total Fleet." The "5-Axles or More Fleet" contains data for various types of truck/tractor-trailer combinations whose total number of axles is greater than or equal to 5 and are of primary interest from a truck size and weight perspective. In general, there are four types of truck/tractor-trailer combinations evaluated: (1) straight truck with trailer; (2) tractor truck with semitrailer; (3) tractor truck with two trailing units; and (4) tractor truck with three trailing units.

1.4 Cautionary Notes

The values presented in the tables throughout this report are the direct result of the analysis of the TIUS databases. There has been limited judgement as to their appropriateness; that task is the responsibility of the reader. It should be noted that the TIUS is based on survey data which assumes that the respondents will devote some time and effort to giving accurate estimates and responses about their vehicle. The Bureau of the Census did do some quality checking of the data.

State of Registration. The data presented in this report has been analyzed on the basis of the state of registration. In drawing inferences from the data, the potential for a registration-bias must be recognized. However, the correlation between state of registration and state of home base location is approximately 90% for the 1987 TIUS. Home base state is defined as the location where the vehicle is parked when not in use. If state level detail is of interest, the correlation should be examined for that state and the vehicles of interest.

Population Estimates. In the analysis of the TIUS database, each record does not reflect one vehicle, but instead it represents a number of vehicles in the population. To make interpretations about the total truck population from this small sample of the population, a weighting factor was applied to each record. This weighting factor differs for vehicles registered in different states and for vehicles belonging to different vehicle type groups. The reason that the weighting factor is not a constant number across all records is due to the method of sampling the truck population which was conducted at the state level, not the national level. In addition, the Bureau of the Census intentionally surveyed certain vehicle types which account for only a small portion of the truck

population (i.e., larger vehicles used for commercial purposes) at a higher rate than other vehicle types in the 1992 survey.

Readers must be cognizant of the fact that this weighting process can create odd results in selected situations—particularly when the sample size relating to a particular group in the population is small. This is particularly true when analyzing the TIUS at the state level where many states have small sample sizes. For example, our analysis of the 1992 TIUS database estimated that Minnesota has 71 vehicles operating as tractor + triple trailer combinations. Minnesota does not permit such combinations, and it is unlikely that any tractors registered in Minnesota are used to haul a triple trailer combination. This problem results from a number of possibilities. While it is unlikely that a tractor registered in Minnesota is used in this way, it is not impossible—in that the tractor may see its major use in an adjacent state where triples are permitted. Alternatively, the 71 vehicle population estimate could have arisen from an incorrect answer on as little as 1 or 2 survey records—which were subsequently factored-up to create the population estimate.

Small Sample Size. In general, readers must be very cognizant of the potential for "small size problems" in parts of the analysis presented in this report. As the data set is sub-categorized from national statistics, to regional statistics, to state statistics—by configuration, by body type—and subsequently into individual statistical measures such as "empty weight" or "width," the sample used to estimate the population value for a particular cell may become very small. In a number of sections throughout this report, the sample sizes and population estimates associated with particular parameters are presented. Readers must use judgement and caution in assessing the appropriateness of the results presented from small samples.

Differences between 1987 and 1992. The majority of the analysis in this report was conducted on the 1992 TIUS database. However, comparisons were conducted against the 1987 TIUS database. Overall, it should be noted that the quality of the 1992 TIUS database is better than the 1987 TIUS based on a few of the key differences listed below:

- Sampling - For the 1992 TIUS database, the Bureau of the Census intentionally collected more sample data from truck-tractor vehicle owners than in the previous years. Truck-tractor vehicles only represent a small portion of the population; however, they are of interest to a number of groups, organizations, and policies. By collecting a bigger sample, it is more likely that the statistics and generalizations based on this larger data set will more accurately reflect the population than statements made from a smaller sample set. It is vital to have a large sample set when you want to discuss the characteristics of some small portion of the population, such as triples.

- Survey - Differences exist in the format of the survey and in the wording of the survey questions between the 1987 and 1992 TIUS surveys. In general, it has been noticed that the clarity of the 1992 survey questions is better than the 1987 survey questions. This may have an effect on how persons interpret and respond to the questions. An example of a question

that differs in format between 1987 and 1992 is the question on vehicle's trailer width. On the 1987 survey, respondents were to give an estimate of their trailer's width in inches, while on the 1992 survey, respondents were given four categories from which to choose. It was noticed in the 1987 width data that a number of people responded with zero as their trailer width and that a number of respondents gave widths that are not typically found on trailers. Other instances of these differences are noted as appropriate throughout the report. A copy of each year's survey Form #9502 is attached in Appendix I.

- Error Checking and Correction - A more thorough examination of the quality of the data was conducted by the Bureau of the Census on the 1992 TIUS database than on the 1987 TIUS database. All data variables in the 1992 database were examined for such problems as variable values lying outside of the defined range. Only a limited number of variables in the 1987 database were checked and corrected by the Bureau. As a result, some corrections to the 1987 variables were necessary in order to conduct this analysis. Such corrections are noted in the text.

- Other Category - The 1992 survey gave the respondent "another option" under which respondents could write in an answer. The 1987 survey did not have this "other option."

2.0 Categorization of Vehicles

For analysis and for interpretation of data in terms of TS&W issues, trucks were placed into different categories based on their vehicle configuration class, vehicle group, and state of registration. These categories are used throughout this report to illustrate the TIUS data.

2.1 Vehicle Configuration Classes

Based on vehicle information provided in the survey, the Bureau of the Census placed each registered truck into a configuration class. The configuration class identifies the way in which the truck is most often operated. 'Most often' is a subjective term used on the TIUS survey which has no quantitative number associated with it, such as percent of VMT. Because of this, any interpretation of the TIUS data should use discretion. In addition, some of the analyses may be misleading if interpreted incorrectly. For example, our analysis of commodities is based on the percent of VMT that a particular vehicle configuration hauls various commodities. Some of the commodities hauled by a particular truck may not be hauled in the vehicle configuration/body type that the truck usually travels in (e.g., an auto transporter hauling farm products). However, to conduct the analysis it must be assumed that a particular truck hauls all its commodities in the configuration identified with it.

From responses on the survey, each truck was classified by the Bureau of the Census into a vehicle configuration class based on 3 factors. The first factor was vehicle type, which classified a truck as a straight truck not pulling trailer, a straight truck pulling trailer, a truck tractor (power unit) pulling trailer, or other. The second factor was the total number of axles on the truck/tractor. The third factor was the number and kind of trailers most often hauled, including the number of axles. The questions used for this categorization were 5, 6, and 9 in the 1987 survey, and 5, 6, and 10 in the 1992 survey as shown in Appendix I.

Upon examination of the data, vehicles were placed in one of the five major vehicle configuration classes, which was a general categorization into truck or truck+trailer combination groups. The five vehicle configuration classes were partitioned into 31 subclasses based on the number of axles on the truck unit and the number of axles on the trailer(s). The labels of the subclasses are interpreted as follows: the first number represents the number of axles on the power unit, the second number defines the number of axles on the first trailer, a third and fourth number represent the number of axles on the second trailer and the third trailer, respectively. Subclass names with an * by a number, N, indicate that this subclass includes vehicles with N-axles or greater (e.g., 2+*3 subclass contains all 2-axle straight trucks hauling 3-axles or more trailers).

Table 2.1-1 The 5 Major Vehicle Configurations and the 31 Subclasses

Truck	Truck & Trailer	Tractor-Semitrailer	Tractor + Doubles	Tractor + Triples
2	2 + 2	2-S1	2-S1-2	2-S1-2-2
3	2 + *3	2-S2	3-S1-2	3-S1-2-2
4	3 + 2	2-*S3	2-S2-2	other
	3 + *3	3-S1	3-S2-2	
	*4 + 2	3-S2	other @ *7-axle	
	*4 + *3	3-*S3	3-S2-3	
		4-S1	other @ *8-axle	
		4-S2	3-S2-4	
		4-*S3	other @ *9-axle	
			other @ *10-axle	

Notes:

- A semitrailer is classified by S and its number of axles (e.g., S2 means a semitrailer with 2 axles).
- The * means "equal to or more" (e.g., *4 + 2 means a straight truck with "4 or more" axles pulling a trailer with 2 axles).
- Even though the survey only asks the total number of axles on the attached trailers, the configuration type can be more clearly defined based on operational practice.

2.2 Vehicle Groups

In the analysis of the 5-axles or more fleet, trucks were categorized into 8 vehicle groups (see Figure 2.2-1 for pictures of various configurations in each group):

- Truck + Trailer with 5-axles (which contains vehicle configurations 2+*3 and 3+2)
- Truck + Trailer with 6 or more axles (which contains 2+*4, 3+*3, *4+2, *4+*3)
- 3-S2 Tractor-Semitrailers
- Tractor-Semitrailers with tridem axles (which contains 2-*S3, 3-*S3, 4-*S3)
- Other Tractor-Semitrailers (which are 4-S1 and 4-S2)
- STAA Tractor+Double Trailers (which is 2-S1-2)
- Tractor+Double Trailer combinations with 6 or more axles
- Tractor+Triple Trailers.

It should be noted that a small number of trucks may be misclassified into the wrong vehicle groups. For instance, the tridem axle tractor-semitrailers may contain a few records for vehicles hauling a trailer with more than 3-axles. The reason for this is that the survey question on the number of axles on the semitrailer was limited to 3 responses with the last category being “3 or more axles.”

2.3 Traffic Regions and States

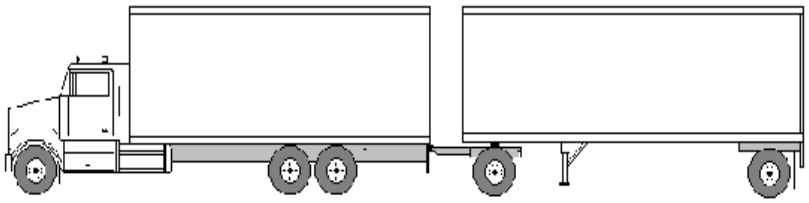
Besides evaluating the truck fleet at the national level, our analysis also focused on the regional truck fleets. Given the small sample of trucks surveyed, analyzing the truck fleet at the state level requires careful analysis and an understanding of the sample size used to generate truck populations.

- 5 traffic regions (see Figure 2.3-1)
  - North Central
  - North East
  - South Atlantic
  - South Gulf
  - West
- 50 States and Washington, D.C.

Figure 2.2-1

Vehicle Group Descriptions for the 5-Axles or More Truck Fleet

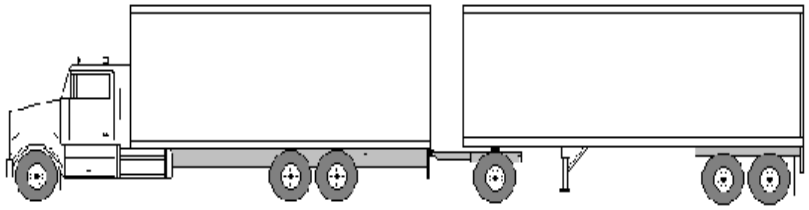
1) Truck Trailer @ 5 Axles



(3+2)

Other Examples:
2+3*

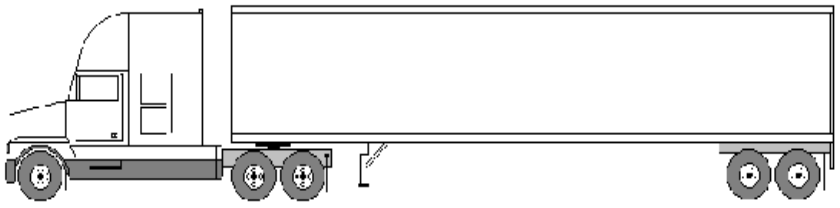
2) Truck Trailer @ 6+ Axles



(3+3)

Other Examples:
3+3*, 4*+2, 4*+3*

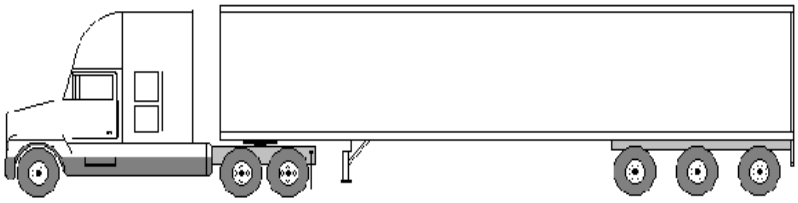
3) 3-S2



Note: * Number of axles equal to or greater than specified number.

Figure 2.2-1

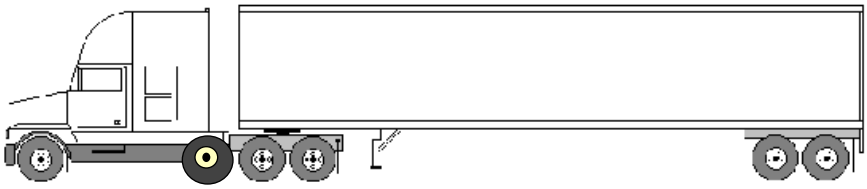
4) Tridem Axle Semitrailer



(3-S3)

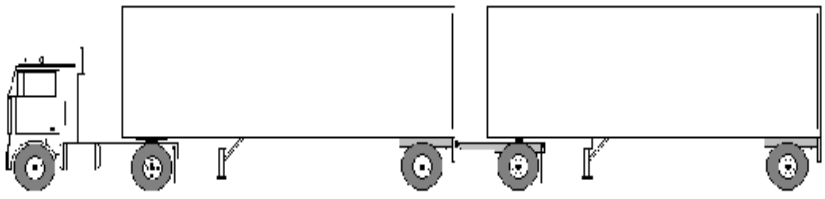
Other Examples:
2-S3*, 4-S3*

5) 4S1/S2



(4-S2)

6) STAA

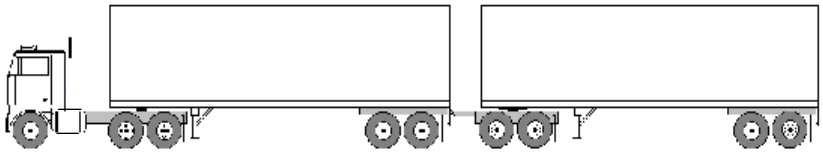


(2-S1-2)

Note: * Number of axles equal to or greater than specified number.

Figure 2.2-1

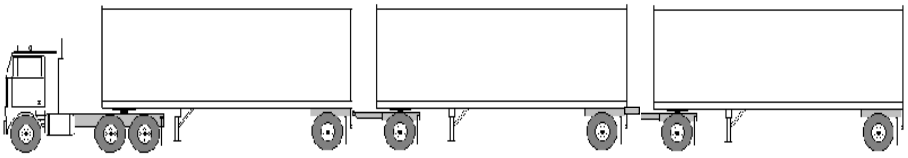
7) Doubles @ 6 + Axles



(3-S2-4)

Other Examples:
2-S2-2, 3-S1-2, 3-S2-2, 3-S2-3, 3-S2*-4*,
others @ 7-10 axles

8) Triples

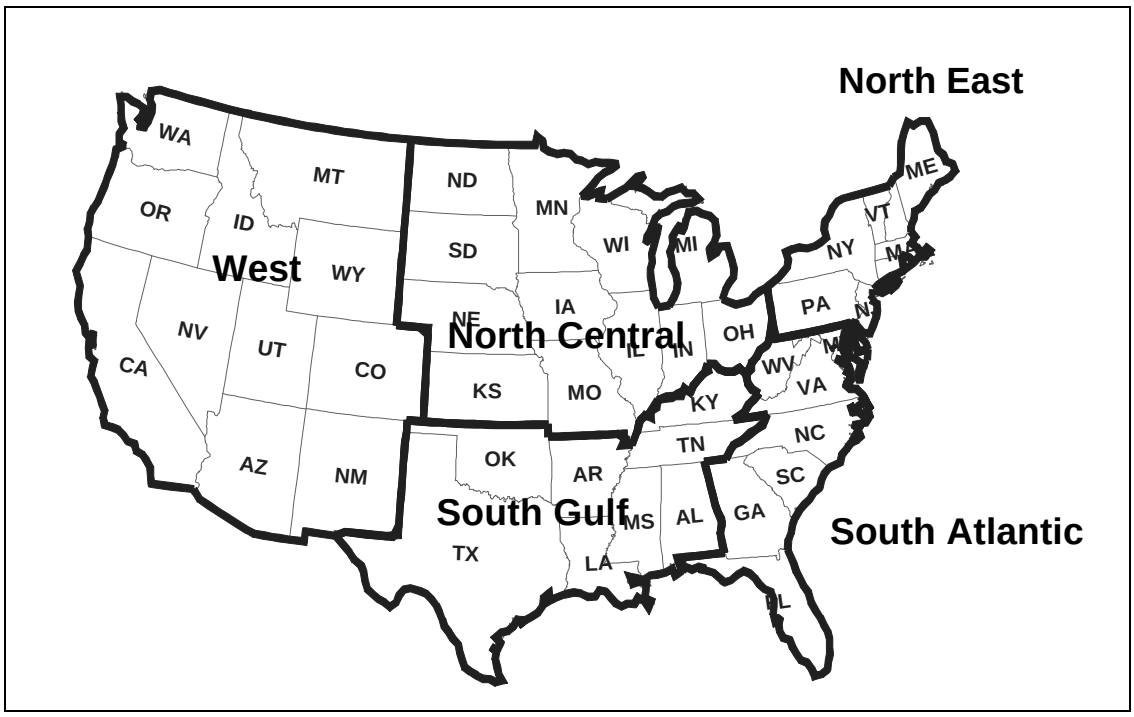


(3-S1-2-2)

Other Examples:
2-S1-2-2, Other triples

Note: * Number of axles equal to or greater than specified number.

Figure 2.3-1 Traffic Data Regions



3.0 Analysis of the Distribution of the Truck Fleet

This section focuses on the distribution of the truck fleet by vehicle configuration, region, and state. The first part of this section analyzes the entire truck fleet with a brief discussion of the 4-axles or less truck fleet. The second part evaluates the 5-axles or more truck fleet. The vehicle configuration is derived by the Bureau of the Census from questions 5, 6, and 9 on the 1987 survey, and from questions 5, 6, and 10 on the 1992 survey as shown in Appendix I. Appendix H gives details on the vehicle configuration variable and its use.

3.1 Analysis Structure

This section evaluates the TIUS database by the following variables:

- 5 Vehicle Configuration Classes and 31 Subclasses (as defined in Table 2.1)
- 8 Vehicle Groups (as defined in Section 2.2)
- 5 Regions (as defined in Section 2.3 and Figure 2.3-1)
- 50 States

3.2 Observations on the Size of the Total Truck Fleet

The following observations focus primarily on the 1992 total truck fleet (note exclusions in Section 1.3) with some selected comparisons made with the 1987 total truck fleet. Table 3.2-1 describes the number of vehicles in a configuration class, by region for 1992. Table 3.2-2 rank orders the 1992 state populations. For detailed tables of the composition of the 1987 and 1992 truck fleet, Appendix A contains population numbers for the total truck fleet broken down by configuration class, by state, by region—for 1992 and 1987.

NATIONWIDE - 1992

- The 1992 total truck fleet contained 4.07 million trucks.

REGIONAL VARIATIONS - 1992

- One-third of the total fleet was registered in the North Central region.
- The other four regions, each contained about one-sixth of the total truck population.

STATE VARIATIONS - 1992

- California had the largest state truck population (392,572 trucks) which accounted for about one-tenth (9.6%) of the national truck fleet.

- The next five largest state truck populations were Illinois (6.7%), Texas (5.3%), Pennsylvania (5.1%), Ohio (4.5%), and New York (4.0%). These states account for one-quarter of the total fleet.

CHANGES BETWEEN 1987 AND 1992

- Nationwide, the total truck fleet increased in size by 4.2% between 1987 and 1992.

- Regionally, the West region experienced the most growth in their truck population (+19.3%). The North Central region (+5.3%), and North East region (+1.3%) experienced an increase, while the South Atlantic region (-1.1%) and the Gulf region (-4.9%) experienced a decrease.

- For the States,

  - California's share of the total truck fleet has increased from 7.8% in 1987 to 9.6% in 1992.

  - The combination of Illinois, Texas, Pennsylvania, Ohio and New York's share of the total fleet did not change from 1987 to 1992. However, Texas's share of the total fleet was greater in 1987 (6.3%) than in 1992 (5.3%), while Pennsylvania's share was less in 1987 (4.4%) than in 1992 (5.1%). The 1987 shares for Illinois (6.5%), Ohio (4.4%), and New York (4.1%) did not differ from 1992.

3.3 Size and Make-up of the 4-Axles or Less Fleet

The 1992 "4-axles or less" truck fleet, which is a subsection of the total truck fleet, is briefly discussed in this section of the report as supported in Table 3.2-1 and in Appendix A. Note that this part of the fleet is not the emphasis of this report.

NATIONWIDE - 1992

- Over two-thirds of the total national truck fleet (68.2%) were single-unit straight trucks. This included 2-axle 6-tire straight trucks and 3-axle straight trucks. This component of the fleet is subject to a future detailed analysis.

- The remainder of the total truck fleet which has 4 axles or less is:

  - 4-axle straight truck, single unit (1.9% of total truck fleet)
  - 2+2, the 2-axle straight truck with 2-axle trailer combinations (2.8% of total truck fleet)
  - 2-S1, the 2-axle tractor with 1-axle semitrailer combinations (1.6% of total truck fleet)
  - 2-S2, the 2-axle tractor with 2-axle semitrailer combinations (3.3% of total truck fleet)
  - 3-S1, the 3-axle tractor with 1-axle semitrailer combinations (0.2% of total truck fleet)

Table 3.2-1

1992 Total Truck Fleet
Number of Vehicles by Truck Configuration, by Region

Configuration Class	Regions					
	North Central	North East	South Atlantic	South Gulf	West	Total
Straight Truck						
2-axle	690,046	397,595	390,340	337,257	453,782	2,269,021
3-axle	167,723	63,637	60,103	59,890	78,636	429,989
4-axle	29,693	21,093	7,474	8,492	10,242	76,994
Subtotal	887,462	482,325	457,918	405,640	542,659	2,776,004
Truck + Trailer						
2+2	35,261	13,776	23,284	20,636	19,130	112,086
2+*3	4,488	2,753	3,711	2,744	1,565	15,261
3+2	9,600	3,487	2,586	8,008	19,640	43,321
3+*3	1,173	693	145	522	1,612	4,146
***4+2**	2,027	586	194	535	1,780	5,122
***4+*3**	1,307	36	36	116	451	1,946
Subtotal	53,856	21,330	29,956	32,561	44,179	181,881
Tractor + Semitrailer						
2-S1	17,672	5,804	9,749	10,903	21,863	65,990
2-S2	40,640	23,030	22,170	25,764	21,455	133,059
2-*S3	2,290	691	1,288	2,299	1,995	8,563
3-S1	1,765	815	1,089	2,083	2,683	8,434
3-S2	305,414	90,239	109,979	142,300	117,711	765,643
3-*S3	20,314	6,888	4,576	9,776	7,502	49,056
4-S1	121	0	8	67	22	217
4-S2	8,195	4,357	3,318	4,012	3,612	23,494
4-*S3	2,653	678	511	871	2,086	6,799
Subtotal	399,064	132,501	152,689	198,074	178,927	1,061,255
Tractor + Double						
2-S1-2	8,052	1,417	1,586	2,732	19,680	33,467
3-S1-2	1,225	144	450	230	1,910	3,958
2-S2-2	506	87	52	20	1,084	1,748
3-S2-2	536	602	96	29	3,716	4,979
Other @ 7-axle	58	0	0	0	758	815
3-S2-3	128	29	0	98	1,739	1,994
Other @ 8-axle	104	29	0	105	777	1,014
3-*S2-*4	1,959	58	0	162	1,054	3,233
Other @ 9-axle	30	0	13	0	107	149
Other @10-axle	481	0	0	0	191	673
Subtotal	13,079	2,365	2,196	3,375	31,015	52,031
Tractor + Triples						
2-S1-2-2	8	0	0	0	279	288
3-S1-2-2	71	0	0	0	262	333
Other	0	33	0	0	93	126
Subtotal	79	33	0	0	635	747
Total	1,353,541	638,554	642,759	639,650	797,415	4,071,918

* Note: Excludes pickups, mini-vans, utility sports, station wagons, trucks or truck-tractors with 4-tires, and trucks pulling 1-axle trailer or 1-axle utility trailer, as defined in Section 1.3.

