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Guide for Mechanistic-Empirical Design
OF NEW AND REHABILITATED PAVEMENT STRUCTURES

FINAL DOCUMENT

APPENDIX AA:
TRAFFIC LOADINGS

NCHRP

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Disclaimer

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Foreword

The purpose of this document is two-fold. The first objective is to present and discuss the traffic module of the Design Guide software which provides traffic information and input data that are needed for the incremental damage computations in predicting load related distresses. The second objective is to present the data analyses and research that were completed to support the assumptions made in developing the traffic module and for determining the default values when sufficient traffic data are unavailable to the user or designer.

The document is divided into five chapters and supported by eleven sub-appendices. It is a supporting reference to traffic related discussions presented in PART 2, Chapters 4, and PART 3, Chapters 3, 4, 6, and 7 of the Design Guide.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF TABLES (CONT.)

LIST OF FIGURES

LIST OF FIGURES (CONT.)

LIST OF FIGURES (CONT.)

LIST OF FIGURES (CONT.)

NCHRP Project 1-37A
"2002 Guide for the Design of New and Rehabilitated Pavement Structures"

DETERMINATION OF TRAFFIC INFORMATION AND DATA FOR PAVEMENT STRUCTURAL DESIGN AND EVALUATION

1 - INTRODUCTION

Background

Traffic data is one of the key data elements required for the design/analysis of pavement structures. Specifically, the number of Equivalent Single Axle Loads (ESALs) is the traffic feature that has been required for most pavement structural design procedures, including the 1993 AASHTO Design Guide. The equivalency factors used to determine the number of ESALs are based on the Present Serviceability Index (PSI) concept and are dependent on the type and surface thickness of the pavement (e.g., rigid versus flexible).

Historically, State highway agencies (SHAs) accumulate two types of traffic data --- Weigh-In-Motion (WIM) and Automatic Vehicle Classification (AVC) data. The first is in the format of the Federal Highway Administration (FHWA) W-4 Truck Weight Tables that are tabulations of the number of axles observed within a series of load groups, with each load group covering a specified load interval (4.4-, 8.9- or 13.3-kN). Traffic information relative to truck type (i.e., axle configuration) is provided in the W-2 tabulations or the distribution of vehicles counted and weighed. The second is in the form of number of vehicles by vehicle type counted over a period of time.

Most states take the information from the W-4 tables and convert that data into relatively simple multipliers, sometimes referred to as truck equivalency factors, that represent each truck type in the traffic stream. These multipliers are used to convert mixed streams of traffic into the number of ESALs. In the 1993 AASHTO Design Guide, Appendix D "Conversion of Mixed Traffic to Equivalent Single Axle Loads for Pavement Design" provides a set of guidelines for converting mixed traffic into a number of ESALs.

However, these equivalency factors are dependent not only on the type and thickness of the pavement surface, as stated above, but also upon the type of distress. Previous studies have shown the effect of distress type, failure criteria and other parameters on the equivalency or damage factors used to calculate ESALs (1,2). For evaluating or designing for specific distresses using mechanistic based pavement performance models, the use of ESAL data is limited and unwarranted. Although ESALs have been used in the past, mechanistic based distress prediction models require the use of axle load and vehicle classification data.

Historically, SHAs have installed and implemented limited data collection procedures for measuring traffic loads and vehicles on the highway system. Within the past decade, however, there have been major initiatives underway that have improved on the quality of the traffic data. The Long Term Pavement Performance (LTPP) program has been one of the key programs that has emphasized the importance of collecting adequate and representative traffic data for estimating existing and future traffic levels for pavement design purposes.

Statistically based programs for traffic monitoring and data collection have been adopted in the LTPP program and are being implemented by many SHAs. In addition, the technology, in terms of data processing, has rapidly improved over the past decade, allowing large or massive amounts of traffic data to be accumulated over time using the Automatic Vehicle Classification (AVC) and Weigh-In-Motion (WIM) installations.

An important observation, from an initial analysis of the LTPP traffic database, is that estimates of the historical traffic have been found to be in error compared to the actual monitored traffic. Some of this error is probably a result of not properly accounting for the large variations in traffic relative to an adequate traffic-sampling plan. This has resulted in a concern over how estimates of traffic loads (both the wheel load magnitudes and number of axle load applications) are projected with time for new pavement and rehabilitation design purposes. Similarly, predicting historical traffic levels for pavement structural evaluations for determining the remaining life also is in question based on recent analyses of the LTPP traffic data.

Currently, there are on-going initiatives to improve on the traffic data collection procedures and to improve on estimating both historical and future traffic levels using a limited amount of traffic data measured over a short period of time(3). Some of these initiatives (or studies) will not be completed in time to incorporate their findings into the 2002 design guide. Therefore, a study was undertaken to use existing databases for developing the traffic module in support of the distress prediction models.

Purpose of Document

The purpose of this document is two-fold. The first objective is to present and discuss the traffic module of the Design Guide software which provides traffic information and input data that are needed for the incremental damage computations in predicting load related distresses. The second objective is to present the data analyses and research that were completed to support the assumptions made in developing the traffic module and for determining the default values when sufficient traffic data are unavailable to the user or designer.

Scope of Document

The document is divided into five chapters and supported by eleven sub-appendices. The second chapter provides an overview of the hierarchical inputs and methodology incorporated into the traffic module and a discussion of the different steps within the core program (software) and auxiliary programs that were prepared to assist in the data analyses. The third chapter presents the default values for each of the traffic inputs and provides detailed discussion on how those default values were determined. Chapter four provides typical traffic variability measured at selected sites and suggests minimal sampling plans over a range of confidence intervals and expected errors. Chapter five presents and discusses a series of example problems using each one of the four hierarchical input levels and the difference in results between each level of inputs.

2 - GENERAL OVERVIEW - APPROACH AND METHODOLOGY

The traffic module takes AVC and WIM data in a structured format and determines the number of axle applications for each axle type and axle load group over the design or analysis period. The number of axle or wheel load applications are then used in the damage computations module for predicting the time to different levels of load related distresses for both rigid and flexible pavements. This section of the document discusses the general methodology that was used for developing the traffic module.

Flexibility and User Interaction: Focus on Implementation

The general approach for developing and organizing the traffic module was focused towards ease of use or "adaptability" to allow as many users to utilize the mechanistic-empirical design guide as possible. Specifically, flexibility and user-interaction were incorporated into the different functions of the module so that the user can incorporate their specific traffic features and/or parameters into the module for design and evaluation purposes.

Adaptability. As stated in the Introduction, SHAs generally collect two types of traffic data – AVC and WIM. More importantly, the LTPP program has been monitoring the traffic in terms of AVC and WIM at many of the test sections across the U.S. Thus the traffic module was structured to use these existing traffic databases to the maximum extent possible and to reduce the amount of new information and data that needs to be collected in order to implement the 2002 design guide.

Flexibility. The traffic module utilizes a graphical presentation format of the computed parameters to permit the user to review the results and to make modifications to those computed parameters. For example, the calculated total number of vehicles or individual trucks are plotted over time to ensure that the predicted traffic does not exceed the capacity of the roadway. The user also can compare the specific traffic features determined for the roadway in question to the default values incorporated into the program. In addition, different levels of data complexity were used to allow a wide cross section of users with varying historical information of the traffic features.

Modular Framework and Functions. The traffic module was prepared in individual units of operation of varying complexity and detail. Specific operations can be revised or removed and replaced at a minimal programming effort. This hierarchical framework is defined in the following sections of this chapter.

Hierarchical Approach: Design/Analysis Levels of Varying Detail

The full axle-load spectrum data for single, tandem and tridem axles is needed for the 2002 Design Guide for both new pavement and rehabilitation design procedures. It is recognized, however, that some SHAs and/or small municipalities may not have the resources that are needed to collect these data over time. To facilitate the use of the Guide by different SHAs and/or municipalities as well as other users, a hierarchical approach was envisioned for developing the traffic inputs to the new pavement and rehabilitation design process. This hierarchical approach for traffic is divided into four levels. These four levels are briefly defined below.

Level 1 Inputs – Site Specific Vehicle Classification and Axle Weight Data. Level 1 requires the gathering and analysis of site-specific traffic data and is recommended for use in evaluating or designing most high-volume highways. The traffic data measured at the site includes counting and classifying the number of vehicles traveling over the roadway, along with the breakdown by lane and direction, and measuring the axle loads for each vehicle class over a sufficient period of time to reliably determine the design traffic.

Level 1 is considered the most accurate because it uses the actual axle weights and vehicle class spectrum measured over or near the project site. However, the designer may not be able to use Level 1 under certain conditions, for example, in the development of new routes where roadways do not currently exist. For these conditions, Level 3 would need to be used, even though the roadway may eventually be a high-volume and very important route for transporting goods and the public. On the other hand, the traffic inputs for levels 1 or 2 can be predicted for new routes through detailed traffic forecasting and trip generation models/studies. The application of traffic forecasting and trip generation models are beyond the scope and intent of the traffic module. These types of studies should be completed external to the traffic module.

Special Case Studies - User Defined Gear Loads and Axle Configurations. Special Case Studies is a subset of the Level 1 Inputs in the hierarchical approach that allows the designer or user to input a specific axle load and configuration. For example, this level could be used for parking lots or facilities used by heavy transport vehicles or to determine the effect on pavement performance of special vehicles in transporting very heavy loads. This level can also be used to evaluate and/or design pavement structures using the existing standard input for traffic --- ESALs.

Level 2 Inputs – Site-Specific Vehicle Classification Data and Regional Axle Weight Data. Level 2 is identical to Level 1 with the exception that it does not require site-specific axle weight data. Regional or state axle weight data for similar highways are used to develop the axle load spectra for each vehicle class that can be used for a specific project or roadway.

Level 3 Inputs – Regional Vehicle Classification and Axle Weight Data. Level 3 is similar to Levels 1 and 2, but does not require site specific data other than AADT and percent trucks information. Regional or State vehicle classification and axle weight data for similar highway classifications are used to develop axle load spectra or distributions for each vehicle class that can be used for a specific project.

Level 3 would be used for designing rehabilitation strategies where AVC and WIM data are unavailable for a specific highway, or for designing new pavements where routes do not currently exist. It is expected that Levels 2 and 3 will be those most commonly used for both new pavement designs and rehabilitation designs.

If State and/or regional axle-load spectra or distributions are unavailable (i.e., no weighing-in-motion data), Level 4 should be used. The designer can use the axle load spectra default values included in the traffic module software or use values obtained from other sources.

Level 4 Inputs – Site Specific Vehicle Count Data, AADT. Level 4 does not require any traffic data other than vehicle counts and percent trucks information, but is the least accurate. For this level, default axle load distribution and vehicle classification distribution parameters are used with the Average Annual Daily Traffic (AADT) and percent trucks information to estimate the traffic data required for the mechanistic-empirical design procedure.

The default values to describe the vehicle classification distribution and axle load spectra that are incorporated in the software were determined from analyzing selected test sections in the LTPP traffic database with extensive traffic data and are dependent on the truck traffic classification of the highway. The truck traffic classification is defined and discussed in a latter section of this chapter. Level 4 inputs are recommended for use only in designing local highways and by small municipalities that do not have the proper equipment for traffic data collection.

The operational flowchart for the traffic analyses conducted as a part of this study is included in Appendix AA.1. Before proceeding with the discussion of the analyses completed as a part of this study, however, the reader is cautioned to note the following to prevent confusion between the two phrases “level of inputs” and “level of data” :

- “Level of inputs” refers to the different hierarchical levels included in the traffic module, but does not refer to the data itself.

- “Level of data” refers to the organization and/or level of detail of the traffic data stored in the LTPP central traffic database and the FHWA W2, W3 and W4 traffic tables.

Traffic Module Data Analyses

Eight types of traffic data were required for developing the traffic module in support of the 2002 mechanistic-empirical design guide and evaluation procedure for both new pavement designs and pavement rehabilitation designs. These are listed below and defined in latter sections of this chapter:

1 – AVC Data. AVC data are used to determine the normalized vehicle class or truck distribution over a specified period of time. These vehicle classification data are needed for Levels 1, 2 and 3 inputs. Default values are provided for Level 4 inputs. These default values are truck traffic distribution dependent.

2 – WIM Data. Level 2 WIM data are used to determine the normalized axle load distribution or spectra for each axle type within each vehicle class. These axle weight data are needed for levels 1, 2 and 3 inputs. Default values are provided for Level 4 inputs. These default values are vehicle class and axle type specific. Level 4 WIM data are used to determine the number of axles for each vehicle class and axle type over a specified time period.

3 – Average Annual Daily Truck Traffic (AADTT). The average annual daily truck traffic is needed for the base year for levels 1, 2 and 3. For level 3 inputs, where traffic measurements are unavailable for the roadway, these values can be estimated from traffic studies of similar highways or represent regional averages.

4 – Average Annual Daily Traffic (AADT) or Vehicle Counts. The average annual daily traffic is needed for the base year, but is only required for level 4 inputs.

5 – Percent Trucks. Percent trucks represents the percentage of vehicle classes 4- 13 in the traffic stream. The percent trucks is required for the base year for the level 4 inputs.

6 – Truck Traffic Classification (TTC) for Pavement Structural Design. This factor classifies those highways into groups with similar truck traffic features or characteristics that are needed for pavement structural designs for selecting the default values for the level 4 inputs of various traffic parameters. The TTCs are discussed in the next section of this chapter.

7 – Loading details of the axle load and axle configuration. Default values are provided for each of the following elements that describe the details of the tire and axle loads. However, the designer can use a different set of values that are site specific.

- Tire pressure – Default value that is dependent on the axle load for single or dual usage.

- Tire and axle load – Tire and axle load increments as specified in the W4 traffic tables.

- Axle and tire spacing – Default values are dependent on the axle type.

- Average number of axles by axle type per vehicle classification or truck type – Default values are truck type dependent.

8 – Traffic factors. Default values for each of the following elements are provided for different types of highways. However, the designer can specify different values for any of the traffic hierarchical levels. These elements or design inputs are discussed in a latter part of this chapter.

- Traffic time distribution factors – Two types of truck distribution factors are needed as inputs. Seasonal or monthly distribution factors are used to adjust the AADTT into monthly Average Daily Truck Traffic (ADTT) values/volumes, while the hourly distributions are used to distribute the monthly ADTT volumes by hour of the day. The average hourly distribution of traffic is needed for the incremental damage computations for different thermal gradients during the day. These time distribution factors are determined from detailed studies of the AVC or WIM data.

- Weekday and weekend truck traffic factors – These truck traffic factors adjust the ADTT to weekend and weekday conditions or take the average weekday truck factors and estimate the ADTT. If the AVC traffic sampling plan covers both weekdays and weekends adequately using the same proportion, the ADTT can be used directly without making any adjustments.

- Directional distribution factor – The directional distribution factors account for the percentage of trucks in one direction of the total truck traffic population. These directional distribution factors can be truck type dependent.

- Lane distribution factor – The lane distribution factors account for the percentage of trucks of the total truck traffic population in one lane (i.e., one direction). These lane distribution factors are area (urban versus rural) and highway (number of lanes) dependent, but can be truck type dependent also.

- Lateral distribution factor – The lateral distribution factors account for the wander or lateral distribution of trucks across one lane of traffic.

- Traffic growth factor or function – The traffic growth function allows for the growth or decay in truck traffic over time (for forecasting or backcasting truck traffic) and can be truck type dependent.

Truck Traffic Classification: Functional Versus Structural

The performance and design of pavements is significantly affected by both the number of axles (or trucks) and magnitude of loads, rather than just the shear number of total vehicles. However, highways have been historically categorized into different functional classifications that are more related to geometrical design and highway capacity. Most databases have used functional classifications for collecting and storing the traffic data. These functional classifications used to categorize the roadways in the LTPP database are listed below:

Code	Functional Classification Description
01	Rural Principal Arterial – Interstate
02	Rural Principal Arterial – Other
06	Rural Minor Arterial
07	Rural Major Collector
08	Rural Minor Collector
09	Rural Local System
11	Urban Principal Arterial – Interstate
12	Urban Principal Arterial – Other Freeways and Expressways
14	Urban Principal Arterial – Other
16	Urban Minor Arterial
17	Urban Collector
19	Urban Local System

The traffic data being maintained and stored in the LTPP database initially were evaluated by functional classification for selected sections or roadways. The roadways selected covered a wide range of functional classifications and AADT. Both the mean and variance of the annual normalized axle load distributions and annual normalized vehicle class distributions were calculated from the LTPP traffic data. The standard deviations or coefficients of variations determined from this analysis were found to be greater within the same functional classification than between the functional classification groups. As a result, it was found that these functional classifications do not properly describe the distribution of trucks travelling on the roadway. Thus the sections were subdivided into roadways that have a similar composition of trucks (vehicle classes four through thirteen).

Seventeen groupings, called truck traffic classifications (TTC), with similar truck traffic compositions, were defined for pavement structural design purposes. These groups represent the range of commonly encountered vehicle distribution spectra and were developed primarily around vehicle classes 5, 9, and 13. These three vehicle classes showed the greatest variability and were natural choices for distinguishing between truck traffic streams. Characteristics of the seventeen TTCs are listed below and will be discussed in much greater detail in Chapter 3.

- TTC 1 – Major Single-Trailer Truck Route (Type I)
- TTC 2 – Major Single-Trailer Truck Route (Type II)
- TTC 3 – Major Single- and Multi- Trailer Truck Route (Type I)
- TTC 4 – Major Single-Trailer Truck Route (Type III)
- TTC 5 – Major Single- and Multi- Trailer Truck Route (Type II)
- TTC 6 – Intermediate Light and Single-Trailer Truck Route (I)
- TTC 7 – Major Mixed Truck Route (Type I)
- TTC 8 – Major Multi-Trailer Truck Route (Type I)
- TTC 9 – Intermediate Light and Single-Trailer Truck Route (II)
- TTC 10 – Major Mixed Truck Route (Type II)
- TTC 11 – Major Multi-Trailer Truck Route (Type II)
- TTC 12 – Intermediate Light and Single-Trailer Truck Route (III)
- TTC 13 – Major Mixed Truck Route (Type III)
- TTC 14 – Major Light Truck Route (Type I)
- TTC 15 – Major Light Truck Route (Type II)
- TTC 16 – Major Light and Multi-Trailer Truck Route
- TTC 17 – Major Bus Route

Work done using these classifications to group the sections into similar truck traffic distributions show a decrease in variability within these groupings. Thus the relevant TTCs were assigned to existing functional classes based on the traffic distributions from 133 sites. The variation in axle load spectra within a section is so large that separate axle load spectra, representing individual functional classes or truck traffic classes, would not be meaningful. More details on these TTCs are discussed in the next chapter.

Assumptions

Four major assumptions were used in developing the traffic module. Each of these assumptions is listed below.

1. The normalized axle load distributions by axle type for each vehicle class remain constant from year-to-year unless there are political and/or economical changes that have an affect on the maximum axle or gross vehicle loads. However, the vehicle class distributions can change from year-to-year.

2. The normalized axle load distribution by axle type and vehicle class does not change throughout the time of day or over the week (weekday versus weekend

and night versus day). However, the vehicle class or truck distributions can change over the time of day or day of week.

3. The normalized axle load distribution for each axle type and vehicle class does not change from site-to-site within a specific region.

4. The truck traffic classifications for pavement design discussed previously provide a better description or grouping of roadways with similar truck traffic characteristics than the more traditional functional classifications.

Module Operational Functions and Designer Decisions

Various procedures have been used to estimate the cumulative traffic over time. Unfortunately, most of these projections are very crude with an undefined level of reliability. An approach that has been used in earlier studies to estimate future and historical traffic levels uses a normalization procedure. This normalization procedure is based on and uses information from the traffic tables that have been maintained through FHWA and LTPP. These data are readily available within the LTPP traffic database.

The traffic module has been subdivided into six major decision functions. Some of these decisions are external and some are internal to the traffic module software. However, all six functions were considered and used in evaluating the LTPP traffic data for developing the module. These functions are:

1. Decide whether seasonal differences in the truck traffic should be considered in analyzing the traffic data – external to the traffic module software.

2. Determination of vehicle (or truck) distribution for the base year (weekday and weekend truck traffic, nighttime and daytime truck traffic, and seasonal variations) – external to the traffic module software.

3. Calculate or estimate the probable or expected error for the truck traffic (ADTT) – external to the traffic module software.

4. Forecast truck traffic over the design/analysis period and/or reverse forecast (or ”back-cast”) truck traffic to the time of construction for pavement structural evaluation of existing pavements – internal to the traffic module software.

5. Determination of axle load spectra for each axle type and vehicle class – internal to the traffic module software.

6. Combine the axle load spectra with the vehicle class distribution to establish the number of axle applications within each axle load group and axle type – internal to the traffic module software.

The following briefly discusses the major steps that were used in analyzing the LTPP traffic data from selected sites for developing the traffic module. These steps are consistent with the operational flowchart included in Appendix AA.1. As noted above, some of these major steps are completed external to the traffic software.

A. Subdivide the Annual Truck Traffic into Seasons or Times with Similar Traffic Features. The user first decides whether the site should be divided into different traffic seasons. A season can be defined in various ways, however, only the AVC data were used initially to evaluate seasonal differences in the truck traffic volumes and distributions for specific LTPP sites. The WIM data are not used to determine if seasonal differences in traffic features exist at the site.

It has been found from previous studies that a season could be highway dependent (based on the economy or industry of a specific area), time of day dependent, weekday dependent, and/or climate dependent. The number of seasons and length of each season is site specific. However, the length of each season in the traffic module software has been preset to one month for simplicity and computation efficiency between the different modules of the 2002 design guide software. The user should confirm this assumption and make any appropriate changes that are necessary for a specific site. As most seasonal variations are region and highway dependent, the number and length of the seasons should be determined external to the traffic module and sufficient traffic data (AVC and WIM) should be collected within each of the seasons. This decision definitely has an impact on the recommended traffic-sampling plan discussed in Chapter 4.

As a minimum, the weekdays should be considered separately from the weekends for each season because many of the LTPP sites were found to have significantly different traffic characteristics. The AADTT input to the traffic software must take into account the difference between weekday and weekend traffic volumes.

For Level 4 inputs, the use of seasonal variations in traffic are not suggested because detailed truck traffic data are unavailable, which has the affect of reducing accuracy when determining the existing or base traffic level. For new routes and/or Level 3 inputs, different traffic seasons can be planned for, but are not encouraged because traffic patterns and characteristics have yet to be defined. For this case, gross estimates must be used and seasonal changes may not be accurate and, therefore, are not recommended without detailed trip generation and traffic forecasting studies.