Source: 1992 Truck Inventory and Use Survey

Table 3.2-2

1992 Total Truck Fleet
Ranking of States from Highest Truck Population to Lowest

State	Region	Straight Truck	%	Truck + Trailer	%	Tractor + Semitrailer	%	Tractor+ Doubles	%	Tractor +Triples	%	Total Number	Total %
California	WE	266,700	9.61	18,906	10.39	86,414	8.14	20,436	39.28	115	15.45	*392,572*	***9.64***
Illinois	NC	139,077	5.01	11,167	6.14	114,611	10.80	6,957	13.37	0	0.00	*271,813*	***6.68***
Texas	SG	125,896	4.54	14,157	7.78	73,390	6.92	965	1.86	0	0.00	*214,409*	***5.27***
Pennsylvania	NE	150,493	5.42	5,158	2.84	51,520	4.85	684	1.32	0	0.00	*207,856*	***5.10***
Ohio	NC	126,501	4.56	6,456	3.55	49,018	4.62	557	1.07	0	0.00	*182,531*	***4.48***
New York	NE	130,319	4.69	6,815	3.75	26,498	2.50	800	1.54	0	0.00	*164,431*	***4.04***
Florida	SA	104,632	3.77	9,074	4.99	41,335	3.89	816	1.57	0	0.00	*155,857*	***3.83***
North Carolina	SA	80,903	2.91	5,098	2.80	37,935	3.57	826	1.59	0	0.00	*124,763*	***3.06***
Indiana	NC	75,412	2.72	3,775	2.08	42,415	4.00	471	0.90	0	0.00	*122,072*	***3.00***
Michigan	NC	74,281	2.68	7,539	4.14	34,884	3.29	3,027	5.82	0	0.00	*119,732*	***2.94***
Kansas	NC	89,105	3.21	3,029	1.67	21,503	2.03	556	1.07	0	0.00	*114,193*	***2.80***
Georgia	SA	72,548	2.61	3,004	1.65	32,506	3.06	173	0.33	0	0.00	*108,231*	***2.66***
Missouri	NC	70,568	2.54	5,263	2.89	28,107	2.65	291	0.56	0	0.00	*104,229*	***2.56***
Minnesota	NC	73,792	2.66	5,080	2.79	22,475	2.12	237	0.46	71	9.53	*101,655*	***2.50***
New Jersey	NE	68,088	2.45	3,199	1.76	27,435	2.59	375	0.72	0	0.00	*99,097*	***2.43***
Iowa	NC	63,825	2.30	2,875	1.58	29,149	2.75	296	0.57	0	0.00	*96,145*	***2.36***
Wisconsin	NC	62,313	2.24	4,442	2.44	26,729	2.52	94	0.18	0	0.00	*93,578*	***2.30***
Oklahoma	SG	61,902	2.23	2,699	1.48	26,148	2.46	233	0.45	0	0.00	*90,982*	***2.23***
Alabama	SG	49,672	1.79	4,646	2.55	32,381	3.05	331	0.64	0	0.00	*87,030*	***2.14***
Tennessee	SG	53,063	1.91	3,865	2.12	21,830	2.06	1,258	2.42	0	0.00	*80,015*	***1.97***
Virginia	SA	64,031	2.31	4,804	2.64	8,535	0.80	64	0.12	0	0.00	*77,433*	***1.90***
Kentucky	SG	57,212	2.06	2,109	1.16	15,009	1.41	141	0.27	0	0.00	*74,471*	***1.83***
Maryland	SA	60,290	2.17	3,039	1.67	10,263	0.97	0	0.00	0	0.00	*73,592*	***1.81***
Colorado	WE	46,124	1.66	3,605	1.98	12,581	1.19	309	0.59	81	10.87	*62,700*	***1.54***
Washington	WE	40,732	1.47	6,265	3.44	13,161	1.24	2,018	3.88	22	2.88	*62,197*	***1.53***
Nebraska	NC	40,749	1.47	1,840	1.01	17,075	1.61	94	0.18	0	0.00	*59,759*	***1.47***
Oregon	WE	35,512	1.28	3,926	2.16	17,086	1.61	2,658	5.11	301	40.28	*59,483*	***1.46***
South Carolina	SA	40,117	1.45	3,311	1.82	14,067	1.33	235	0.45	0	0.00	*57,731*	***1.42***
Louisiana	SG	38,440	1.38	2,640	1.45	15,934	1.50	240	0.46	0	0.00	*57,254*	***1.41***
North Dakota	NC	45,347	1.63	1,181	0.65	6,689	0.63	273	0.53	0	0.00	*53,491*	***1.31***
Massachusetts	NE	39,909	1.44	1,936	1.06	10,414	0.98	128	0.25	0	0.00	*52,387*	***1.29***
Connecticut	NE	35,070	1.26	1,042	0.57	4,158	0.39	290	0.56	7	0.92	*40,567*	***1.00***
Arizona	WE	29,164	1.05	2,957	1.63	7,599	0.72	691	1.33	0	0.00	*40,411*	***0.99***
Idaho	WE	29,205	1.05	2,329	1.28	7,015	0.66	1,203	2.31	20	2.63	*39,771*	***0.98***
South Dakota	NC	26,491	0.95	1,210	0.66	6,410	0.60	225	0.43	8	1.11	*34,344*	***0.84***
Utah	WE	17,667	0.64	1,069	0.59	10,872	1.02	1,418	2.73	20	2.66	*31,046*	***0.76***
Montana	WE	20,252	0.73	1,602	0.88	7,894	0.74	1,008	1.94	18	2.47	*30,775*	***0.76***
Maine	NE	22,799	0.82	1,007	0.55	5,487	0.52	18	0.04	0	0.00	*29,311*	***0.72***
West Virginia	SA	23,295	0.84	1,093	0.60	4,400	0.41	77	0.15	0	0.00	*28,865*	***0.71***
Mississippi	SG	14,736	0.53	1,811	1.00	8,478	0.80	186	0.36	0	0.00	*25,211*	***0.62***
New Hampshire	NE	19,058	0.69	1,124	0.62	3,547	0.33	52	0.10	26	3.51	*23,808*	***0.58***
Nevada	WE	16,052	0.58	814	0.45	5,215	0.49	605	1.16	33	4.36	*22,720*	***0.56***
New Mexico	WE	17,953	0.65	1,301	0.72	2,545	0.24	36	0.07	0	0.00	*21,836*	***0.54***
Delaware	SA	10,410	0.37	521	0.29	3,553	0.33	4	0.01	0	0.00	*14,488*	***0.36***
Hawaii	WE	8,986	0.32	443	0.24	2,460	0.23	27	0.05	0	0.00	*11,916*	***0.29***
Wyoming	WE	6,255	0.23	401	0.22	4,109	0.39	371	0.71	14	1.83	*11,150*	***0.27***
Alaska	WE	8,057	0.29	560	0.31	1,976	0.19	234	0.45	11	1.49	*10,838*	***0.27***
Vermont	NE	8,485	0.31	602	0.33	1,701	0.16	17	0.03	0	0.00	*10,806*	***0.27***
Rhode Island	NE	8,104	0.29	446	0.25	1,740	0.16	0	0.00	0	0.00	*10,291*	***0.25***
Arkansas	SG	4,718	0.17	635	0.35	4,905	0.46	20	0.04	0	0.00	*10,278*	***0.25***
District of Columbia	SA	1,692	0.06	11	0.01	96	0.01	0	0.00	0	0.00	*1,799*	***0.04***

* Note: Excludes pickups, mini-vans, utility sports, station wagons, trucks or truck-tractors with 4-tires, and trucks pulling 1-axle trailer or 1-axle utility trailer, as defined in Section 1.3.

REGIONAL VARIATIONS - 1992

- The proportion of 2- and 3-axle trucks in the total regional fleets was close to the national average in the South Atlantic region (68.2%) and West region (66.8%); however, greater in the North East region (72.2%), and less in the North Central region (63.3%) and South Gulf region (60.6%).

3.4 Size of the 5-Axles or More Fleet

The 5-axles or more truck fleet, which was the focus of the rest of this analysis, was obtained by removing trucks in the total fleet with 4-axles or less from the total truck fleet. The 5-axles or more truck fleet is of more interest to a truck size and weight analysis. A general map of the state distribution of the 5-axles or more fleet in 1992 is presented in Figure 3.4-1. A regional look is provided in Figure 3.4-2. More detail on the distribution of the fleet is discussed below and highlighted in Tables 3.4-1 and 3.4-2. Appendix B gives the detailed results for the number of 5-axles or more trucks in the fleet, by configuration class, by state, by region—for 1992 and 1987.

NATIONWIDE - 1992

- The 1992 5-axles or more truck fleet was 976,346, about 24% of the total truck fleet.

REGIONAL VARIATIONS - 1992

- The North Central region accounts for more than one-third (38.0%) of the 5-axles or more truck fleet which is the largest population for any region.

- The West region (19.4%) and the South Gulf region (17.9%) together account for one-third of the 5-axles or more truck fleet.

- The North East region (11.6%) and South Atlantic region (13.2%) together account for one-quarter of the 5-axles or more truck fleet.

STATE VARIATIONS - 1992

- Combined, Illinois and California account for one-fifth of the 5-axles or more truck fleet (20.5%).

- Illinois, California, Texas, Pennsylvania, and Ohio account for over one-third of the 5-axles or more truck fleet (36%).

- 22 States and District of Columbia have less than 10,000 5-axles or more trucks and between them account for less than 11.5%. (See Table 3.4-2)

Figure 3.4-1 State Distribution of the 5-Axles or More Fleet in 1992

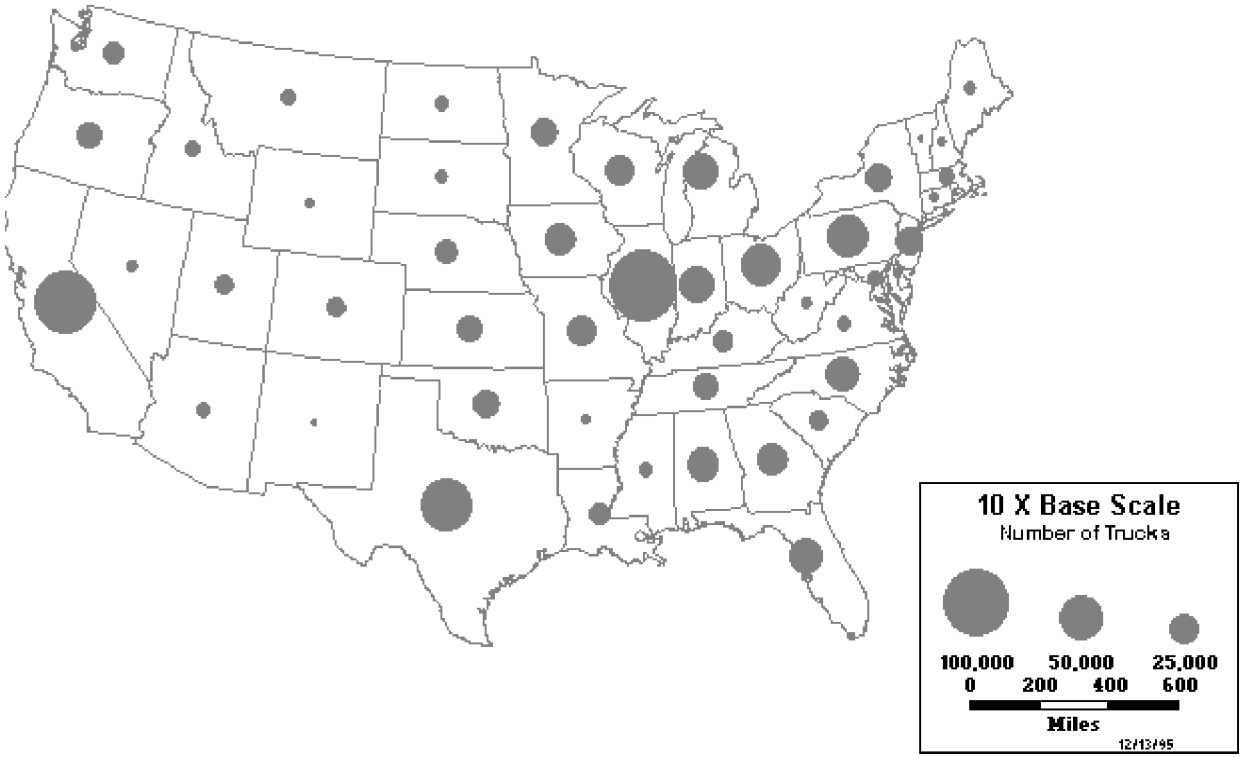
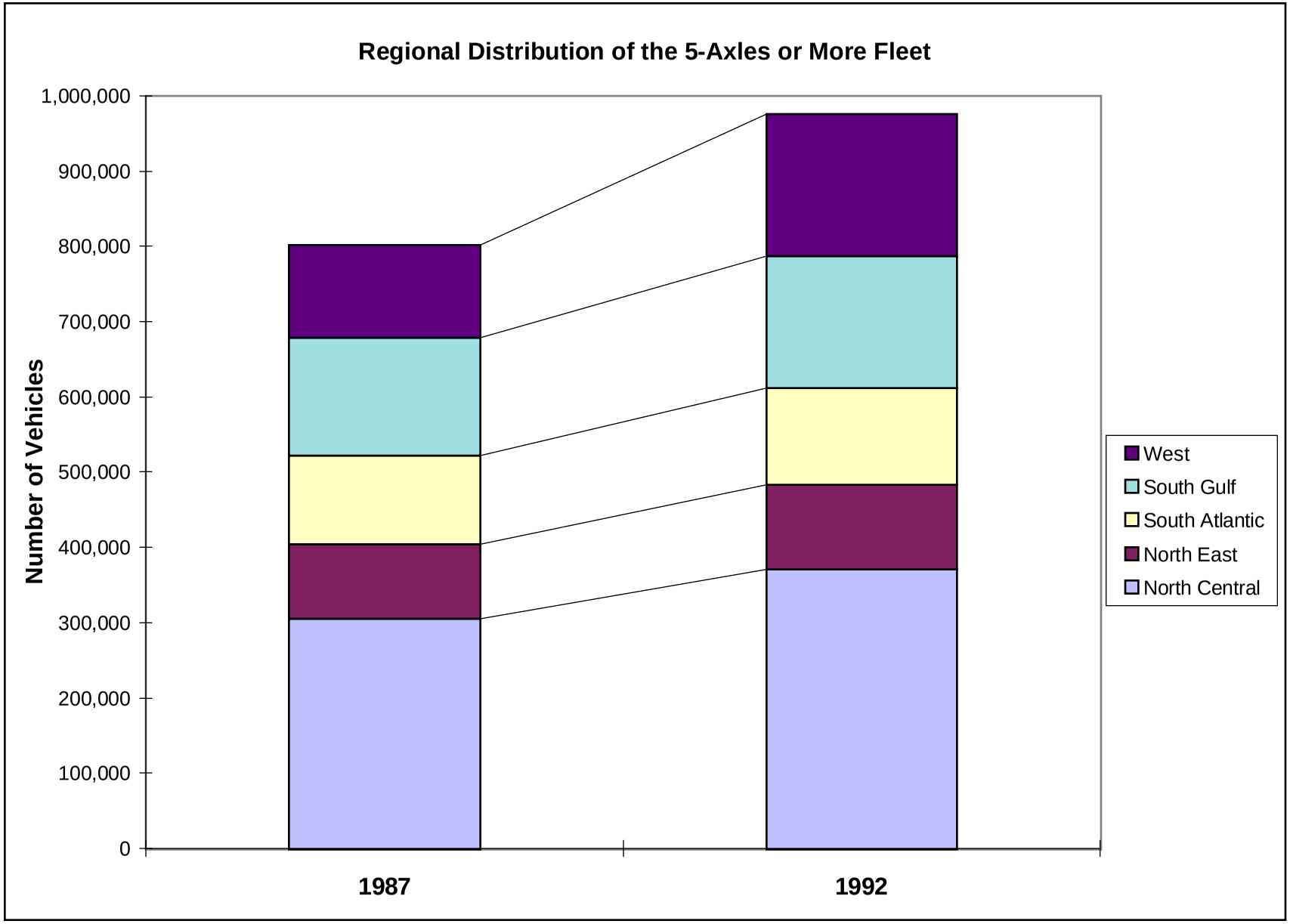


Figure 3.4-2



Source: 1987 and 1992 Truck Inventory and Use Survey

3/3/96

Table 3.4-1

1992 Truck Fleet (@ 5-axles or more)
Number of Vehicles by Truck Configuration, by Region

Configuration Class	Regions					
	North Central	North East	South Atlantic	South Gulf	West	Total
Truck + Trailer						
2+*3	4,488	2,753	3,711	2,744	1,565	15,261
3+2	9,600	3,487	2,586	8,008	19,640	43,321
3+*3	1,173	693	145	522	1,612	4,146
***4+2**	2,027	586	194	535	1,780	5,122
***4+*3**	1,307	36	36	116	451	1,946
Subtotal	18,595	7,554	6,672	11,925	25,049	69,795
Tractor + Semitrailer						
2-*S3	2,290	691	1,288	2,299	1,995	8,563
3-S2	305,414	90,239	109,979	142,300	117,711	765,643
3-*S3	20,314	6,888	4,576	9,776	7,502	49,056
4-S1	121	0	8	67	22	217
4-S2	8,195	4,357	3,318	4,012	3,612	23,494
4-*S3	2,653	678	511	871	2,086	6,799
Subtotal	338,988	102,853	119,681	159,324	132,927	853,773
Tractor + Double						
2-S1-2	8,052	1,417	1,586	2,732	19,680	33,467
3-S1-2	1,225	144	450	230	1,910	3,958
2-S2-2	506	87	52	20	1,084	1,748
3-S2-2	536	602	96	29	3,716	4,979
Other @ 7-axle	58	0	0	0	758	815
3-S2-3	128	29	0	98	1,739	1,994
Other @ 8-axle	104	29	0	105	777	1,014
3-*S2-*4	1,959	58	0	162	1,054	3,233
Other @ 9-axle	30	0	13	0	107	149
Other @10-axle	481	0	0	0	191	673
Subtotal	13,079	2,365	2,196	3,375	31,015	52,031
Tractor + Triples						
2-S1-2-2	8	0	0	0	279	288
3-S1-2-2	71	0	0	0	262	333
Other	0	33	0	0	93	126
Subtotal	79	33	0	0	635	747
Total	370,741	112,805	128,549	174,624	189,626	976,346

* Note: Excludes pickups, mini-vans, utility sports, station wagons, trucks or truck-tractors with 4-tires, and trucks pulling 1-axle trailer or 1-axle utility trailer, as defined in Section 1.3.

Table 3.4-2

1992 Truck Fleet (@ 5-axles or more)
Ranking of States from Highest Truck Population to Lowest

State	Region	Truck + Trailer	%	Tractor + Semitrailer	%	Tractor+ Doubles	%	Tractor +Triples	%	Total Number	Total %
Illinois	NC	2,574	3.69	99,987	11.71	6,957	13.37	0	0.00	*109,519*	***11.22***
California	WE	12,249	17.55	57,472	6.73	20,436	39.28	115	15.45	*90,272*	***9.25***
Texas	SG	5,720	8.20	58,660	6.87	965	1.86	0	0.00	*65,345*	***6.69***
Pennsylvania	NE	2,138	3.06	41,314	4.84	684	1.32	0	0.00	*44,136*	***4.52***
Ohio	NC	1,065	1.53	40,186	4.71	557	1.07	0	0.00	*41,808*	***4.28***
Michigan	NC	4,213	6.04	28,083	3.29	3,027	5.82	0	0.00	*35,323*	***3.62***
Indiana	NC	845	1.21	33,928	3.97	471	0.90	0	0.00	*35,244*	***3.61***
North Carolina	SA	1,549	2.22	31,051	3.64	826	1.59	0	0.00	*33,426*	***3.42***
Florida	SA	1,493	2.14	29,812	3.49	816	1.57	0	0.00	*32,121*	***3.29***
Alabama	SG	1,625	2.33	26,296	3.08	331	0.64	0	0.00	*28,252*	***2.89***
Iowa	NC	1,264	1.81	25,810	3.02	296	0.57	0	0.00	*27,369*	***2.80***
Georgia	SA	349	0.50	26,538	3.11	173	0.33	0	0.00	*27,060*	***2.77***
Missouri	NC	1,889	2.71	23,730	2.78	291	0.56	0	0.00	*25,909*	***2.65***
Wisconsin	NC	1,494	2.14	23,995	2.81	94	0.18	0	0.00	*25,583*	***2.62***
New Jersey	NE	1,140	1.63	21,453	2.51	375	0.72	0	0.00	*22,968*	***2.35***
Oklahoma	SG	587	0.84	21,415	2.51	233	0.45	0	0.00	*22,235*	***2.28***
New York	NE	1,900	2.72	19,534	2.29	800	1.54	0	0.00	*22,234*	***2.28***
Minnesota	NC	2,145	3.07	18,673	2.19	237	0.46	71	9.53	*21,127*	***2.16***
Tennessee	SG	887	1.27	18,284	2.14	1,258	2.42	0	0.00	*20,429*	***2.09***
Oregon	WE	2,814	4.03	14,205	1.66	2,658	5.11	301	40.28	*19,978*	***2.05***
Kansas	NC	1,285	1.84	17,749	2.08	556	1.07	0	0.00	*19,590*	***2.01***
Nebraska	NC	889	1.27	15,077	1.77	94	0.18	0	0.00	*16,060*	***1.64***
Washington	WE	2,617	3.75	10,087	1.18	2,018	3.88	22	2.88	*14,743*	***1.51***
Louisiana	SG	1,562	2.24	12,636	1.48	240	0.46	0	0.00	*14,438*	***1.48***
South Carolina	SA	1,200	1.72	11,101	1.30	235	0.45	0	0.00	*12,536*	***1.28***
Kentucky	SG	569	0.82	11,694	1.37	141	0.27	0	0.00	*12,405*	***1.27***
Colorado	WE	1,698	2.43	9,914	1.16	309	0.59	81	10.87	*12,002*	***1.23***
Utah	WE	567	0.81	9,584	1.12	1,418	2.73	20	2.66	*11,589*	***1.19***
Maryland	SA	834	1.20	8,495	1.00	0	0.00	0	0.00	*9,329*	***0.96***
Montana	WE	997	1.43	7,252	0.85	1,008	1.94	18	2.47	*9,276*	***0.95***
Idaho	WE	1,604	2.30	6,225	0.73	1,203	2.31	20	2.63	*9,053*	***0.93***
Massachusetts	NE	586	0.84	7,289	0.85	128	0.25	0	0.00	*8,003*	***0.82***
Mississippi	SG	871	1.25	6,310	0.74	186	0.36	0	0.00	*7,367*	***0.75***
Arizona	WE	1,179	1.69	5,486	0.64	691	1.33	0	0.00	*7,357*	***0.75***
North Dakota	NC	553	0.79	6,072	0.71	273	0.53	0	0.00	*6,899*	***0.71***
Virginia	SA	551	0.79	5,862	0.69	64	0.12	0	0.00	*6,477*	***0.66***
South Dakota	NC	379	0.54	5,698	0.67	225	0.43	8	1.11	*6,310*	***0.65***
Maine	NE	602	0.86	4,833	0.57	18	0.04	0	0.00	*5,453*	***0.56***
Nevada	WE	216	0.31	3,945	0.46	605	1.16	33	4.36	*4,798*	***0.49***
West Virginia	SA	504	0.72	3,912	0.46	77	0.15	0	0.00	*4,493*	***0.46***
Arkansas	SG	105	0.15	4,030	0.47	20	0.04	0	0.00	*4,154*	***0.43***
Wyoming	WE	85	0.12	3,576	0.42	371	0.71	14	1.83	*4,045*	***0.41***
Connecticut	NE	471	0.68	2,913	0.34	290	0.56	7	0.92	*3,681*	***0.38***
New Hampshire	NE	352	0.50	2,682	0.31	52	0.10	26	3.51	*3,113*	***0.32***
Delaware	SA	192	0.27	2,828	0.33	4	0.01	0	0.00	*3,025*	***0.31***
Hawaii	WE	301	0.43	1,994	0.23	27	0.05	0	0.00	*2,323*	***0.24***
Alaska	WE	392	0.56	1,624	0.19	234	0.45	11	1.49	*2,261*	***0.23***
New Mexico	WE	330	0.47	1,563	0.18	36	0.07	0	0.00	*1,929*	***0.20***
Vermont	NE	239	0.34	1,507	0.18	17	0.03	0	0.00	*1,763*	***0.18***
Rhode Island	NE	126	0.18	1,327	0.16	0	0.00	0	0.00	*1,453*	***0.15***
District of Columbia	SA	0	0.00	81	0.01	0	0.00	0	0.00	*81*	***0.01***

* Note: Excludes pickups, mini-vans, utility sports, station wagons, trucks or truck-tractors with 4-tires, and straight trucks pulling 1-axle trailer or 1-axle utility trailer, as defined in Section 1.3.

Source: 1992 Truck Inventory and Use Survey

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CHANGES BETWEEN 1987 AND 1992

- Nationwide, the 5-axles or more truck fleet increased in size by 21.7%.

- Regionally, the truck population in the West region increased at a rate (+53.3%) double that of the national growth rate. The North Central region truck population increased at the same rate as the nation (+21.7%). The North East region (+13.6%), the South Gulf region (+11.9%), and the South Atlantic region (+8.5%) truck populations grew at a slower rate compared to the nation. (See Figure 3.4-2)

- The states with the highest growth rates in their 5-axles or more truck fleet were Colorado (459.7%), Idaho (119%), Nevada (108.4%), Vermont (94%), and Montana (85.6%). The states experiencing a major decline in the growth of their 5-axles or more fleet were Virginia (-56.4%), Massachusetts (-22%), Delaware (-19.7%), and Mississippi (-19.2%). (Care needs to be taken when using state data because of the sample sizes used to generate state truck fleet totals.)

3.5 Make-up of the 5-Axles or More Fleet

This section evaluates the make-up of the 5-axles or more fleet in terms of the 8 vehicle groups (as defined in Section 2.2). Table 3.5-1 summarizes both years, while Figures 3.5-1 and 3.5-2 provide a pictorial comparison. More detailed information is available in Appendix B.

NATIONWIDE - 1992

- 87.4% of the 5-axles or more fleet was comprised of tractor-semitrailer combinations. More specifically, the 3-S2s accounted for 78% of the 5-axle fleet.

- 7.1% of the 5-axles or more fleet were straight truck + trailer combinations.

- 5.3% of the fleet were tractor + double trailer combinations (two-thirds of the doubles were STAA).

- 0.08% of the fleet were tractor + triple trailer combinations.

REGIONAL VARIATIONS - 1992

- The composition of the regional truck fleets in the North Central, North East, South Atlantic, and South Gulf parts of the U.S. is very similar. Over 90% of these regional fleets consist of tractor-semitrailer combinations. About 5 to 6% of these fleets contain truck+trailer combinations. Tractor + double trailers account for 5%, and triples, if any in a particular region, are sparse.

- The composition of West region fleet differs dramatically from the other regions. Tractor-semitrailer combinations only comprise 70% of the western fleet—note the U.S. average is 90%. There are more truck + trailer combinations (13%), tractor + double trailer combinations (16%), and tractor + triple trailer combinations (0.3%).

STATE VARIATIONS - 1992

The maps in Appendix B illustrate the state distribution of each of the 8 vehicle groups.

- California has the largest state population of truck+trailer combinations (17.6% of all truck+trailers) and of tractor + double trailer (39.3% of all tractor + double trailer). It has the second largest population of tractor + triple trailer (15.5% of all tractor triple trailer).

- Illinois has the largest state population of tractor-semitrailer combinations (11.7% of all tractor-semitrailers), and the second largest tractor-double population (13.4% of all tractor-doubles).

- Oregon has the largest population of tractor-triples (40.3% of all triples).

(Care needs to be taken when using state data because of the sample sizes used to generate state truck fleet totals.)

CHANGES BETWEEN 1987 AND 1992

- Nationwide, the mix of the 5-axles or more fleet has remained relatively constant. There was a decrease in the proportion of truck + trailer combinations (from 8.5% to 7.2% of the national 5-axles or more fleet) and an increase in the proportion of tractor + double trailer combinations (from 4.0% to 5.3% of the 5-axles or more fleet). The 3-S2 population remained steady at 9 out of every 10 tractor-semitrailers. The proportion of tractor-semitrailers with tridems has remained constant. The proportion of tractor-semitrailers with quad-axles on the tractor has increased slightly from 1.8% to 2.4%.

- Regionally, the proportion of tractor-semitrailers in each regional fleet has remained relatively constant. The distribution of the various vehicle types has remained constant for the North Central fleet. The fleets in the other four regions have experienced a decline in the proportion of truck + trailer combinations (for the most part) coupled to a corresponding increase in the proportion of tractor + double trailer combinations (see Table 3.5-1).

3.6 Comments on the STAA Double Fleet

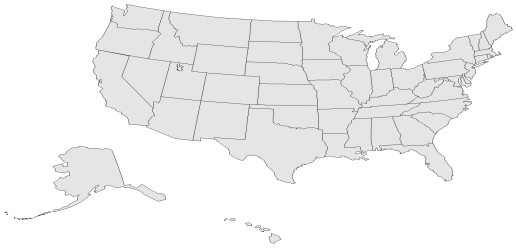
The 1982 Surface Transportation Assistance Act provided for the use of standard STAA (2-S1-2) tractor +double trailer (2-28') combinations on the National Network. The take-up of these units has been relatively small. In 1992, they accounted for 3.4% of the 5-axles or more fleet—a slight increase from 3.1% of the fleet in 1987 as shown in Figure 3.5-1. California and Illinois account for nearly three-quarters of all of the STAA doubles. This is an area where registration bias must be examined more closely.

3.7 Comments on Tridem Axle Fleet

In 1992, the tractor-semitrailers with tridem or more axle semitrailers accounted for 6.6% of the 5-axles or more fleet as shown in Table 3.5-1. They are more common than tractor-double trailer combinations. Every state has them. Three-quarters of the tridem axle fleet are 6-axle (3-S3) tractor-semitrailers combinations. On average, there is about one 3-S3 for every sixteen 3-S2s. The 3-S3 tractor-semitrailer combinations are most common in the North East region (one 3-S3 for every thirteen 3-S2s) and least frequent in the South Atlantic region (one 3-S3 for every twenty-four 3-S2s).

Table 3.5-1

***Truck Fleet** (@ 5-axles or more)*
Number of Vehicles in Each Vehicle Group, by Region



1992 Truck Fleet

Vehicle Group	Regions						% of Total
	North Central	North East	South Atlantic	South Gulf	West	Total	
Truck + Trailer @ 5-axle	14,087	6,218	6,044	10,752	21,184	58,285	6.0
Truck + Trailer @ 6-axle +	4,507	1,336	628	1,173	3,865	11,509	1.2
3-S2	305,413	90,239	109,978	142,300	117,710	765,640	78.4
Tridem Axle Semitrailer	25,258	8,256	6,375	12,946	11,583	64,419	6.6
4S1/S2	8,316	4,357	3,327	4,079	3,633	23,712	2.4
STAA	8,052	1,417	1,586	2,732	19,681	33,468	3.4
Doubles @ 6-axle or more	5,027	948	611	644	11,335	18,564	1.9
Triples	79	33	0	0	635	747	0.1
Total	370,740	112,805	128,548	174,625	189,626	976,343	100

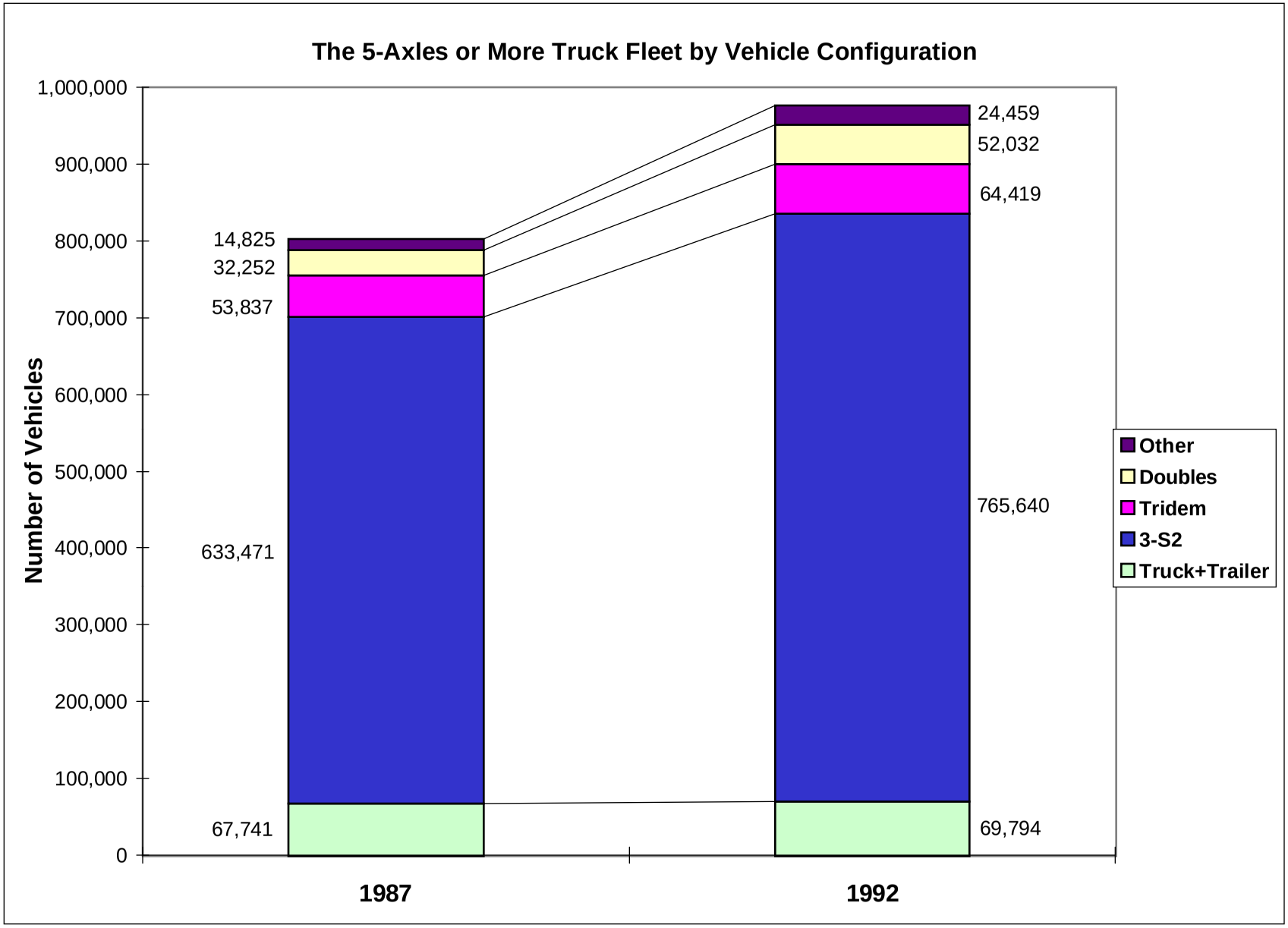
1987 Truck Fleet

Vehicle Group	Regions						% of Total
	North Central	North East	South Atlantic	South Gulf	West	Total	
Truck + Trailer @ 5-axle	12,147	6,832	8,221	11,812	17,656	56,668	7.1
Truck + Trailer @ 6-axle +	3,668	1,672	1,601	1,128	3,004	11,073	1.4
3-S2	249,344	81,228	97,249	128,336	77,314	633,471	79.0
Tridem Axle Semitrailer	22,191	6,622	7,505	10,160	7,359	53,837	6.7
4S1/S2	5,115	2,328	2,534	2,628	1,788	14,393	1.8
STAA	7,734	519	1,310	1,643	13,713	24,919	3.1
Doubles @ 6-axle or more	4,499	86	38	289	2,421	7,333	0.9
Triples	9	10	0	5	408	432	0.1
Total	304,707	99,297	118,457	156,001	123,663	802,125	100

* Note: Excludes pickups, mini-vans, utility sports, station wagons, trucks or truck-tractors with 4-tires, and straight trucks pulling 1-axle trailer or 1-axle utility trailer, as defined in Section 1.3.

Source: 1987 and 1992 Truck Inventory and Use Survey

Figure 3.5-1



Source: 1987 and 1992 Truck Inventory and Use Survey

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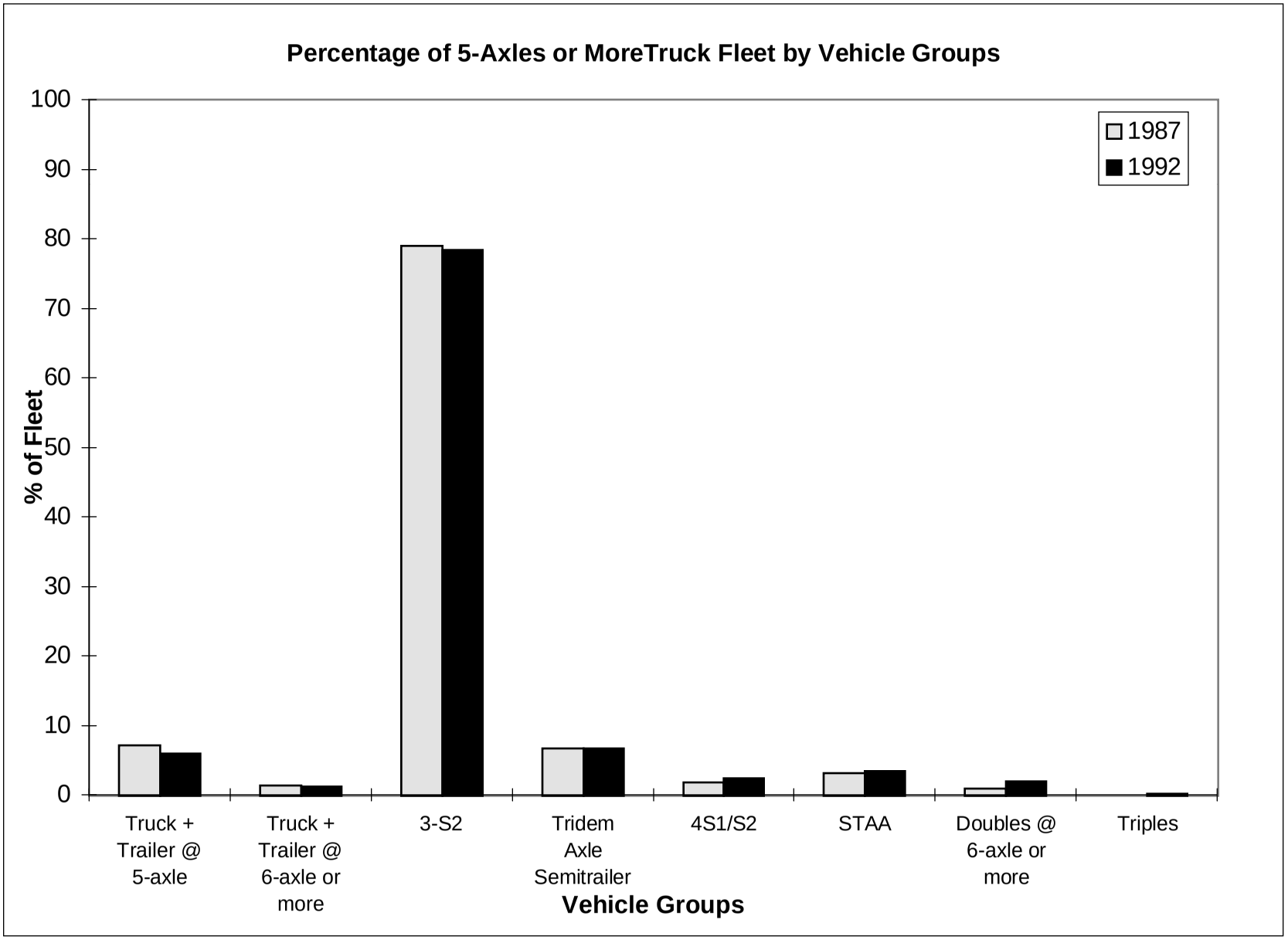
Figure 3.5-2



Source: 1987 and 1992 Truck Inventory and Use Survey

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4.0 Analysis of the 5-Axles or More Fleet by Body Type

For each truck in the 5-axles or more fleet, there is a body type identified with this vehicle. This body type classification is an indicator of the body of the vehicle or the trailer MOST OFTEN attached to it. This analysis uses Question 8 on the 1987 survey and Question 9 on the 1992 survey, as shown in Appendix I.

4.1 Analysis Structure

This analysis focused on the composition of the 5-axles or more fleet in terms of the number of vehicles in the different body type categories. The distribution of body types was evaluated across the regions and across vehicle groups.

- 26 body types (as defined in the TIUS Survey Question 9 on Form 2)

  - multi-stop or step van (including hi-cube or cutaway)
  - platform with devices permanently mounted on bed of truck
  - low boy (gooseneck)—platform with depressed center
  - basic platform—including flatbed, stake, etc.
  - livestock truck (including livestock drop frame)
  - insulated, non-refrigerated van
  - insulated, refrigerated van
  - drop frame van (including furniture van, etc.)
  - open top van (including fruit)
  - basic enclosed van (dry cargo)
  - beverage truck
  - utility truck—used in public utility operations
  - winch or crane truck—lifting equipment (including roll-on, roll-off)
  - wrecker—for motor vehicle towing or lifting
  - pole, logging, pulpwood or pipe truck
  - automobile transport
  - service truck or craftsman's vehicle
  - yard tractor—cab and chassis only used to spot trailers
  - oil field truck—service equipment permanently mounted on vehicle
  - grain bodies (including low-side grain and hoppers, etc.)
  - garbage truck
  - dump truck (including belly or bottom dump)
  - tank truck for liquids or gases
  - tank truck for dry bulk
  - concrete mixer
  - other (trucks whose body type was not one of the previous types)

- 8 vehicle groups (see Section 2.2)

- 5 traffic regions (see Section 2.3)

Appendix C gives the detailed results of the distribution of the 5-axles or more fleet, by body type, by vehicle group, by region for 1992 and 1987. This chapter will focus on the major body type categories which were obtained by grouping the 26 body types into 11 major body types.

- 11 major body type groups (collapsed from the 26 body types) :

  - **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)

Appendix D gives the regional detailed results for the distribution of the 5-axles or more fleet by major body type group and by vehicle group for 1992 and 1987.

4.2 Observations on Major Body Types in the 5-Axles or More Fleet

Table 4.2-1 summarizes the distribution of the fleet by the 11 major body type groups and by 5 regions for both 1992 and 1987. Table 4.2-2 describes the distribution of the fleet by the 11 major body type groups and by the 8 major vehicle groups for both 1992 and 1987.

The following observations on body type were made about the 1992 fleet. Selected comparisons with 1987 were made and noted in their section.

NATIONWIDE - 1992 (as shown in Figure 4.2-2)

- Close to half of the trucks in the fleet were vans (44.6%).

- Platforms accounted for the next largest portion of the population (22.2%)

- 10.1% of the fleet were dump trucks.

- 9.4% of the fleet were tanker trucks—with approximately 4 out of every 5 tankers being used for transporting liquids or gases and 1 out of every 5 being used for transporting dry bulk materials.

- The remaining major body types accounted for a very small proportion of the truck fleet: grain body trucks (4.2%), pole or logging trucks (3.2%), auto transporters (1.5%), livestock trucks (1.3%), and other body types (3.1%).

REGIONAL VARIATIONS - 1992

- Industry-specific body types tend to concentrate in certain geographical regions:

  - 75% of the auto transporters are concentrated in the North Central region.

  - Two-thirds (64%) of the grain bodies are concentrated in the North Central region. The remaining third is mostly located in the South Gulf region (18%) and West region (13%).

  - One-third (35%) of the pole and logging trucks are concentrated in the West region. One-half of these trucks are located in South Gulf region (25%) and South Atlantic region (24%).

  - Half of the livestock trucks are concentrated in the North Central region (47%). The remaining population tends to be in the West region (22%) and in the South Gulf region (19%).

CHANGES BETWEEN 1987 AND 1992 (as shown in Figures 4.2-2 and 4.3-3)

- Nationwide for both years, vans and platforms together account for two-thirds of all body types. However, the proportion of vans in the fleet grew from 41.4% to 44.6%, while the proportion of platforms in the fleet decreased from 26.9% to 22.2%. There has been a small increase in the proportion of specialized body types (i.e., "non van or platform" body types)—from 31.7% of the fleet in 1987 to 33.2% in 1992. Certain specialized body types have grown faster than the national growth rate of the 5-axles or more fleet (21.9%)—auto transporters increased 37.9%, grain bodies increased 61.9%, and pole and logging trucks 38.3%. The body types that experienced almost no growth were livestock trucks (0.6%) and platforms (0.6%).

- Regionally, a major shift away from platforms to vans and/or specialized body types occurred in all regions except the West region.

- North Central region—platforms decreased from 25.8% to 19.9% of the North Central fleet with noticeable increases in the proportion of vans, grain bodies and autotransporters.

- North East region—platforms decreased from 29.1% to 21.2% of the fleet, and vans have increased a corresponding amount from 39.2% to 47.5%, with the proportion of other body types remaining relatively constant.

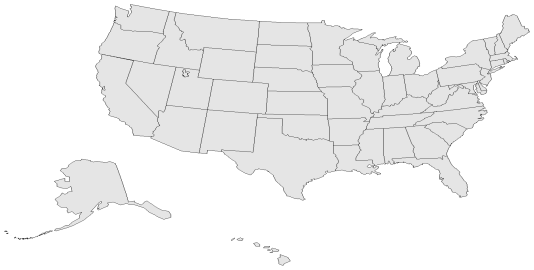
- South Atlantic region—platforms decreased from 26.4% to 22.7% of the fleet, and vans increased a corresponding amount from 44.3% to 48.7%, with noticeable increases in the proportion of pole and logging trucks.

- South Gulf region—platforms decreased from 28.3% to 23.2% of the fleet, and vans increased from 36.5% to 39.5% of the fleet.

- West region—the proportion of vans increased from 33.7% to 37.7%, while the proportion of most of the remaining body types remained constant or changed insignificantly.

Table 4.2-1

Truck Fleet ***(@ 5-axles or more)***
Number of Vehicles by Major Body Type, by Region



1992 Truck Fleet

Major Body Type	Regions					Total	% of Total
	North Central	North East	South Atlantic	South Gulf	West		
Platform	73,850	23,955	29,218	40,915	48,826	216,763	22.2
Van	178,832	53,547	62,535	69,009	71,554	435,477	44.6
Auto Transport	10,889	541	729	1,441	1,027	14,626	1.5
Dump Truck	31,361	15,759	9,750	14,956	27,040	98,865	10.1
Grain Bodies	26,484	547	1,535	7,449	5,202	41,217	4.2
Garbage Truck	949	1,202	286	303	745	3,483	0.4
Livestock Truck	5,825	326	1,194	2,360	2,792	12,496	1.3
Logging	3,391	1,501	7,427	7,862	11,072	31,253	3.2
Tank Truck, Dry Bulk	7,253	2,091	2,758	3,818	3,497	19,417	2.0
Tank Truck, Liquid or Gas	24,943	10,302	8,893	16,859	11,546	72,543	7.4
Other	6,965	3,033	4,225	9,654	6,328	30,205	3.1
Total	370,741	112,804	128,549	174,625	189,627	976,345	100

1987 Truck Fleet

Major Body Type	Regions					Total	% of Total
	North Central	North East	South Atlantic	South Gulf	West		
Platform	78,740	28,927	31,291	44,103	32,392	215,453	26.9
Van	142,269	38,964	52,430	57,003	41,629	332,294	41.4
Auto Transport	4,778	1,411	1,468	1,391	1,557	10,606	1.3
Dump Truck	25,681	14,020	9,825	15,683	17,007	82,216	10.2
Grain Bodies	15,695	313	1,091	4,247	4,113	25,459	3.2
Garbage Truck	380	361	31	144	251	1,167	0.1
Livestock Truck	5,746	250	881	3,869	1,663	12,410	1.5
Logging	892	1,268	4,587	6,522	9,338	22,606	2.8
Tank Truck, Dry Bulk	5,502	2,089	3,204	3,100	2,125	16,020	2.0
Tank Truck, Liquid or Gas	19,000	9,164	9,194	12,993	8,173	58,524	7.3
Other	6,025	2,530	4,456	6,948	5,416	25,374	3.2
Total	304,707	99,298	118,458	156,003	123,663	802,129	100

Source: 1987 and 1992 Truck Inventory and Use Survey

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Table 4.2-2

Truck Fleet ***(@ 5-axles or more)***

Number of Vehicles by Major Body Type, by Vehicle Group

1992 Truck Fleet

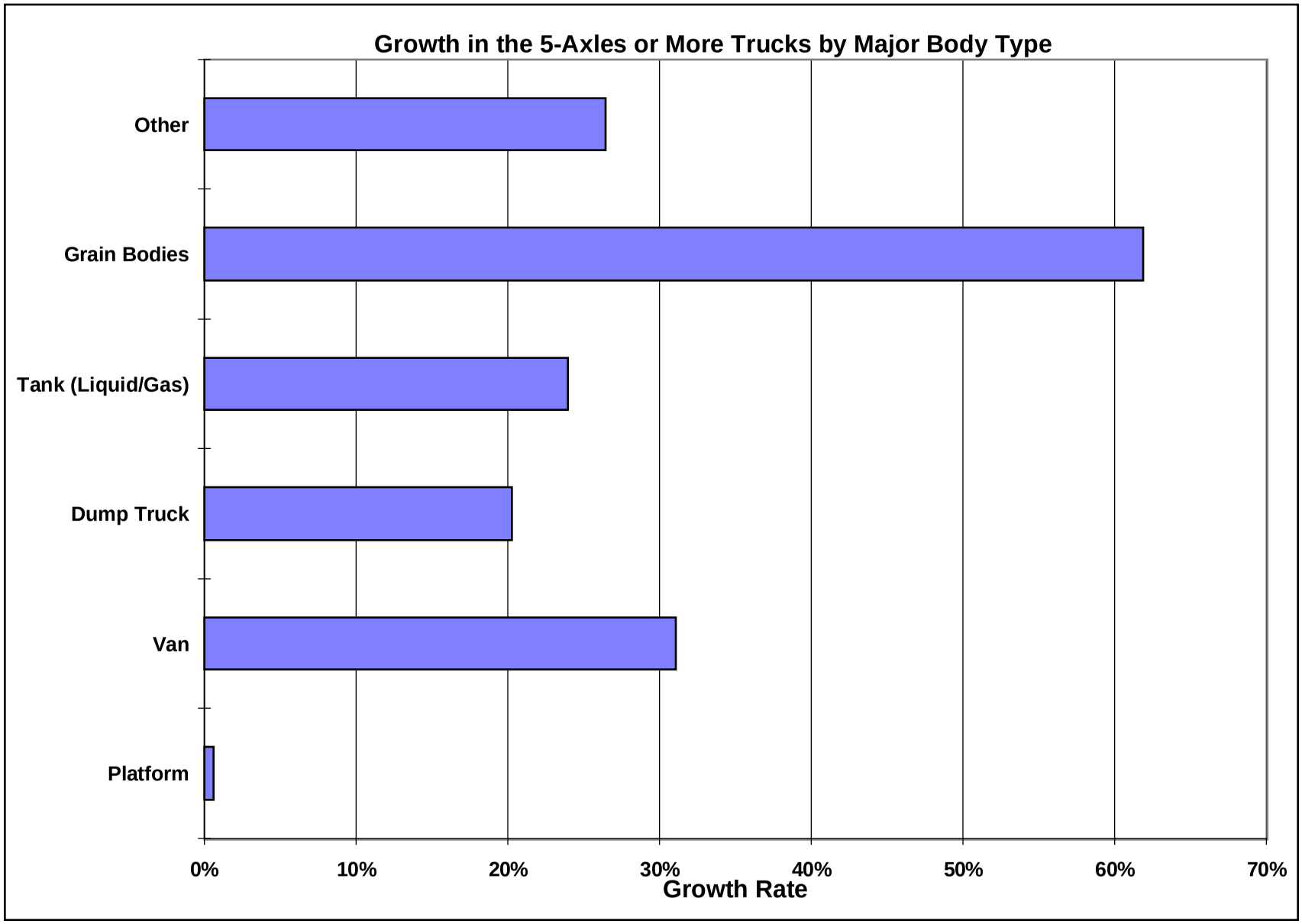
Major Body Type	Truck + Trailer @ 5-axle	Truck + Trailer @ 6-axle +	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles +	Triples	Total
Platform	16,115	2,166	158,733	23,645	6,839	5,122	4,059	84	216,763
Van	3,057	279	382,155	11,577	7,595	23,637	6,557	619	435,477
Auto Transport	717	0	13,164	515	230	0	0	0	14,626
Dump Truck	20,666	5,430	51,301	12,891	3,084	1,780	3,680	34	98,865
Grain Bodies	3,342	579	32,697	1,224	1,461	946	968	0	41,217
Garbage Truck	578	176	2,195	281	254	0	0	0	3,483
Livestock Truck	885	78	10,012	389	575	440	116	0	12,496
Pole, Logging Truck	4,147	815	22,313	2,476	1,084	0	418	0	31,253
Tank Truck, Dry Bulk	224	29	15,809	606	503	1,240	1,006	0	19,417
Tank Truck, Liquid or Gas	2,759	1,327	61,043	4,261	1,546	127	1,470	9	72,543
Other	5,796	629	16,221	6,553	542	175	289	0	30,205
Total	58,286	11,509	765,642	64,418	23,712	33,468	18,564	747	976,345

1987 Truck Fleet

Major Body Type	Truck + Trailer @ 5-axle	Truck + Trailer @ 6-axle +	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles +	Triples	Total
Platform	20,220	2,174	160,929	23,553	4,613	2,675	1,179	109	215,452
Van	3,350	961	291,101	10,378	4,432	17,945	3,818	307	332,292
Auto Transport	262	5	9,898	136	305	0	0	0	10,606
Dump Truck	17,792	4,054	45,947	10,048	1,967	1,352	1,039	17	82,216
Grain Bodies	1,251	482	20,042	1,226	496	1,298	664	0	25,460
Garbage Truck	51	0	945	140	0	0	31	0	1,167
Livestock Truck	1,165	197	10,377	510	144	0	17	0	12,410
Pole, Logging Truck	4,048	668	16,045	1,250	587	0	9	0	22,607
Tank Truck, Dry Bulk	178	110	13,536	737	270	744	445	0	16,020
Tank Truck, Liquid or Gas	2,439	386	51,018	2,829	1,068	679	105	0	58,524
Other	5,913	2,035	13,634	3,030	511	225	26	0	25,374
Total	56,669	11,073	633,473	53,837	14,393	24,918	7,333	432	802,127

Source: 1987 and 1992 Truck Inventory and Use Survey

Figure 4.2-1



Source: 1987 and 1992 Truck Inventory and Use Survey

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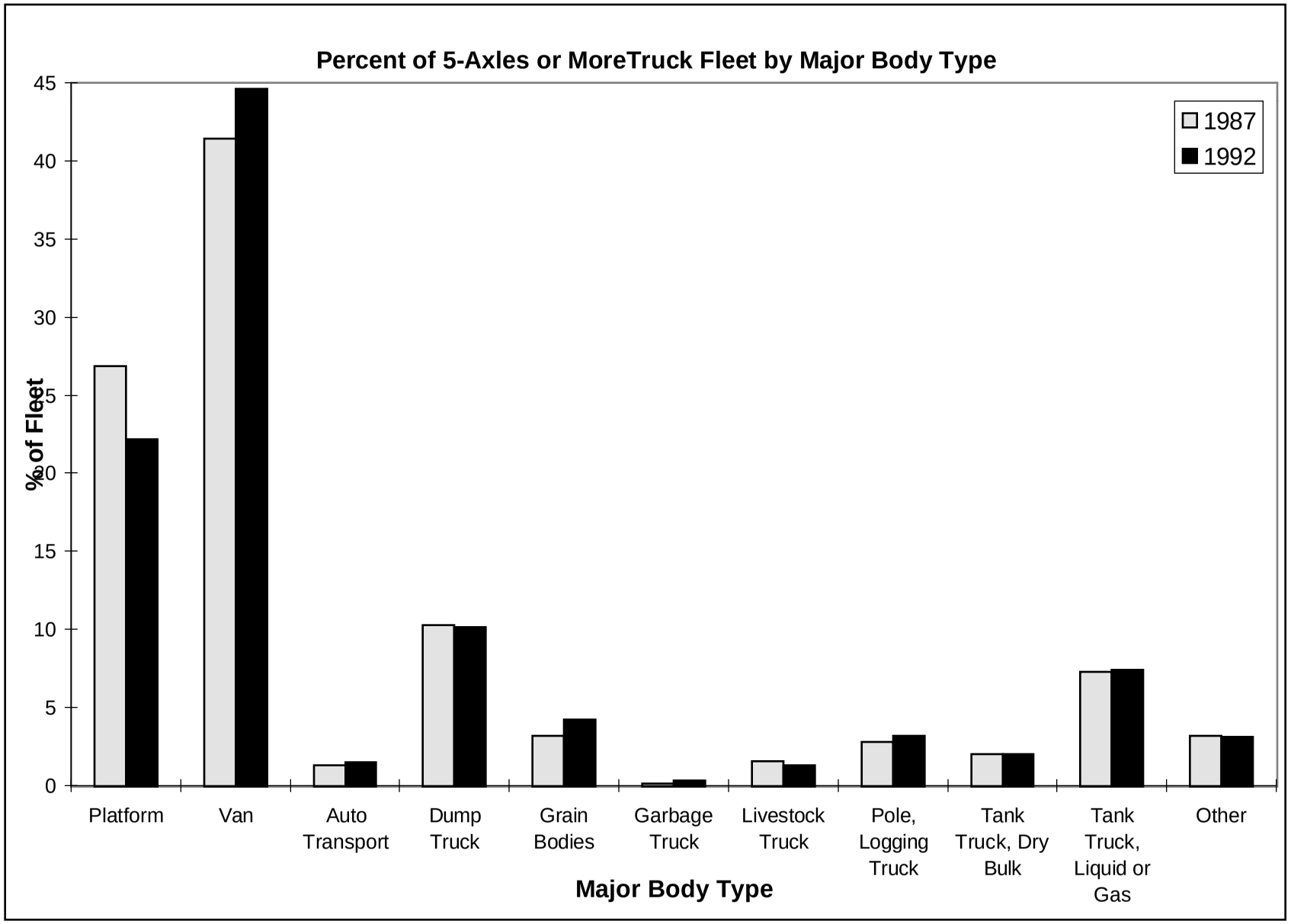
Figure 4.2-2