B. Determination of the Vehicle Class (Truck) Distribution. The second part of the procedure was to determine the normalized distribution of the number of trucks by vehicle class within each season and to determine if the percentages of the total number of trucks within each vehicle class are changing with time. Chapter 3 lists and discusses the default values that were determined from a preliminary analysis of the LTPP traffic data. These default values were found to be dependent on truck traffic composition. The following summarizes those steps that were used to calculate the average daily-normalized vehicle class distribution or spectra within each season or time increment (weekday versus weekend and/or day versus night).

> **STEP B.1.** Collect or recover the total number of trucks per day measured at the site from the AVC data for each season. Calculate the percentage of the total annual number of trucks within vehicle class four through thirteen for each year by season with sufficient data. Figure 1 shows an example of an annual truck traffic distribution for four years of AVC data. As shown, the truck traffic composition/distribution did not change significantly over time at this site.
>
> **STEP B.2.** Calculate the overall mean and variance of the annual or seasonal normalized number of axles or vehicles per day within each vehicle class.

STEP B.3. Compare the annual or seasonal values to determine if there are significant differences from year to year. Based on those results, either combine the annual data or keep the years separate. This information and data are used to determine the base year for future traffic projections.

STEP B.4. Decide whether to combine all years, selected years, or use only one year of data to determine the base seasonal vehicle class distributions. Calculate the percentage of the normalized traffic within each pre-defined season. This step is needed only if the damage computations and performance predictions are made on a seasonal basis or if there are seasonal variations in the truck distribution. If seasonal variations are considered the user defines the limits of each season. In the traffic module software, the length of each season has been pre-set to one month.

STEP B.5. If the seasons are defined by another time parameter, calculate the normalized weekday and weekend vehicle distribution within each season.

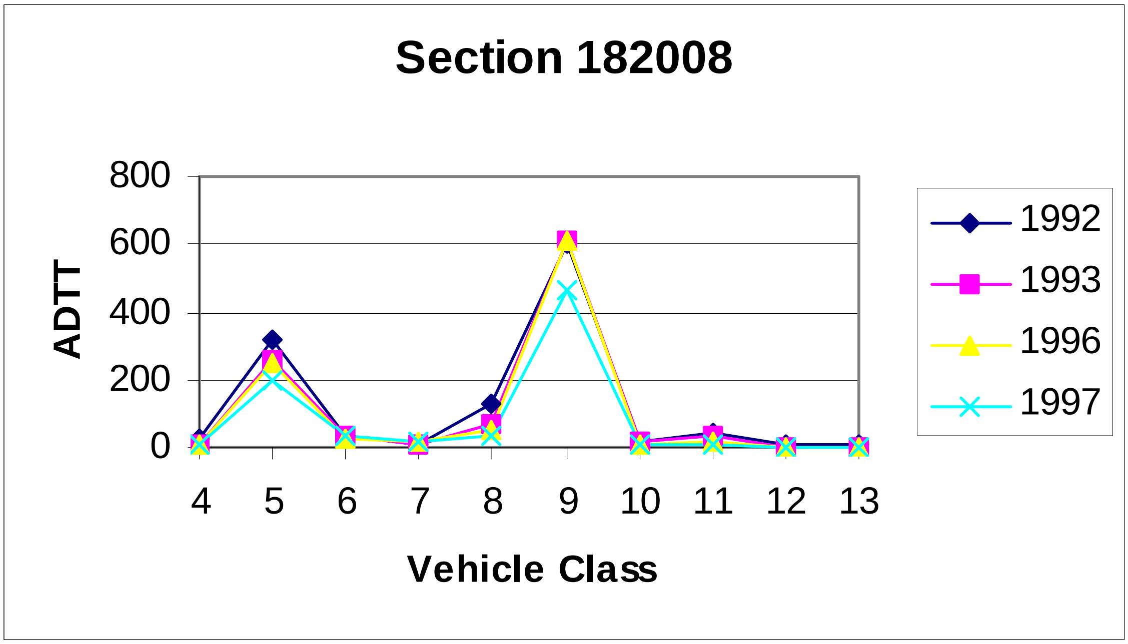

Figure 1. Example of annual normalized truck traffic distribution for Section 182008.

STEP B.6. Determine if there are systematic time differences or trends in the data for use in predicting the historical and future traffic. If significant systematic differences exist, this information can be used in estimating the growth and/or decay rates for the next major function.

C. Determination of the Expected Error of the Traffic Data. The third part of the process was to determine the expected error of the traffic estimates based on the amount of data collected at a site given the variation in the data and the confidence interval selected for the evaluation. To ensure an adequate amount of traffic data was available for this step, only those LTPP sites with more than 200 days per year for at least two years of AVC data were used in the initial analyses. These sites were defined as the "core set" of sites that were used to determine the statistics of each traffic parameter.

The computation of the expected error at a selected confidence interval is explained in Chapter 4. This computation of the expected error is used to provide the designer with additional information as to the accuracy of the estimates for the seasonal or annual traffic levels. Based on the expected error computation, the designer may want to use more traffic data or decrease the overall reliability of the design.

D. Establish Traffic Growth/Decay Rates or Patterns.   To establish and confirm the long-term changes (growth or decay) in traffic, all available data should be used. This includes existing historical estimates of the annual 80-kN ESALs per design lane, if that data are available.

STEP D.1. Determine if there are trends or systematic differences between the data for use in predicting the historical and future traffic spectrums. Using the AVC data from Step 1 (number of axles/vehicles) per day) determine the average number of axles per day for each year or season, whichever applies to the response analysis and damage computations. If trends are observed, determine the growth or decay rate from those trends. The designer should use this information and other criteria to decide on the type of growth function and the rate of change or growth that should be used for the roadway in question.

STEP D.2. Two options are available to the designer for forecasting traffic. One option assumes that the normalized traffic distribution determined for the base year and season do not change with time. For this option, the seasonal or annual ADTT values are projected into the future or past.

The second option assumes that the normalized traffic distributions for the base year (seasons) do change because of changing political climates and/or the growth of different industries that the roadway serves. For the second option, individual truck classifications are projected into the future or past using different functions.

STEP D.3. After the forecast option is selected, the growth functions for each season and vehicle classification are selected. Three growth functions are included in the program. These are listed below:

- Increasing at an increasing rate for future projections or decreasing at a decreasing rate for historical projections (i.e., reverse forecasting or back-casting the traffic data).

- Linear increases per year.

- No growth.

STEP D.4. The module calculates the projected traffic with time and provides the designer with annual or seasonal plots for specific traffic or truck volumes. The designer uses this information to evaluate the reasonableness of the projections with time and can make revisions to those projections, if needed, for any reason.

E. Normalization of Axle Load Spectrum. The fifth part of the procedure was to determine the normalized axle load distribution or spectra. The load spectra are normalized on an annual or seasonal basis to determine if there are systematic or significant differences in the data. Chapter 3 lists and discusses the default values for the axle load distribution by axle type and vehicle classification. The seasonal or incremental traffic categories should equal the same time increment used in the response analyses and incremental damage computations.

STEP E.1. Collect or recover the WIM data and total the number of axles measured within each axle load range by axle type within each vehicle class. Calculate the percentage of the total number of axle applications within each load range for each axle type and vehicle class for each year of data. In other words, normalize the number of axle load applications within each vehicle class and axle type.

Figure 2 shows an example of an annual normalized tandem axle load distribution for vehicle class 7, 8 and 9 for all years of available data combined. As illustrated, the tandem axle load spectra for these three trucks are different and should be considered separately in the analysis.

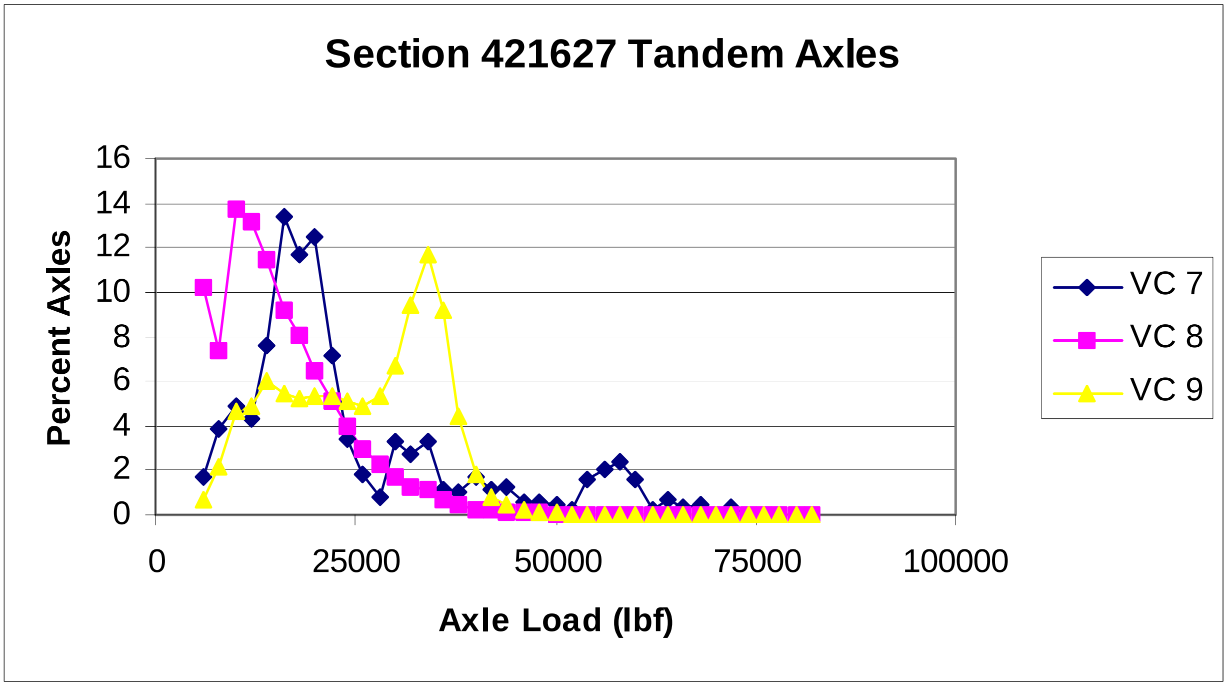

Figure 2. Average annual tandem axle load distribution for Section 421627 for years that good data was available.

STEP E.2. Calculate the annual or seasonal mean and variance (or coefficient of variation) for each axle load range for each axle type within each vehicle class. Both the mean and variance are important for determining the number of samples that are needed to estimate the total traffic population and to determine if there are significant differences between seasons and years. The questions to be asked and answered from these calculations are:

- How different is the annual or seasonal normalized load spectrum among the different vehicle classes for each axle type (singles, tandems, triples and quads) and does the distribution change from year to year?

- Can the data be represented mathematically by a normal, binomial or skewed distribution?

STEP E.3. Compare the annual normalized axle load spectra or distributions for the truck class that has the greatest number of vehicle applications at the site. If the annual normalized values are not significantly different from year to year, all of the years can be combined to result in a site normalized load distribution histogram for each vehicle class and axle type. If statistical differences are found, the years should be considered separately in the analysis. The user decides which axle load distribution should be used as the base year and whether that distribution needs to change from year to year. It is suggested that one axle load distribution for each axle type and vehicle class be used and that distribution be kept constant throughout the analysis period.

Figure 3 shows an example for comparing the annual normalized tandem axle load distributions for vehicle class 9 for four different years. As shown, the normalized tandem axle load distribution for vehicle (truck) class 9 does not change over time at this site.

STEP E.4. Decide whether to combine all years, selected years or use only one year of data to determine the base seasonal or annual axle load distribution for each axle type and vehicle class. To do this, first determine if there are significant differences in the normalized load distribution histogram by season within a year. This step is needed only if the pavement response analysis and damage computations are being made on a seasonal basis. As noted above, the seasons have been preset to one month in the traffic module software. If annual damage computations are being made, the seasonal traffic analysis is not necessary.

STEP E.5. Determine if there are significant differences between the days of the week and/or weekdays versus the weekends using the same type of process noted in the above steps. The module software assumes that the average normalized axle load distributions are basically the same regardless of the day of week.

STEP E.6. All of the data and calculations were evaluated to determine how the normalized load distribution histograms change with time and if those changes are significant. These values are then used to predict the load distribution values for future years or to back-calculate values for previous years.

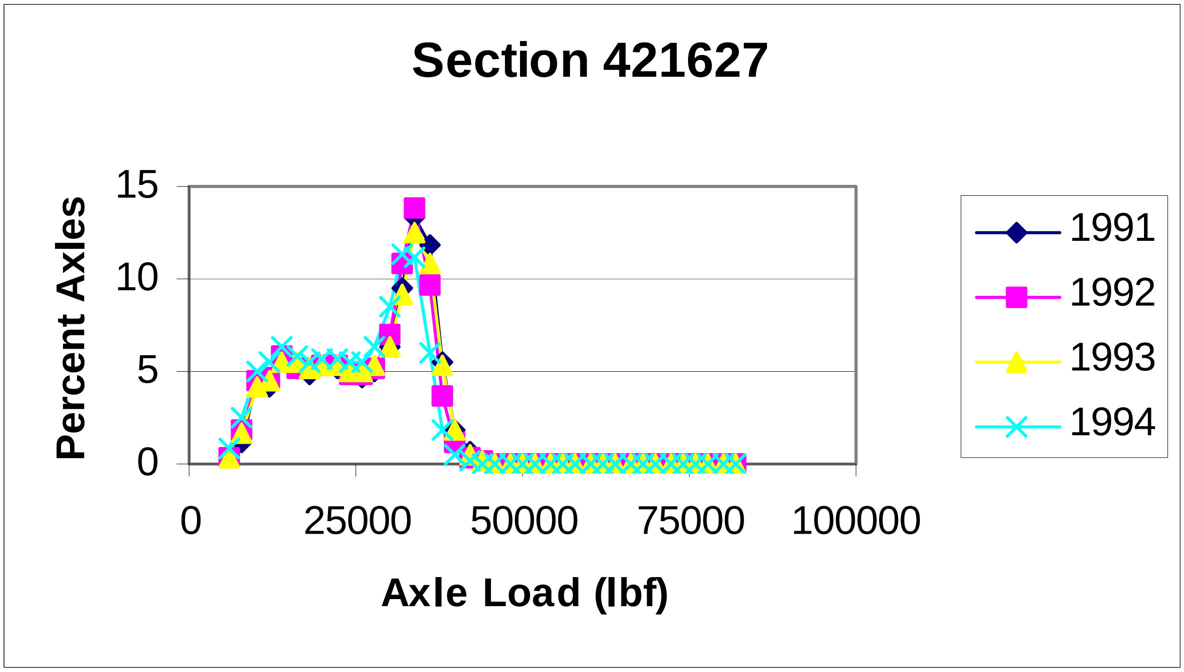

Figure 3. Annual normalized tandem axle load distribution for Section 421627.

F. Prediction of Total Traffic – Future and Historical. The normalized axle load distribution and the normalized traffic distribution are combined with the total number of vehicles that are predicted with time. These normalized relationships are used to determine the number of axle loads within each load group for each axle type. The following steps summarize the prediction of the future or historical total number of single, tandem and tridem axles within each load group.

STEP F.1. The average seasonal number of vehicles or trucks per day are obtained for a particular year based on the selected growth function and multiplied by the number of days within that season to obtain the total seasonal vehicles for that year and season.

STEP F.2. The average number of axles by axle type (single, tandem and tridem) for each truck (which is independent of time) are multiplied by the total number of trucks within each vehicle class to obtain the total number of axles (singe, tandem and tridem) for that vehicle class.

STEP F.3. The total number axles for each axle type for a specific vehicle class are multiplied by the normalized axle load distribution percentages to obtain the number of axles (by axle type) within each load group for a specific axle type under a specific vehicle class.

STEP F.4. The number of axle applications for each axle type are then summed for all vehicle classifications to obtain the total number of axle applications within each load group by axle type.

STEP F.5. These number of axle applications by axle type and load group for each season and year are then used within the incremental damage module to predict the load related distresses with time.

It should be noted that the percentage of the total traffic population in the light axle load groups are not important regarding pavement design and prediction of load related distresses. Therefore, the normalized approach focuses more on the heavier load groups for which a sufficient number of axles have been recorded.

3 – Traffic Default Values

This section of the document presents and discusses the analyses used to determine the default values for Level 4 inputs of the traffic module. Default values and/or functions are provided for the following input parameters.

- Annual Weekday Normalized Truck Distribution by Highway Structural Design Classification
- Loading Details for Axle Loads and Axle Configurations
- Traffic Factors

Acquisition and Processing of LTPP Traffic Data

Phase I of the "Development of LTPP Traffic Backcasting Procedure" identified 163 sites with sufficient WIM and AVC data to develop and demonstrate a method for reverse forecasting of the load spectrum (3). The criteria for sufficient data were defined as follows:

- The availability of not less than 210 days of AVC data.
- The availability of not less than one-week day and one weekend of WIM per quarter (preferably one week per quarter as a minimum).
- Availability of above data items for at least two years in a five-year period.

A total of 163 sections met this criteria and were chosen for use in NCHRP 1-37A. FHWA approved the use these traffic data to establish default values for Level 4 inputs in the traffic module. Unfortunately, many of the 163 sections did not have as much AVC and WIM data as originally expected. It should be remembered that the phrases "levels of data" and "levels of inputs" are used throughout this chapter and have different meanings. "Levels of data" refers to the organization and level of detail of the traffic AVC and WIM data stored in the LTPP-IMS database and the LTPP central traffic database. "Levels of inputs" refers to the different hierarchical levels included in the traffic module.

Level 4 AVC data and Level 3 and Level 4 WIM data were requested from Chaparral through SAIC. The Level 2 WIM data were provided by the FHWA-DATS team on the traffic forecasting work from their data request submitted in February 1998. The traffic team decided to use the Level 2 WIM data in the final analyses to calculate the recommended default values because the traffic module does not consider seasonal or night versus day variations in the axle load spectra. This will be discussed in greater detail in a latter subsection of this chapter entitled "Evaluation of WIM Data." The traffic module does consider the seasonal and night versus daytime variations in the truck class distributions. Using Level 4 AVC data and Level 2 WIM data, the following analyses were planned and conducted to develop default values to be used with the Level 4 inputs of the traffic module.

- Evaluation of traffic characteristics and trends in the AVC data.
  - Normalized vehicle class spectra.
  - ADT trend in the LTPP lane.
  - Directional distribution factor.
  - Lane distribution factor.
  - Weekday/weekend factors.
  - Night versus day traffic factors.

- Development of default axle load spectra from the WIM data.

- Development of truck traffic classification groupings for pavement structural design and evaluation.

In addition, work was conducted to examine "real world" truck and tire features. The following tire and axle configuration features were studied to determine if default values could be developed and incorporated into the module to simplify its use.

- Tire dimensions
- Tire pressures
- Tire spacings
- Axle spacings

Level 4 AVC data was requested for the entire 163 selected sections and received from Chaparral. However, no AVC data was available for 11 sections (eight SPS sites and three GPS sections). Another 15 sections have less number of years of AVC data than indicated in the "Development of LTPP Traffic Backcasting Procedure, LTPP DATS – Work Order No. 12, Task 1 – Interim Report." Thus a total of 134 sites were used in the analysis of the traffic data. The NCHRP 1-37A traffic team has coordinated with the FHWA-DATs team on the traffic forecasting work to ensure that there is consistency between the two projects and that duplicated work efforts were minimized.

Processing of AVC Data for Daily Information. First, Level 4 AVC traffic data was acquired from the Central Traffic Database (CTDB). Table 1 shows the list of information available and the corresponding column numbers in the AVC data file. The program identifies information in the AVC data file from its column number.

In order to maintain uniformity in quality control and version control of the AVC data, all subsequent data analysis was carried out on AVC data supplied by Chaparral. This hourly AVC data provided was processed using the following methodology. This included a check to ensure that only days with exactly twenty-four hours of data were used in deriving the daily traffic counts.

Figure 4 shows the flow chart for the program that reads the Level 4 AVC data and created the master data file. As the program begins, it creates a temporary array (Table 2) and reads the first record of the first AVC data file. It then identifies the State identification (ID), Strategic Highway Research Program (SHRP) ID, highway functional class, year, month, day, direction and lane number for the record and enters it into the temporary array with the traffic counts for that record. For the rest of the report, AVC string will refer to a set of information containing the State ID, SHRP ID, highway functional class, year, month, day, direction and lane number.

Table 1. List of information in Level 4 data and
their corresponding column numbers.

Field Description	**Column Numbers**
Record Type	1
State Code	2-3
Functional Class	4-5
Station ID Number	6-8
Direction	9
Year	10-11
Month	12-13
Date	14-15
Hour	16-17
Vehicle Class 1 Vehicle Count	18-19
Vehicle Class 2 Vehicle Count	20-23
Vehicle Class 3 Vehicle Count	24-26
Vehicle Class 4 Vehicle Count	27-28
Vehicle Class 5 Vehicle Count	29-31
Vehicle Class 6 Vehicle Count	32-33
Vehicle Class 7 Vehicle Count	34-35
Vehicle Class 8 Vehicle Count	36-37
Vehicle Class 9 Vehicle Count	38-40
Vehicle Class 10 Vehicle Count	41-42
Vehicle Class 11 Vehicle Count	43-44
Vehicle Class 12 Vehicle Count	45-46
Vehicle Class 13 Vehicle Count	47-48
Motorcycle	49
Vehicle Class	50
Blank or optional data	51-80

Table 2. AVC temporary array for hourly data.

	State ID	**SHRP ID**	**Year**	**Month**	**Day**	**Direction**	**Lane**	**Functional Class**	**Tally Count**	**VC1-VC13**
No. Of Fields Stored	1	1	1	1	1	1	1	1	1	13

The program then reads the next record until the last record of the last file. It checks to see if this next record has the same State AVC string as the one stored in the temporary array. If it does, the traffic count for each vehicle class is added to the corresponding value in the array. If it does not, the information in the temporary array is recorded in the master file, the temporary array is cleared and a new AVC string is entered into the temporary array with its corresponding traffic counts. The normalized traffic counts (based the contribution of each vehicle class to the total daily traffic volume, as a percentage) are calculated and entered into the master data file at the same time that the rest of the information is sent from the temporary array.

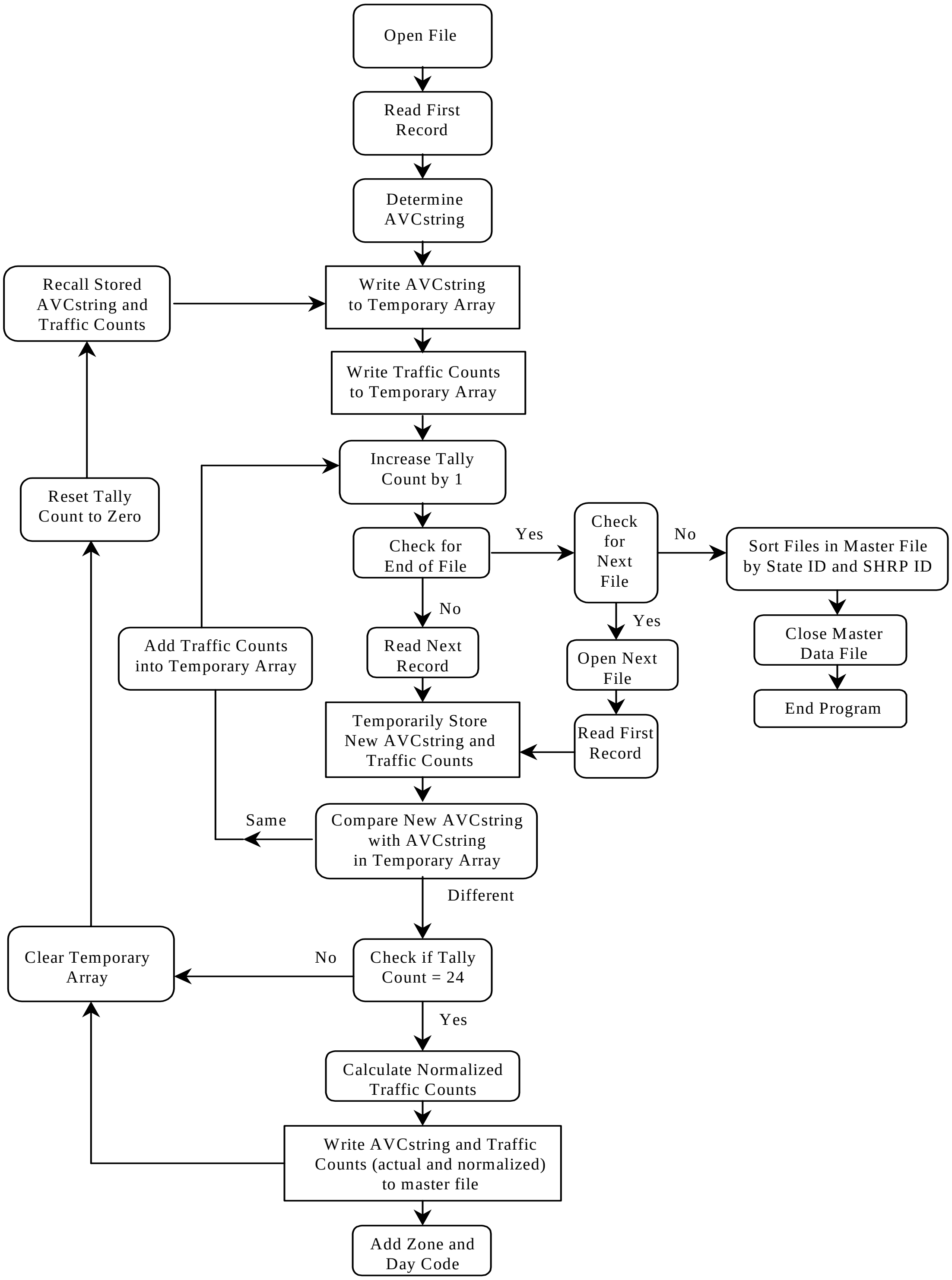

Figure 4. Flow chart for developing AVC master data file.

A data quality check is embedded in this process. The “tally count” field in the array starts at zero and increases by one every time a set of traffic data is added to the array. In other words, it keeps track of the number of hours of data that is entered into the array before it is sent to the master file. When the array is ready to be sent to the master file, if the count is exactly 24, the array is sent to the master file. If the count is more or less than 24, the array is discarded.

In the master file, the program adds a day code (e.g. Monday) to each line of daily data. This is done by an in-built function in visual basic, the programming language used for this program. A region code is also added. This is achieved by allocating an alphanumeric code based on the State ID.

The process continues until every line of data in this file has been processed. Then the program moves to the next data file and this continues until all the data files have been processed. When the program has completed its work, a master data file containing all the daily traffic information will have been created.

A separate program queries the master file to retrieve information from it. A flow chart for this program is shown in Figure 5. Based on criteria entered by the user, a query string is developed (AVC query). This query string is used to search the master data file allowing the relevant information to be extracted and entered into a secondary data file. The user has multiple opportunities to select different combinations of criteria to enter into the secondary data file. Once the user is satisfied that all the information has been entered into the secondary data file, he/she will then initiate the calculation of the mean, variance and coefficient of variation for each vehicle class in the secondary data file. The program will provide two output files. The first output file (filename.dat2) lists all the information extracted from the secondary data file, information that is considered in the calculation process. The second output file (filename.out) lists the number of days, means, variances and coefficient of variances for each vehicle class.

Processing of AVC Data for Hourly Data. As in the preparation of daily data, Level 4 AVC traffic data were acquired from the Central Traffic Database (CTDB) for processing. Table 1 shows the list of information available and the corresponding column numbers in the AVC data file. The program identifies information in the AVC data file from its column number.

The flow chart for creating the hourly master file is the same as that for the daily master file. The only difference is that the temporary array also contains an additional field for the hour of the day. The query program for the hourly master file is also similar to that for the daily master file, except that there is an additional query criteria --- the five time periods selected throughout the day. These five time periods are:

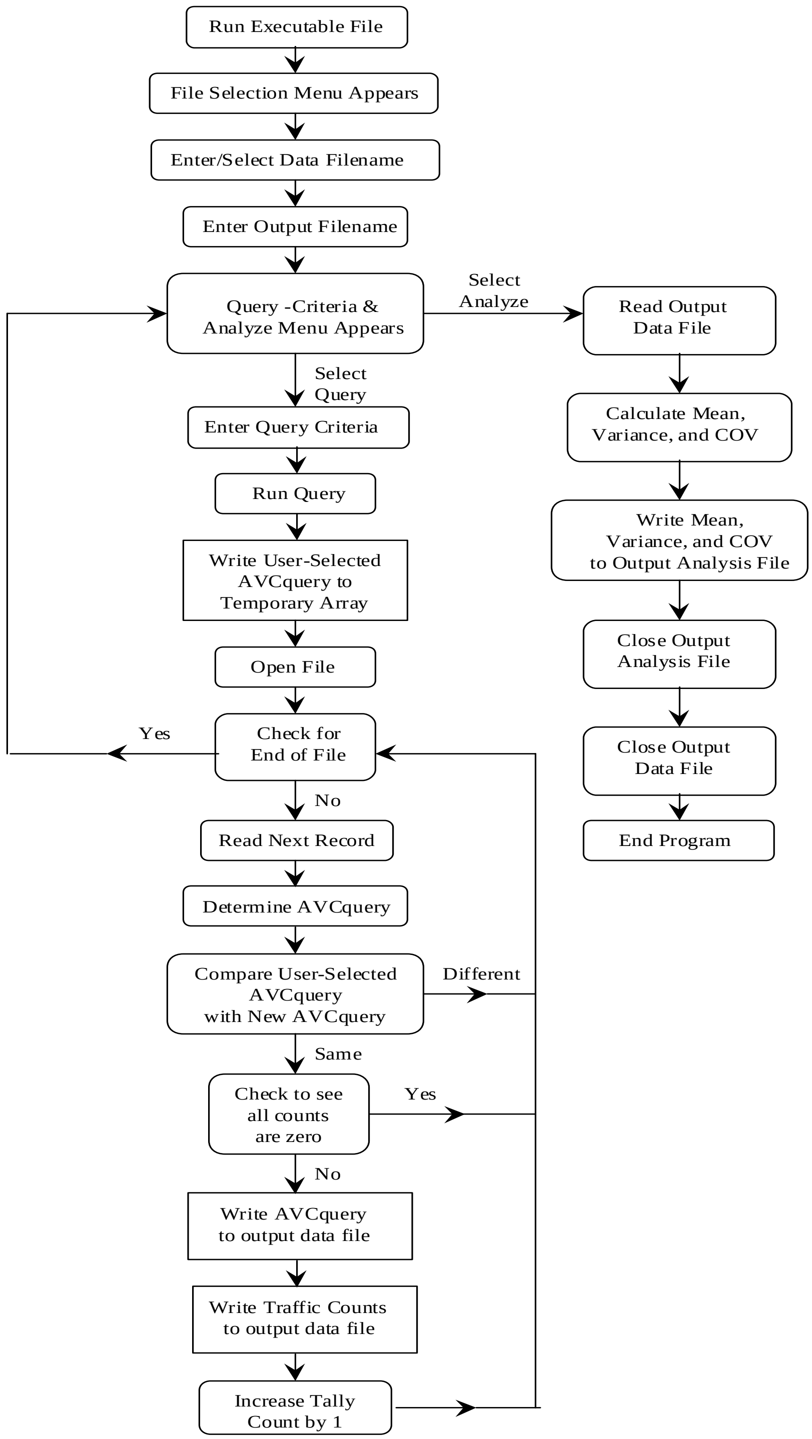

Figure 5. Flow chart for AVC query program.

- Midnight to 6 a.m.,
- 6 a.m. to 10 a.m.,
- 10 a.m. to 4 p.m.,
- 4 p.m. to 8 p.m., and
- 8 p.m. to midnight.

It should be noted that the AVC data often have unequal number of days of data for the different directions and lanes within a section. A query for a given direction may yield a biased estimate of the actual or normalized traffic. For example, a section with 200 days of data in the outside lane and only 100 days of data in the inside lane will produce a directional ADT biased in favor of the outside lane since it contributes twice as many days of data. In addition, the ratio of the number of weekdays to weekend days may not be 2.5 (5 weekdays divided by 2 weekend days). This could also lead to a biased estimate of the ADT.

Analysis and Processing of WIM Data. Level 3 WIM data was requested for the 163 sections and was received from Chaparral. However, the files were in binary form and had to be extracted into ASCII format before they could be processed. Upon further consideration, it was decided that Level 3 WIM data would not be required to achieve the objectives of this part of the research effort --- determination of a default axle load spectra. Level 2 WIM data were found to suffice and were used in place of the Level 3 WIM data. These data were provided by the FHWA/DATS team on the traffic forecasting work from their data submitted in February 1998. However, some Level 3 data was extracted to investigate the monthly variations in axle load spectra.

Level 4 WIM data was also requested for the 163 sections and received from Chaparral. These individual truck records have to be processed in order to give hourly truck counts. Again, initial thoughts of processing all the Level 4 WIM data were abandoned in favor of using Level 2 WIM data. However, the Level 4 data were used to study the axle spacings in trucks.

The approach to analyze the WIM data was similar to that for the AVC data. As such, the program flow chart for the WIM data analysis is similar to the AVC analysis flow chart , with the following exceptions. The first difference is in the contents of the temporary array. Unlike the array used in the AVC data analysis, the array used for the WIM data required different identifiers. Instead of having the State ID, SHRP ID, year, month, day, direction and lane number as identifiers, the array for the WIM data included State ID, SHRP ID, year, month, day, vehicle class, axle type and load group. It did not include the direction and lane number because WIM data is only collected in one lane. Table 3 shows an example of this array. While the WIM data were collected on an annual basis and are less detailed, some of the Level 2 summary information was added because it provided additional information deemed beneficial to the project.

Table 3. WIM temporary array.

	State ID	SHRP ID	Year	Month	Day	Functional Class	Vehicle Class	Tally Count	Axle Group and Load Group Data
No. Of Fields Stored	1	1	1	1	1	1	1	1	140

The second difference is the normalizing of data. In the AVC program, vehicle counts were normalized daily across all vehicle classes. In the WIM program, axle counts are normalized daily across load groups within each axle type. That means that each day will have four sets of normalized numbers, one for each axle type – single, tandem, tridem and quadruple axle groups.

For the Level 4 WIM data, the same sixteen sections were processed through a program to pick out the axle spacings. This program went into each vehicle record and picked out the axle spacings. This information is used to verify the selected axle spacings in tandem, tridem and quadruple axle groups.

Evaluation of AVC Data

Upon completion of the Level 4 AVC data processing, some analyses were carried out to identify trends and similarities between the different sites. Figure 6a shows the normalized percentage of vehicles in the LTPP lane for all 13 vehicle classes for the 152 sections, while Figure 6b shows the normalized percentage of vehicles in the LTPP lane for vehicle classes 4 through 13 (truck traffic). As shown, these sites represent a wide range of traffic distributions. Most of the sections showed peaks in the normalized percentage of vehicles for vehicle classes 2, 5 and 9. Vehicle classes 2, 3, 5, 8 and 9 consistently showed the greatest variation and could be used to differentiate between traffic streams.

Fifteen sections were selected to evaluate annual traffic trends, directional distribution factor, lane distribution factor, and WE/WD (weekend/weekday factor, ratio of the average number of vehicles on a weekend day over the average number of vehicles on a weekday day), and time of day distribution factors. These fifteen sections were chosen to represent the range of normalized percentages for vehicle classes 2, 3, 5, 8, 9, and trucks. Of these fifteen sections, nine were four-lane roadways and six were six-lane roadways. Table 4 lists both the four and six-lane roadways and some characteristics of their traffic streams.

Table 4. LTPP sections selected for initial traffic analysis.

Section ID	Func. Class	LTPP		No. of Lanes	Normalized Percentage of Vehicles*						ADT/ Lane*
		Dir.	Lane		VC 2	VC 3	VC 5	VC 8	VC 9	Truck	
123995	11	1	1	6	86.1	8.9	0.8	1.4	1.4	4.8	19501
124103	12	7	1	6	95.4	2.5	0.2	0.4	0.1	1.7	18010
124106	1	1	1	6	89.3	5.1	0.9	0.8	2.3	5.4	8985
182008	2	5	1	4	62.6	16.5	5.4	1.4	11.9	20.6	4642
185022	11	1	1	6	48.2	18.0	9.7	2.5	16.8	32.7	8528
274037	11	5	1	4	73.0	22.3	1.5	0.2	2.0	4.4	12955
283099	1	3	1	4	50.1	9.9	2.1	2.2	31.5	40.0	4869
285805	11	7	1	4	69.5	13.1	2.0	1.6	11.7	17.3	12493
344042	11	1	1	6	65.5	16.8	4.0	1.5	9.8	17.6	13039
395010	1	7	1	4	68.1	13.0	1.2	1.9	13.1	18.7	1110
421627	1	7	1	4	37.3	13.8	2.5	1.6	38.7	48.8	6730
511417	2	1	1	4	44.8	8.9	13.9	3.4	22.7	46.5	4647
511423	2	1	1	4	51.3	5.7	13.9	2.9	17.5	42.9	2612
515010	1	1	1	6	48.2	10.4	5.8	3.2	28.6	41.3	3926
851801	2	7	1	4	13.8	2.3	5.1	3.2	28.3	83.9	68

* Data is from the LTPP lane only.

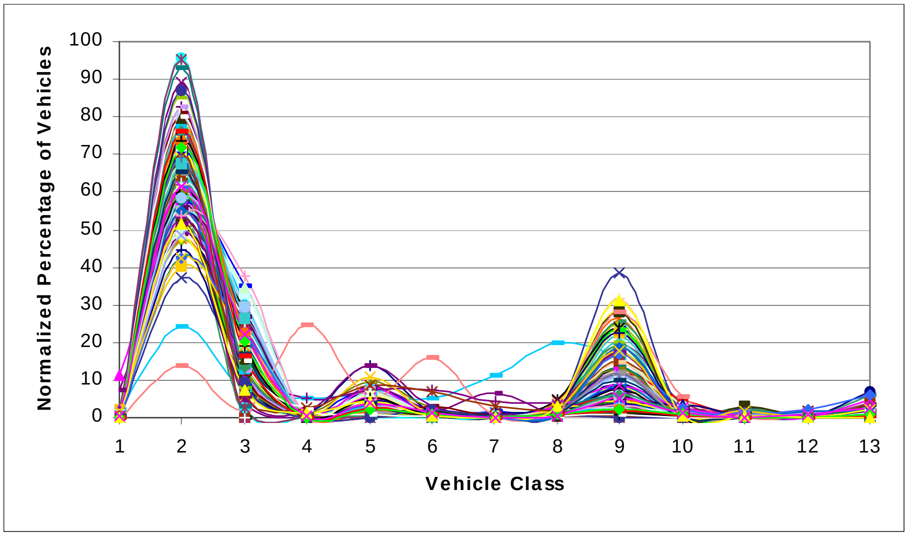

Figure 6a. Normalized percentage of vehicles for all vehicle classes for all highway functional classes.

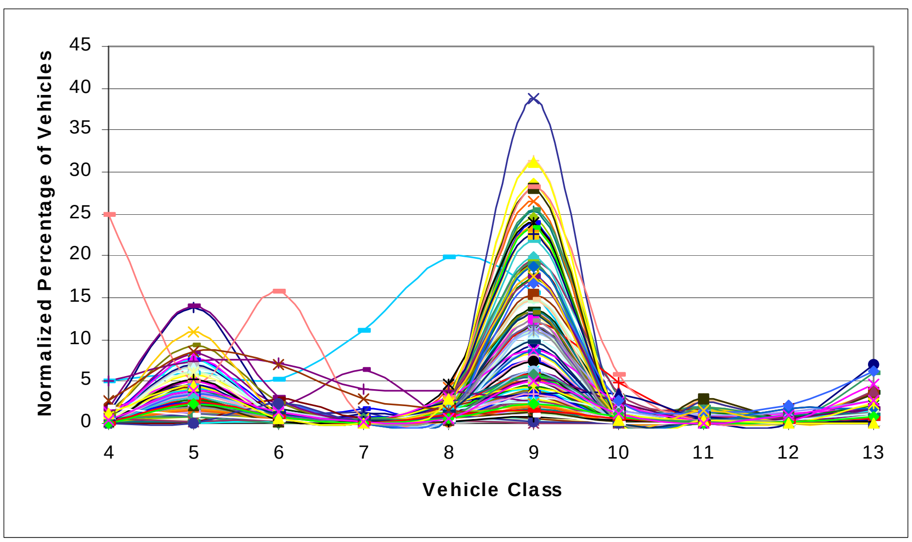

Figure 6b. Normalized percentage of vehicles for vehicle Classes 4 through 13 for all highway functional classes.

Annual Traffic Trends. The annual traffic trends are based on traffic in the LTPP lane only. This will eliminate any bias introduced by unequal number of days of data for the different directions and lanes. The possible weekday-weekend bias discussed earlier is eliminated by calculating the overall average ADT based on a 5/7 contribution from the weekday average and 2/7 contribution from the weekend average.

Figures 7 and 8 show the ADT and truck ADT, respectively, in the LTPP lane, for the years where good data are available. Figure 9 shows the normalized percentage of trucks in the traffic stream for years where adequate and good data are available. It should be noted that an increase in ADT does not necessarily correspond with an increase in truck ADT. For example, Section 124106 in Florida. Table 5 shows the ADT, truck ADT and the normalized percentage of trucks for 1994 through 1996.

Table 5. Traffic characteristics for Section 124103

Year	Truck ADT (veh/lane)	Total ADT (veh/lane)	Percent Trucks (%)
1994	36	7749	0.4
1995	7	8636	0.0
1996	1636	10415	15.4

While there has been a 35 percent increase in the ADT for the LTPP lane from 1994 to 1996, the truck ADT has increased by almost 4500 percent in the same time period. This is consistent with the increase in the percentage of truck traffic from 1994 to 1996, but the truck ADT may be in error for 1994 and 1995. These types of inconsistencies in the data severely complicate the determination of default values, but more importantly cause concern over some of the traffic data stored in the LTPP database.

Figure 10 shows the annual normalized truck class distributions or spectra for the years of data stored in the LTPP database for site 185022. As shown, the annual normalized truck class distributions are constant at this site. Appendix AA.2 provides a graphical comparison of the truck class or type distribution at selected sites for each year included in the LTPP database. Generally, the truck distributions do not change over time for the relatively short period of time represented by these sites. Thus all years of data at a specific site were combined in further evaluations and analyses of the truck distributions.

It should be noted, however, that the annual normalized truck class distribution/spectra can be expected to change with changes in the local or regional economy, construction of new trucking routes, and/or changes in trucking laws or transportation policies at the regional or national levels. In forecasting truck traffic for pavement design, potential changes in transportation policies, transportation plans and the economy that will affect local, regional or national traffic levels must be considered.

Seasonal (Monthly) Traffic Trends. Depending on the location and industries in the area, seasonal differences in the truck traffic distribution/spectrum are expected over the course of a year. Figure 11 shows the variation in monthly truck distributions for Section 185022. The seasonal (monthly) variations for selected sites are shown in Appendix AA.2.

Variability within a month is often equal if not greater than the variability between months. Based on an evaluation of the core sites, no significant difference was found on a consistent basis between the normalized monthly truck traffic distributions/spectra. However, the monthly ADTT was found to vary from month to month for selected seasons. In other words, the total truck traffic was found to be season specific, while the normalized truck spectra was found to be season independent for many of the sites. For those sites that were found to have seasonal or monthly differences, the seasonal traffic factors based on volume were found to be variable and site specific.

In summary, seasonal variations are site-specific as well as highly dependent on the local economy and climatic conditions related to the different seasons. Therefore, no seasonal (monthly) distribution defaults are recommended. Each agency should develop seasonal distribution factors for different types of commodities and climatic conditions. As a result, all data collected at a site were combined for determining the recommended default values for the normalized truck traffic distributions. The mean values and other statistics of the normalized truck traffic distributions for each site are tabulated in Appendix AA.2.

Weekend Versus Weekday Traffic. Figures 12 and 13 show the normalized vehicle class spectra for weekdays and weekend days respectively. Figures 14 and 15 show the normalized truck vehicle class spectra for weekdays and weekend days respectively. The greatest difference in the normalized truck traffic vehicle class spectra is observed for vehicle class 9. The other vehicle classes show less significant differences.