Source: 1987 and 1992 Truck Inventory and Use Survey

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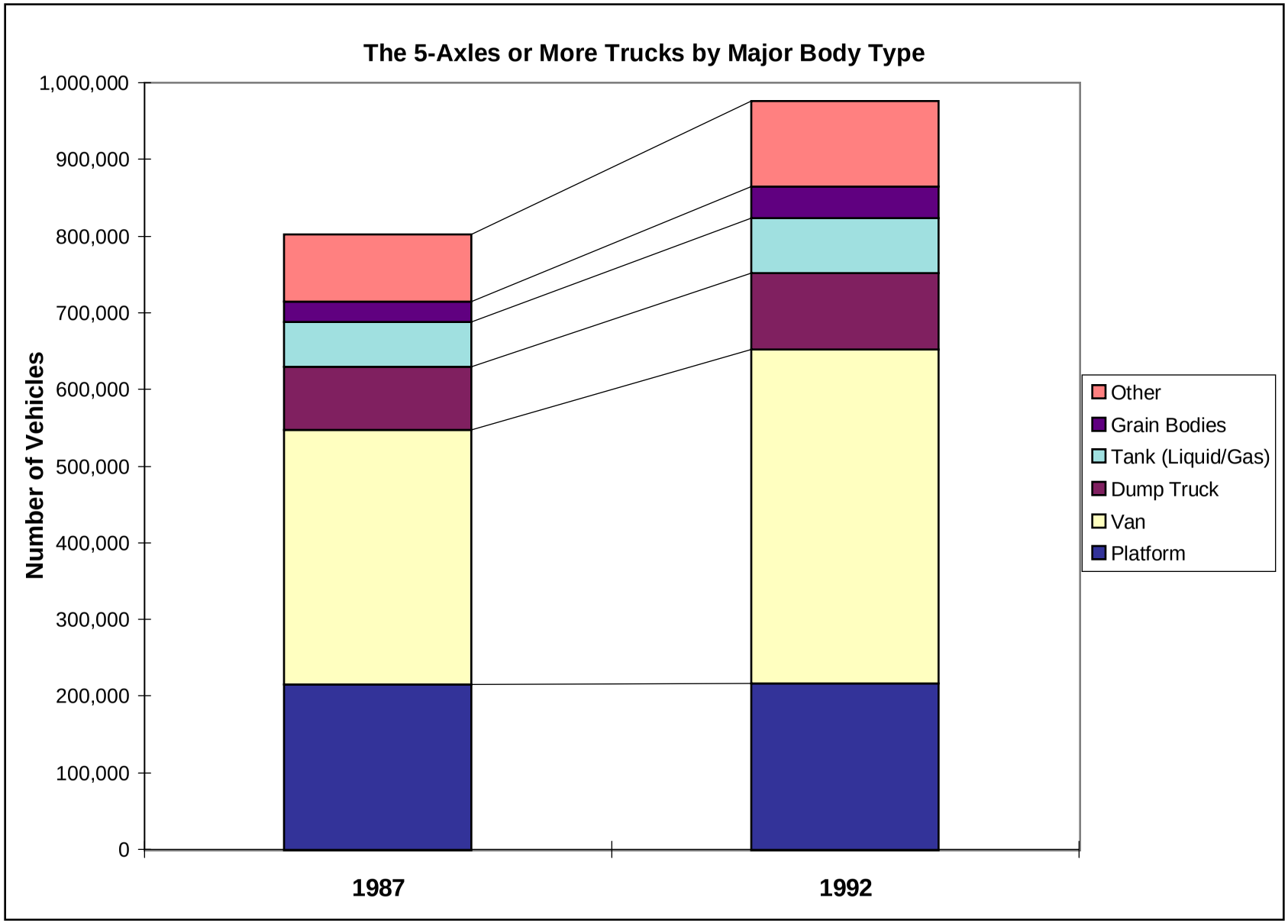
Figure 4.2-3



Source: 1987 and 1992 Truck Inventory and Use Survey

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5.0 Analysis of the 5-Axles or More Truck Fleet by Principal Product Carried

On the survey, all trucks defined the percent of their annual mileage that they hauled each of the 29 listed commodities or no load (1992 TIUS Survey, Question 28). The percent of vehicles miles of travel (VMT) hauling the various 29 commodities and the percent of VMT hauling no load totaled to 100% for 1992. Based on the respondent's reply to this question, the Bureau of the Census created a new variable which would indicate the principal product hauled MOST OFTEN by a given truck. Analyzing principal product ignores the remaining products by a respondent. Additionally, the only analysis available is determining the number of trucks in each vehicle group or region that have a given product as their "principal products."

5.1 Analysis Structure

This analysis focuses on the principal product hauled by various vehicles in the national fleet. In section 6.0, the distribution of VMT across commodities is discussed and this data was used to make general conclusions about the commodities/products that are hauled most frequently. Principal product was evaluated across the various vehicle groups and across the different traffic regions.

- 30 principal products (Derived variable created by the Bureau of the Census)

  - **no load** — vehicle empty
  - **live animals**
  - fresh **farm products**
  - **processed foods** and tobacco products
  - **animal feed**
  - **mining products**
  - **building materials** (gravel, sand, concrete, flat glass, etc.—except cut lumber)
  - **logs and** other **forest products**
  - **lumber and fabricated wood products**—except furniture
  - **paper and paper products**
  - **chemicals** and/or drugs (including fertilizers, pesticides, cosmetics, paints, etc.)
  - **petroleum and petroleum products** (including paving and roofing materials)
  - **plastics** and/or and **rubbe**r products
  - **primary metal** products—pipes, ingots, billets, sheets, etc.
  - **fabricated metal** products—except machinery or transportation equipment
  - **machinery**—electrical or non-electrical and electronic
  - **transportation equipment** (including complete vehicles) and parts
  - **furniture** (wood and non-wood) and/or hardware—not involved in household moving
  - **glass products**
  - **textiles and apparels**—fibers, leather goods, carpets, clothing, etc.

- **miscellaneous products** of manufacturing
- moving of **household** and office furniture
- **craftsman's equipment** - miscellaneous tools and/or parts for specialized use
- **mixed cargo** (including the delivery of small packages)
- **scrap** (not for recycling), garbage, trash, septic tank waste
- **industrial** "waste" **water**
- **hazardous waste (EPA** manifest)
- **hazardous waste (non-EPA** manifest)
- **recyclable products**
- **other**

- 8 vehicle groups (see Section 2.2)

- 5 traffic regions (see Section 2.3)

5.2 Observations on the Principal Products Carried by 5-Axles or More Trucks

Tables 5.2-1 and 5.2-2 give the distribution of the 5-axles or more truck fleet by principal product carried by vehicle group, and by region for 1992.

NATIONWIDE - 1992

- Three-quarters of the 5-axles or more fleet vehicles reported hauling primarily only 12 products
  - processed foods (13.7% of total 5-axles or more fleet)
  - building materials (11.2% of total 5-axles or more fleet)
  - farm products (9.9% of total 5-axles or more fleet)
  - mixed cargo (7.2% of total 5-axles or more fleet)
  - machinery (5.5% of total 5-axles or more fleet)
  - transportation equipment (5.0% of total 5-axles or more fleet)
  - logs and forest products (4.6% of total 5-axles or more fleet)
  - paper and paper products (4.5% of total 5-axles or more fleet)
  - primary metals (4.4% of total 5-axles or more fleet of total 5-axles or more fleet)
  - petroleum and petroleum products (4.0% of total 5-axles or more fleet)
  - chemicals (3.7% of total 5-axles or more fleet)
  - lumber and fabricated wood (3.6% of total 5-axles or more fleet).

- For the 3-S2 vehicle group,

  - 1 out of 6 (16.2%) primarily hauled processed foods.
  - 1 out of 10 (10.1%) primarily hauled fresh farm products.
  - 1 out of 11 (8.5%) primarily hauled building materials.

Table 5.2-1

1992 Truck Fleet (@ 5-axles or more)
Principal Product Hauled, by Vehicle Group

Commodity	Truck + Trailer @ 5-axle	Truck + Trailer @ 6-axle	3-S2	Axle Semi-trailer	4S1/S2	STAA	Doubles @ 6-axles+	Triples	National Total
Farm Products	6,791	792	77,197	3,341	2,795	3,691	2,271	0	96,878
Live Animals	1,648	305	19,917	966	1,023	679	372	0	24,911
Animal Feed	958	85	15,513	580	523	577	575	0	18,812
Processed Foods	996	194	123,698	3,045	2,610	1,929	1,751	113	134,336
Mining	1,001	243	10,494	2,181	704	231	478	18	15,350
Building	19,076	5,144	65,246	9,608	3,767	2,577	4,079	26	109,523
Logs	4,909	937	32,445	4,226	1,688	0	541	19	44,764
Lumber	2,083	394	25,458	4,258	1,197	604	755	14	34,764
Paper	23	12	41,906	734	391	598	678	47	44,390
Chemicals	1,111	37	30,001	1,070	301	2,568	656	109	35,854
Petroleum	2,112	1,422	30,536	3,123	799	127	952	9	39,080
Plastics	528	0	11,751	467	254	383	22	19	13,424
Primary Metal	643	74	38,262	2,372	1,452	34	491	5	43,333
Fabricated	594	315	19,078	2,055	751	578	88	0	23,460
Machinery	4,432	729	35,528	11,476	937	53	301	4	53,459
Transportation Equipment	3,653	149	37,361	6,467	1,037	12	63	40	48,781
Furniture	358	7	11,981	211	265	0	440	0	13,262
Textile	57	0	12,293	204	49	371	80	0	13,054
Household Goods	154	11	14,664	421	456	10	50	0	15,766
Craftsman's Equipment	1,563	35	2,883	184	82	28	29	0	4,804
Mixed Cargo	134	157	47,671	1,303	657	17,067	2,920	209	70,118
Refuse	745	210	5,700	1,355	653	0	105	0	8,769
Glass Products	132	0	2,883	353	111	242	145	0	3,866
Miscellaneous	315	145	20,758	628	348	196	133	0	22,522
Industrial Water	165	29	1,990	248	128	0	0	0	2,560
Hazardous Waste(EPA)	540	0	3,667	587	139	0	37	0	4,970
Hazardous (Non-EPA)	36	0	906	39	0	0	4	0	985
Recyclables	319	0	8,566	1,031	115	144	208	0	10,383
Other*	2,484	83	14,759	1,643	459	769	341	0	20,539
No Load	727	0	2,527	239	19	0	0	115	3,627
Total	58,286	11,509	765,640	64,418	23,712	33,468	18,564	747	976,343

* Other category contains 'other', 'personal transportation', and 'not in use'.

Table 5.2-2

1992 Truck Fleet (@ 5-axles or more)
Principal Product Hauled, by Region

Commodity	North Central	North East	South Atlantic	South Gulf	West	National Total	% of Total
Farm Products	41,730	8,612	11,448	14,589	20,499	96,878	9.9
Live Animals	10,197	1,385	3,816	4,079	5,434	24,911	2.6
Animal Feed	8,404	1,210	1,968	3,829	3,403	18,812	1.9
Processed Foods	53,289	17,557	17,752	16,503	29,235	134,336	13.8
Mining	4,832	2,119	1,811	4,279	2,310	15,351	1.6
Building	34,057	14,357	13,723	17,745	29,640	109,522	11.2
Logs	6,634	3,591	10,161	10,183	14,195	44,764	4.6
Lumber	7,685	3,923	6,609	7,700	8,847	34,764	3.6
Paper	24,503	5,636	3,593	7,142	3,516	44,390	4.5
Chemicals	13,271	4,549	4,426	6,235	7,373	35,854	3.7
Petroleum	12,440	5,557	4,734	9,356	6,993	39,080	4.0
Plastics	5,211	1,634	2,462	3,174	943	13,424	1.4
Primary Metal	23,474	5,003	2,535	7,924	4,396	43,332	4.4
Fabricated Metal	9,523	2,657	2,952	4,749	3,579	23,461	2.4
Machinery	20,345	6,224	7,864	10,953	8,073	53,459	5.5
Transportation Equipment	25,229	4,081	3,849	9,693	5,929	48,781	5.0
Furniture	5,331	768	3,064	1,603	2,497	13,262	1.4
Textile	1,652	1,579	5,800	2,966	1,057	13,055	1.3
Household Goods	8,034	1,871	1,082	2,148	2,630	15,765	1.6
Craftsman's Equipment	1,221	1,054	1,095	1,030	404	4,804	0.5
Mixed Cargo	29,162	6,940	8,023	12,150	13,843	70,118	7.2
Refuse	2,540	2,824	722	967	1,715	8,769	0.9
Glass Products	751	634	770	674	1,037	3,866	0.4
Miscellaneous	9,443	3,101	3,223	3,850	2,905	22,522	2.3
Industrial Water	501	146	111	1,437	365	2,560	0.3
Hazardous Waste (EPA)	1,317	1,044	460	1,142	1,007	4,970	0.5
Hazardous Waste (Non-EPA)	88	179	97	474	147	985	0.1
Recyclables	3,928	1,747	1,184	1,599	1,925	10,383	1.1
Other*	5,744	2,615	3,093	3,739	5,349	20,539	2.1
No Load	204	211	121	2,712	379	3,627	0.4
Total	370,738	112,804	128,549	174,624	189,626	976,340	100

* Other category contains 'other', 'personal transportation', and 'not in use'.

Source: 1992 Truck Inventory and Use Survey

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- For all truck + trailer combinations which includes the truck+tractor @ 5-axles and the truck+tractor @ 6-axles or more vehicle groups,

  - 1 out of 3 (34.7%) primarily hauled building materials.

  - 1 out of 10 (10.9%) primarily hauled fresh farm products.

  - An additional one-quarter of the truck+trailer combinations primarily hauled either logs and forest products (8.4%), machinery (7.4%), transportation equipment (5.5%), or petroleum products (5.1%).

- For the tridem axle semitrailer group, more than one-quarter primarily hauled either machinery (17.8%) or transportation equipment (10.0%). An additional one-quarter primarily hauled either building materials (14.9%), logs and forest products (6.6%), or lumber and fabricated woods (6.6%).

- For the STAA Doubles trucks, more than one-half (51.0%) hauled mixed cargo. Other principal products hauled often by STAA doubles were farm products (11.0%), building materials (7.7%), and chemicals (7.7%).

- For the doubles at 6-axles or more, one-half of the group primarily hauled either building materials (22.0% of total), mixed cargo (15.7%), or farm products (12.2%).

REGIONAL VARIATIONS - 1992

- One-third of the fleet vehicles (34.9%) primarily hauled one of these three principal products: processed foods (13.8%), building materials (11.2%), or farm products (9.9%). Significant proportions of the regional fleets (North Central region—34.9%, North East region—35.9%, South Atlantic region—33.4%, South Gulf region—27.8%, West region—41.8%) also claim these as their top three products.

Table 5.2-3 Ranking of Principal Products by Regions in 1992

Products	National	North Central	North East	South Atlantic	South Gulf	West
Processed Foods	1	1	1	1	2	2
Building Materials	2	3	2	2	1	1
Farm Products	3	2	3	3	3	3
Mixed Cargo	4	4	4	5	4	5
Machinery	5	✓	5	6	5	7
Transportation Equipment	6	5	✓	✓	7	✓
Logs and Forest Products	7	✓	✓	4	6	4

Note: ✓ indicates 8th or lower ranking.

6.0 Analysis of the 5-Axles or More Truck Fleet by Percent of VMT Hauling a Commodity

On the survey, all trucks defined the percent of their annual mileage that they hauled each of the 29 listed commodities or no load (TIUS Survey, Question 28 for 1992 and Question 30 for 1987, Appendix I). The percent of vehicle miles of travel (VMT) hauling the various 29 commodities and the percent of VMT hauling no load totaled to 100% for 1992.

6.1 Analysis Structure

This analysis estimates the percent of VMT that a particular commodity is hauled. Commodities are evaluated across the different vehicle groups and the different regions. No comparison was done with the 1987 data because of differences in the formatting and wording of the question, particularly because no load was not included with the list of commodities in the 1987 survey.

- 30 commodities

  - **no load** — vehicle empty
  - **live animals**
  - fresh **farm products**
  - **processed foods** and tobacco products
  - **animal feed**
  - **mining products**
  - **building materials** (gravel, sand, concrete, flat glass, etc.—except cut lumber)
  - **logs and** other **forest products**
  - **lumber and fabricated wood products**—except furniture
  - **paper and paper products**
  - **chemicals** and/or drugs (including fertilizers, pesticides, cosmetics, paints, etc.)
  - **petroleum and petroleum products** (including paving and roofing materials)
  - **plastics** and/or and **rubbe**r products
  - **primary metal** products—pipes, ingots, billets, sheets, etc.
  - **fabricated metal** products—except machinery or transportation equipment
  - **machinery**—electrical or non-electrical and electronic
  - **transportation equipment** (including complete vehicles) and parts
  - **furniture** (wood and non-wood) and/or hardware—not involved in household moving
  - **glass products**
  - **textiles and apparels**—fibers, leather goods, carpets, clothing, etc.
  - **miscellaneous products** of manufacturing
  - moving of **household** and office furniture
  - **craftsman's equipment** - miscellaneous tools and/or parts for specialized use
  - **mixed cargo** (including the delivery of small packages)
  - **scrap** (not for recycling), garbage, trash, septic tank waste

- **industrial** "waste" **water**
- **hazardous waste (EPA** manifest)
- **hazardous waste (non-EPA** manifest)
- **recyclable products**
- **other**

- 8 vehicle groups (see Section 2.2)

- 5 traffic regions (see Section 2.3).

6.2 Observations on the Percent of VMT Hauling a Commodity

NATIONWIDE - 1992 (Table 6.2-1)

- Two-thirds of the 5-axles or more truck fleet's VMT was used to haul 12 commodities.

  - processed foods (14.8%)
  - building materials (7.0%)
  - farm products (6.7%)
  - mixed cargo (8.7%)
  - machinery (2.7%)
  - transportation equipment (3.5%)
  - logs and forest products (3.0%)
  - paper and paper products (5.1%)
  - primary metals (4.4%)
  - petroleum and petroleum products (3.6%)
  - chemicals (4.2%)
  - lumber and fabricated wood (3.3%)

- Vehicles carried no loads for about 11.0% of their VMT.

VEHICLE GROUPS - 1992 (Table 6.2-2)

- Half of the truck + trailer @ 5-axles group's VMT was used to haul 5 commodities: building materials (24.1% of VMT), logs or forest products (11.5%), petroleum (6.2%), farm products (5.1%), and lumber (5.1%). No loads were carried for about one-sixth of their VMT (16.4%).

- Half of the truck + trailer @ 6-axles group's VMT was used to haul 2 commodities: building materials (34.5% of VMT) and petroleum (23.7%). No loads were carried for about one-eighth of their VMT (12.9%).

Table 6.2-1

1992 Truck Fleet ***(@ 5-axles or more)***

Distribution of Percent of VMT Hauling a Commodity, by Vehicle Group
Based on Total Fleet VMT

Commodity	Truck+Trailer @ 5-axle	Truck+Trailer @ 6-axle	Tridem axle 3-S2	Tridem axle Semitrailer	4S1/S2	STAA	Doubles @ 6-axles+	Triples	National Total
No Load	0.39	0.08	9.06	0.60	0.25	0.28	0.25	0.01	10.93
Live Animal	0.03	0.01	1.61	0.06	0.07	0.05	0.04	0.00	1.87
Farm Products	0.12	0.02	5.75	0.21	0.17	0.26	0.14	0.00	6.66
Processed Food	0.09	0.01	13.75	0.32	0.31	0.18	0.18	0.01	14.84
Animal Feed	0.05	0.01	1.56	0.07	0.05	0.09	0.05	0.00	1.87
Mining	0.08	0.01	0.84	0.19	0.05	0.03	0.07	0.00	1.26
Building	0.58	0.21	4.83	0.63	0.24	0.18	0.28	0.00	6.96
Logging	0.27	0.05	2.19	0.32	0.12	0.00	0.07	0.00	3.02
Lumber	0.12	0.01	2.63	0.28	0.13	0.05	0.08	0.00	3.30
Paper	0.01	0.00	4.80	0.09	0.05	0.08	0.08	0.00	5.10
Chemicals	0.04	0.00	3.63	0.12	0.03	0.28	0.07	0.01	4.18
Petroleum	0.15	0.15	2.86	0.27	0.06	0.03	0.09	0.00	3.61
Plastic	0.04	0.00	1.93	0.04	0.03	0.03	0.03	0.01	2.09
Primary Metal	0.05	0.00	3.93	0.17	0.18	0.02	0.05	0.00	4.40
Fabricated Metal	0.01	0.01	2.03	0.17	0.07	0.07	0.02	0.00	2.38
Machinery	0.07	0.02	2.06	0.45	0.05	0.02	0.02	0.00	2.67
Transport Equipment	0.10	0.00	2.88	0.34	0.12	0.01	0.01	0.00	3.47
Furniture	0.03	0.00	1.82	0.02	0.02	0.01	0.05	0.00	1.96
Glass	0.00	0.00	0.69	0.05	0.02	0.02	0.02	0.00	0.82
Textile	0.01	0.00	1.81	0.04	0.01	0.05	0.02	0.00	1.95
Miscellaneous	0.02	0.00	2.64	0.07	0.04	0.04	0.04	0.00	2.87
Household Goods	0.00	0.00	1.48	0.04	0.05	0.00	0.00	0.00	1.57
Craftsman's Tools	0.03	0.00	0.19	0.02	0.00	0.00	0.00	0.00	0.25
Mixed Cargo	0.02	0.02	5.56	0.12	0.09	2.47	0.42	0.04	8.73
Refuse	0.02	0.01	0.37	0.09	0.04	0.00	0.00	0.00	0.54
Industrial Water	0.02	0.00	0.14	0.01	0.00	0.00	0.00	0.00	0.17
Hazardous EPA	0.01	0.00	0.39	0.05	0.01	0.00	0.00	0.00	0.47
Hazardous Non-EPA	0.01	0.00	0.14	0.02	0.01	0.03	0.00	0.00	0.21
Recyclables	0.02	0.00	0.75	0.07	0.01	0.02	0.02	0.00	0.90
Other	0.01	0.00	0.86	0.03	0.04	0.01	0.01	0.00	0.96
Total	2.38	0.62	83.19	4.96	2.33	4.32	2.11	0.10	100.00

Source: 1992 Truck Inventory and Use Survey

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Table 6.2-2

1992 Truck Fleet ***(@ 5-axles or more)***

Distribution of Percent of VMT Across Commodities
For a Given Vehicle Group

Commodity	Truck+Trailer @ 5-axle	Truck+Trailer @ 6-axle	3-S2	Tridem axle Semitrailer	4S1/S2	STAA	Doubles @ 6-axles+	Triples	National Total
No Load	16.41	12.88	10.90	12.11	10.66	6.59	11.74	12.41	10.93
Live Animal	1.17	1.63	1.94	1.13	3.22	1.10	1.89	0.00	1.87
Farm Products	5.14	3.22	6.91	4.14	7.42	5.94	6.43	0.14	6.66
Processed Food	3.80	1.50	16.53	6.42	13.37	4.16	8.36	5.66	14.84
Animal Feed	2.03	0.83	1.87	1.37	2.03	2.16	2.32	0.12	1.87
Mining	3.20	1.71	1.00	3.86	2.27	0.64	3.09	2.54	1.26
Building	24.14	34.48	5.81	12.79	10.20	4.25	13.13	2.60	6.96
Logging	11.45	7.57	2.63	6.52	5.00	0.03	3.51	4.19	3.02
Lumber	5.13	1.53	3.16	5.73	5.42	1.26	3.59	0.27	3.30
Paper	0.27	0.13	5.77	1.72	2.24	1.85	3.63	3.08	5.10
Chemicals	1.49	0.25	4.36	2.42	1.34	6.50	3.56	6.59	4.18
Petroleum	6.21	23.72	3.44	5.42	2.74	0.67	4.22	1.23	3.61
Plastic	1.51	0.00	2.31	0.75	1.31	0.62	1.30	9.33	2.09
Primary Metal	2.03	0.61	4.72	3.52	7.86	0.41	2.18	0.59	4.40
Fabricated Metal	0.62	1.01	2.44	3.38	3.16	1.57	0.78	0.31	2.38
Machinery	2.78	2.55	2.47	9.04	2.02	0.36	1.04	0.45	2.67
Equipment	3.99	0.64	3.46	6.84	5.16	0.24	0.52	2.86	3.47
Furniture	1.39	0.03	2.19	0.50	0.88	0.18	2.36	0.44	1.96
Glass	0.15	0.00	0.83	1.10	0.80	0.57	1.17	0.08	0.82
Textile	0.24	0.00	2.18	0.85	0.50	1.24	1.08	0.36	1.95
Miscellaneous	0.86	0.68	3.18	1.50	1.82	0.91	2.04	2.42	2.87
Household Goods	0.14	0.27	1.78	0.72	1.94	0.09	0.13	0.00	1.57
Craftsman's Tools	1.09	0.33	0.23	0.34	0.11	0.11	0.17	0.35	0.25
Mixed Cargo	0.80	2.65	6.68	2.40	3.87	57.16	19.76	42.26	8.73
Refuse	1.04	1.23	0.45	1.77	1.73	0.00	0.17	0.00	0.54
Industrial Water	0.75	0.02	0.17	0.17	0.13	0.00	0.00	0.00	0.17
Hazardous EPA	0.54	0.00	0.47	0.96	0.44	0.11	0.19	0.14	0.47
Hazardous Non-EPA	0.37	0.05	0.17	0.43	0.30	0.71	0.04	0.14	0.21
Recyclables	0.85	0.20	0.91	1.43	0.53	0.41	1.15	0.44	0.90
Other	0.43	0.28	1.03	0.68	1.54	0.14	0.46	0.99	0.96
Total	100	100	100	100	100	100	100	100	100

Source: 1992 Truck Inventory and Use Survey

3/3/96

- For the 3-S2 group,

  - One-fifth of the VMT was used to haul either processed foods (16.5% of VMT) or farm products (6.9%).

  - No loads were carried for one-tenth of their VMT (10.9%).