Figure 16 shows ratio of weekend truck traffic divided by weekday truck traffic (WE/WD) for vehicle classes 2, 3, 5, 8, 9, trucks and all vehicles. The lighter vehicle classes (vehicle classes 2 and 3) and the overall (for all vehicles combined) have a WE/WD greater than 0.8. However, the truck vehicle classes and the trucks as a whole have WE/WDs ranging from 0.4 to 0.8. While differences between weekend and weekday traffic are not considered directly for damage evaluations, these differences confirm the need to develop appropriate sampling methods to evaluate the traffic volumes properly. This was confirmed by the FHWA-LTPP DATs contractor, but was confined to vehicle class 9 trucks.

For detailed traffic projections under Levels 1, 2 and 3 inputs for pavement design, weekday and weekend should be compiled separately. The AADTT value used for design must reflect the combined weighted average between weekday and weekend truck traffic. For the lower level inputs (level 4), it may not be necessary to keep weekend and weekday truck traffic separate, but the AADTT and percent trucks should compensate for these differences between day of week.

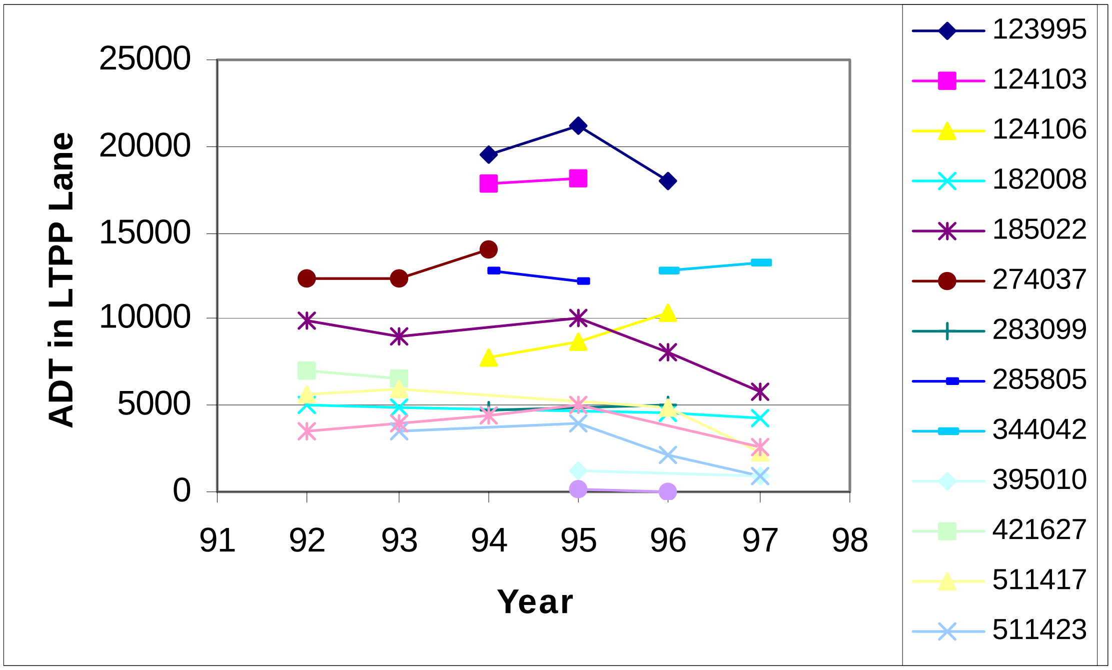

Figure 7. ADT for years where good data is available.

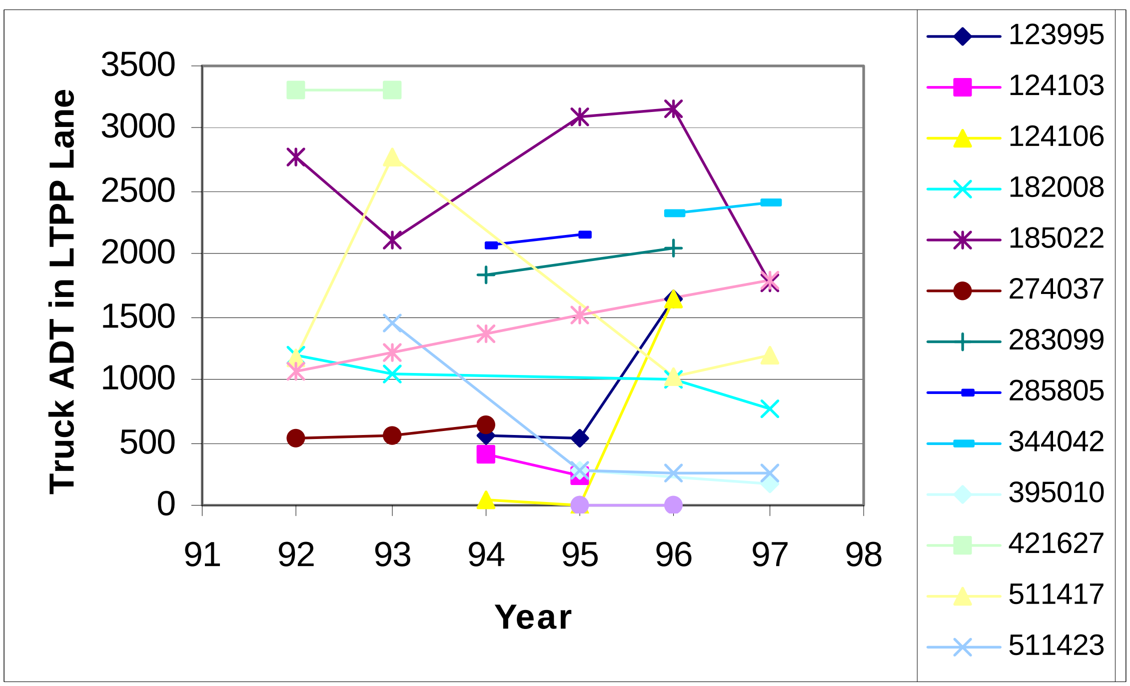

Figure 8. Truck ADT for years where good data is available.

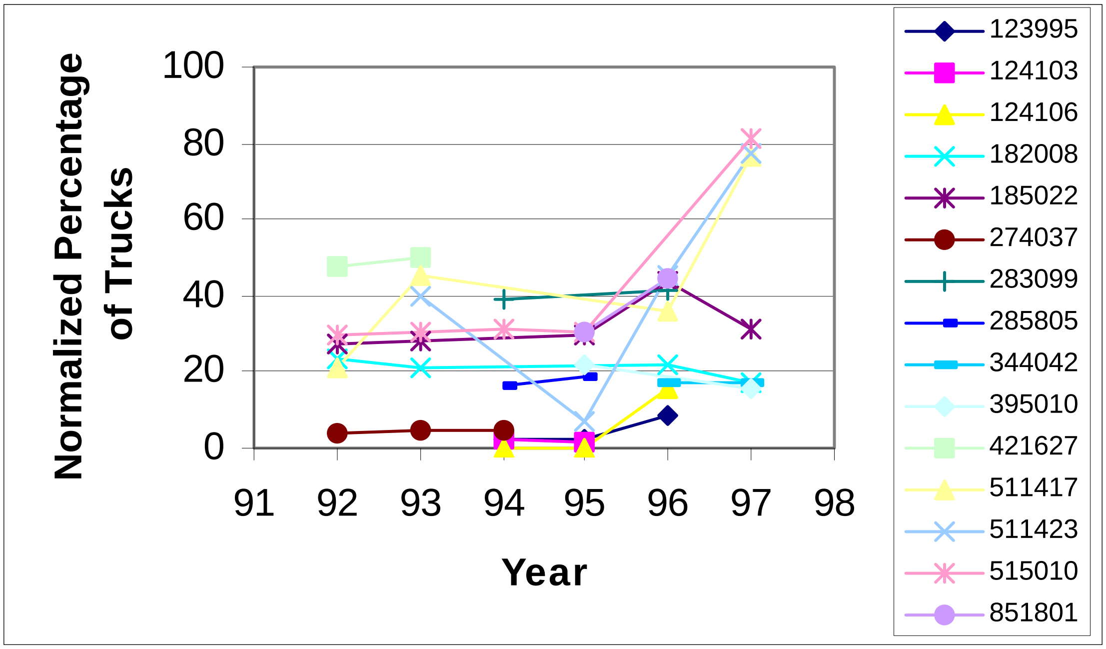

Figure 9. Normalized truck contribution to the total traffic stream.

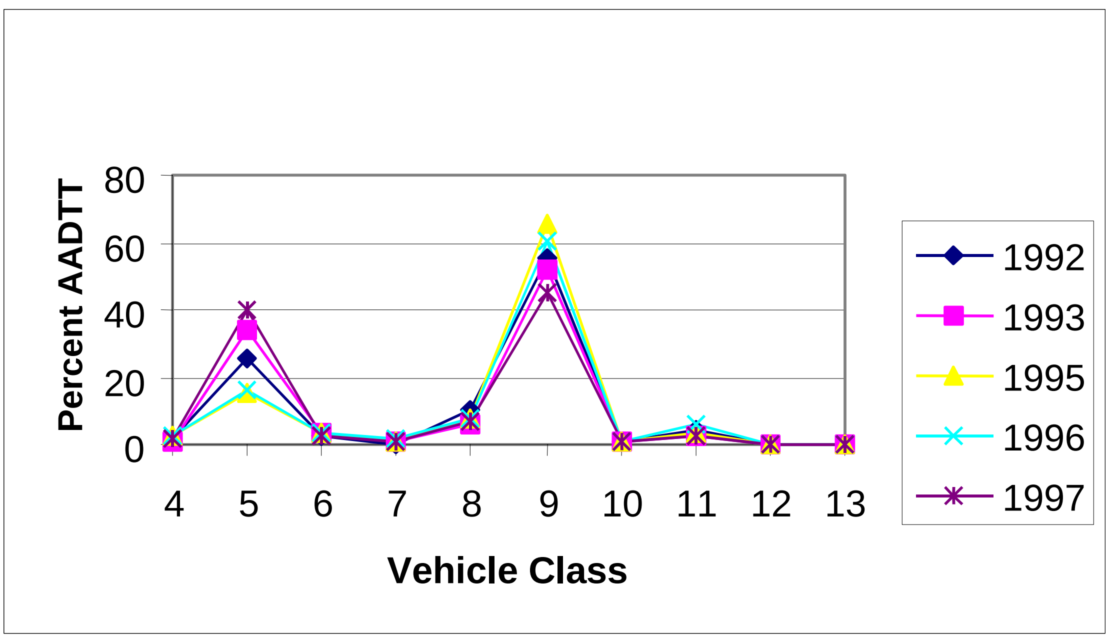

Figure 10. Annual normalized truck traffic distributions or spectra for LTPP site 185022.

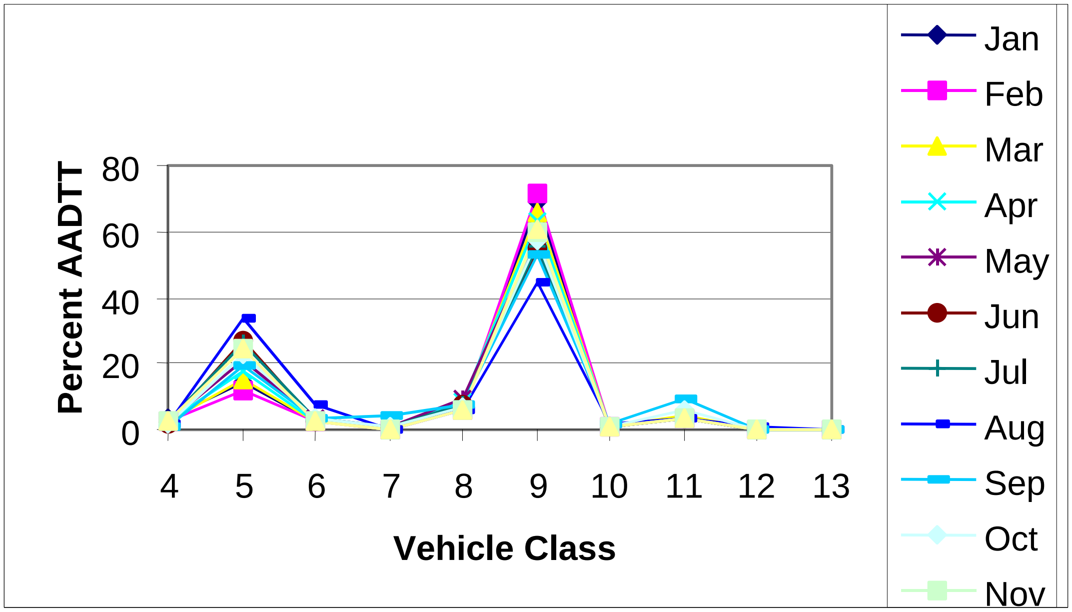

Figure 11. Average normalized truck traffic distributions or spectra by month for LTPP Site 185022.

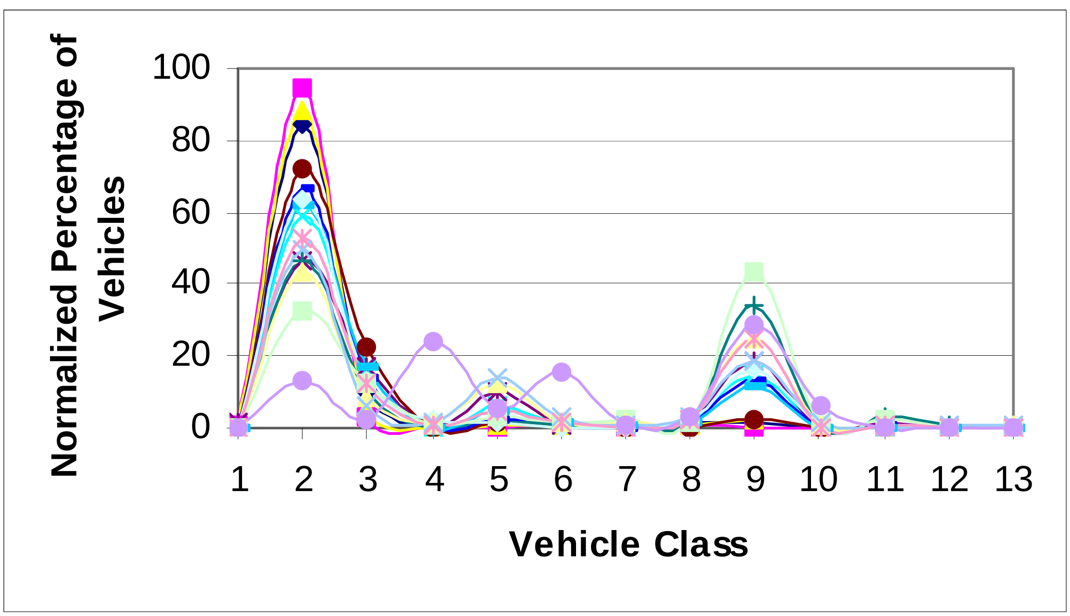

Figure 12. Normalized vehicle class spectra for weekdays for the 16 LTPP traffic sites included in the analysis.

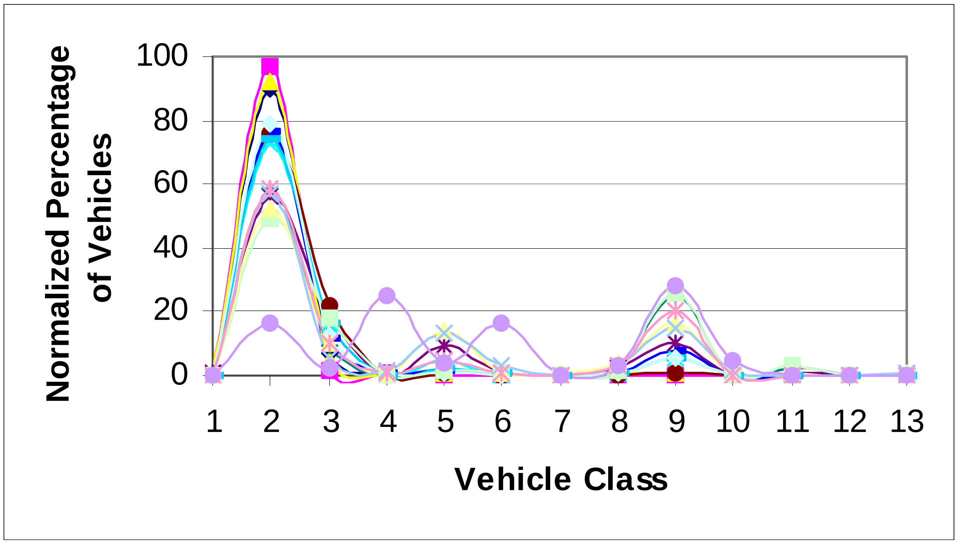

Figure 13. Normalized vehicle class spectra for weekend days.

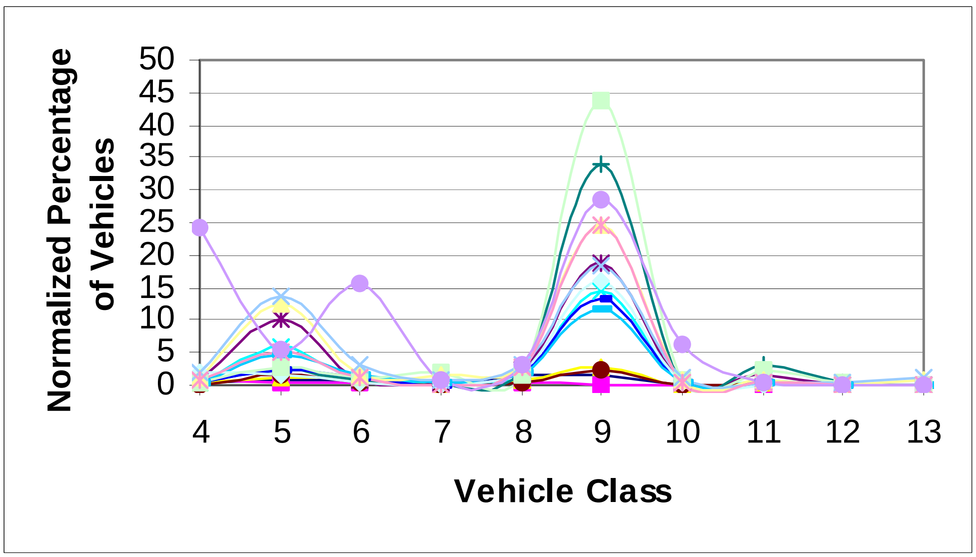

Figure 14. Normalized truck vehicle class spectra for weekdays.

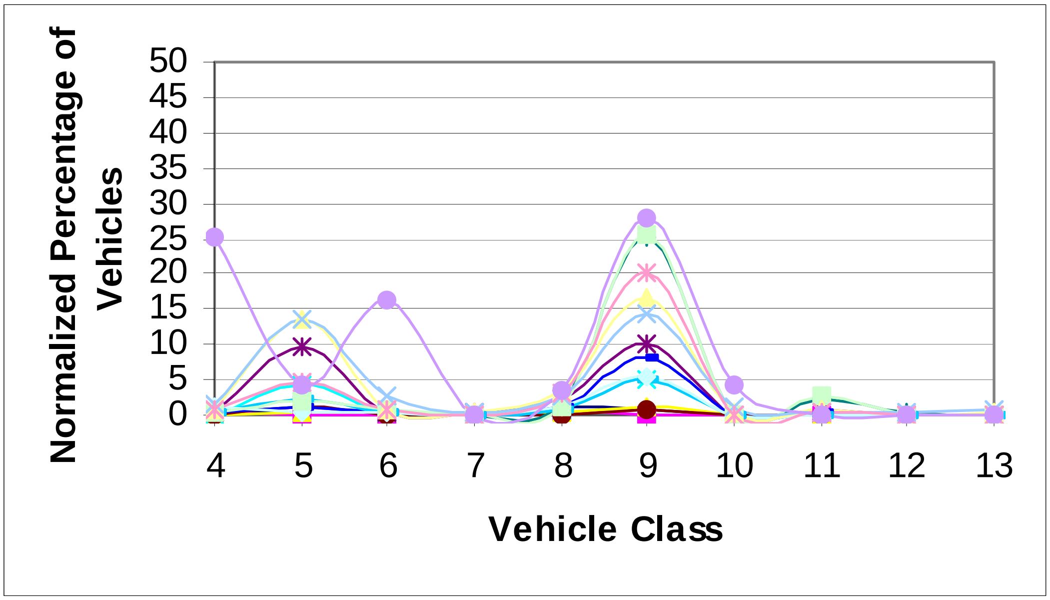

Figure 15. Normalized truck vehicle class spectra for weekend days.

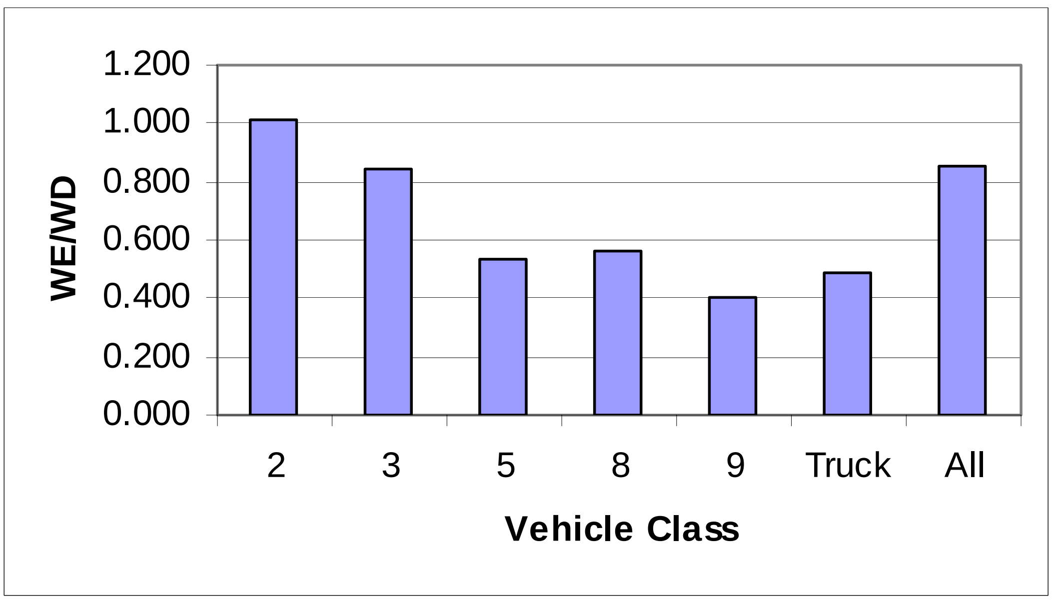

Figure 16. WE/WD for vehicle Classes 2, 3, 5, 8, 9, trucks and all vehicles.

Truck Directional Distribution Factor. This factor is used to quantify any differences in the overall volume of trucks in two directions. Generally, this value is 0.5 since the AADT is given in two directions and the number of trucks in each direction should be the same over the long term. However, this is not always the case. In fact, using a different route for transporting goods to and from certain areas and facilities is not uncommon, and depends on the commodities being transported as well as other regional/local traffic patterns.

Figure 17 shows the mean directional distribution factors for individual vehicle classes (2, 3, 5, 8 and 9), truck traffic, and all vehicles for the core set of sites included in the initial analyses. With the exception of vehicle class 5, the observed directional distribution factors lie in the range of 0.5 to 0.6. The directional distribution factor for vehicle class 9 (the most common truck type), which is of greatest concern, is 0.549. The directional distribution factors were calculated for all of the individual core sites where sufficient AVC data were available for both directions of the roadway. These values were found to be fairly consistent for the different vehicle classes and conditions represented by these core sites. The following directional distribution factors were computed from the LTPP traffic database for those sections with AVC data across all lanes of the roadway (i.e., not just limited to the LTPP lane):

- Vehicle Class 4, Buses – 0.50.

- Vehicle Classes 5 – 7, Single Unit Trucks – 0.62. These types of trucks consistently had the largest directional distribution factors.

- Vehicle Classes 8 – 10, Tractor-Trailer Trucks – 0.55.

- Vehicle Classes 11 – 13, Multi-Trailer Trucks – 0.50.

It should be noted that the normalized distribution of truck types discussed in the next section of this chapter (Truck Traffic Classification of Pavement Design) was determined for the design or LTPP traffic lane. Those default values already account for differences in directional distribution by truck type. As a result, the directional distribution factor for the most common truck type (Vehicle Class 9 trucks) is recommended as the default value (0.55) for the directional distribution factor.

As an improvement to the traffic module for future studies, the directional distribution factor should be evaluated using additional sites and time series data to determine if they are vehicle class and/or area dependent (e.g., urban versus rural conditions).

Truck Lane Distribution Factor. This factor accounts for the distribution of truck traffic between the lanes in one direction. For two-lane, two-way highways, this factor is usually 1.0 because all truck traffic in one direction must use the same lane. For multiple lanes in one direction, it depends on the AADT and other geometric and site specific conditions.

Figure 18 shows the mean lane distribution factors for the vehicle classes 2, 3, 5, 8, 9, trucks, and all vehicles. For four-lane roadways, the lane distribution factor for vehicle class 9 is 0.891 and the lane distribution for all trucks is 0.872. For six-lane roadways, the lane distribution factor for vehicle class 9 is 0.589 and the lane distribution for all trucks is 0.545. Therefore, a lane distribution factor of 0.9 is recommended for four-lane roadways, and a lane distribution factor of 0.6 is recommended for six-lane roadways.

As an improvement to the traffic module for future studies, the lane distribution factor should be evaluated using additional sites to determine if these factors are area or highway dependent (urban versus rural conditions) and to determine if they are truck class dependent.

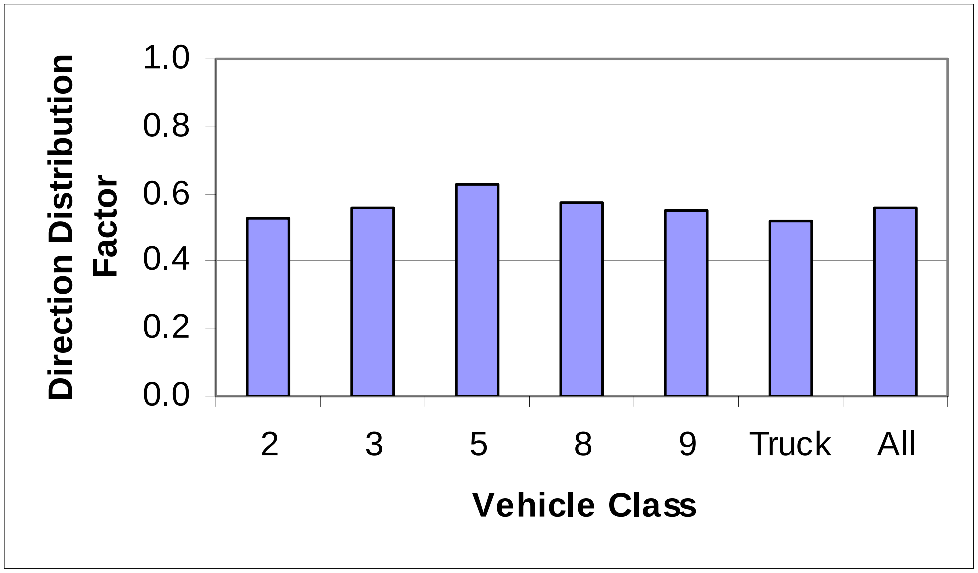

Figure 17. Directional distribution factors for four and six- lane roadways.

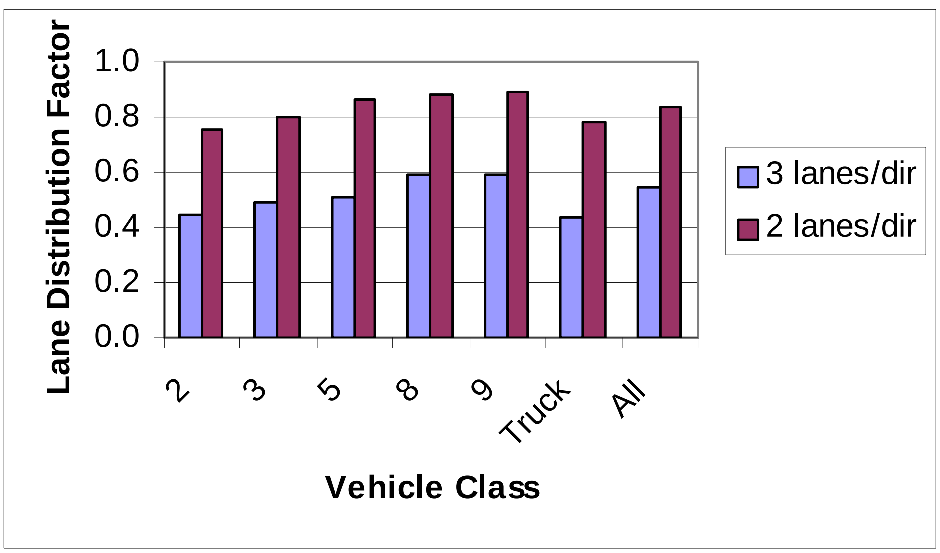

Figure 18. Directional distribution factors for four and six-lane roadways.

Daily Distribution of Trucks (Time of Day). The time of day evaluation was based on five time periods provided by the rigid pavement team. These five time periods, midnight to 6 a.m., 6 a.m. to 10 a.m., 10 a.m. to 4 p.m., 4 p.m. to 8 p.m., and 8 p.m. to midnight, are labeled as time periods one to five respectively. Figures 19 and 20 show an example of the truck and normalized truck distribution with time of day for section 123995 for both weekdays and weekends.

Most of the sections studied showed a normal distribution similar to the one shown in this example. The midday period, 10 a.m. to 4 p.m., has the greatest percentage of trucks and night, 8 p.m. to midnight and midnight to 6 a.m., has the lowest percentage of trucks. Since weekday traffic counts are more readily available and weekdays contribute a higher percentage of trucks, the time of day distribution was developed based on weekday truck distribution.

Figures 21 and 22 show the weekday time of day truck distribution for the five urban and eight rural sections, respectively. A close look at these two figures shows that there is not a significant difference between urban and rural time of day distributions. Therefore, both urban and rural distributions were combined to give a general default time distribution. Table 6 shows the recommended default time of day distribution factors.

Table 6. Time of day distribution.

Time Period	Time of Day	Default Percent of Truck Traffic, %
1	Midnight to 6 a.m.	14.0
2	6 a.m. – 10 a.m.	19.8
3	10 a.m. – 4 p.m.	35.1
4	4 p.m. – 8 p.m.	18.5
5	8 p.m. – midnight	12.6

However, there were two sections that showed time of day distributions significantly different from the default distribution. Section 124103 has a higher percentage of trucks in the middle of the day and a lower percentage of trucks from 8 p.m. to 6 a.m. Section 851801 has the highest percentage of trucks from 4 p.m. to 8 p.m. with similar percentages of trucks in the midday period. This section is likely to be a special time of day distribution. Figures 23 and 24 both show the default time of day percentages of truck traffic and two special cases.

As an improvement to the traffic module for future studies, the time of day traffic factors should be computed for additional sites to determine if these factors are highway dependent, area dependent (rural versus urban) and truck dependent.

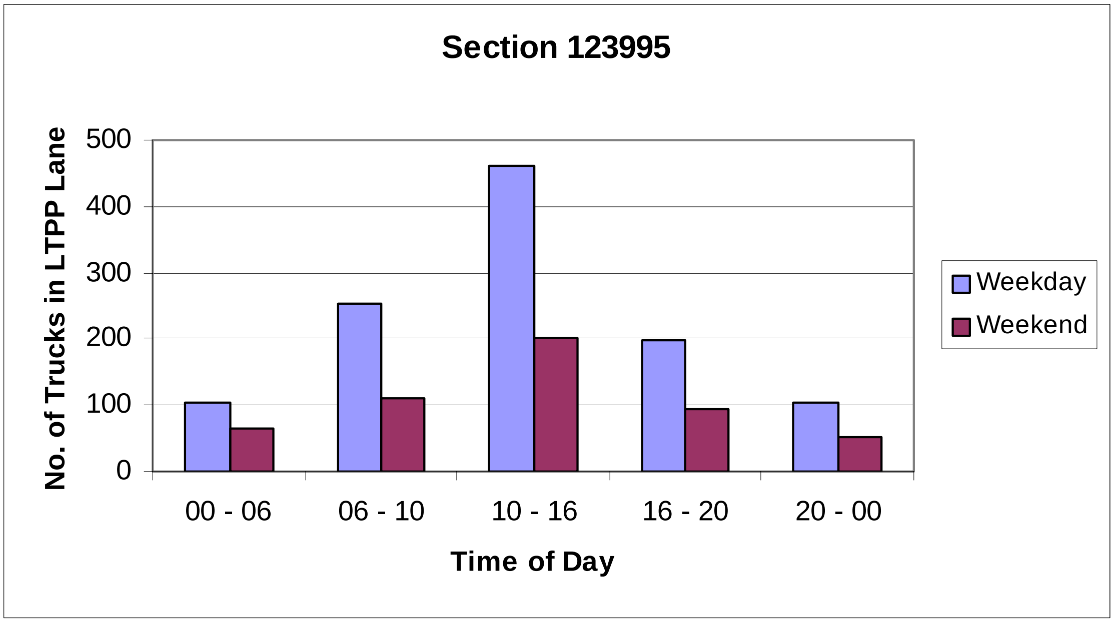

Figure 19. Example of truck distribution with time of day for weekdays and weekends.

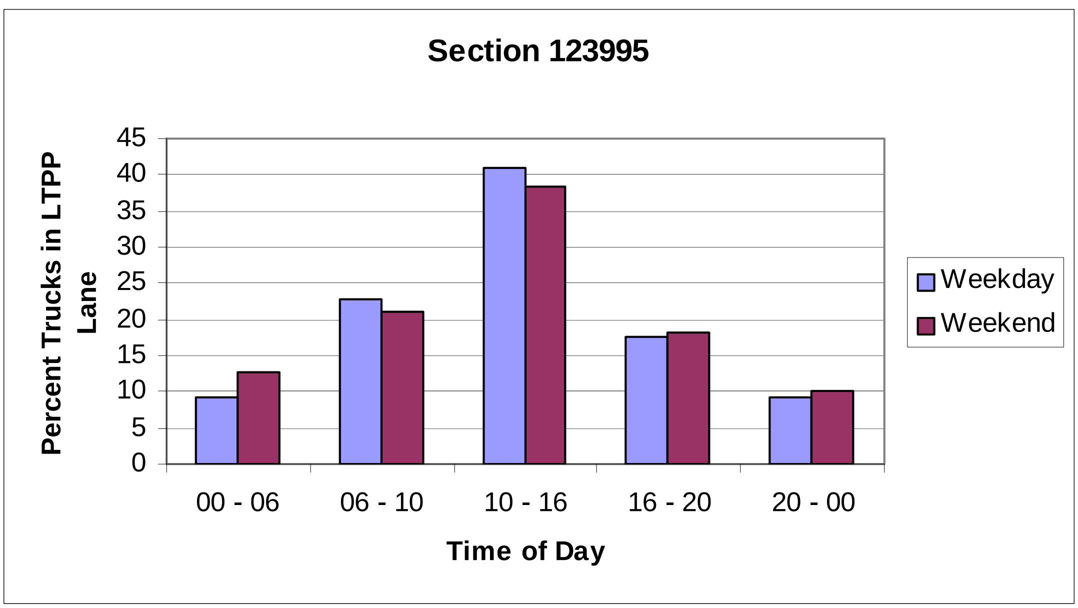

Figure 20. Example of normalized truck distribution with time for weekdays and weekends.

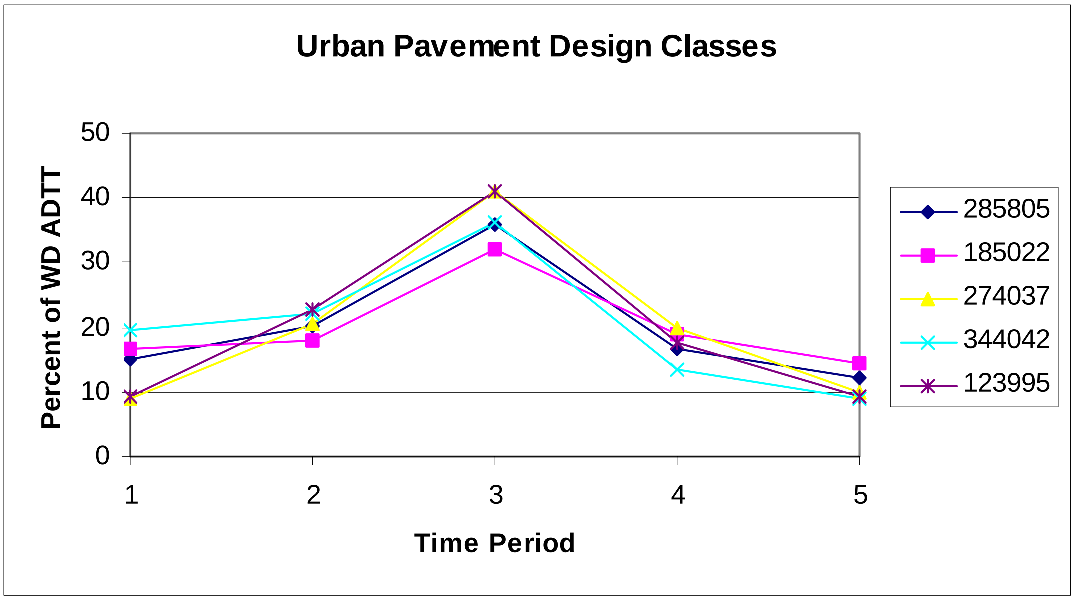

Figure 21. Time of day normalized truck distribution for urban roadways based on weekday truck traffic.

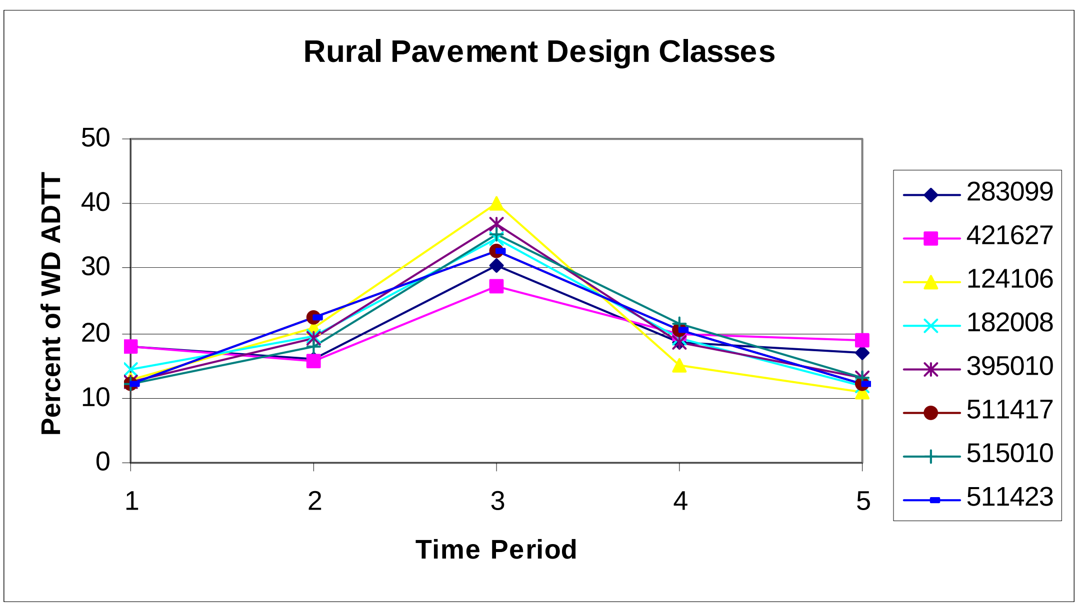

Figure 22. Time of day normalized truck distribution for rural roadways based on weekday truck traffic.

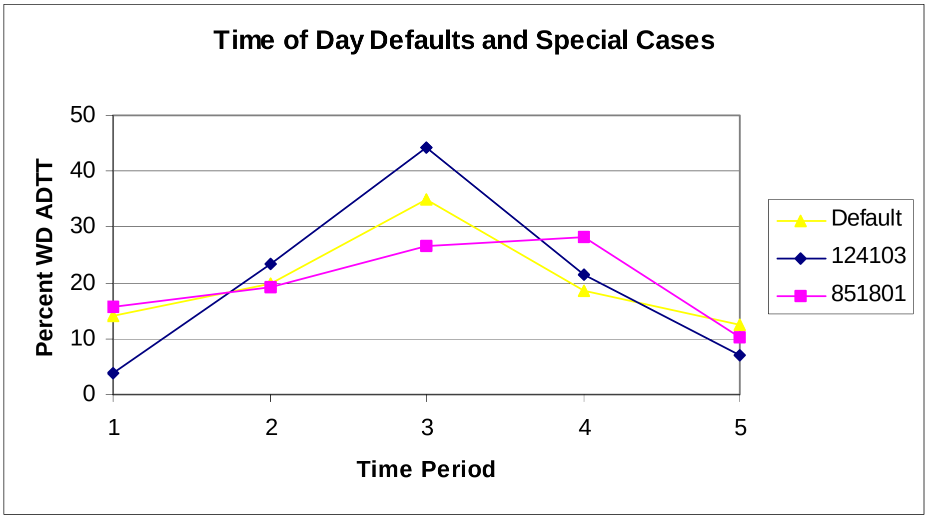

Figure 23. Recommended time of day normalized truck distribution default and two special cases.

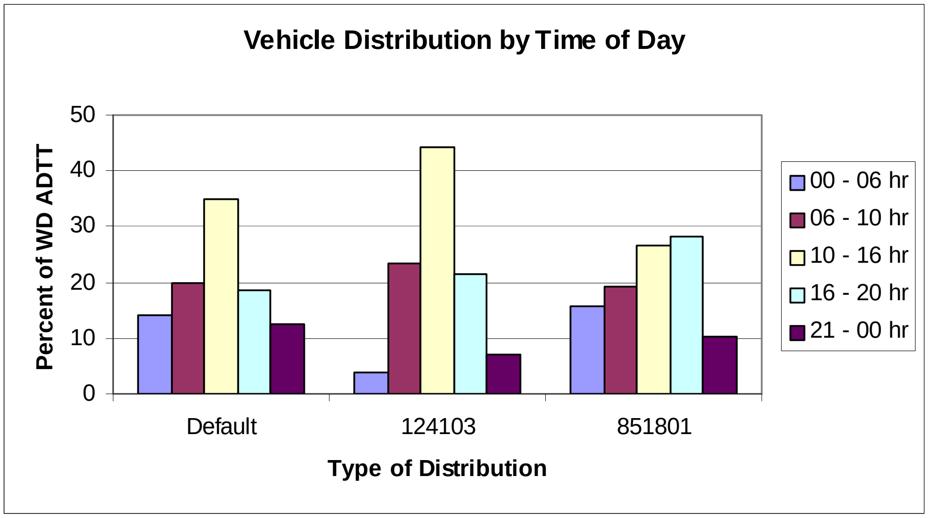

Figure 24. Recommended time of day normalized truck distribution default and two special cases plotted as histograms.

Truck Traffic Classifications for Pavement Design

As stated in Chapter 2, highway functional classification (HFC) is included in the LTPP traffic database. The traffic data obtained from Chaparral were analyzed to develop typical default values to describe the truck traffic distributions and axle load distributions for use in pavement structural designs for Level 4 inputs of the traffic module.

Functional classification, in accordance with the LTPP definitions, initially was used to evaluate the average normalized traffic distributions for all vehicle classes and those for all truck classes (vehicle classes 4 – 13). If significant differences were observed between highway functional classes for the traffic streams, a roadway or truck traffic classification grouping could be developed easily based upon the traffic streams from these 152 sections. Figures 25a through 32b show the average normalized traffic distributions for each of the highway functional classes where AVC data are available. As illustrated, the variation in traffic streams within a highway functional class appears to be equal if not greater than the variation between highway functional classes. Therefore, it was concluded that functional classification alone was not a good parameter for developing the default values for the normalized truck traffic distributions.

Average daily traffic (ADT) was another factor considered in the development of a traffic classification grouping of the data. A possible relationship between a) the normalized percentage of vehicles in vehicle classes 2, 3, 5, 8, 9 and trucks, and b) ADT was examined. Figures 33 through 38 show the normalized percentage of vehicles as a function of ADT in the LTPP lane for vehicle classes 2, 3, 5, 8, 9 and total trucks. Section 213016 has 19.9 percent of its normalized traffic in vehicle class 8 with an ADT of 2943 vehicles/day. It should be noted that this site falls significantly outside the scale used in figure 36. As a result, this site was considered an outlier and removed from this part of the analysis. In summary, no clear trends were observed. HFC does not necessarily have any relationship to the number of heavy trucks or their distribution (characteristics of heavy truck traffic). Therefore, the truck traffic classification for pavement structural design should be geared more towards truck usage.