- Half of the tridem axle semitrailer group's VMT was used to haul 6 commodities: building materials (12.8% of VMT), machinery (9.0%), transportation equipment (6.8%), logs and forest products (6.5%), lumber (5.7%), and processed foods (6.4%). No loads were carried for about one-eighth of their VMT (12.1%).

- Over half of the STAA doubles group's VMT was used to haul mixed cargos (57.2% of VMT).

- Close to half of the triple trailers group's VMT was used to haul mixed cargos (42.5%).

- For all commodities, the 3-S2 vehicle group accounted for the large proportion of the VMT hauling a particular product (at minimum 63% of a commodity's VMT was hauled in a 3-S2). (See Table 6.2-3.)

REGIONAL VARIATIONS - 1992 (Tables 6.2-4)

- 42% of the 5-axles or more fleet's VMT is driven by vehicles registered in the North Central region. For all but 5 commodities, the North Central trucks accounted for a large proportion of the VMT hauling a particular product. The exceptions were logs and forest products which were hauled mostly by West region vehicles (31.1% of logs VMT), textiles which were hauled mostly by South Atlantic region vehicles (40.4% of textiles VMT), refuse which was hauled mostly by North East region vehicles (36.1%), industrial waste water and hazardous non-EPA waste which were hauled by South Gulf region vehicles (68.8% of industrial water and 25.6% of non-EPA waste).

COMPARISON OF COMMODITY DATA AND PRINCIPAL PRODUCT

- A comparison of Tables 5.2-3 and 6.2-4 shows a difference in the ranking of commodities. Table 6.2-5 is a ranking based on the VMT that each of the commodities accounted for in 1992. Table 5.2-3 is a ranking based on the number of trucks that haul a given principal product.

Table 6.2-5 Ranking of the Major Commodities (based on VMT) by Regions in 1992

Products	National	North Central	North East	South Atlantic	South Gulf	West
Processed Foods	1	1	1	1	1	1
Mixed Cargo	2	2	3	4	3	4
Building Materials	3	5	2	3	2	2
Farm Products	4	4	4	2	4	3
Paper Products	5	3	5	✓	7	✓
Primary Metal	6	6	6	✓	6	✓
Chemicals	7	✓	7	✓	✓	7

Note: ✓ indicates 8th or lower ranking.

Table 6.2-3

1992 Truck Fleet ***(@ 5-axles or more)***

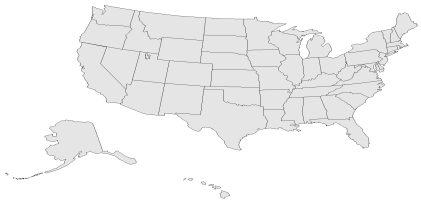
Distribution of Percent of VMT Across Vehicle Groups
Hauling a Given Commodity

Commodity	Truck+Trailer @ 5-axle	Truck+Trailer @ 6-axle	Tridem axle 3-S2	Tridem axle Semitrailer	4S1/S2	STAA	Doubles @ 6-axles+	Triples	National Total
No Load	3.58	0.73	82.94	5.50	2.27	2.60	2.26	0.11	100.00
Live Animal	1.49	0.54	86.30	3.00	4.00	2.54	2.13	0.00	100.00
Farm Products	1.84	0.30	86.30	3.09	2.60	3.85	2.03	0.00	100.00
Processed Food	0.61	0.06	92.65	2.15	2.10	1.21	1.19	0.04	100.00
Animal Feed	2.59	0.27	83.35	3.64	2.53	4.99	2.61	0.01	100.00
Mining	6.04	0.84	66.19	15.20	4.18	2.19	5.16	0.20	100.00
Building	8.27	3.07	69.48	9.12	3.41	2.64	3.97	0.04	100.00
Logging	9.02	1.55	72.26	10.70	3.85	0.05	2.44	0.14	100.00
Lumber	3.70	0.29	79.63	8.62	3.82	1.65	2.29	0.01	100.00
Paper	0.12	0.02	94.04	1.67	1.02	1.57	1.50	0.06	100.00
Chemicals	0.85	0.04	86.83	2.87	0.74	6.72	1.79	0.16	100.00
Petroleum	4.10	4.07	79.30	7.46	1.77	0.80	2.46	0.03	100.00
Plastic	1.72	0.00	92.02	1.77	1.46	1.28	1.31	0.44	100.00
Primary Metal	1.10	0.09	89.22	3.97	4.16	0.40	1.04	0.01	100.00
Fabricated Metal	0.62	0.26	85.41	7.06	3.10	2.85	0.69	0.01	100.00
Machinery	2.47	0.59	76.96	16.80	1.76	0.58	0.82	0.02	100.00
Transport Equipment	2.75	0.11	83.18	9.79	3.47	0.30	0.32	0.08	100.00
Furniture	1.69	0.01	93.03	1.26	1.05	0.40	2.54	0.02	100.00
Glass	0.45	0.00	84.60	6.63	2.28	3.02	3.01	0.01	100.00
Textile	0.29	0.00	93.03	2.16	0.59	2.74	1.17	0.02	100.00
Miscellaneous	0.72	0.15	92.11	2.59	1.48	1.37	1.50	0.08	100.00
Household Goods	0.22	0.11	94.11	2.28	2.87	0.24	0.18	0.00	100.00
Craftsman's Tools	10.42	0.82	77.58	6.76	0.99	1.88	1.41	0.14	100.00
Mixed Cargo	0.22	0.19	63.69	1.37	1.03	28.26	4.76	0.48	100.00
Refuse	4.61	1.42	69.48	16.33	7.50	0.00	0.66	0.00	100.00
Industrial Water	10.49	0.07	82.66	5.04	1.75	0.00	0.00	0.00	100.00
Hazardous EPA	2.71	0.00	83.25	10.04	2.15	0.96	0.85	0.03	100.00
Hazardous Non-EPA	4.17	0.16	67.23	10.02	3.35	14.62	0.39	0.07	100.00
Recyclables	2.25	0.14	83.61	7.91	1.38	1.99	2.68	0.05	100.00
Other	1.06	0.18	89.79	3.52	3.73	0.62	1.00	0.10	100.00
Total	2.38	0.62	83.19	4.96	2.33	4.32	2.11	0.10	100.00

Source: 1992 Truck Inventory and Use Survey

3/3/96

Table 6.2-4



1992 Truck Fleet ***(@ 5-axles or more)***
Distribution of Percent of VMT
Hauling a Commodity, by Region
Based on Total Fleet VMT

Commodity	North Central	North East	South Atlantic	South Gulf	West	National Total
No Load	4.10	1.12	1.58	2.21	1.92	10.93
Live Animal	0.80	0.12	0.24	0.31	0.39	1.87
Farm Products	2.61	0.68	0.98	1.05	1.35	6.66
Processed Food	6.61	1.55	1.89	2.01	2.79	14.84
Animal Feed	0.90	0.13	0.19	0.35	0.30	1.87
Mining	0.41	0.17	0.16	0.34	0.18	1.26
Building	2.40	0.77	0.93	1.38	1.48	6.96
Logging	0.44	0.25	0.70	0.69	0.94	3.02
Lumber	0.88	0.31	0.56	0.73	0.82	3.30
Paper	2.71	0.62	0.46	0.81	0.51	5.10
Chemicals	1.69	0.45	0.54	0.73	0.77	4.18
Petroleum	1.15	0.42	0.45	0.92	0.67	3.61
Plastic	0.95	0.19	0.28	0.46	0.20	2.09
Primary Metal	2.32	0.49	0.32	0.84	0.44	4.40
Fabricated Metal	1.14	0.26	0.28	0.47	0.23	2.38
Machinery	1.22	0.25	0.35	0.52	0.33	2.67
Transport Equipment	2.15	0.19	0.26	0.54	0.32	3.47
Furniture	0.86	0.10	0.44	0.29	0.27	1.96
Glass	0.30	0.12	0.12	0.16	0.12	0.82
Textile	0.39	0.17	0.79	0.43	0.17	1.95
Miscellaneous Mfg.	1.33	0.34	0.35	0.49	0.36	2.87
Household Goods	0.84	0.16	0.11	0.20	0.25	1.57
Craftsman's Tools	0.08	0.04	0.05	0.06	0.02	0.25
Mixed Cargo	4.58	0.71	0.85	1.35	1.23	8.73
Refuse	0.14	0.19	0.05	0.07	0.09	0.54
Industrial Water	0.02	0.01	0.01	0.12	0.01	0.17
Hazardous EPA	0.14	0.11	0.04	0.12	0.06	0.47
Hazardous Non-EPA	0.04	0.04	0.03	0.05	0.05	0.21
Recyclables	0.37	0.15	0.11	0.14	0.13	0.90
Other	0.44	0.07	0.13	0.23	0.09	0.96
Total	42.01	10.16	13.24	18.09	16.50	100.00

Source: 1992 Truck Inventory and Use Survey

7.0 Analysis of Weights, Dimensions, and Operating Characteristics for the 5-Axles or More Fleet

7.1 Analysis Structure

More than 85% of the 1992 5-axles or more fleet is accounted for by the combination of the 4 specific truck configurations and the 13 specific body types listed below:

FOUR SPECIFIC CONFIGURATIONS

- the 3 + 2 truck + trailer (3.7% of total)
- the 3-S2 tractor-semitrailer (78.4%)
- the 3-S3 tractor-semitrailer (4.6%)
- the 2-S1-2 STAA tractor + double trailer combination (2.9%).

THIRTEEN SPECIFIC BODY TYPES

- low boy
- basic platform
- livestock truck
- insulated non-refrigerated van
- insulated refrigerated van
- drop frame van
- basic enclosed van
- pole and logging truck
- automobile transporter
- grain body
- dump truck
- tank truck for liquids or gases
- tank truck for dry bulk.

Various combinations of configuration and body type (e.g., the 3-S2 refrigerated van) were chosen for analysis based on their occurrence in the truck fleet. The most prevalent configuration/body types in the truck fleet were analyzed in terms of their national operational characteristics for both 1992 and 1987. Eight vehicle characteristics were of interest:

- empty (tare) weight
- average gross weight
- maximum gross weight
- external width of trailer
- overall length
- annual vehicle miles of travel (VMT)
- base of operation
- range of operation—% of VMT used for different lengths of haul

Based on our knowledge of the general operational characteristics of the truck fleet, some data were excluded in the various analyses based on the following criteria:

- if the empty weight, average weight, or maximum weight was reported as less than or equal to 20,000 lbs
- if the empty weight was reported as more than 50,000 lbs
- if the average weight or maximum weight was reported as greater than 140,000 lbs
- where no value of a given attribute was reported
- if the average weight or maximum weight exceeded the empty weight.

Appendix E gives the detailed results for each year. Each page in the appendix represents one cell in the matrix of 4 configuration types versus 13 body types. The population size of each configuration/body type and the sample size, which indicates the number of survey records analyzed, are shown at the top of the page. In addition, on the plots of empty weight, average weight and maximum weight, the following statistics are given—sample size, population size, population mean and population standard deviation. The annual VMT includes the population size, population mean, and population standard deviation.

In Appendix E, all the graphs, except for the range of operation graph, were plotted in reference to the percent of trucks in that particular configuration/body type. In other words, the Y-axis represents percent of trucks or the cumulative percent of trucks. Range of operation differs because the Y-axis is in terms of percent of total VMT for that configuration/body type.

In addition to the previously mentioned 8 characteristics that were analyzed, further analysis was conducted on the distribution of average and maximum payload weights for each configuration/body type. The results are presented in Appendix F. Payload weights were not addressed on the survey. For this analysis, they were derived by subtracting the reported empty (tare) weight from the reported average or maximum gross weights. The weight exclusions mentioned before also applied to the payload analysis; however, one more exclusion was added which did not allow the empty weight to be greater than the average/maximum weight.

Note: all weights and payloads are described in Kips (thousands of pounds) in both Appendices E and F.

7.2 Observations on Specific Truck Configurations and Body Types

In order to verbally summarize each of the 1992 configuration/body types shown in Appendix E, the following rating scales were used in the review that follows in Section 7.3. The scales defined below were used to make generalizations about the operational characteristics of the various configuration/body type groups and to provide a means of comparison between configuration/body types.

- Key words and their percentage indication
  - most (mostly) means more than 80%
  - many (mainly) means 61 to 80%
  - half means 41 to 60%
  - some means 20 to 40%
  - few (infrequently) means less than 20%

- Sample size
  - very small— less than 100
  - small—100 to 250
  - good—251 to 500
  - large—501 to 1000
  - very large—greater than 1000

- Weigh-out means operation at a gross weight of 80,000 lbs. or more as shown on the cumulative percentage chart for average weight.

- Base of Operation - uses the percentage definitions above and applies them to the percent of the vehicles that have the following travel characteristics:

  - mostly intra-state travel; means less than or equal to 20% of annual VMT out-of-state
  - mainly out-of-state travel; means 60% or more of annual VMT out of state
  - mostly out-of-state travel; means 80% or more of annual VMT out of state.

- Range of Operation - Percent of VMT used in different lengths of haul
  - short haul lengths mean less than 100 miles
  - very long haul lengths mean greater than 500 miles

- Width of Trailer
  - narrow means 96 inches
  - wide means 102 inches

- Overall Length of Vehicle
  - short means less than 65 feet (bumper to tailgate)
  - long means more than 65 feet (bumper to tailgate)

- Annual VMT
  - small—1 to 40,000 miles
  - medium—40,001 to 80,000 miles
  - large—80,001 to 120,000 miles
  - very large—greater than 120,000 miles

7.3 Review of Selected Truck Configurations/Body Types

The following section provides a summary of the operational demands and typical equipment use for selected truck configuration/body type combinations as described in Section 7.1 in the 1992 5-axles or more fleet. As highlighted above, the summary for each combination is organized as follows:

- Sample size
- Weigh-Out
- Never Weigh-Out
- Base of Operation: intra-state or inter-state
- Range of operation: defined by VMT use in specific haul lengths
- Trailer width
- Overall vehicle length
- Annual VMT

7.3.1 Review of 3 + 2 Truck + Trailer Combinations - 1992

- (3 + 2) Low Boy Platform [pop = 1,526 or 0.2% of the 5-axles or more fleet]
  - very small (<100) sample
  - few (<20%) weigh-out on average
  - many (60-80%) never weigh-out
  - many (60-80%) operate mostly (80-100%) intra-state
  - some (20-40%) VMT is used for short haul lengths (< 100 miles), no VMT is used in very long haul lengths (> 500 miles)
  - many (60-80%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—most (80-100%) have a small annual VMT (<40,000 miles)

- (3 + 2) Basic Platform [pop = 7,370 or 0.8% of the 5-axles or more fleet]
  - small (100-250) sample
  - some (20-40%) weigh-out on average
  - many (60-80%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—many (60-80%) have a small annual VMT (<40,000 miles)

- (3 + 2) Basic Enclosed Van [pop = 1,344 or 0.1% of the 5-axles or more fleet]
  - very small (<100) sample
  - few (<20%) weigh-out on average
  - many (60-80%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), some (20-40%) VMT is used for very long haul lengths (> 500 miles)
  - half (40-60%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a medium annual VMT (40,000-80,000 miles)

- (3 + 2) Pole and Logging Truck [pop = 4,147 or 0.4% of the 5-axles or more fleet]
  - small (100-250) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - most (80-100%) VMT is used for short haul lengths (< 100 miles)
  - many (60-80%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT— many (60-80%) have a medium annual VMT (40,000-80,000 miles)

- (3 + 2) Grain Bodies [pop = 3,313 or 0.3% of the 5-axles or more fleet]
  - very small (<100) sample
  - some (20-40%) weigh-out on average
  - half (40-60%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - VMT is used mainly (60-80%) for short haul lengths (< 100 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—most (80-100%) have a small annual VMT (<40,000 miles)

- (3 + 2) Dump Truck [pop = 15,426 or 1.6% of the 5-axles or more fleet]
  - good (250-500) sample
  - some (20-40%) weigh-out on average
  - half (40-60%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - most (80-100%) VMT is used for short haul lengths (< 100 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—many (60-80%) have a small annual VMT (<40,000 miles)

- (3 + 2) Tank Trucks for Liquids or Gases [pop = 2,664 or 0.3% of the 5-axles or more fleet]
  - small (100-250) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles)
  - most (80-100%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet)
  - Annual VMT—mixed.

7.3.2 Review of 3-S2 Tractor-Semitrailer Combinations - 1992

- (3-S2) Low Boy Platform [pop = 36,709 or 3.8% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - many (60-80%) weigh-out on average
  - half (40-60%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles), some (20-40%) VMT is used for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—many (60-80%) have a small annual VMT (<40,000 miles)

- (3-S2) Basic Platform [pop = 122,022 or 12.5% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - half (40-60%) weigh-out on average
  - some (20-40%) never weigh-out
  - some (20-40%) operate mainly (60-80%) intra-state, some (20-40%) operate mainly (60-80%) out-of state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), half (40-60%) of VMT is used for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—mixed

- (3-S2) Livestock Truck [pop = 10,012 or 1.0% of the 5-axles or more fleet]
  - good (250-500) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - some (20-40%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of state
  - some (20-40%) VMT is used for short haul lengths (< 100 miles), some (20-40%) VMT is used for very long haul lengths (> 500 miles)
  - many (60-80%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

- (3-S2) Insulated Non-Refrigerated Van [pop = 9,391 or 1.0% of the 5-axles or more fleet]
  - good (250-500) sample
  - some (20-40%) weigh-out on average
  - some (20-40%) never weigh-out
  - few (<20%) operate mostly (80-100%) intra-state, half (40-60%) operate mostly (80-100%) out-of state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), half (40-60%) of VMT is used for very long haul lengths (> 500 miles)
  - half (40-60%) are narrow (96 inches)
  - half (40-60%) are short (< 65 feet), half (40-60%) are long (> 65 feet)
  - Annual VMT—mixed.

- (3-S2) Insulated Refrigerated Van [pop = 95,224 or 9.8% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - half (40-60%) weigh-out on average
  - few (<20%) never weigh-out
  - few (<20%) operate mostly (80-100%) intra-state, half (40-60%) operate mostly (80-100%) out-of state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), VMT is used mainly (60-80%) for very long haul lengths (> 500 miles)
  - half (40-60%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

- (3-S2) Drop Frame Van [pop = 15,514 or 1.6% of the 5-axles or more fleet]
  - large (500-1,000) sample
  - few (<20%) weigh-out on average
  - many (60-80%) never weigh-out
  - few (<20%) operate mostly (80-100%) intra-state, half (40-60%) operate mostly (80-100%) out-of state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), VMT is used mainly (60-80%) for very long haul lengths (> 500 miles)
  - some (20-40%) are narrow (96 inches), many (60-80%) are wide (102 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

- (3-S2) Basic Enclosed Van [pop = 253,776 or 26.0% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - few (<20%) weigh-out on average
  - some (20-40%) never weigh-out
  - some (20-40%) operate mostly (80-100%) intra-state, some (20-40%) operate mostly (80-100%) out-of-state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), half (40-60%) of VMT is used for very long haul lengths (> 500 miles)
  - some (20-40%) are narrow (96 inches), many (60-80%) are wide (102 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

- (3-S2) Pole and Logging Truck [pop = 22,313 or 2.3% of the 5-axles or more fleet]
  - large (500-1,000) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - most (80-100%) VMT is used for short haul lengths (< 100 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—mixed

- (3-S2) Automobile Transport [pop = 13,164 or 1.3% of the 5-axles or more fleet]
  - good (250-500) sample
  - some (20-40%) weigh-out on average
  - few (<20%) never weigh-out
  - few (<20%) operate mostly (80-100%) intr-state, many (60-80%) operate mainly (60-80%) out-of-state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), some (20-40%) VMT is used for very long haul lengths (> 500 miles)
  - some (20-40%) are narrow (96 inches), many (60-80%) are wide (102 inches)
  - most (80-100%) are long (> 65 feet)
  - Annual VMT—half (40-60%) have a medium annual VMT (40,000-80,000 miles)

- (3-S2) Grain Bodies [pop = 32,696 or 3.3% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - many (60-80%) operate mostly (80-100%) intra-state, few (<20%) operate mainly (60-80%) out-of-state
  - VMT is used mainly (60-80%) for short haul lengths (< 100 miles),VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (3-S2) Dump Truck [pop = 51,300 or 5.3% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state
  - VMT is used mainly (60-80%) for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (3-S2) Tank Trucks for Liquids or Gases [pop = 61,043 or 6.3% of the 5-axles or more fleet]
  - very large (>1,000) sample
  - most (80-100%) weigh-out on average
  - few (<20%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles),VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—mixed

- (3-S2) Tank Trucks for Dry Bulk [pop = 15,809 or 1.6% of the 5-axles or more fleet]
  - large (500-1,000) sample
  - most (80-100%) weigh-out on average
  - few (<20%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles),VMT is infrequently (<20%) used for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - few (<20%) are long (more than 65 feet)
  - Annual VMT—mixed

7.3.3 Review of 3-S3 Tractor-Semitrailer Combinations - 1992

- (3-S3) Low Boy Platform [pop = 13,430 or 1.4% of the 5-axles or more fleet]
  - large (500-1,000) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - many (60-80%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles)
  - half (40-60%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—many (60-80%) have a small annual VMT (< 40,000 miles)

- (3-S3) Basic Platform [pop = 5,788 or 0.6% of the 5-axles or more fleet]
  - small (100-250) sample
  - half (40-60%) weigh-out on average
  - few (<20%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mainly (60-80%) out-of state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles)
  - many (60-80%) are narrow (96 inches), some (20-40%) are wide (102 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (3-S3) Insulated Refrigerated Van [pop = 1,772 or 0.2% of the 5-axles or more fleet]
  - very small (<100) sample
  - half (40-60%) weigh-out on average
  - few (<20%) never weigh-out
  - some (20-40%) operate mostly (80-100%) intra-state, half (40-60%) operate mostly (80-100%) out-of state
  - most (80-100%) VMT is used for very long haul lengths (> 500 miles)
  - half (40-60%) are narrow (96 inch)
  - half (40-60%) are short (< 65 feet), half (40-60%) are long (> 65 feet)
  - Annual VMT—half (40-60%) have a large annual VMT (80,000-120,000 miles)

- (3-S3) Basic Enclosed Van [pop = 5,932 or 0.6% of the 5-axles or more fleet]
  - small (100-250) sample
  - few (<20%) weigh-out on average
  - some (20-40%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - some (20-40%) VMT is used for short haul lengths (< 100 miles), half (40-60%) of VMT is used for very long haul lengths (> 500 miles)
  - half (40-60%) are narrow (96 inches), half (40-60%) are wide (102 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

- (3-S3) Pole and Logging Truck [pop = 2,087 or 0.2% of the 5-axles or more fleet]
  - small (100-250) sample
  - most (80-100%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - VMT is used mainly (60-80%) for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for long haul lengths (> 200 miles)
  - half (40-60%) are narrow (96 inches), half (40-60%) are wide (102 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—half (40-60%) have a medium annual VMT (40,000-80,000 miles)

- (3-S3) Grain Bodies [pop = 1,014 or 0.1% of the 5-axles or more fleet]
  - very small (<100) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mainly (60-80%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for long haul lengths (> 200 miles)
  - most (80-100%) are narrow (96 inches)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (3-S3) Dump Truck [pop = 10,542 or 1.1% of the 5-axles or more fleet]
  - good (250-500) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - many (60-80%) operate mostly (80-100%) intra-state, few (<20%) operate mainly (60-80%) out-of-state
  - VMT is used mainly (60-80%) for short haul lengths (< 100 miles)
  - most (80-100%) are narrow (96 inch)
  - most (80-100%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (3-S3) Tank Trucks for Liquids or Gases [pop = 3,447 or 0.4% of the 5-axles or more fleet]
  - small (100-250) sample
  - most (80-100%) weigh-out on average
  - few (<20%) never weigh-out
  - many (60-80%) operate mostly (80-100%) intra-state, few (<20%) operate mainly (60-80%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inch)
  - many (60-80%) are short (< 65 feet)
  - Annual VMT—half (40-60%) have a medium annual VMT (40,000-80,000 miles)

7.3.4 Review of 2-S1-2 Tractor + Double Trailer Combinations - 1992

- (2-S1-2) Basic Platform [pop = 4,640 or 0.5% of the 5-axles or more fleet]
  - very small (<100) sample
  - many (60-80%) weigh-out on average
  - few (<20%) never weigh-out
  - most (80-100%) operate mostly (80-100%) intra-state, few (<20%) operate out-of state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) are narrow (96 inches)
  - half (40-60%) are short (< 65 feet), half (40-60%) are long (> 65 feet)
  - Annual VMT—half (40-60%) have a small annual VMT (< 40,000 miles)

- (2-S1-2) Drop Frame Van [pop = 1,611 or 0.2% of the 5-axles or more fleet]
  - very small (<100) sample
  - few (<20%) weigh-out on average
  - most (80-100%) never weigh-out
  - half (40-60%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of state
  - VMT is used infrequently (<20%) for short haul lengths (< 100 miles), VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - few (<20%) are narrow (96 inches), most (80-100%) are wide (102 inches)
  - few (<20%) are short (< 65 feet), most (80-100%) are long (> 65 feet)
  - Annual VMT—half (40-60%) have a medium annual VMT (40,000-80,000 miles)

- (2-S1-2) Basic Enclosed Van [pop = 20,812 or 2.1% of the 5-axles or more fleet]
  - good (250-500) sample
  - few (<20%) weigh-out on average
  - some (20-40%) never weigh-out
  - some (20-40%) operate mostly (80-100%) intra-state, few (<20%) operate mostly (80-100%) out-of-state
  - some (20-40%) VMT is used for short haul lengths (< 100 miles), half (40-60%) of VMT is used for very long haul lengths (> 500 miles)
  - few (<20%) are narrow (96 inches), most (80-100%) are wide (102 inches)
  - few (<20%) are short (< 65 feet), most (80-100%) are long (> 65 feet)
  - Annual VMT—mixed

- (2-S1-2) Grain Bodies [pop = 946 or 0.1% of the 5-axles or more fleet]
  - very small (<100) sample
  - most (80-100%) weigh-out on average
  - few (<20%) never weigh-out
  - some (20-40%) operate mostly (80-100%) intra-state, some (20-40%) operate mainly (60-80%) out-of-state
  - half (40-60%) of VMT is used for short haul lengths (< 100 miles),VMT is used infrequently (<20%) for very long haul lengths (> 500 miles)
  - most (80-100%) (80-100%) are narrow (96 inches)
  - many (60-80%) are short (< 65 feet), some (20-40%) are long (> 65 feet)
  - Annual VMT—mixed

7.4 Summary of the Weight, Dimension and Operating Characteristics by Truck Configuration/Body Type

For the 1992 5-axles or more fleet, configuration/body type combinations described above, Tables 7.4-1 and 7.4-2 illustrate the degree of weigh-out operations—at maximum loaded weight and average loaded weight, respectively.

- 3-S2 trucks typically weigh-out except for the Basic Enclosed Van and Drop Frame Van .
- 3-S3 trucks typically weigh-out at average loaded weight
- 3-S2 trucks reflect the entire range of weights
- Basic Enclosed Van, the most favored trailer type, rarely weighs-out.

Table 7.4-3 illustrates the degree of intra-state travel in 1992 by the configuration/body type combinations described in Section 7.3.