As a starting point, the different types of trucks were grouped into four major categories as follows:

- Buses (Vehicle Class 4).
- Single Unit Trucks (Vehicle Classes 5, 6 and 7).
- Tractor-Trailer or Truck-Single Trailer Units (Vehicle Classes 8, 9 and 10).
- Multi-Trailer Trucks (Vehicle Classes 11, 12 and 13)

All normalized truck type distributions initially were categorized into sites with similar truck percentages based on truck classes 5, 9 and 13. The criteria used for differentiating between TTCs are shown in Table 7. The other truck classes were considered in finding similar truck type spectra between the different sites.

Seventeen different groupings were derived based on the truck distributions of 133 sections. All seventeen groupings were found to exist within the rural roadways while only ten groupings were found to exist within urban roadways. Appendix AA.3 shows a graphical and tabular summary of the recommended default values for each of the seventeen TTCs. It should be noted, however, that only 13 of the 133 sections are classified as urban roadways. It is very possible that urban roadways may include some of the other traffic classes. The truck traffic classifications that are applicable to each functional class and the number of sites that fall into each of the TTCs are shown in Table 8. As tabulated not all of the highway functional classifications were included in the core set of sites. Table 9 provides guidance on identifying the TTCs that are considered applicable to the different HFCs. Some judgement, rather than just hard data, was used to cover all of the different HFCs. Table 10 provides a more complete description and definition for each of the seventeen TTCs based on truck traffic composition.

As an additional improvement, the normalized truck traffic spectra for additional sites should be calculated for a more diverse set of conditions. These additional sites should be used to clearly define the TTCs that are related to HFC, or determine if the TTCs are independent of HFC.

Table 7. Truck traffic classification criteria.

TTC	Type	Percent of AADTT			
		VC 9	VC 5	VC 13	VC 4
1	truck	> 70	< 15	< 3	-
2	truck	60 - 70	< 25	< 3	-
3	truck	60 - 70	5 - 30	3 - 12	-
4	truck	50 - 60	8 - 30	0 - 7.5	-
5	truck	50 - 60	8 - 30	> 7.5	-
6	truck	40 - 50	15 - 40	< 6	-
7	truck	40 - 50	15 - 35	6 - 11	-
8	truck	40 - 50	9 - 25	> 11	-
9	truck	30 - 40	20 - 45	< 3	-
10	truck	30 - 40	25 - 40	3 - 8	-
11	truck	30 - 40	20 - 45	> 8	-
12	truck	20 - 30	25 - 50	0 - 8	-
13	truck	20 - 30	30 - 40	> 8	-
14	truck	< 20	40 - 70	< 3	-
15	truck	< 20	45 - 65	3 - 7	-
16	truck	< 20	50 - 55	> 7	-
17	bus	-	-	-	> 35

Table 8. Number of sections from each TTC that fall into each functional class.

TTC	Number from Each Functional Class													
	FC 1	FC 2	FC 6	FC 7	FC 8	FC 9	FC 11	FC 12	FC 14	FC 16	FC 17	FC 19	Period*	Total
1	13	6					1						1	21
2	8	10					1							19
3	3	2												5
4	4	7	3				4							18
5	7													7
6		9	4				2							15
7	1	4												5
8	2	1	2											5
9	1	4	2						1					8
10		2												2
11		3								1			1	5
12		5	2				1							8
13	1	1							1					3
14		4		1										5
15			1						1					2
16		1	1											2
17	1							1	1					3
													Total	133

*Period is used in the IMS for those sites that do not have a functional classification definition.

Table 9. Suggested guidance for selecting appropriate TTCs for different highway functional classifications.

Highway Functional Classification Descriptions	Suggested Traffic Classification Number
Principal Arteries – Interstate and Defense Routes	1,2,3,4,5,8,11,13
Principal Arteries – Intrastate Routes, including Freeways and Expressways	1,2,3,4,6,7,8,9,10,11,12,14,16
Minor Arteries	4,6,8,9,10,11,12,15,16,17
Major Collectors	6,9,.12,14,15,17
Minor Collectors	9,12,14,17
Local Routes and Streets	9,12,14,17

Table 10. Definitions and descriptions for the truck traffic classifications.

Buses in Traffic Stream	Commodities being Transported by Type of Truck		TTC
	Multi-Trailer	Single-Trailers & Single-Units	
Low to None (<2%)	Relatively High Amount of Multi-Trailer Trucks (>10%)	Predominantly single-trailer trucks	5
		High percentage of single-trailer trucks, but some single-unit trucks	8
		Mixed truck traffic with a higher percentage of single-trailer trucks	11
		Mixed truck traffic with about equal percentages of single-unit and single-trailer trucks	13
		Predominantly single-unit trucks	16
	Moderate Amount of Multi-Trailer Trucks (2-10%)	Predominantly single-trailer trucks	3
		Mixed truck traffic with a higher percentage of single-trailer trucks	7
		Mixed truck traffic with about equal percentages of single-unit and single-trailer trucks	10
		Predominantly single-unit trucks	15
Low to Moderate (>2%)	Low to None (<2%)	Predominantly single-trailer trucks	1
		Predominantly single-trailer trucks, but with a low percentage of single-unit trucks	2
		Predominantly single-trailer trucks with a low to moderate amount of single-unit trucks	4
		Mixed truck traffic with a higher percentage of single-trailer trucks	6
		Mixed truck traffic with about equal percentages of single-unit and single-trailer trucks	9
		Mixed truck traffic with a higher percentage of single-unit trucks	12
		Predominantly single-unit trucks	14
Major Bus Route (>25%)	Low to None (<2%)	Mixed truck traffic with about equal single-unit and single-trailer trucks	17

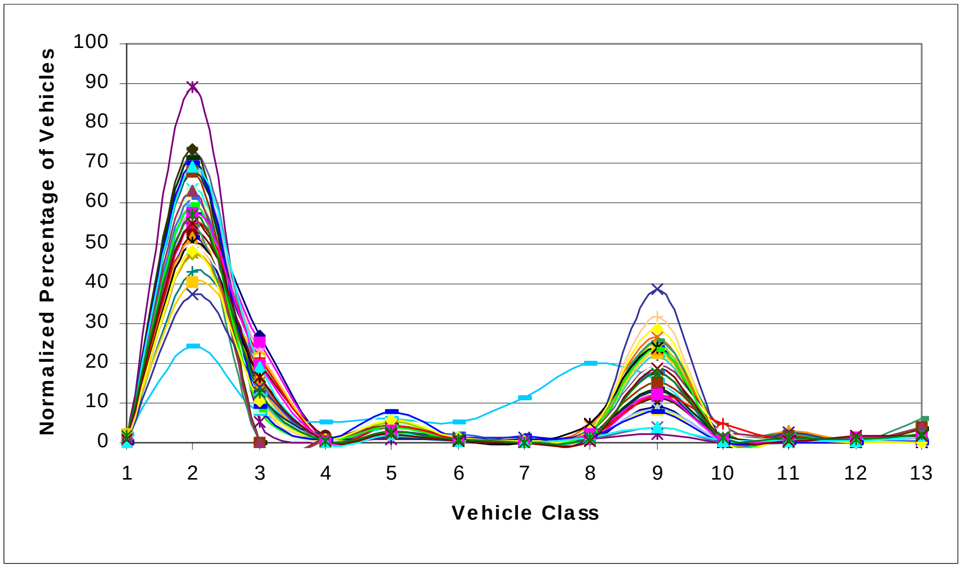

Figure 25a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 1.

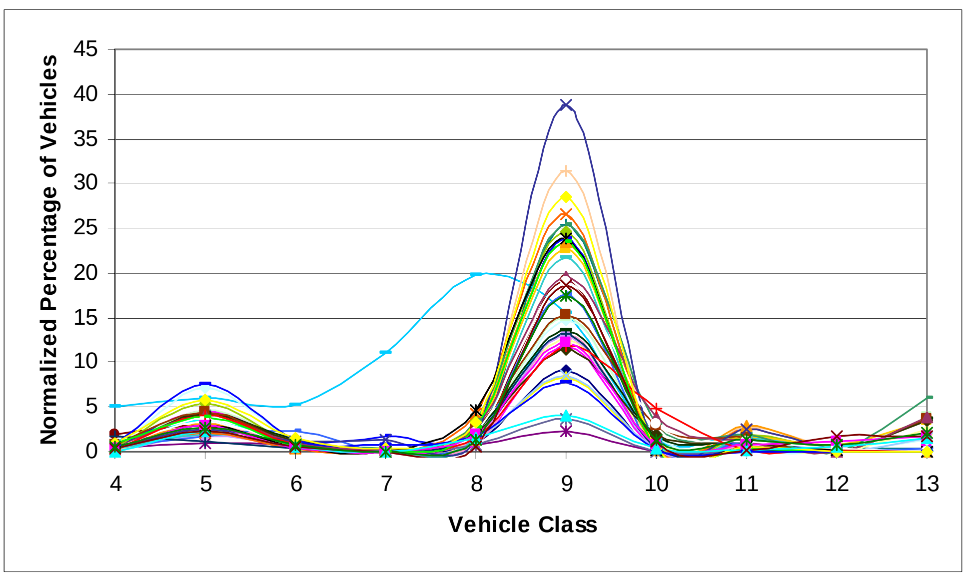

Figure 25b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 1.

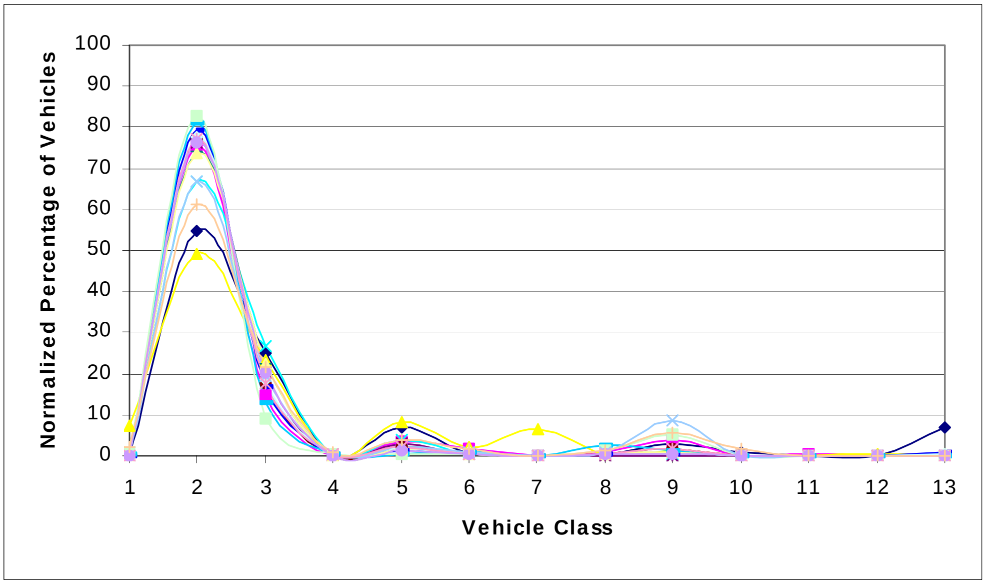

Figure 26a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 2.

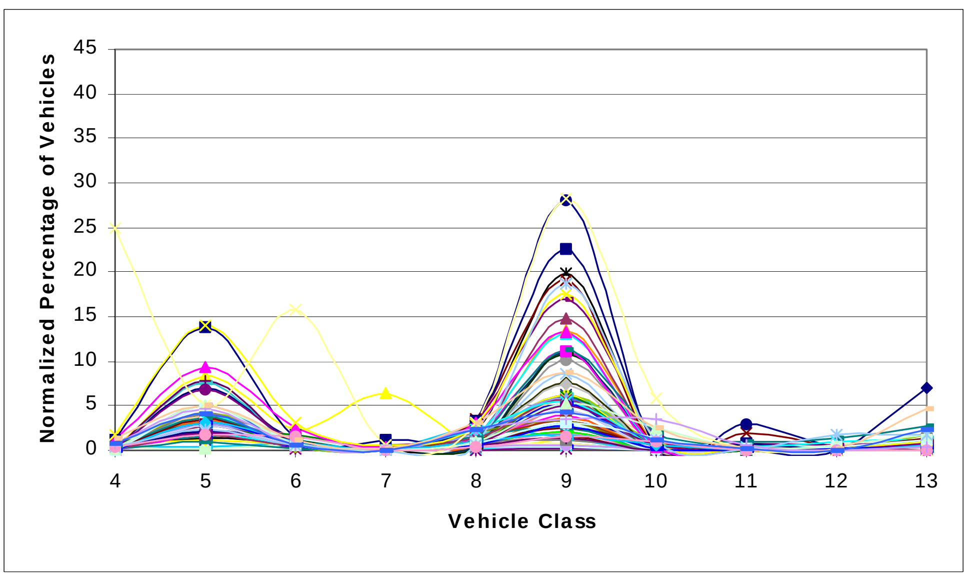

Figure 26b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 2.

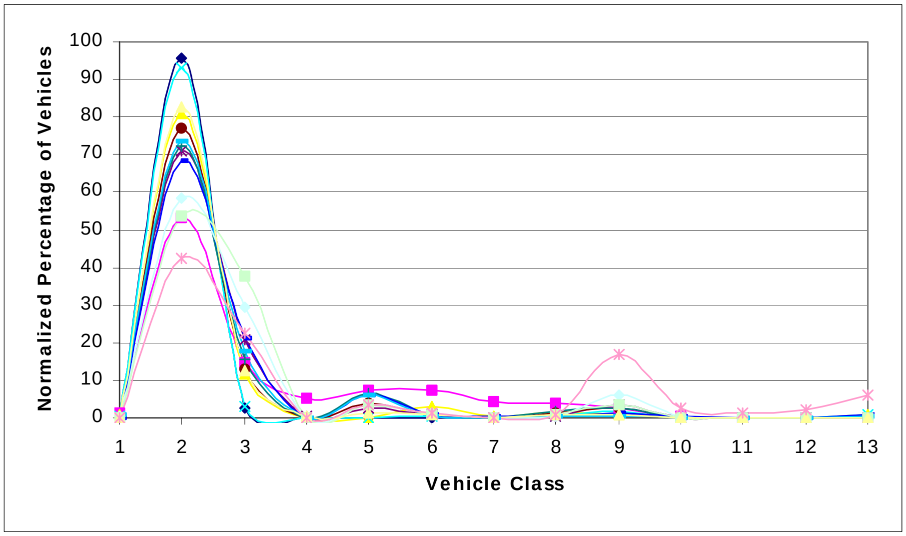

Figure 27a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 6.

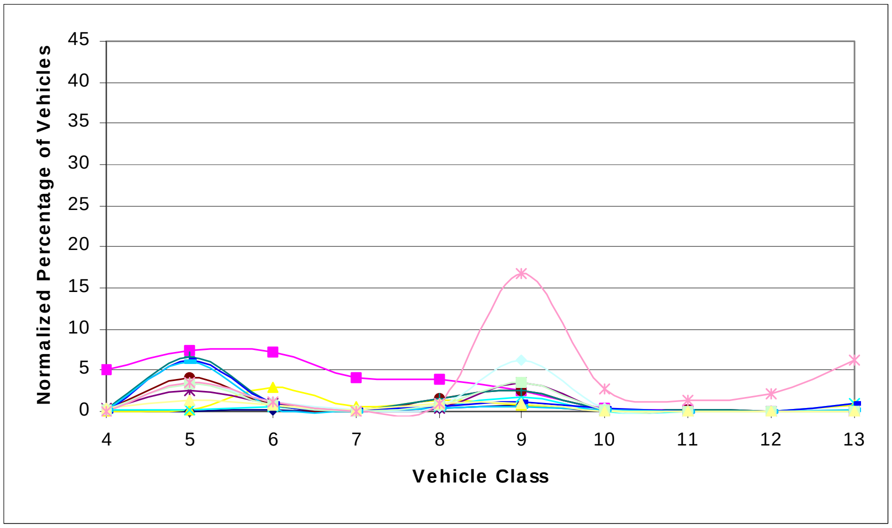

Figure 27b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 6.

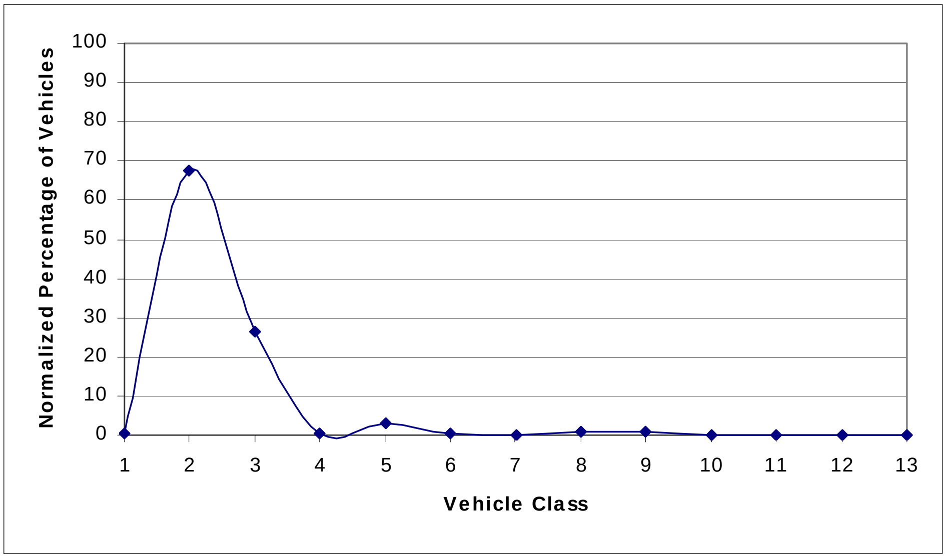

Figure 28a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 7.

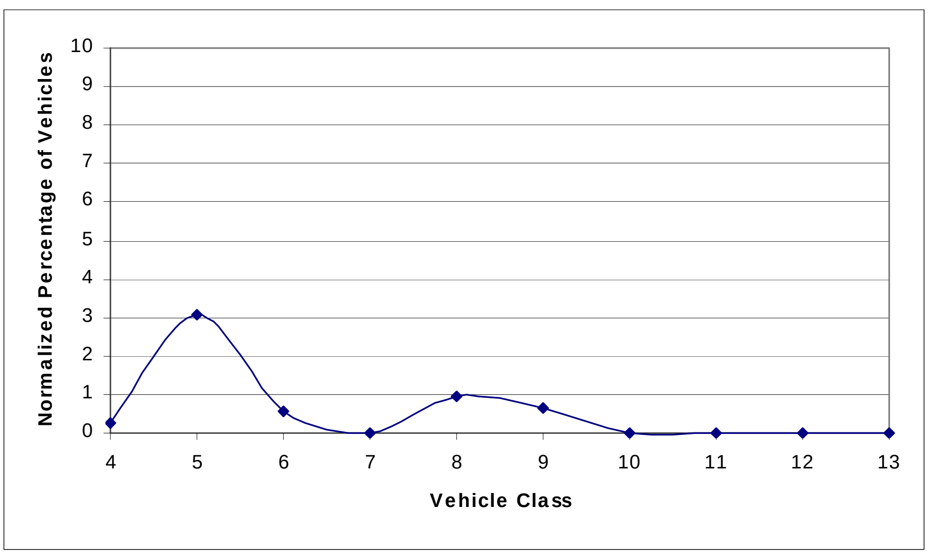

Figure 28b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 7.

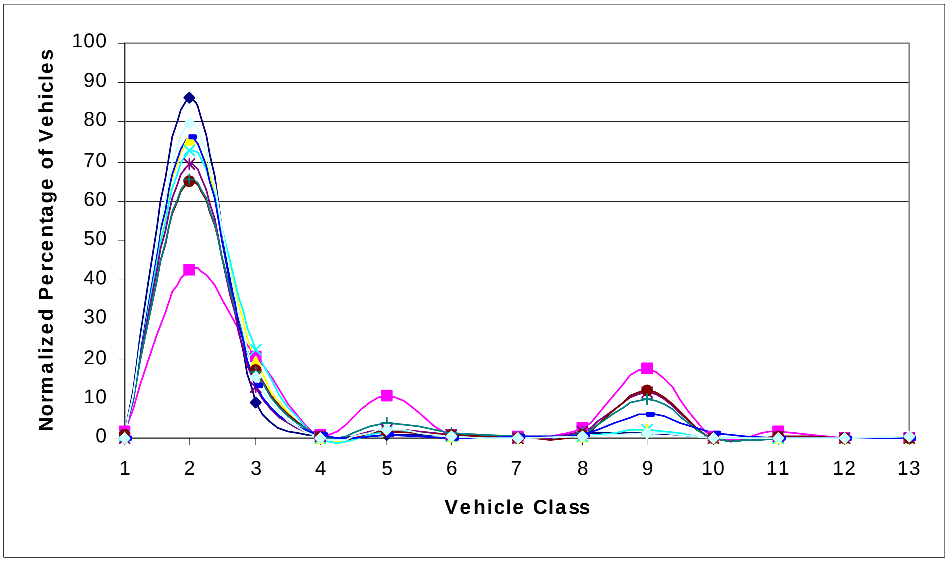

Figure 29a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 11.

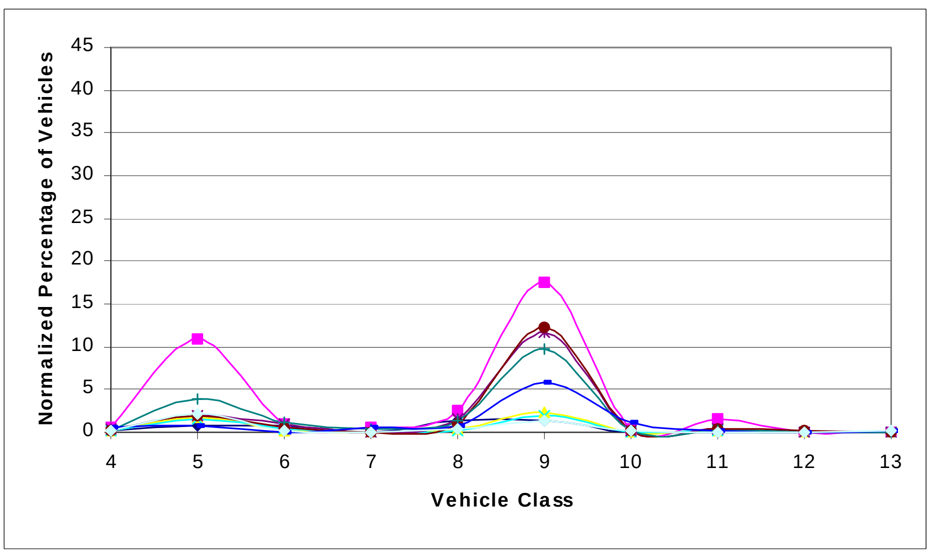

Figure 29b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 11.

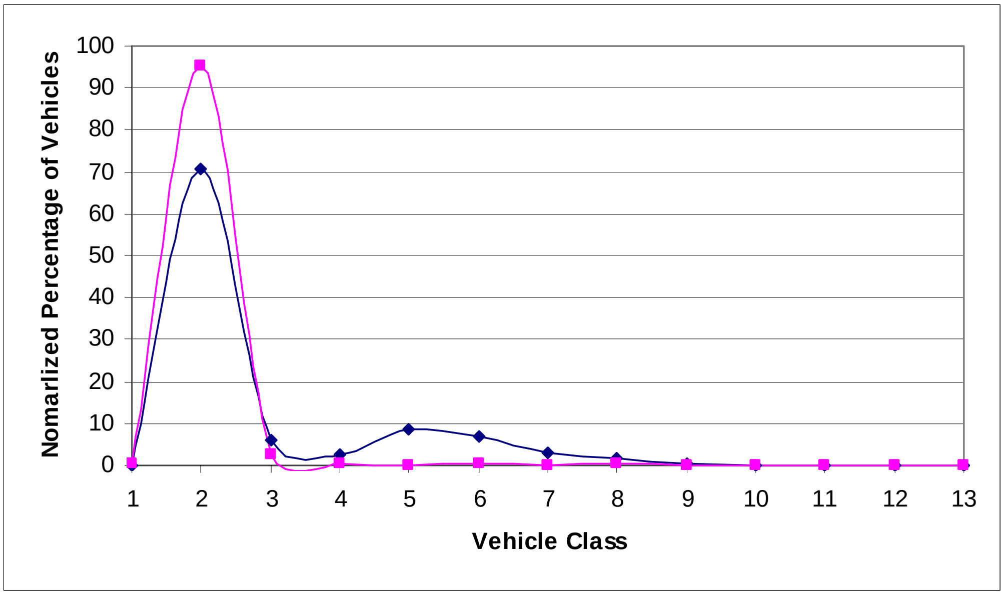

Figure 30a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 12.

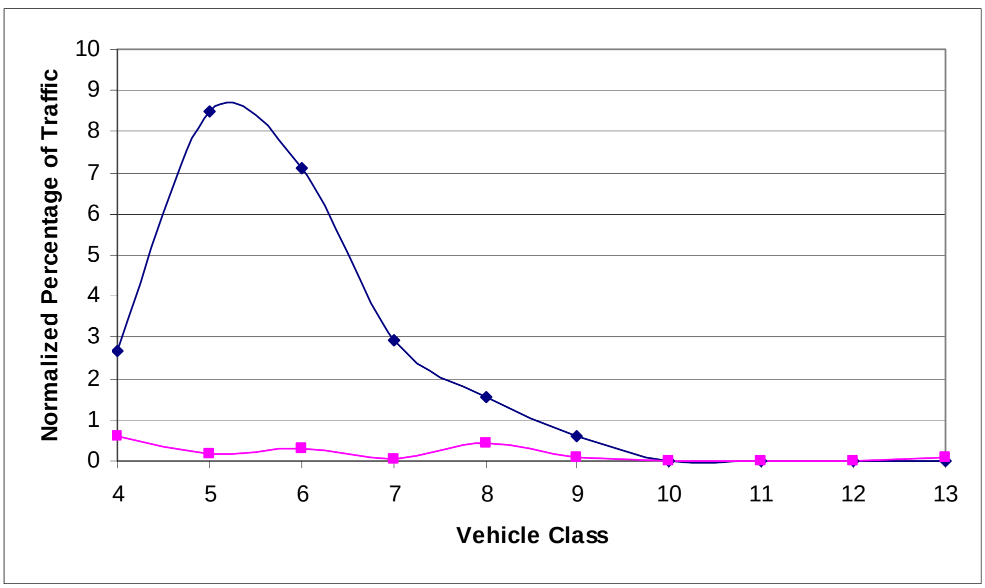

Figure 30b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 12.

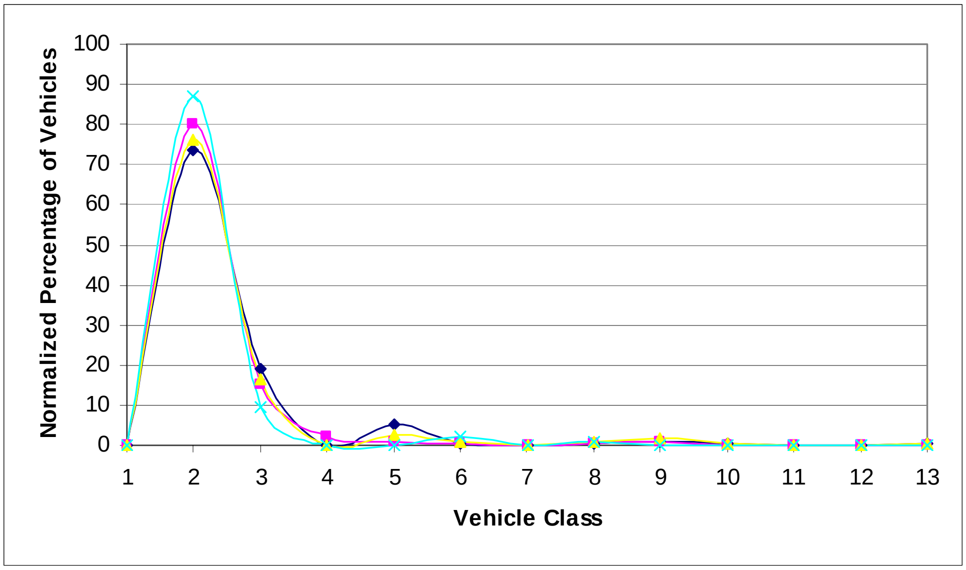

Figure 31a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 14.

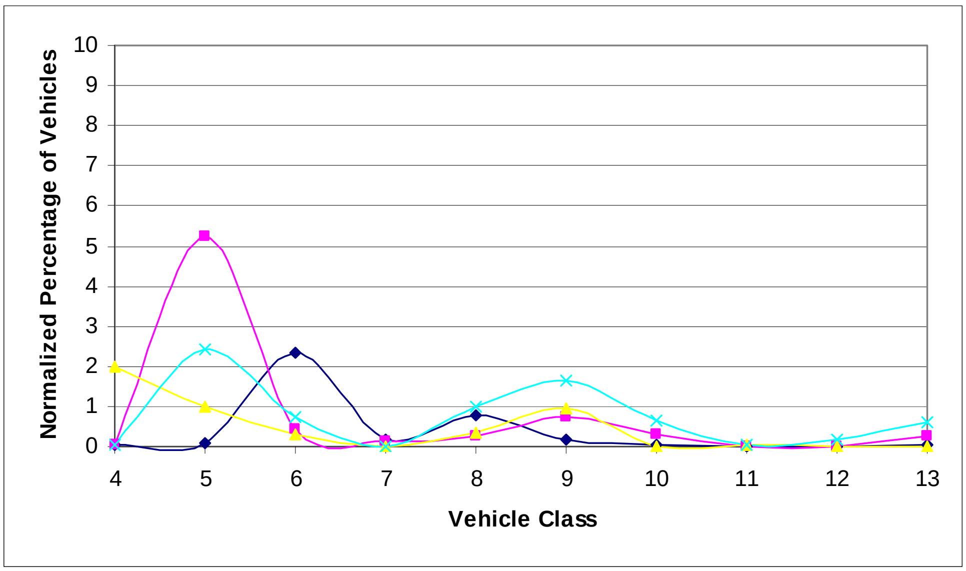

Figure 31b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 14.

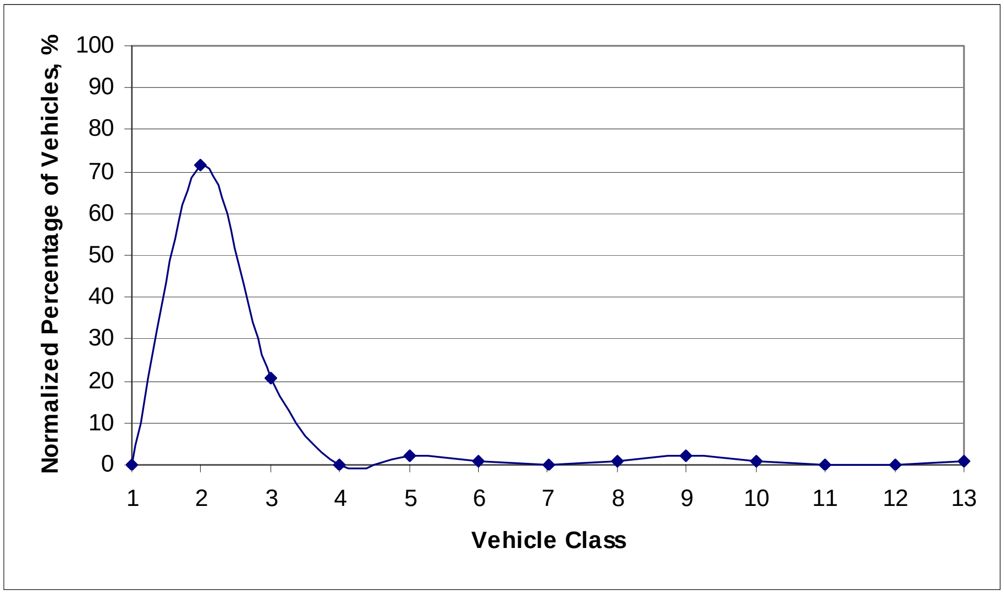

Figure 32a. Normalized percentage of vehicles for all vehicle classes for highway functional Class 16.

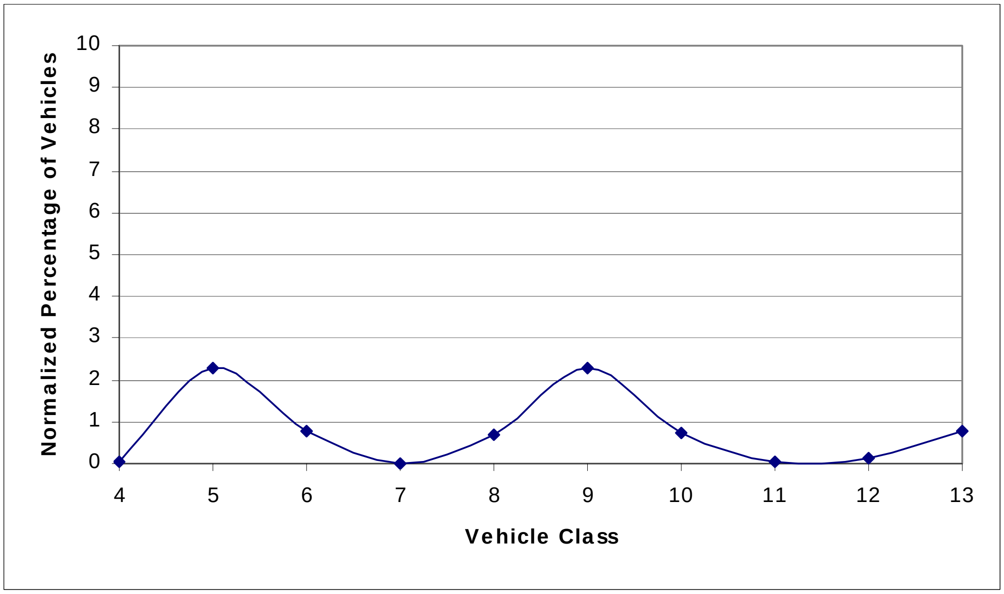

Figure 32b. Normalized percentage of vehicles for vehicle Class 4 through 13 for highway functional Class 16.

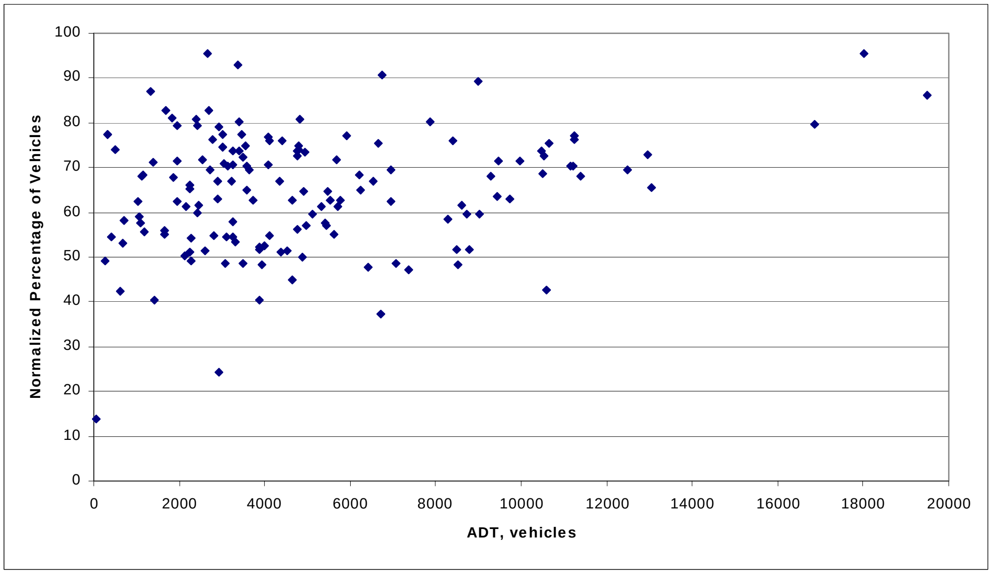

Figure 33. Normalized percentage of vehicles as a function of ADT for vehicle Class 2.

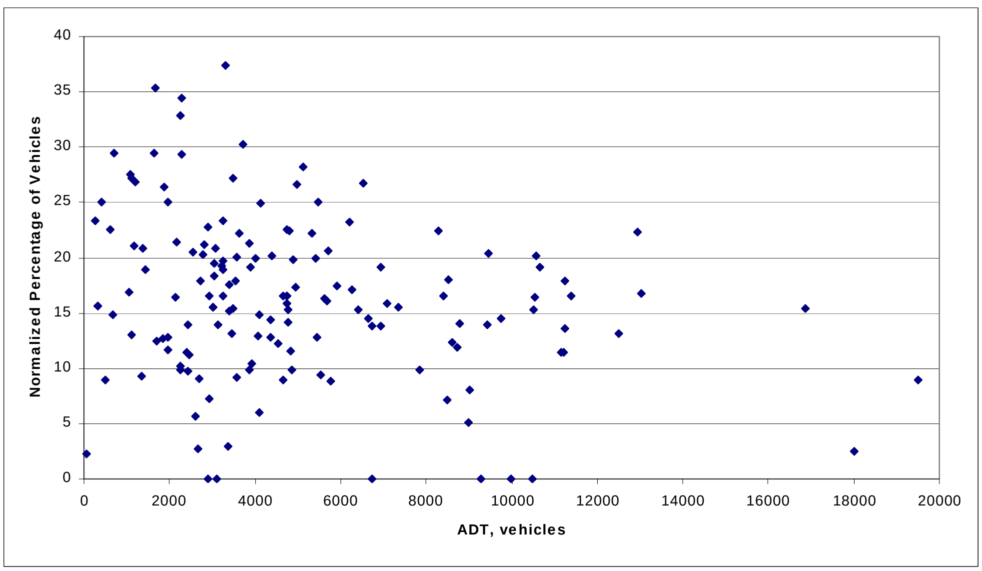

Figure 34. Normalized percentage of vehicles as a function of ADT for vehicle Class 3.

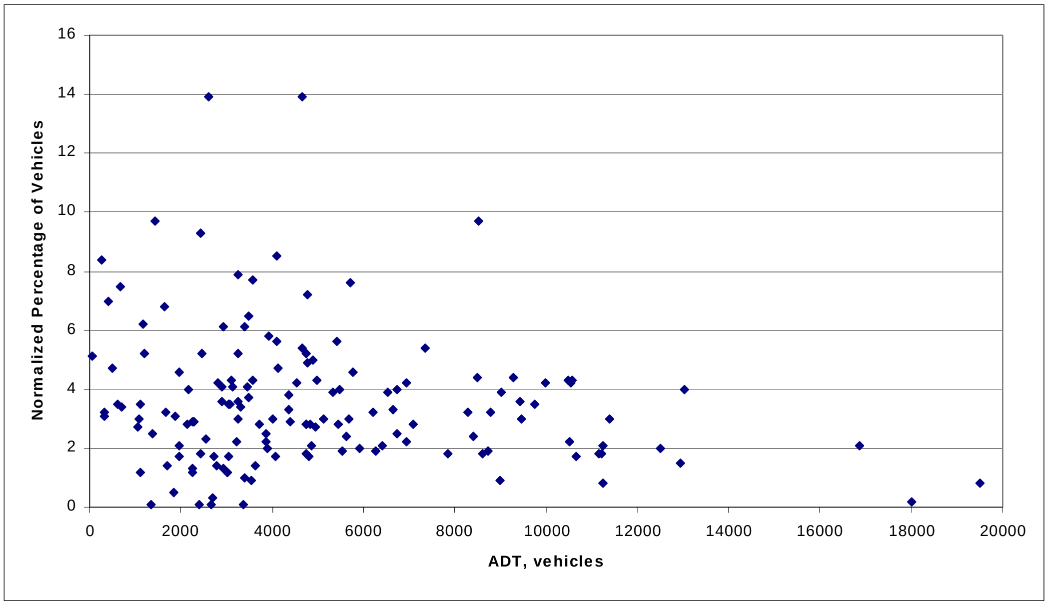

Figure 35. Normalized percentage of vehicles as a function of ADT for vehicle Class 5.

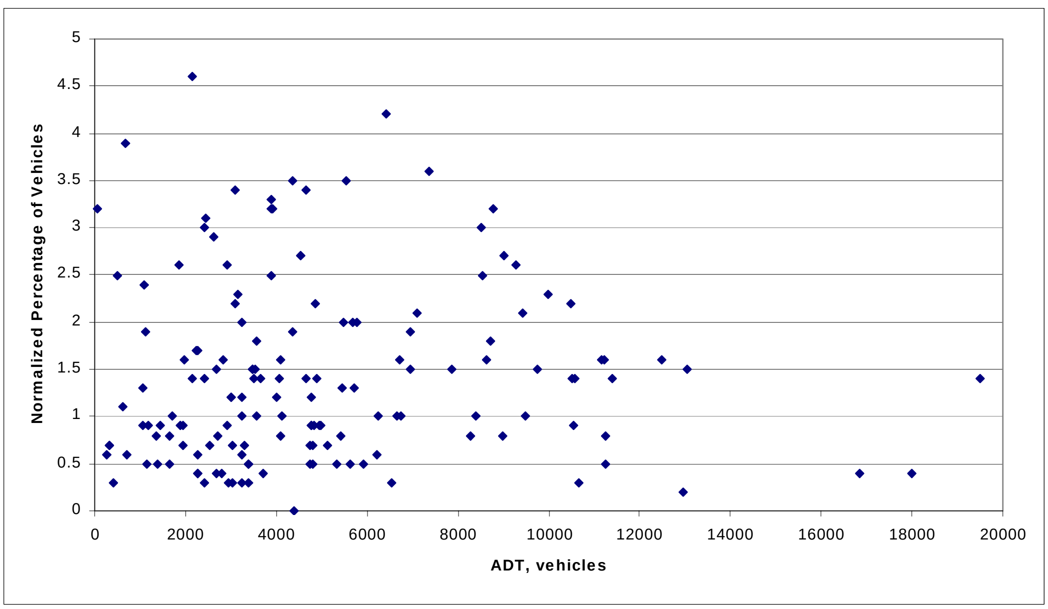

Figure 36. Normalized percentage of vehicles as a function of ADT for vehicle Class 8.

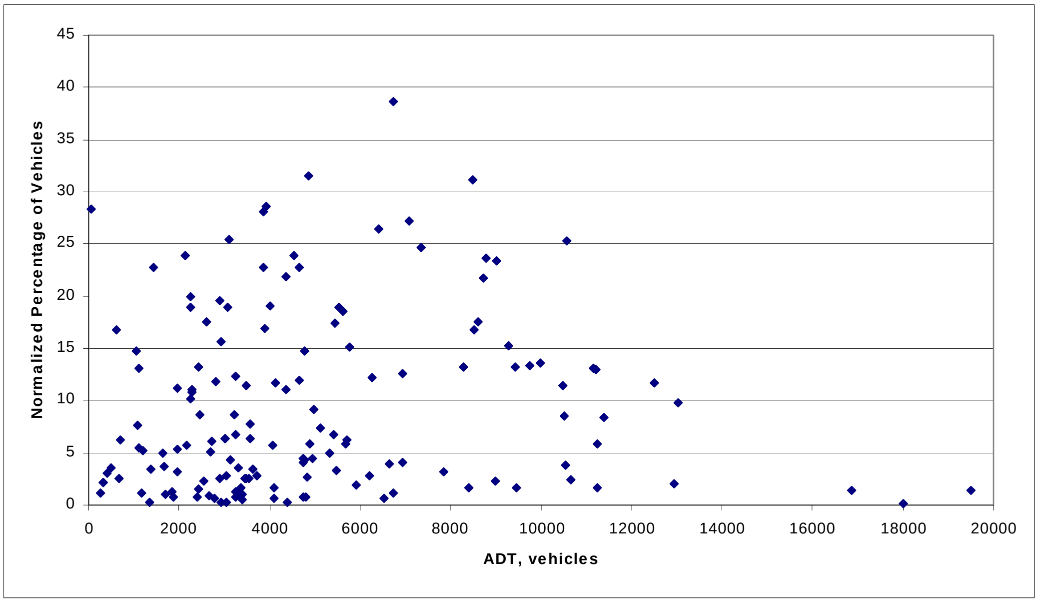

Figure 37. Normalized percentage of vehicles as a function of ADT for vehicle Class 9.