Table 7.4-1

Theme Matrix for Percent of Fleet That Weighs-Out - "Maximum" Loaded Weight (Empty Weight + "Maximum" Payload)

by Vehicle Class/Body Type Combination

Body Type	Vehicle Configuration			
	3+2	3-S2	3-S3	2-S1-2
Low Boy Platform				*
Basic Platform				
Livestock Truck	*		*	*
Insulated Non-Refrigerated	*		*	*
Insulated Refrigerated	*			*
Drop Frame Van	*		*	
Basic Enclosed Van				
Pole, Logging etc. Truck				*
Automobile Transporter	*		*	*
Grain Body				
Dump Truck				*
Tank Truck, Liquids or Gas				*
Tank Truck, Dry Bulk	*		*	*

* Indicates very small sample size for the cell.

Percent of Fleet that Weighs-Out

 0 - 20 %

 21 - 40 %

 41 - 60 %

 61 - 80 %

 81 - 100 %

Table 7.4-2

Theme Matrix for Percent of Fleet That Weighs-Out - "Average" Loaded Weight (Empty Weight + "Average" Payload)
by Vehicle Class/Body Type Combination

Body Type	Vehicle Configuration			
	3+2	3-S2	3-S3	2-S1-2
Low Boy Platform				*
Basic Platform				
Livestock Truck	*		*	*
Insulated Non-Refrigerated	*		*	*
Insulated Refrigerated	*			*
Drop Frame Van	*		*	
Basic Enclosed Van				
Pole, Logging etc. Truck				*
Automobile Transporter	*		*	*
Grain Body				
Dump Truck				*
Tank Truck, Liquids or Gas				*
Tank Truck, Dry Bulk	*		*	*

* Indicates very small sample size for the cell.

Percent of Fleet that Weighs-Out

 0 - 20 %
 21 - 40 %
 41 - 60 %
 61 - 80 %
 81 - 100

Table 7.4-3

Theme Matrix for Percent of Fleet That "Mostly" Travel Intra-State
by Vehicle Class/Body Type Combination

Body Type	Vehicle Configuration			
	3+2	3-S2	3-S3	2-S1-2
Low Boy Platform				*
Basic Platform				
Livestock Truck	*		*	*
Insulated Non-Refrigerated	*		*	*
Insulated Refrigerated	*			*
Drop Frame Van	*		*	
Basic Enclosed Van				
Pole, Logging etc. Truck				*
Automobile Transporter	*		*	*
Grain Body				
Dump Truck				*
Tank Truck, Liquids or Gas				*
Tank Truck, Dry Bulk	*		*	*

* Indicates very small sample size for the cell.

Percent of Fleet that Weighs-Out

 0 - 20 %

 21 - 40 %

 41 - 60 %

 61 - 80 %

 81 - 100 %

7.5 Observations on Changes between 1987 and 1992 for Particular Truck Configurations and Body Types

7.5.1 Changes in Trailer Widths by 1992

As of 1992, the take-up of the 102 inch width trailer possibility afforded by the 1982 STAA by different body types/truck configurations is summarized below and in Table 7.5.1-1. Figure 7.5.1-1 compares, for 1987 and 1992, the percentage of specific truck configuration/body type combinations that have trailer widths equal to or greater than 102 inches. Figure 7.5.1-2 compares the regional percent of 3S2s with trailer widths of 102 inches or more for certain body types for 1992.

- VERY LOW TAKE-UP OF 102 INCH TRAILER WIDTH (less than 10%) - 1992

  - pole and logging trucks—for 3-S2
  - grain bodies—all configurations
  - dump trucks—3+2, 3-S2, 3-S3
  - tank trucks for liquids or gas—3+2, 3-S2, 3-S3
  - tank trucks for dry bulk—3-S2.

  These truck categories are dominated by 96 inch width trailers (more than 90%). While their take-up of the 102-inch width has been low, most of them have experienced some increase in the take-up since 1987.

- SOME TAKE-UP OF 102 INCH WIDTH (between 10 and 50%) - 1992

  - low boy platforms—all configurations
  - basic platform—all configurations
  - livestock truck—3-S2
  - pole and logging trucks—3+2, 3-S2, 3-S3

- HIGH TAKE-UP OF 102 INCH WIDTH (more than 50%) - 1992

  - insulated non-refrigerated van—3-S2
  - insulated refrigerated van—3-S2
  - drop frame vans—3-S2 and 2-S1-2
  - basic enclosed vans—all configurations
  - automobile transporter—3-S2

  There has been a substantial increase in the take-up of 102 inch trailer widths for most of these truck categories between 1987 and 1992.

Table 7.5.1-1

Comparison of Percentage of Truck Fleet With Trailer Widths of 96" and 102"

by Vehicle Class/Body Type Combination (Rounded to nearest 5%)

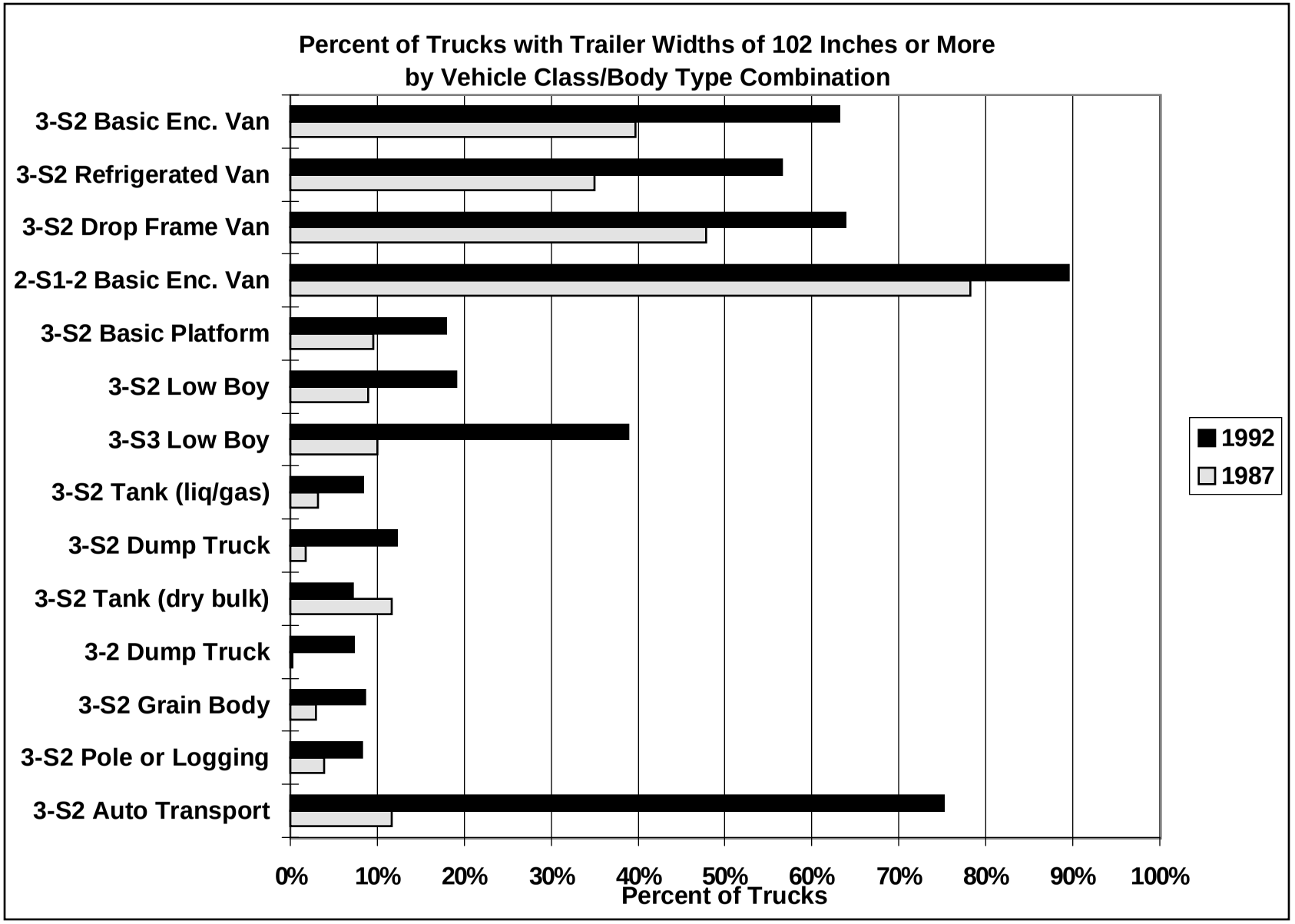
Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	80% 96" 15% 102"	85% 96" 5% 102"	80% 96" 15% 102"	80% 96" 10% 102"	60% 96" 30% 102"	85% 96" 10% 102"	*	*
Basic Platform	90% 96" 5% 102"	70% 96" 5% 102"	80% 96" 20% 102"	85% 96" 10% 102"	75% 96" 20% 102"	90% 96" 5% 102"	85% 96" 15% 102"	80% 96" 15% 102"
Livestock Truck	*	*	65% 96" 35% 102"	70% 96" 20% 102"	*	*	*	*
Insulated Non-Refrigerated	*	*	40% 96" 55% 102"	55% 96" 45% 102"				
Insulated Refrigerated	*	*	45% 96" 55% 102"	60% 96" 35% 102"	50% 96" 50% 102"	55% 96" 45% 102"		
Drop Frame Van	*	*	35% 96" 65% 102"	50% 96" 50% 102"	*	*	20% 96" 80% 102"	30% 96" 70% 102"
Basic Enclosed Van	50% 96" 50% 102"	70% 96" 30% 102"	35% 96" 65% 102"	55% 96" 40% 102"	45% 96" 55% 102"	60% 96" 35% 102"	10% 96" 90% 102"	20% 96" 80% 102"
Pole, Logging etc. Truck	70% 96" 30% 102"	80% 96"	90% 96" 10% 102"	85% 96" 5% 102"	60% 96" 40% 102"	70% 96" 25% 102"	*	*
Automobile Transporter	*	*	25% 96" 75% 102"	80% 96" 10% 102"	*	*	*	*
Grain Body	80% 96" 10% 102"	90% 96"	90% 96" 10% 102"	80% 96" 5% 102"	95% 96" 5% 102"	90% 96"	90% 96" 10% 102"	85% 96"
Dump Truck	90% 96" 5% 102"	85% 96"	90% 96" 10% 102"	80% 96" 5% 102"	90% 96" 10% 102"	80% 96" 5% 102"	*	*
Tank Truck, Liquids or Gas	95% 96"	90% 96"	90% 96" 10% 102"	80% 96" 5% 102"	90% 96" 10% 102"	85% 96" 5% 102"	*	*
Tank Truck, Dry Bulk	*	*	90% 96" 5% 102"	80% 96" 10% 102"	*	*	*	*

* Indicates very small sample size for the cell.

Note: Total percentage for a year may not add to 100% because there were two additional categories in the survey question, > 102" or Other

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix E

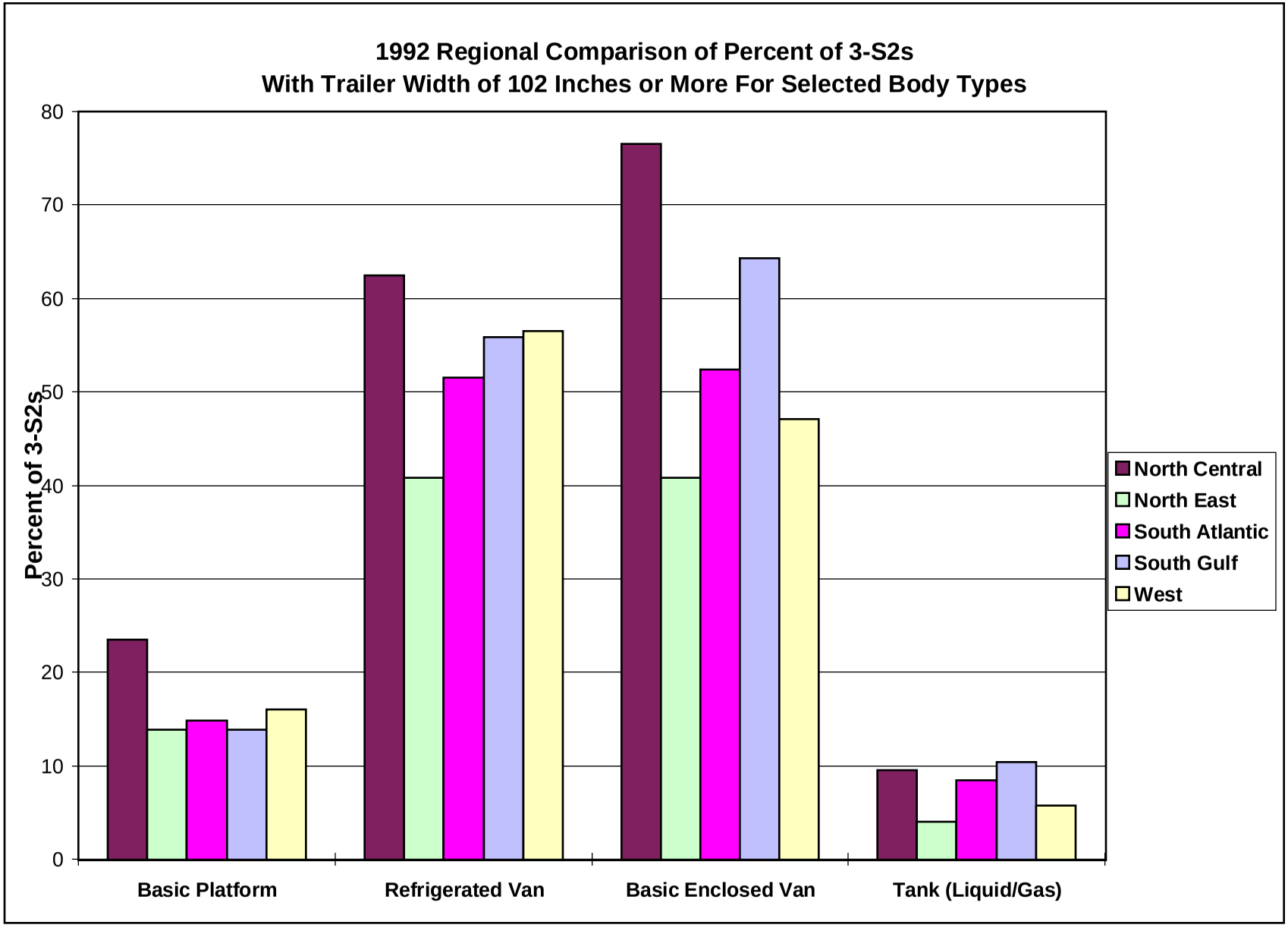
Figure 7.5.1-1



Source: 1992 Truck Inventory and Use Survey

3/3/96

Figure 7.5.1-2



Source: 1992 Truck Inventory and Use Survey, Details in Appendix G

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7.5.2 Changes in Truck Lengths by 1992

As of 1992, the take-up of longer trucks (greater than 65 feet in total length—being taken as a surrogate for the use of a 53+ foot trailer in a 3-S2 or 3-S3 tractor-semitrailer combination, 2-28+ foot trailers in a 2-S1-2 double combination, or the equivalent trailer capacity in a 3 + 2 truck + trailer combination) is summarized below and in Table 7.5.2-1. Figure 7.5.2-1 compares, for 1987 and 1992, the percentage of specific truck configuration/body type combinations that have overall vehicle lengths of 65 feet or more. Figure 7.5.2-2 compares the regional percent of 3-S2s with overall lengths of 65 feet or more for certain body types.

- VERY LOW TAKE-UP OF LONGER TRUCKS (less than 10%) - 1992

  - grain bodies—3 + 2, 3-S2
  - dump trucks—3+2, 3-S2, 3-S3
  - tank trucks for liquids or gas—3-S2
  - tank trucks for dry bulk—3-S2
  - pole and logging trucks—3-S2

  These truck categories are dominated by short combinations. There has been very little (5%), if any, change in their lengths since 1987.

- SOME TAKE-UP OF LONGER TRUCKS (between 10 and 50%) - 1992

  - low boy platforms—3+2, 3-S2, 3-S3
  - basic platform—3 + 2, 3-S2, 3-S3
  - livestock truck—3-S2
  - insulated non-refrigerated van—3-S2
  - insulated refrigerated van—3-S2, 3-S3
  - drop frame van—3-S2
  - basic enclosed van—3 + 2, 3-S2, 3-S3
  - pole and logging trucks—for 3 + 2 and 3-S3
  - tank trucks for liquid and gas—3 + 2 and 3-S3

  Most of these truck categories have experienced some or a substantial increase (5 - 15%) in the proportion of longer trucks since 1987, except livestock trucks (no change) and tank trucks for liquids and gas (slight decrease).

- HIGH TAKE-UP OF LONGER TRUCKS (more than 50%) - 1992

  - basic platform—2-S1-2
  - drop frame vans—2-S1-2
  - basic enclosed vans—2-S1-2
  - automobile transporter—3-S2

Table 7.5.2-1

Comparison of Percentage of Truck Fleet 65 Feet or More in Length

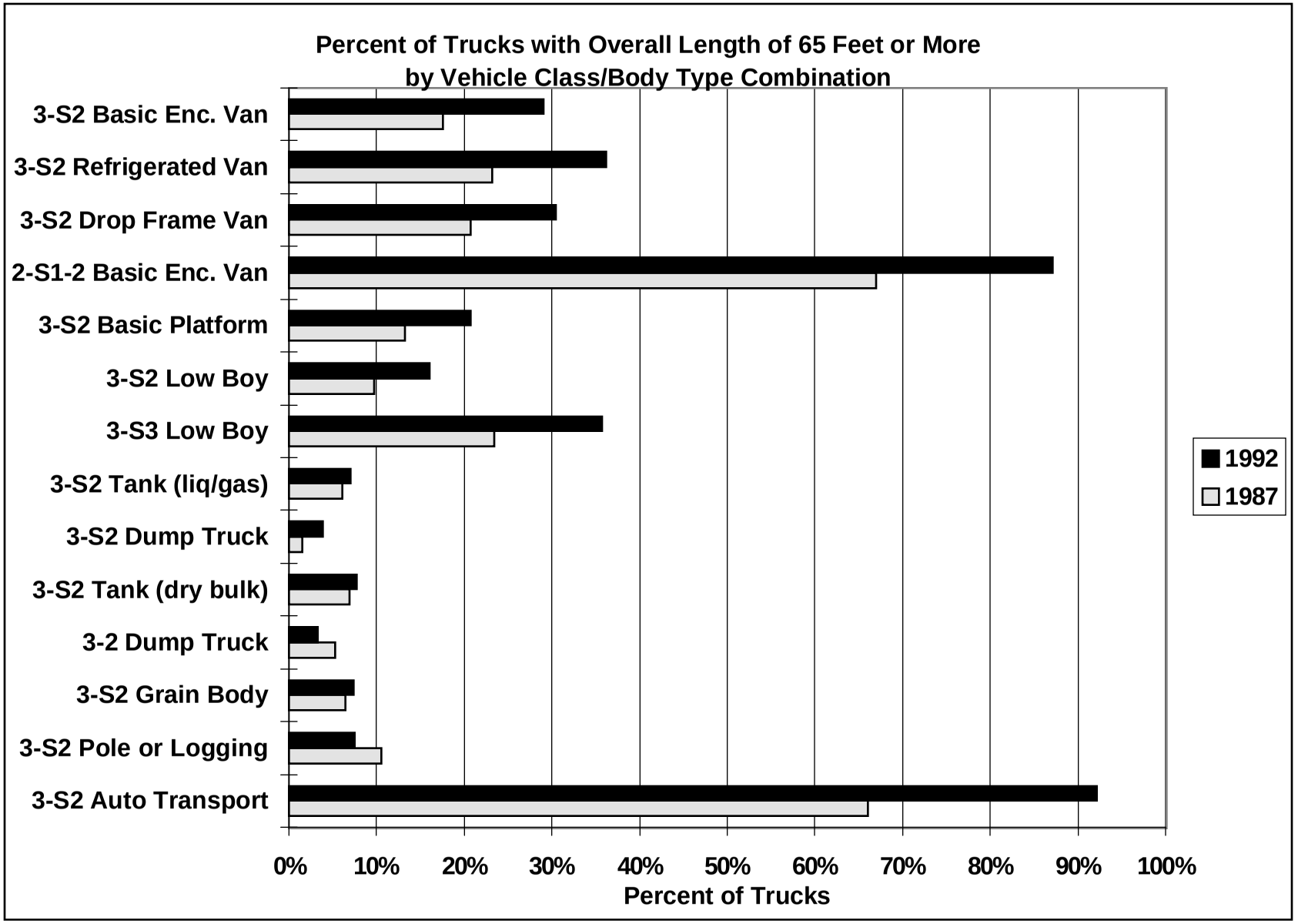
by Vehicle Class/Body Type Combination (Rounded to nearest 5%)

Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	15% > 65'	0% > 65'	15% > 65'	10% > 65'	35% > 65'	25% > 65'	*	*
Basic Platform	15% > 65'	15% > 65'	20% > 65'	15% > 65'	20% > 65'	15% > 65'	55% > 65'	80% > 65'
Livestock Truck	*	*	25% > 65'	25% > 65'	*	*	*	*
Insulated Non-Refrigerated	*	*	40% > 65'	30% > 65'	*	*	*	*
Insulated Refrigerated	*	*	35% > 65'	25% > 65'	45% > 65'	15% > 65'	*	*
Drop Frame Van	*	*	30% > 65'	20% > 65'	*	*	90% > 65'	90% > 65'
Basic Enclosed Van	25% > 65'	20% > 65'	30% > 65'	20% > 65'	35% > 65'	20% > 65'	85% > 65'	70% > 65'
Pole, Logging etc. Truck	15% > 65'	10% > 65'	10% > 65'	10% > 65'	20% > 65'	15% > 65'	*	*
Automobile Transporter	*	*	90% > 65'	65% > 65'	*	*	*	*
Grain Body	5% > 65'	5% > 65'	10% > 65'	5% > 65'	15% > 65'	15% > 65'	35% > 65'	60% > 65'
Dump Truck	5% > 65'	5% > 65'	5% > 65'	0% > 65'	5% > 65'	0% > 65'	*	*
Tank Truck, Liquids or Gas	20% > 65'	30% > 65'	5% > 65'	5% > 65'	25% > 65'	15% > 65'	*	*
Tank Truck, Dry Bulk	*	*	10% > 65'	5% > 65'	*	*	*	*

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix E

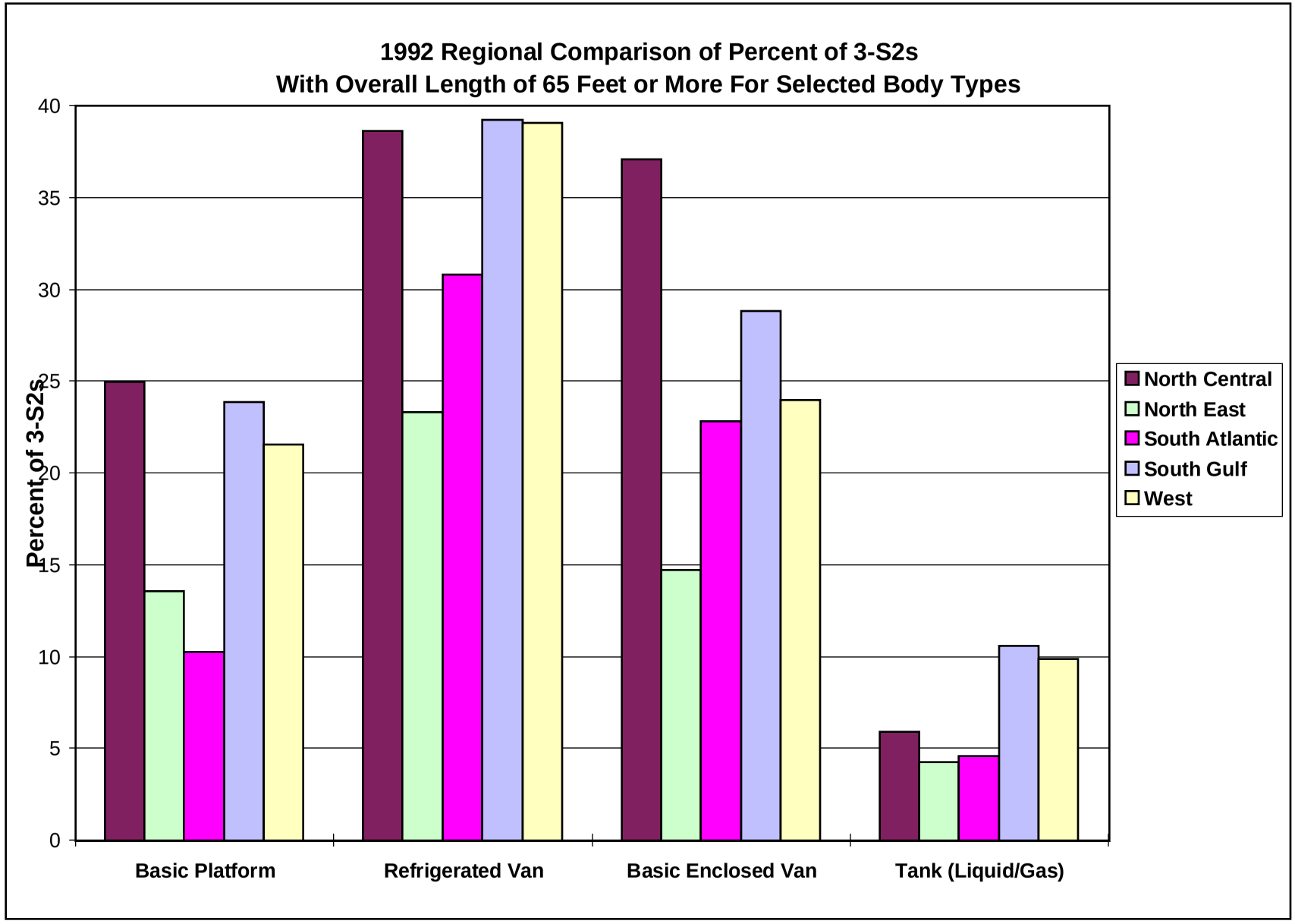
Figure 7.5.2-1



Source: 1992 Truck Inventory and Use Survey

3/3/96

Figure 7.5.2-2



Source: 1992 Truck Inventory and Use Survey, Details in Appendix G

3/3/96

7.5.3 Changes in Truck Weights

- MEAN TARE (EMPTY) WEIGHT

For all 3-S2s irrespective of body type, the mean tare weight, the weight of the vehicle without payload, has increased by anywhere from 600 lbs. to 1,600 lbs. (by 2 to 5 percent) between 1987 and 1992 as shown in Table 7.5.3-1. Figure 7.5.3-1 graphically compares, for 1987 and 1992, the mean tare weight of specific truck configuration/body type combinations. Figure 7.5.3-2 compares regionally the mean empty weights of 3-S2s for selected body types.

The tare weight of most of the other truck categories has also increased. For example, for all 3-S3s, except pole and logging trucks, the average tare weight has increased by anywhere from 1,000 lbs. to 3,800 lbs. (by 3 to 12 percent) between 1987 and 1992.

- MEAN "AVERAGE" LOADED WEIGHT

Mean "average" loaded weight is the statistical mean of the weight reported on the surveys as "average." Between 1987 and 1992 dump trucks and tank trucks have decreased in mean "average" loaded weight for each truck configuration. Also, all 3-S2 body types, except the auto transporter, have stayed about the same or decreased by up to 2,500 lbs. (nearly 4 percent) between 1987 and 1992, as shown in Table 7.5.3-2. Figure 7.5.3-3 compares, for 1987 and 1992, the mean average loaded weight of specific truck configuration/body type combinations. Figure 7.5.3-4 compares, regionally, the mean "average" loaded weights of 3-S2s for selected body types.

- MEAN MAXIMUM LOADED WEIGHT (TARE + MAXIMUM PAYLOAD)

There are no obvious patterns of change in mean maximum loaded weight, the statistical mean of the weight reported on the survey as "maximum" for the particular truck, between 1987 and 1992 as shown in Table 7.5.3-3.

- MEAN MAXIMUM PAYLOAD WEIGHT

For all 3-S2s irrespective of body type, the mean maximum payload weight, the statistical mean of the difference between the empty and maximum weights for a specific truck as reported in the TIUS, has decreased by as much as 3,300 lbs.—but more typically 400 lbs. to 1,600 lbs. (by 1 to 3 percent)—between 1987 and 1992 as shown in Table 7.5.3-4. Figure 7.5.3-5 compares, for 1987 and 1992, the mean maximum payload weight of specific truck configuration/body type combinations.

Most of the 3+2 body types of interest also decreased in mean maximum payload weight as did several of the 3-S3 body types.

- MEAN “AVERAGE” PAYLOAD WEIGHT

For all 3-S2s except for the drop frame van body type, the mean “average” payload weight, the statistical mean of the difference between the empty and “average” weights for a specific truck as reported in the TIUS, has decreased by anywhere from 900 lbs. to 3,800 lbs. (by 1 to 10 percent) between 1987 and 1992 as shown in Table 7.5.3-5. Figure 7.5.3-6 compares, for 1987 and 1992, the mean “average” payload weight of specific truck configuration/body type combinations.

The mean “average” payload of most other truck categories has also decreased. For example, for all 3-S3s except pole and logging and low boy trucks, the mean “average” payload has decreased by as much as 5,000 lbs.

The mean “average” payload of all of the 3+2 body types of interest has experienced a decrease from 1,200 lbs. to 8,000 lbs. (by 2 to 18 percent) between 1987 and 1992.

Table 7.5.3-1

Comparison of Mean Tare (Empty) Weights

by Vehicle Class/Body Type Combination (in kips)

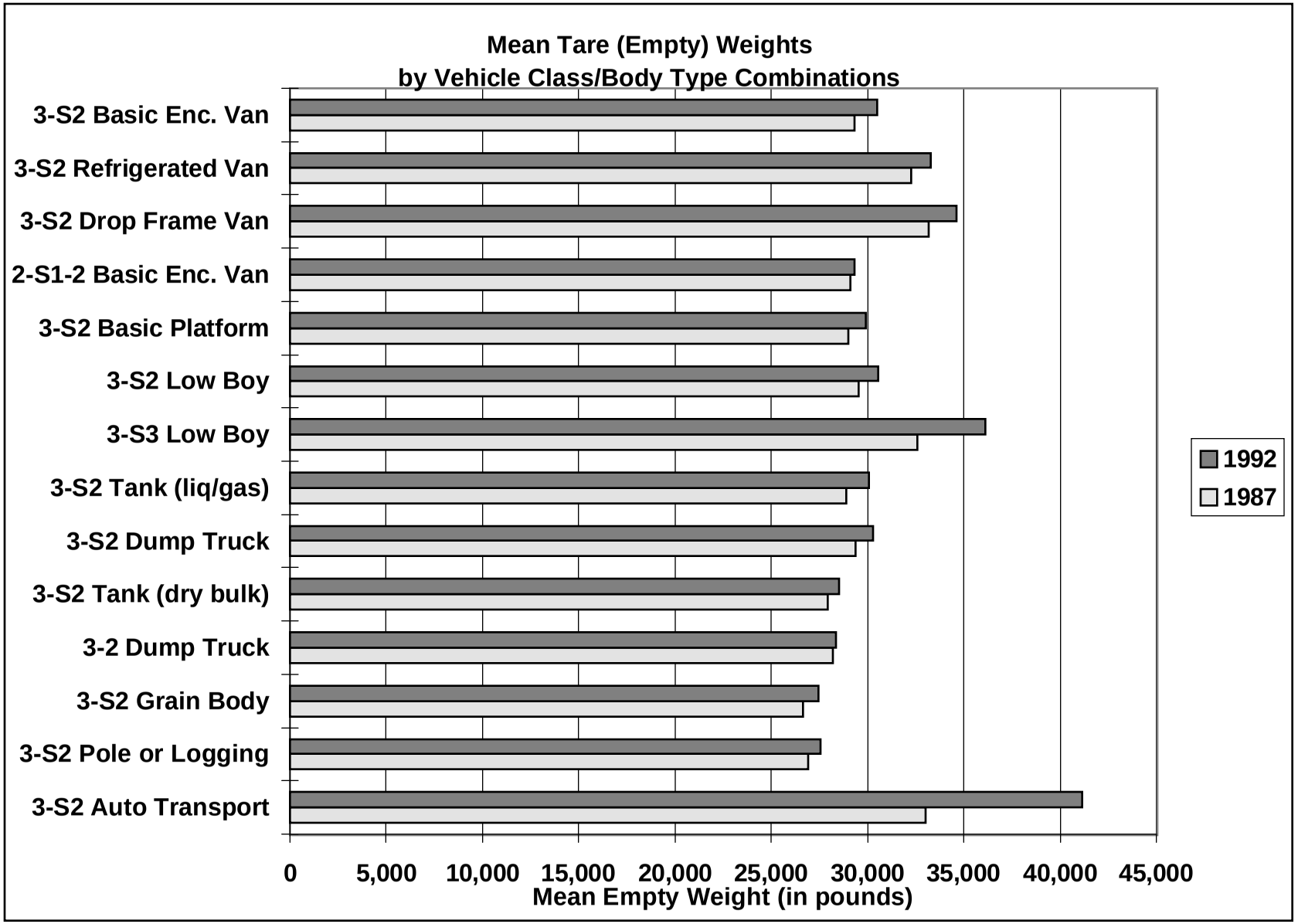
Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	29.97 1.93	28.04	30.53 1.01	29.52	36.10 3.52	32.58	*	*
Basic Platform	28.28 0.90	27.38	29.90 0.89	29.01	34.55 3.78	30.77	27.46 0.09	27.37
Livestock Truck	*	*	30.46 0.88	29.58	*	*	*	*
Insulated Non-Refrigerated	*	*	31.65 1.67	29.98	*	*	*	*
Insulated Refrigerated	*	*	33.26 1.00	32.26	33.29 2.75	30.54	*	*
Drop Frame Van	*	*	34.60 1.40	33.20	*	*	35.21 0.94	34.27
Basic Enclosed Van	29.55 0.29	29.26	30.49 1.17	29.32	31.53 2.19	29.34	29.32 0.24	29.08
Pole, Logging etc. Truck	27.52 1.53	25.99	27.55 0.64	26.91	32.71 -0.55	33.26	*	*
Automobile Transporter	*	*	41.16 8.17	32.99	*	*	*	*
Grain Body	26.06 -1.05	27.11	27.44 0.79	26.65	30.72 2.50	28.22	23.89 -0.93	24.82
Dump Truck	28.35 0.16	28.19	30.29 0.92	29.37	32.62 1.23	31.39	*	*
Tank Truck, Liquids or Gas	28.22 0.56	27.66	30.09 1.21	28.88	33.36 1.01	32.35	*	*
Tank Truck, Dry Bulk	*	*	28.51 0.59	27.92	*	*	*	*

Note: The change in kips from 1987 to 1992 is listed below each 1992 entry.

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix E

Figure 7.5.3-1



Source: 1992 Truck Inventory and Use Survey

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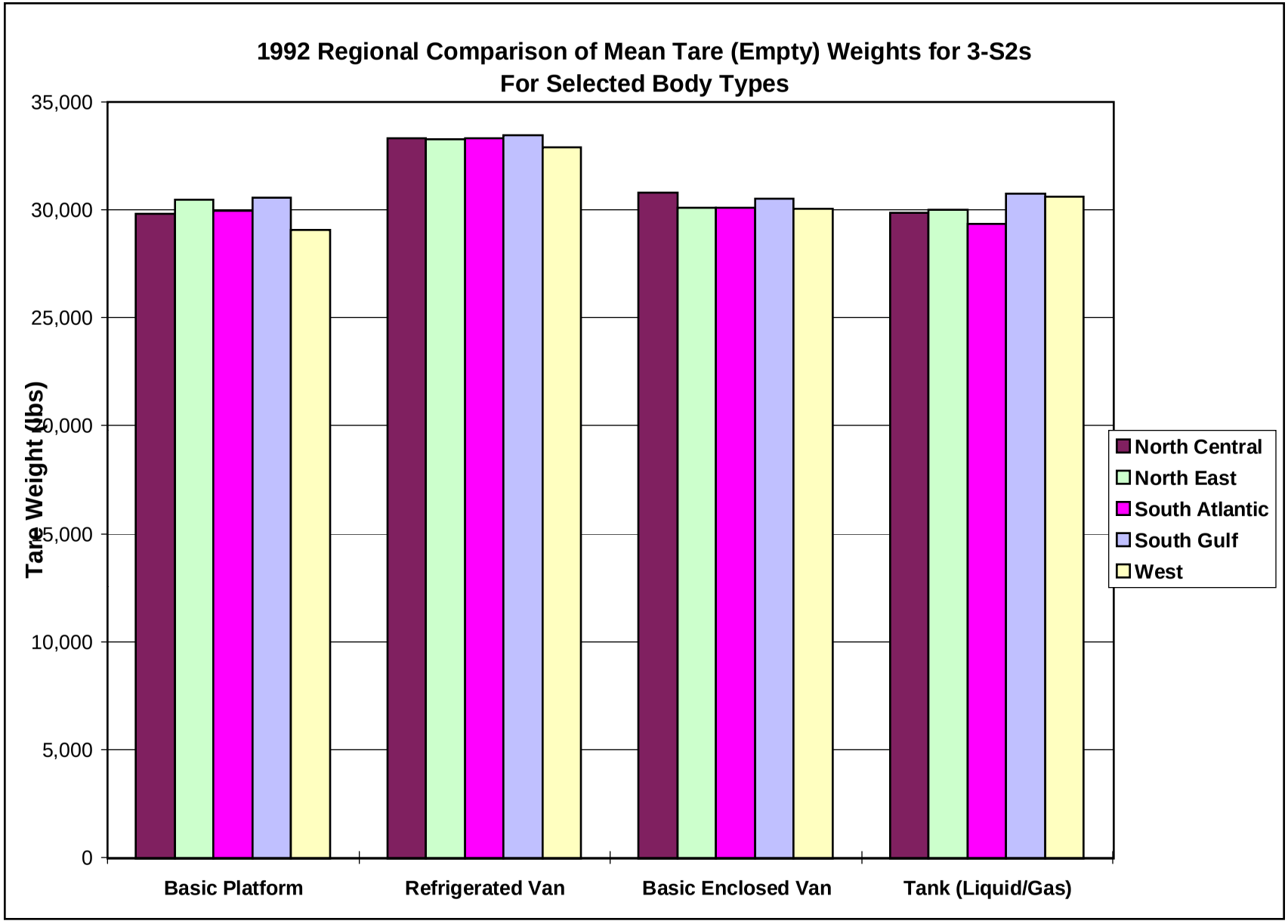
Figure 7.5.3-2



Source: 1992 Truck Inventory and Use Survey, Details in Appendix G

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Table 7.5.3-2

Comparison of Mean "Average" Loaded Weights (tare weight + "average" payload weight) by Vehicle Class/Body Type Combination (in kips)

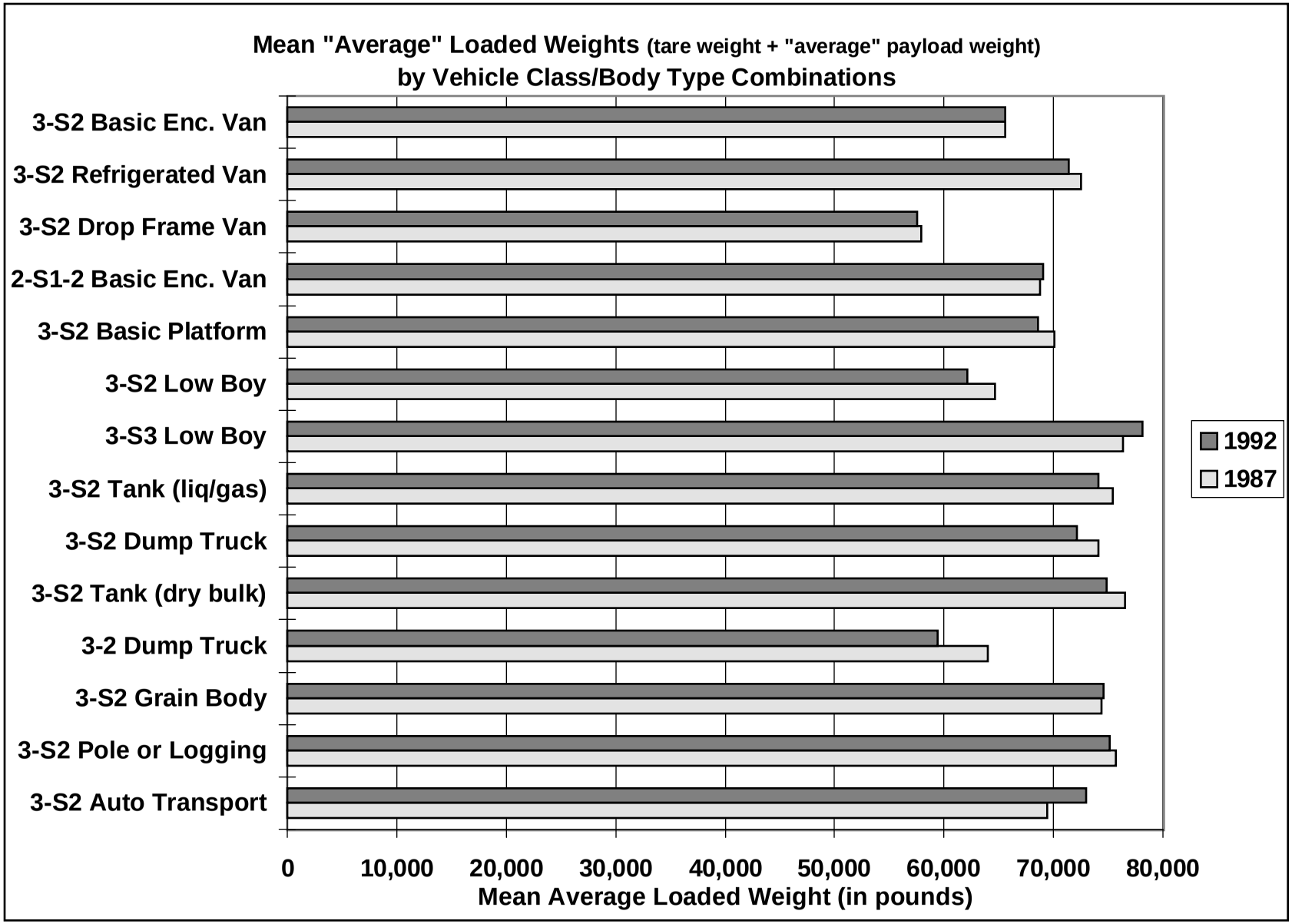
Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	55.58 -1.58	57.16	62.13 -2.55	64.68	78.14 1.79	76.35	*	*
Basic Platform	58.22 2.04	56.18	68.57 -1.55	70.12	74.57 1.47	73.10	64.47 -4.08	68.55
Livestock Truck	*	*	70.53 -2.47	73.00	*	*	*	*
Insulated Non-Refrigerated	*	*	69.24 0.10	69.14	*	*	*	*
Insulated Refrigerated	*	*	71.41 -1.10	72.51	72.34 2.93	69.41		
Drop Frame Van	*	*	57.55 -0.33	57.88	*	*	61.16 -5.58	66.74
Basic Enclosed Van	60.34 2.20	58.14	65.55 -0.05	65.60	64.32 -0.17	64.49	69.04 0.26	68.78
Pole, Logging etc. Truck	72.51 -3.10	75.61	75.17 -0.51	75.68	84.32 -1.28	85.60	*	*
Automobile Transporter	*	*	72.97 3.55	69.42	*	*	*	*
Grain Body	63.34 1.14	62.20	74.57 0.21	74.36	77.61 -2.78	80.39	80.14 3.36	76.78
Dump Truck	59.46 -4.56	64.02	72.16 -1.96	74.12	77.74 -2.27	80.01	*	*
Tank Truck, Liquids or Gas	72.39 -2.11	74.50	74.15 -1.29	75.44	84.39 -3.90	88.29	*	*
Tank Truck, Dry Bulk	*	*	74.83 -1.69	76.52	*	*	*	*

Note: The change in kips from 1987 to 1992 is listed below each 1992 entry.

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix E

Figure 7.5.3-3



Source: 1992 Truck Inventory and Use Survey

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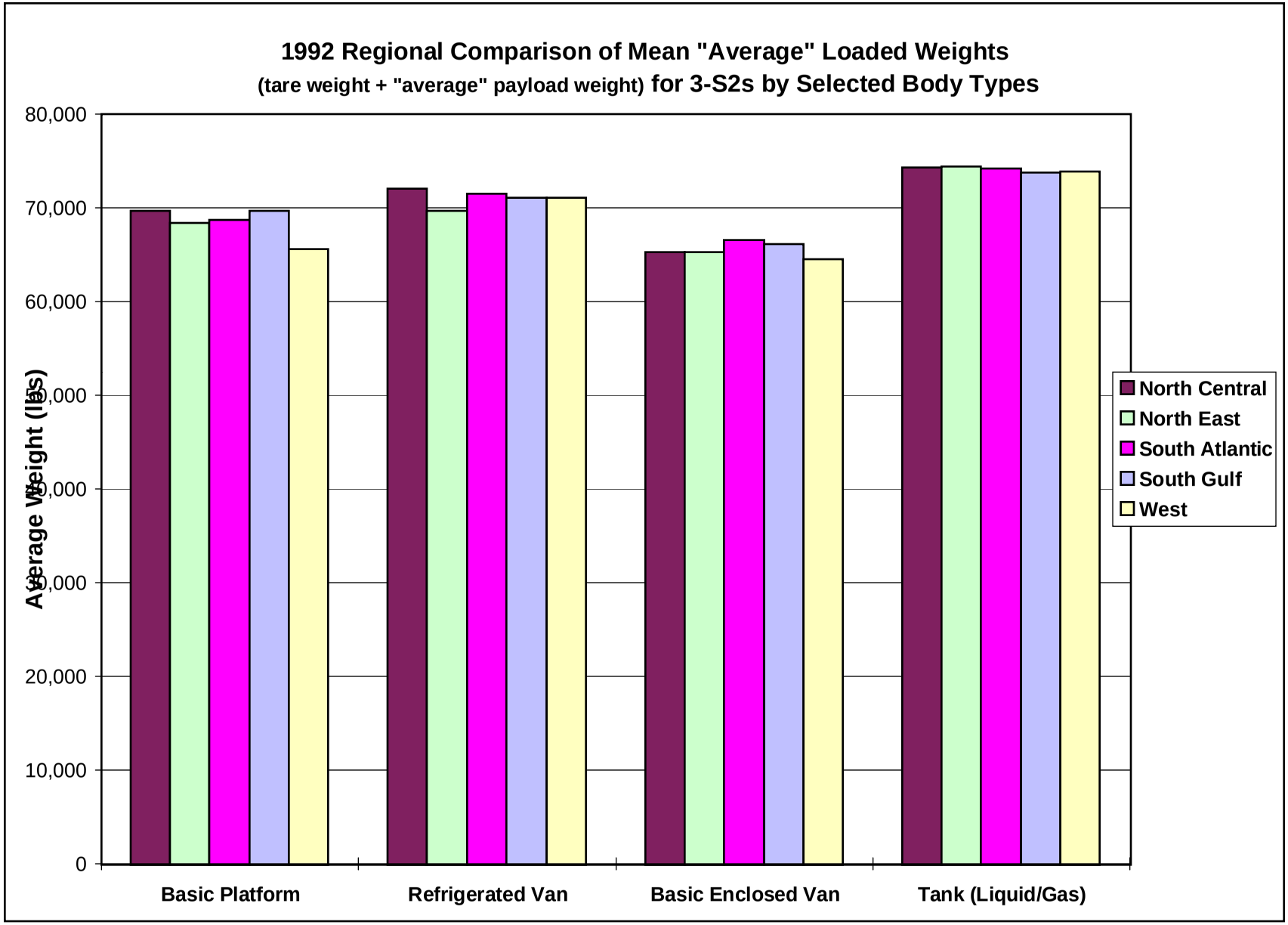
Figure 7.5.3-4



Source: 1992 Truck Inventory and Use Survey, Details in Appendix G

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Table 7.5.3-3

Comparison of Mean Maximum Loaded Weights (tare weight + "maximum" payload weight) by Vehicle Class/Body Type Combination (in kips)

Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	67.76 1.09	66.67	73.64 -2.63	76.27	95.03 1.84	93.19	*	*
Basic Platform	64.97 2.09	62.88	77.53 -0.03	77.56	87.61 4.76	82.85	79.06 2.17	76.89
Livestock Truck	*	*	78.84 0.52	78.32	*	*	*	*
Insulated Non-Refrigerated	*	*	78.29 1.39	76.90	*	*	*	*
Insulated Refrigerated	*	*	78.92 0.34	78.58	80.49 -4.28	84.77	*	*
Drop Frame Van	*	*	69.04 -0.47	69.51	*	*	73.41 -3.46	76.87
Basic Enclosed Van	70.15 -6.81	76.96	76.99 0.70	76.29	80.27 4.01	76.26	77.26 0.02	77.24
Pole, Logging etc. Truck	77.57 -1.40	78.97	79.83 -0.67	80.50	92.20 -10.90	103.10	*	*
Automobile Transporter	*	*	78.65 4.32	74.33	*	*	*	*
Grain Body	73.08 3.30	69.78	79.16 0.20	78.96	82.45 -1.85	84.30	81.08 0.86	80.22
Dump Truck	67.26 -2.37	69.63	77.45 -0.74	78.19	85.54 0.91	84.63	*	*
Tank Truck, Liquids or Gas	77.46 0.23	77.23	79.44 0.52	78.92	92.88 -0.29	93.17	*	*
Tank Truck, Dry Bulk	*	*	79.93 -0.65	80.58	*	*	*	*

Note: The change in kips from 1987 to 1992 is listed below each 1992 entry.

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix E

Table 7.5.3-4

Comparison of Mean Maximum Payload Weight

by Vehicle Class/Body Type Combination (in kips)

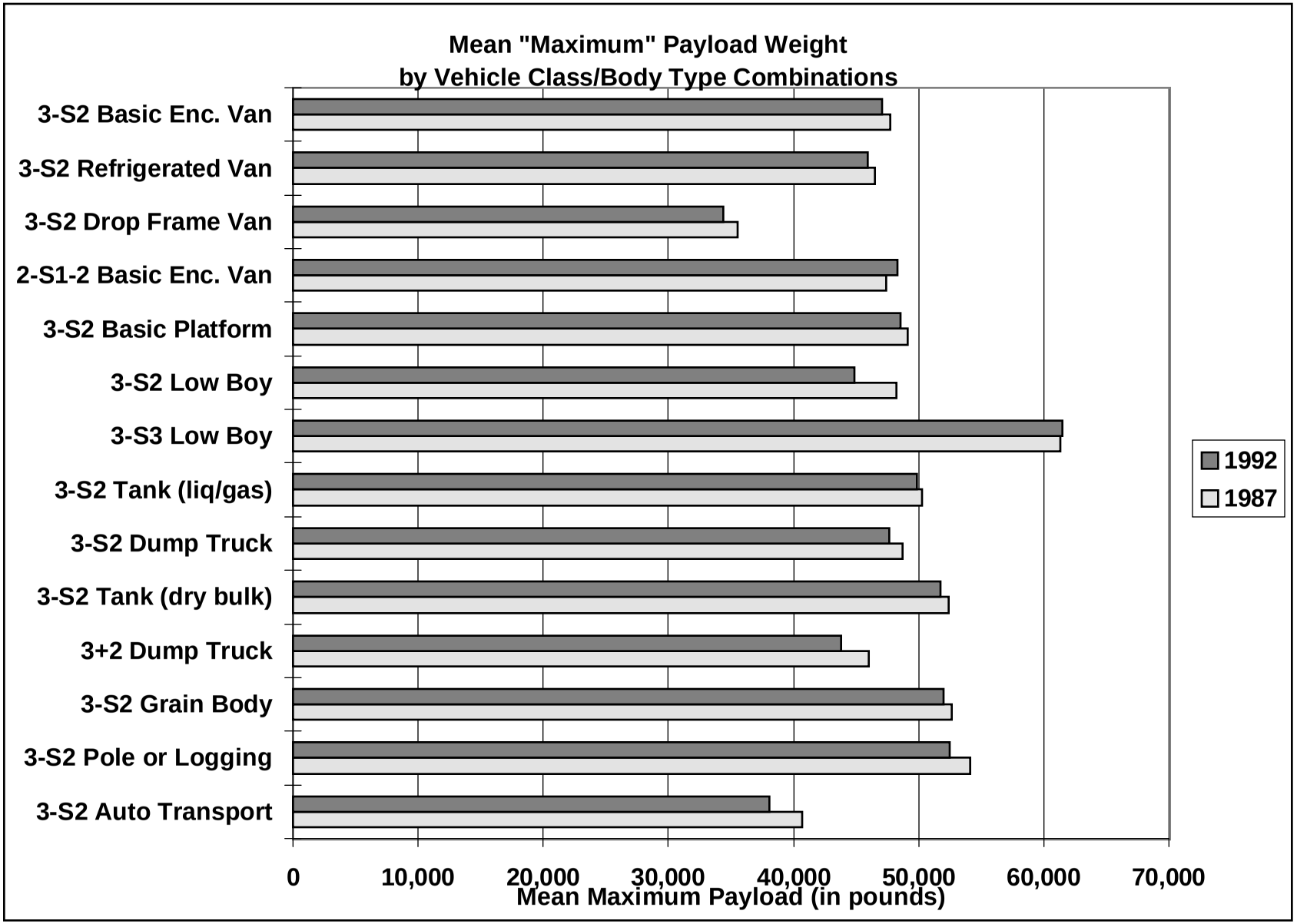
Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	40.89 -0.51	41.40	44.87 -3.34	48.21	61.50 0.18	61.32	*	*
Basic Platform	39.86 -6.81	46.67	48.58 -0.52	49.10	56.29 0.79	55.50	51.58 2.38	49.20
Livestock Truck	*	*	48.77 -0.73	49.50	*	*	*	*
Insulated Non-Refrigerated	*	*	47.04 -0.26	47.30	*	*	*	*
Insulated Refrigerated	*	*	45.91 -0.63	46.54	47.41 -7.56	54.97		
Drop Frame Van	*	*	34.40 -1.13	35.53	*	*	38.28 -4.15	42.43
Basic Enclosed Van	43.96 -6.41	50.37	47.10 -0.65	47.75	50.94 2.14	48.80	48.31 0.94	47.37
Pole, Logging etc. Truck	51.17 -2.10	53.27	52.52 -1.59	54.11	58.96 -12.67	71.63	*	*
Automobile Transporter	*	*	38.10 -2.60	40.70	*	*	*	*
Grain Body	52.90 0.56	52.34	51.97 -0.71	52.68	51.84 -2.70	54.54	57.30 1.86	55.44
Dump Truck	43.82 -2.22	46.04	47.65 -1.07	48.72	53.02 1.77	51.25	*	*
Tank Truck, Liquids or Gas	52.05 -0.32	52.37	49.86 -0.43	50.29	60.49 1.82	58.67	*	*
Tank Truck, Dry Bulk	*	*	51.72 -0.64	52.36	*	*	*	*

Note: The change in kips from 1987 to 1992 is listed below each 1992 entry.

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix F

Figure 7.5.3-5



Source: 1992 Truck Inventory and Use Survey

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Table 7.5.3-5

Comparison of Mean "Average" Payload Weight

by Vehicle Class/Body Type Combination (in kips)

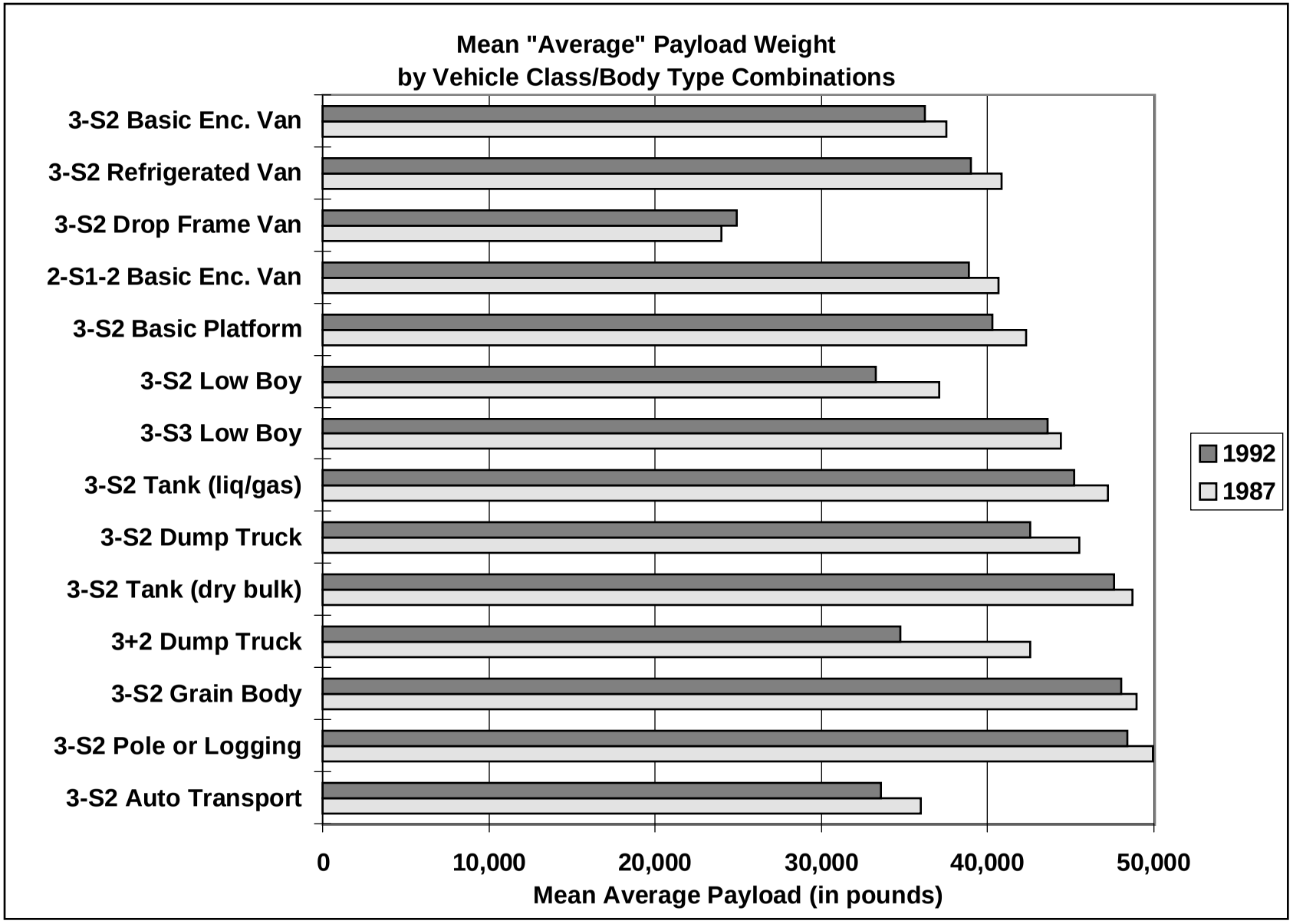
Body Type	Vehicle Configuration							
	3+2		3-S2		3-S3		2-S1-2	
	1992	1987	1992	1987	1992	1987	1992	1987
Low Boy Platform	28.22 -5.41	33.63	33.29 -3.81	37.10	43.58 2.25	41.33	*	*
Basic Platform	33.21 -8.33	41.54	40.27 -2.03	42.30	43.58 -2.60	46.18	45.33 5.00	40.33
Livestock Truck	*	*	40.88 -4.35	45.23	*	*	*	*
Insulated Non-Refrigerated	*	*	37.50 -2.97	40.47	*	*	*	*
Insulated Refrigerated	*	*	38.99 -1.85	40.84	38.90 -5.68	44.58	*	*
Drop Frame Van	*	*	24.91 0.91	24.00	*	*	28.98 -3.55	32.53
Basic Enclosed Van	34.89 -2.11	37.00	36.20 -1.33	37.53	39.81 1.72	38.09	38.89 -1.75	40.64
Pole, Logging etc. Truck	45.85 -4.81	50.66	48.41 -1.50	49.91	51.70 -0.73	52.43	*	*
Automobile Transporter	*	*	33.59 -2.41	36.00	*	*	*	*
Grain Body	48.97 -1.24	50.21	48.03 -0.92	48.95	47.45 -4.94	52.39	56.38 4.49	51.89
Dump Truck	34.76 -7.82	42.58	42.58 -2.95	45.53	46.37 -1.94	48.31	*	*
Tank Truck, Liquids or Gas	47.98 -3.09	51.07	45.20 -2.06	47.26	53.44 -2.02	55.46	*	*
Tank Truck, Dry Bulk	*	*	47.62 -1.06	48.68	*	*	*	*

Note: The change in kips from 1987 to 1992 is listed below each 1992 entry.

* Indicates very small sample size for the cell.

Source: 1987 and 1992 Truck Inventory and Use Survey, Details in Appendix F

Figure 7.5.3-6



Source: 1992 Truck Inventory and Use Survey

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8.0 Analysis of Vehicle Miles of Travel of the 5-Axles or More Truck Fleet

This section provides a comparison of the mean vehicle miles of travel (VMT) for 5-axles or more trucks.

8.1 Analysis Structure

The vehicle miles of travel (VMT) analysis evaluated the mean VMT for 5-axles or more trucks

- 8 vehicle groups (See Section 2.2)

- 11 major body type groups (collapsed from the 26 detailed body types) :

  - 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, oilfield truck, concrete mixer, and other)

8.2 Mean Annual VMT by Major Truck Configuration

Figure 8.2-1 shows a comparison of the mean annual VMT for the 8 major vehicle groups for 1992 and 1987. Table 8.2-1 provides a summary of the means for the vehicle groups, the 11 body types, and various vehicle group/body type combinations. Caution should be used in interpreting this data because of the small samples analyzed for given cases. Table 8.2-2 summarizes the number of sample records used to generate the different cell means. Statisticians have a basic rule that if the sample size is less than 30, no statements can be made. We also feel that caution should be used in interpreting means based on a sample size of less than 100 given the large population this sample represents.

NATIONWIDE - 1992

- The mean annual VMT for the 5-axles or more fleet was 64,000 miles per truck.

- Vehicles with the largest mean annual VMT in the fleet are STAA doubles and tractor + triple trailer combinations which have mean annual VMTs greater than 80,000 miles per truck.

- Vehicles with the smallest mean annual VMT in the fleet are truck + trailer combinations with 5-axles and with 6-axles or more which have mean annual VMT less than 35,000 miles per truck.

- 3-S2s have an mean annual VMT of 68,000 miles per truck. 4-S1/S2s have an mean annual VMT of 61,000 miles per truck. Tridem axle semitrailers have an mean annual VMT of 48,000 miles per truck.

- Doubles at 6-axles or more have an mean annual VMT of 70,702 miles per truck.

CHANGES BETWEEN 1987 AND 1992

- The mean annual VMT for the 5-axles or more fleet increased by 3,000 miles from 61,000 miles/truck in 1987 to 64,000 miles/truck in 1992.

- The mean annual VMT increased for truck + trailers with 6-axles or more, 3-S2s, 4-S1/S2, and double trailer combinations with 6-axles or more.

- The mean annual VMT for truck+trailers with 5-axles, tridem axle semitrailers, and STAA doubles did not change.

- The mean annual VMT for triples appears to have decreased. However, given that only a small sample of triples were surveyed (22 in 1987 and 38 in 1992), this may be a statistical anomaly.

8.3 Annual VMT by Major Truck Configuration by Body Type

NATIONWIDE - 1992

- Vans have the largest mean annual VMT (82,000 miles/truck). Tank trucks for liquid or gases have the next largest mean annual VMT (70,000 miles/truck), and tank trucks hauling bulk goods has a slightly lower mean VMT (68,000 miles/truck). Dump trucks and grain bodies have low mean VMT (<40,000 miles/truck).

CHANGES BETWEEN 1987 AND 1992

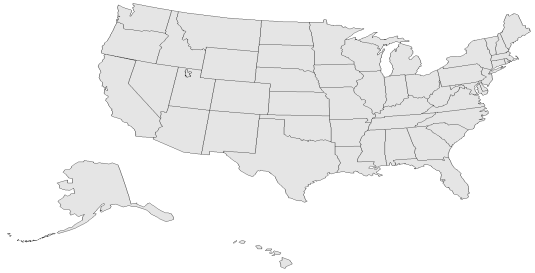
Figure 8.3-1 compares, for 1992 and 1987, the mean annual VMT for particular body type/truck configurations. Figure 8.3-2 compares regionally the mean VMT for 3-S2s for selected body types.

- The mean annual VMT for most body types did not vary significantly between the years.

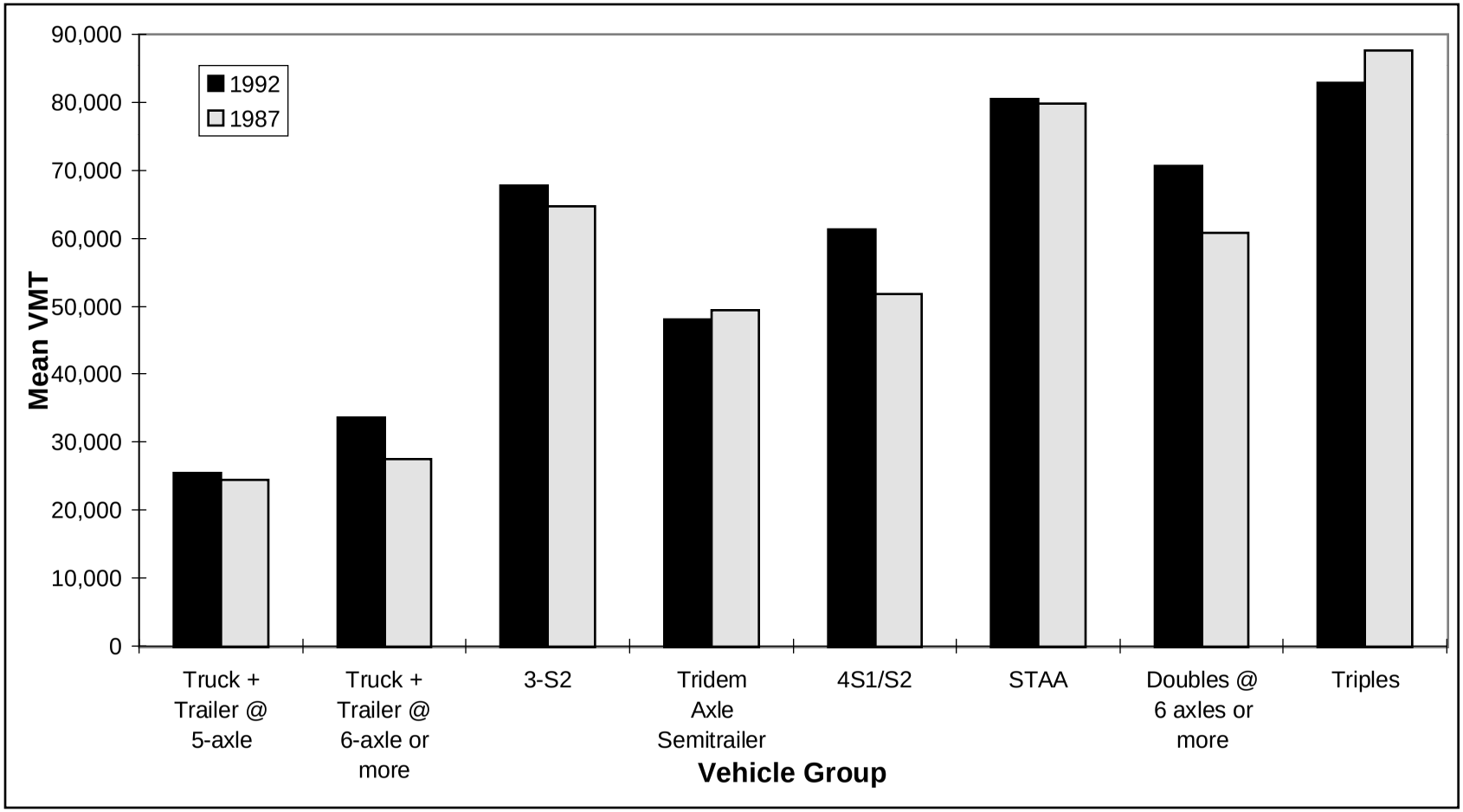
- Tank trucks carrying liquid or gases experienced a 7,000 miles/truck increase, and vans experienced a 4,000 miles/truck increase.

- Several body types experienced a decrease in their mean VMT. Livestock trucks decreased by 5,000 miles/truck. Garbage trucks decreased by 3,000 miles/truck. Grain bodies decreased by 4,000 miles/truck.

Figure 8.2-1



Comparison of Mean Annual VMT, by Vehicle Group and by Year



Source: 1987 and 1992 Truck Inventory and Use Survey

3/3/96

Table 8.2-1

Mean Annual VMT for Major Body Type, by Vehicle Group

1992 Truck Fleet

Major Body Type	Truck + Trailer @ 5-axle	Truck+Trailer @ 6-axles or more	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles or more	Triples	Total Mean
Platform	19,865	22,944	51,551	33,652	54,056	55,788	57,453	73,358	47,255
Van	47,051	27,219	82,453	69,667	79,869	90,586	92,264	85,978	82,378
Auto Transport	59,852	-	56,169	61,897	69,314	-	-	-	56,758
Dump Truck	22,242	30,691	44,619	49,840	46,612	53,163	50,930	58,296	40,313
Grain Bodies	10,744	19,043	39,243	36,789	40,630	59,535	55,501	-	37,472
Garbage Truck	20,875	18,477	55,775	49,500	52,150	-	-	-	47,334
Livestock Truck	15,340	2,347	65,152	39,347	51,934	77,082	132,947	-	60,869
Pole, Logging Truck	46,232	38,062	50,101	51,940	58,018	-	65,114	-	49,895
Tank Truck, Dry Bulk	28,782	21,000	69,480	72,859	75,169	59,115	66,596	-	68,380
Tank Truck, Liquid or Gas	56,583	77,858	71,481	64,645	59,415	27,843	71,367	55,459	70,291
Other	18,586	19,628	34,946	45,973	45,958	13,894	61,864	-	34,214
Total Mean	25,538	33,553	67,747	48,048	61,236	80,410	70,702	82,905	63,868

1987 Truck Fleet

Major Body Type	Truck + Trailer @ 5-axle	Truck+Trailer @ 6-axles or more	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles or more	Triples	Total Mean
Platform	15,865	28,499	52,910	39,223	39,734	69,910	51,865	24,257	47,604
Van	48,583	50,862	78,093	75,455	70,750	86,958	65,434	108,481	77,898
Auto Transport	50,721	10,000	56,784	42,081	74,659	-	-	-	56,938
Dump Truck	20,556	23,386	47,323	47,916	41,307	38,013	45,401	115,691	40,115
Grain Bodies	14,794	5,967	42,490	47,051	39,244	58,114	60,408	-	41,858
Garbage Truck	30,450	-	47,116	65,278	-	-	100,000	-	49,970
Livestock Truck	31,194	6,875	72,847	32,142	53,862	-	80,000	-	66,008
Pole, Logging Truck	44,646	54,843	48,881	47,802	51,970	-	20,000	-	48,308
Tank Truck, Dry Bulk	47,008	17,039	68,454	46,754	5,905	103,603	75,032	-	67,624
Tank Truck, Liquid or Gas	76,079	52,801	63,033	61,503	63,600	44,411	66,783	-	63,236
Other	15,089	17,739	32,257	37,011	35,122	33,950	75,000	-	27,775
Total Mean	24,406	27,539	64,726	49,364	51,837	79,828	60,720	87,599	60,548

Note: Some means are based on very small sample data. Accompanying table gives sample size.

Source: 1987 and 1992 Truck Inventory and Use Survey

3/3/96

Table 8.2-2

Sample Sizes for Body Type, by Vehicle Group

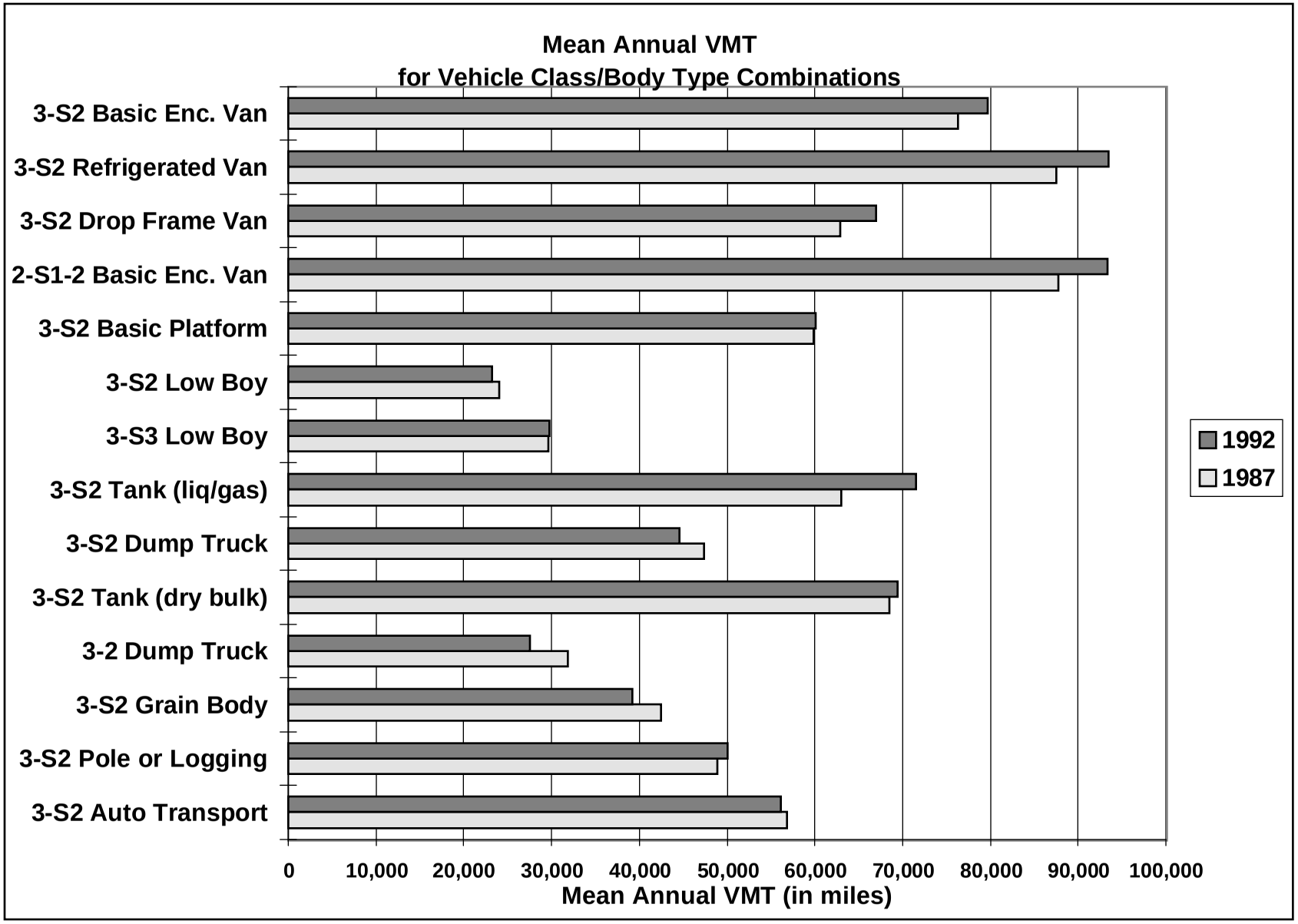
1992 Truck Fleet

Major Body Type	Truck + Trailer @ 5-axle	Truck + Trailer @ 6-axle +	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles or more	Triples	Total
Platform	324	66	6,332	1,002	269	73	191	8	8,265
Van	99	12	13,868	456	288	391	285	34	15,433
Auto Transport	10	0	262	9	10	0	0	0	291
Dump Truck	556	142	2,059	564	141	21	184	4	3,671
Grain Bodies	79	16	1,304	48	61	19	74	0	1,601
Garbage Truck	6	2	95	16	6	0	0	0	125
Livestock Truck	17	2	480	22	30	4	10	0	565
Pole, Logging Truck	177	44	961	163	59	0	15	0	1,419
Tank Truck, Dry Bulk	13	1	534	33	20	28	79	0	708
Tank Truck, Liquid or Gas	102	52	2,350	217	77	2	128	2	2,930
Other	119	18	674	236	26	4	9	0	1,086
Total	1,502	355	28,919	2,766	987	542	975	48	36,094

1987 Truck Fleet

Major Body Type	Truck + Trailer @ 5-axle	Truck + Trailer @ 6-axle +	3-S2	Tridem Axle Semitrailer	4S1/S2	STAA	Doubles @ 6 axles or more	Triples	Total
Platform	342	57	4,691	653	178	47	38	7	6,013
Van	86	16	7,808	306	128	250	71	15	8,680
Auto Transport	7	1	232	4	8	0	0	0	252
Dump Truck	354	79	1,320	259	63	21	42	3	2,141
Grain Bodies	40	13	726	36	19	22	27	0	883
Garbage Truck	2	0	31	4	0	0	1	0	38
Livestock Truck	21	3	333	9	8	0	2	0	376
Pole, Logging Truck	142	23	579	58	28	0	1	0	831
Tank Truck, Dry Bulk	7	3	332	18	4	10	17	0	391
Tank Truck, Liquid or Gas	66	33	1,480	88	41	11	6	0	1,725
Other	106	36	371	76	30	2	1	0	622
Total	1,173	264	17,903	1,511	507	363	206	25	21,952

Figure 8.3-1



Source: 1992 Truck Inventory and Use Survey

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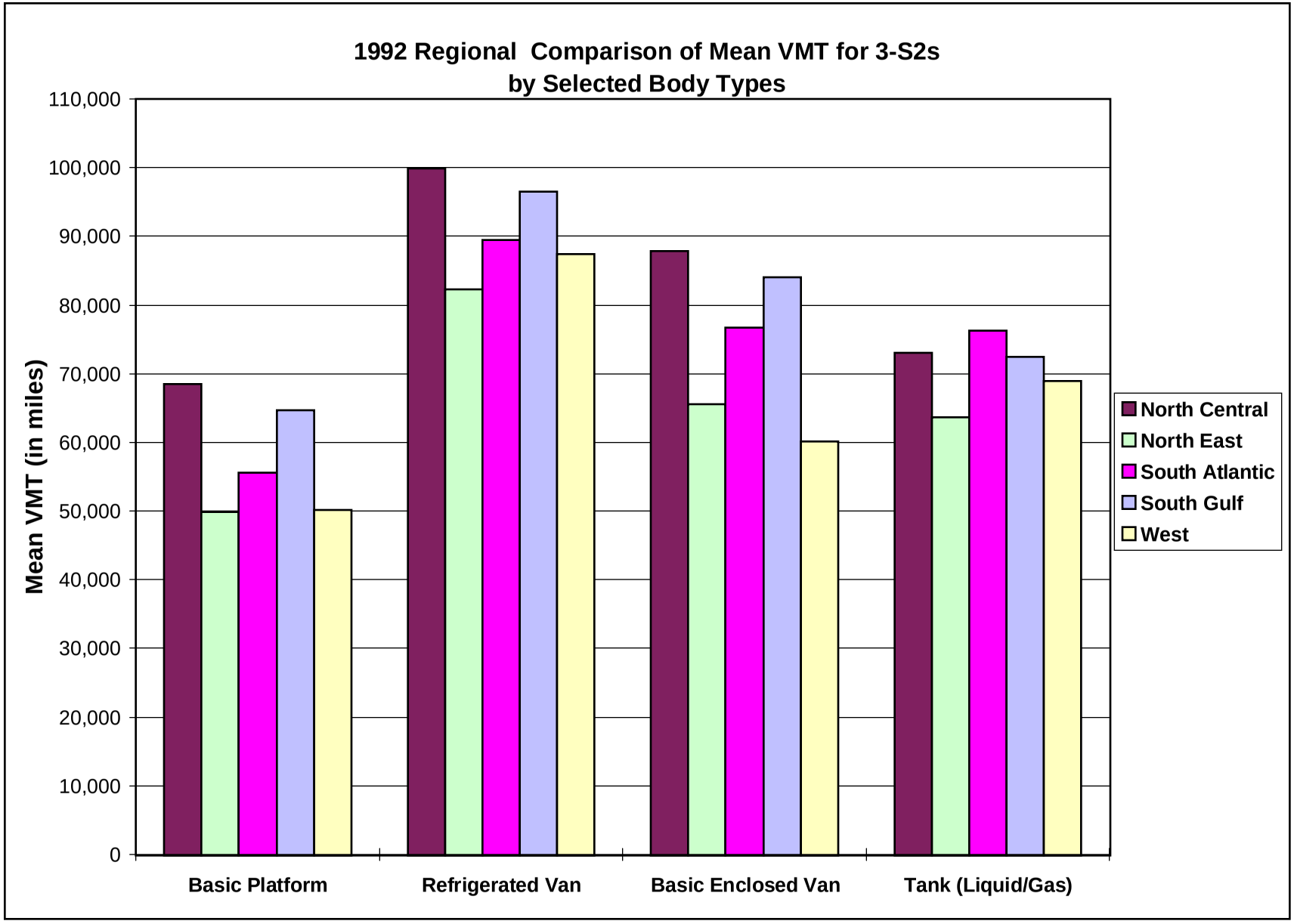
Figure 8.3-2



Source: 1992 Truck Inventory and Use Survey, Details in Appendix G

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