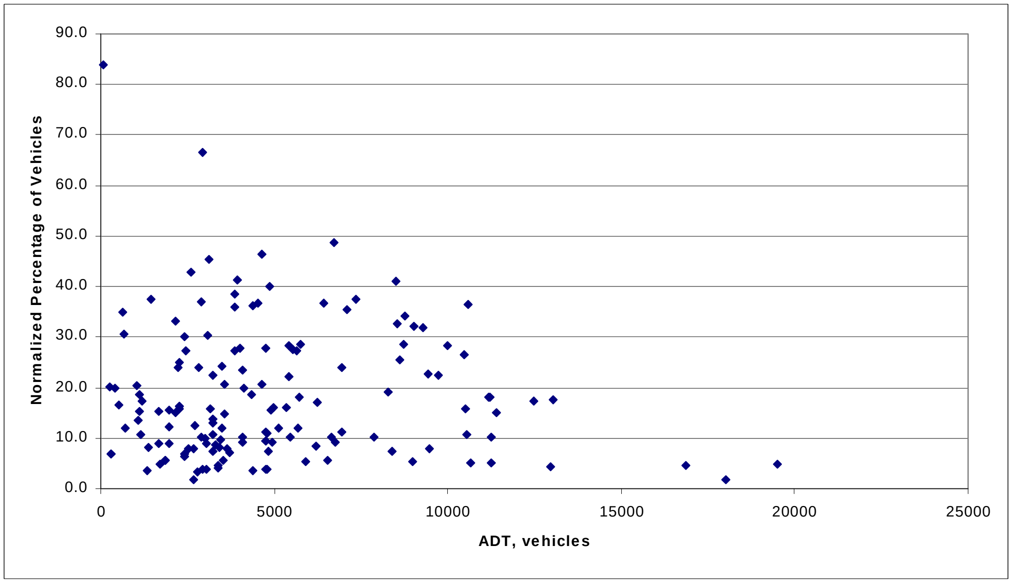

Figure 38. Normalized percentage of vehicles as a function of ADT for trucks.

Evaluation of WIM Data

Upon completion of the Level 2, 3 and 4 WIM data processing, some analyses were carried out to identify trends. Level 2 data was used to evaluate the variation in annual axle load spectra. Level 3 data was used to evaluate the variation monthly axle load spectra. Level 4 data was used to determine the number of single, tandem, tridem and quadruple axles per vehicle for each vehicle class. Because of the volume of WIM data, only a few examples for each type of data will be presented in this report.

The data in the LTPP IMS about traffic and highway characteristics are organized in several tables. Data about functional class, number of lanes and whether the highway section is divided or undivided are obtained from the TRF_BASIC_INFO.F01 table. Data about the load spectra by axle group are found in the TRF_MONITOR_AXLE_DISTRIB.F04 table. Data about highway type (interstate, state, or US) are organized in the INV_ID.I00 table. During the analysis, all these tables were combined to arrive at the data required for this study.

It should be noted that all units in the LTPP traffic database are in the English measurement system. The axle weights were not converted to the International System of Units (SI) because of the level of detail and data column headings in the database. The units for all figures showing the axle load spectra are in English units of measurement.

Determination of Axle Load Distribution. To determine the trend of the load spectrum, a characterization of each individual load spectrum had to be performed. This was done by examining each individual load spectrum. An individual load spectrum is one that is established for a single LTPP site, for a certain axle group, in a given year. The data used from the LTPP IMS has been summarized over all the vehicle classes. A continuation of this study will consider the vehicle class as another characteristic in the process of developing load spectrum estimation methods.

To avoid confusing the results with the different traffic levels on the different highways, the load spectrum data was standardized. The standardization process consisted of dividing the number of axles within each weight group of each individual load spectrum by the total number of axles in that load spectrum. This operation provided the percentage of the number of axles within each weight group.

When the cumulative percentage of the number of axles within each weight group is plotted vs. the mid-range of the weight group an S-shaped, or sigmoidal curve is obtained, as shown in figure 39. Such a curve can be characterized by two parameters ρ and β as shown in the following equation:

$$C = 100 \times e^{-\left(\frac{\rho}{W}\right)^{\beta}} \qquad (1)$$

where: C = cumulative percentage of number of axles
W = mid-range of weight group
ρ, β, = characterizing parameters

Each cumulative percentage spectrum can be characterized by these two parameters. Default values of these parameters can be established for the highway characteristics being studied. These default values can be then used to estimate the load spectra in the Level 3 inputs to the traffic analysis in the Guide. Such default values can be organized in the form of a table as shown in table 11. For a certain combination of highway characteristics, the corresponding default values are substituted in the sigmoidal curve equation to obtain the percentage of the number of axles within each desired weight group. Knowing the total number of axles for the highway characteristics combination, the number of axles among the weight groups can be determined. The cumulative percentages can be also directly estimated from nomographs such as those shown in figure 40.

To obtain the characterizing parameters, a sigmoidal curve is fitted to each individual cumulative percentage spectrum. The individuality of the cumulative percentage spectrum is defined in the same manner as for the load spectrum (see above). The first trial of fitting the sigmoidal curve was done using linear curve fitting. This process produced an average R^2 of 0.75. The fitting process was then redone using non-linear curve fitting methods. This time the R^2 increased to 0.97. Therefore, the results reported here are based on the non-linear curve fitting results.

The results are presented as graphs of the estimated spectra under the different characteristics. These curves are shown in figures 41 and 44. These estimated spectra are obtained from the averaged two parameters of the sigmoidal curve that was individually fitted to each observed load spectrum. For example, the estimated spectrum for single axles on urban highways is plotted using the average ρ and average β for all the spectra that fall in the single-axle-urban-highway category.

The results show that the axle group has a significant effect on the cumulative percentage spectrum. There is a corresponding progression of the percent of heavy axles with the axle group number. The single axle group has the lowest percentages of the heavy axles while the tridem axle group has the highest, with the tandem group in the middle.

It can also be seen that, for the single and tandem axle groups, there is no effect of any of the studied highway factors on the spectra. However, such differences are noticeable in the tridem axle group. Such differences show that urban, U.S., divided, six-lane highways endure the heaviest axles. The lowest axles are observed on rural, interstate, undivided, two-lane highways. It is to be noted, however, that the axle weight is different for the number of axles experienced on each highway category. In other words, the U.S. roads might endure heavier loads than the interstates, yet the number of axles on the interstates could be much higher. For that reason the previously mentioned standardization process was performed.

The values of the parameters under each combination are established in table 11. The next step is to run statistical comparisons to determine the significance of the difference between the parameter values under the different combination levels of the highway characteristics. Based on the observed results, recommendations will be made about what values to use under the different combinations of highway characteristics.

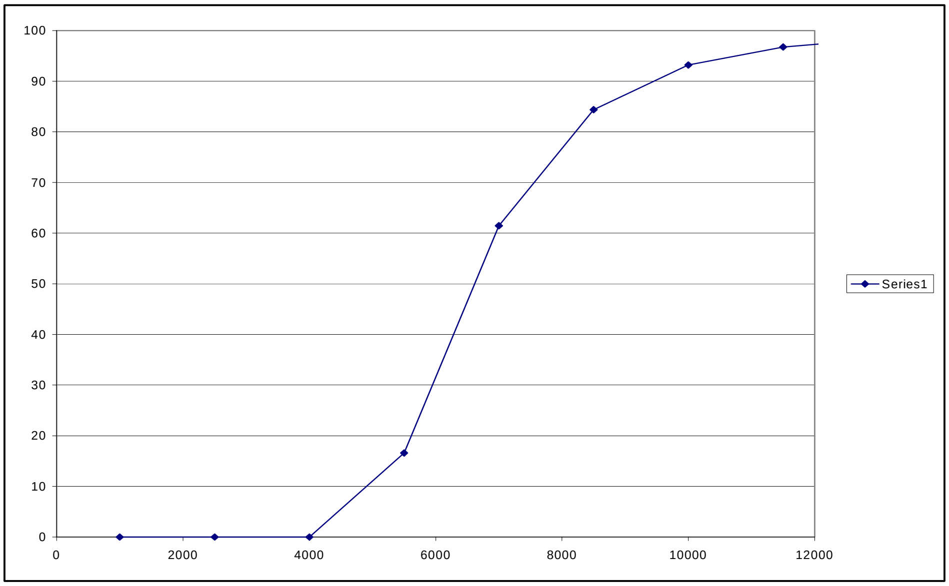

Figure 39. A typical sigmoidal curve.

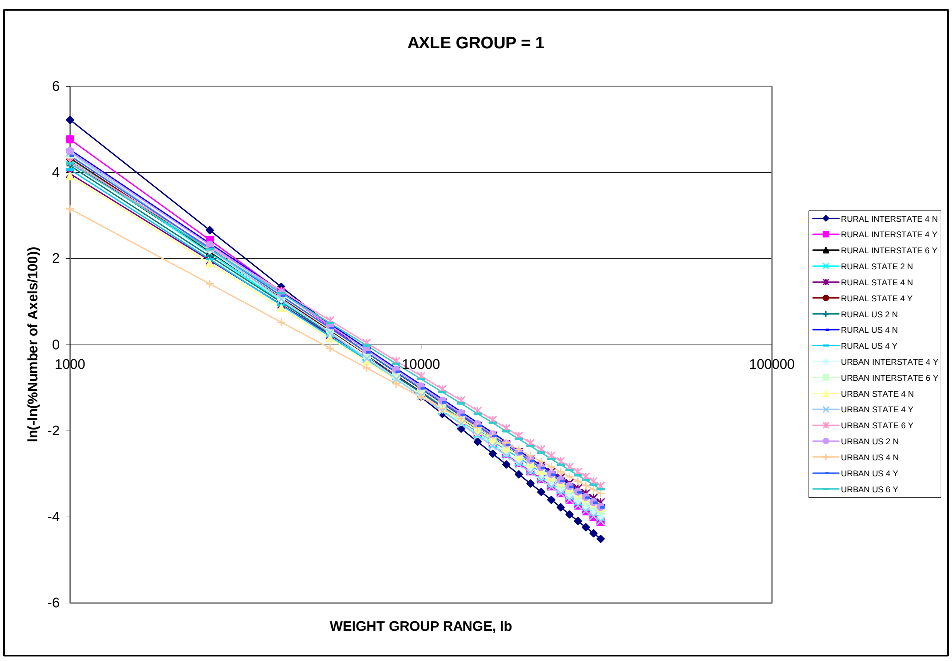

Figure 40. An example of a nomograph used to estimate the percentage of number of axles per weight group.

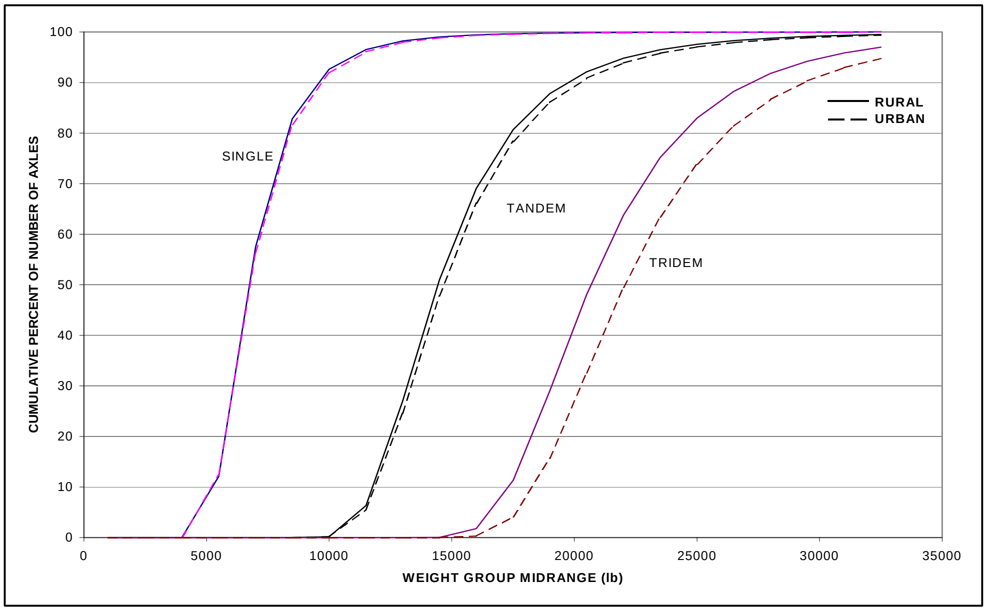

Figure 41. A comparison of cumulative percentage spectra among functional classes.

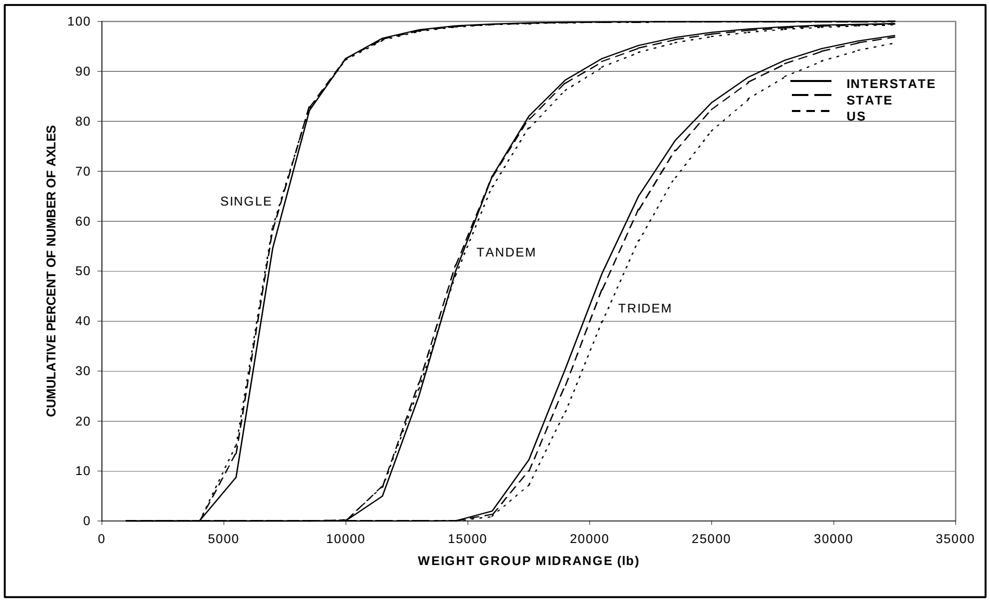

Figure 42. A comparison of cumulative percentage spectra among highway types.

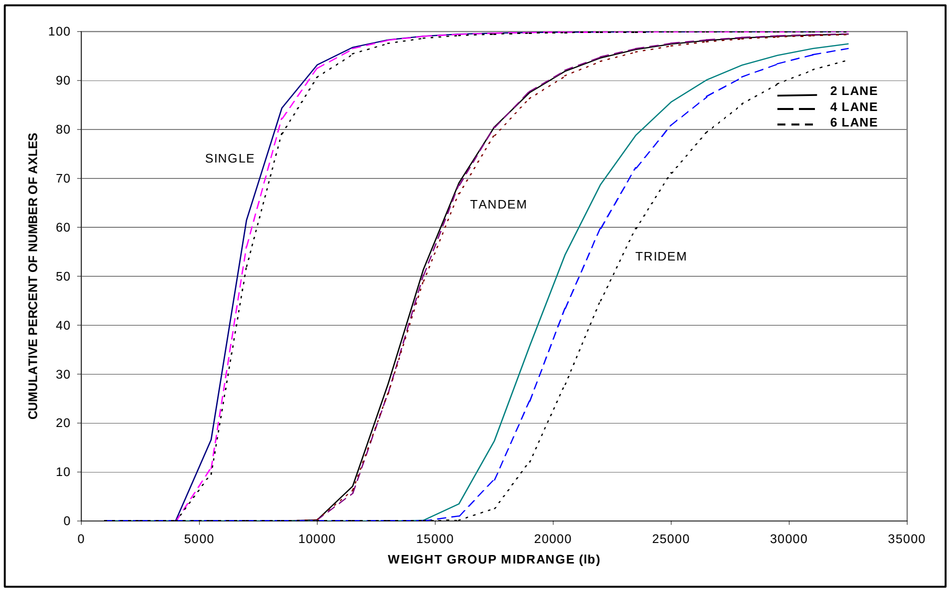

Figure 43. A comparison of cumulative percentage spectra among number of lanes.

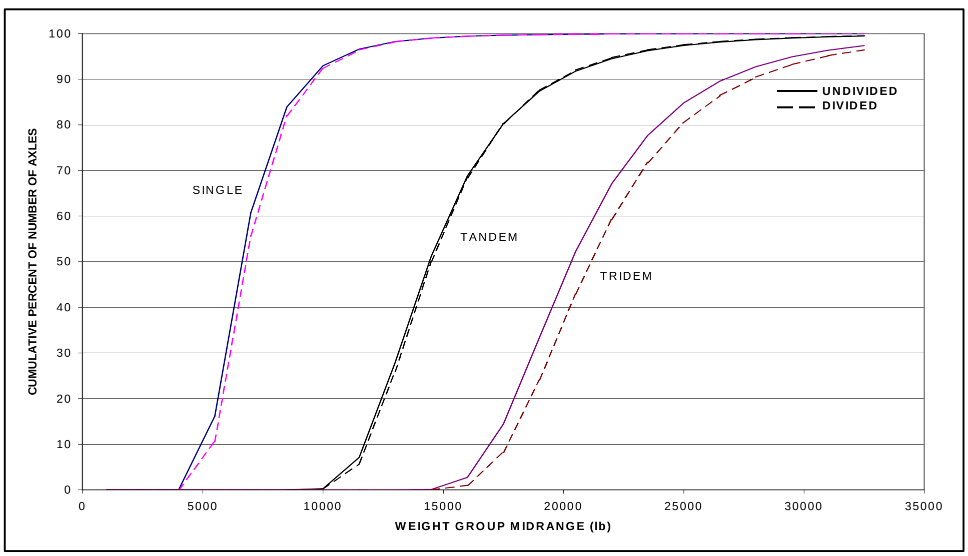

Figure 44. A comparison of cumulative percentage spectra between divided and undivided highways.

Table 11. ρ and β used from the sigmoidal curve equation used to represent the cumulative percentage of the number of axles per weight group.

AXLE GROUP	FUNCTIONAL CLASS	HIGHWAY TYPE	NUMBER OF LANES	DIVIDED/ UNDIVIDED	% OF TOTAL	ρ	β
1	RURAL	INTERSTATE	4	N	0.329761	6472.38	6.438
1	RURAL	INTERSTATE	4	Y	8.876065	6474.81	5.881
1	RURAL	INTERSTATE	6	Y	0.769442	6391.15	5.291
1	RURAL	STATE	2	N	3.48997	6091.30	5.507
1	RURAL	STATE	4	N	0.632042	6115.28	5.047
1	RURAL	STATE	4	Y	7.721902	6340.87	5.406
1	RURAL	US	2	N	4.589173	6149.33	5.272
1	RURAL	US	4	N	0.274801	6740.92	5.465
1	RURAL	US	4	Y	2.198406	5981.93	5.238
1	URBAN	INTERSTATE	4	Y	1.291564	6176.35	5.576
1	URBAN	INTERSTATE	6	Y	0.467161	6394.03	5.478
1	URBAN	STATE	4	N	0.1374	5876.13	5.092
1	URBAN	STATE	4	Y	0.851882	6145.93	5.670
1	URBAN	STATE	6	Y	0.08244	7140.38	4.979
1	URBAN	US	2	N	0.219841	6646.48	5.468
1	URBAN	US	4	N	0.08244	5266.22	4.373
1	URBAN	US	4	Y	1.264084	6488.82	5.406
1	URBAN	US	6	Y	0.247321	6930.23	5.003
2	RURAL	INTERSTATE	4	N	0.329761	13419.57	6.513
2	RURAL	INTERSTATE	4	Y	8.848585	13743.38	6.450
2	RURAL	INTERSTATE	6	Y	0.769442	13406.47	5.816
2	RURAL	STATE	2	N	3.48997	13451.01	6.116
2	RURAL	STATE	4	N	0.632042	13523.22	6.086
2	RURAL	STATE	4	Y	7.721902	13619.59	5.885
2	RURAL	US	2	N	4.561693	13702.08	5.803
2	RURAL	US	4	N	0.274801	13693.54	5.458
2	RURAL	US	4	Y	2.170926	13233.62	5.830
2	URBAN	INTERSTATE	4	Y	1.291564	13725.13	6.212
2	URBAN	INTERSTATE	6	Y	0.467161	13728.13	5.923
2	URBAN	STATE	4	N	0.1374	13616.92	5.518
2	URBAN	STATE	4	Y	0.851882	13390.79	6.432
2	URBAN	STATE	6	Y	0.08244	14976.33	5.191
2	URBAN	US	2	N	0.219841	13611.59	5.412
2	URBAN	US	4	N	0.05496	13192.41	4.933
2	URBAN	US	4	Y	1.264084	14074.11	5.779
2	URBAN	US	6	Y	0.247321	14469.50	5.515
3	RURAL	INTERSTATE	4	N	0.329761	17403.78	7.967
3	RURAL	INTERSTATE	4	Y	8.821105	19265.31	7.091
3	RURAL	INTERSTATE	6	Y	0.714482	20200.34	6.145
3	RURAL	STATE	2	N	3.46249	17872.85	7.275
3	RURAL	STATE	4	N	0.632042	20856.58	7.123
3	RURAL	STATE	4	Y	7.584501	20537.79	6.727
3	RURAL	US	2	N	4.479253	20033.94	6.598
3	RURAL	US	4	N	0.274801	22358.56	6.568
3	RURAL	US	4	Y	2.170926	19414.30	6.654
3	URBAN	INTERSTATE	4	Y	1.291564	20734.35	6.472

Table 11. ρ and β used from the sigmoidal curve equation used to represent the cumulative percentage of the number of axles per weight group, continued.

AXLE GROUP	FUNCTIONAL CLASS	HIGHWAY TYPE	NUMBER OF LANES	DIVIDED/ UNDIVIDED	% OF TOTAL	ρ	β
3	URBAN	INTERSTATE	6	Y	0.439681	21498.98	6.486
3	URBAN	STATE	4	N	0.1374	19594.14	7.092
3	URBAN	STATE	4	Y	0.851882	19212.19	7.051
3	URBAN	STATE	6	Y	0.08244	21637.99	7.634
3	URBAN	US	2	N	0.219841	20015.24	6.851
3	URBAN	US	4	N	0.05496	17606.62	7.711
3	URBAN	US	4	Y	1.264084	21659.55	6.654
3	URBAN	US	6	Y	0.247321	23042.52	7.343

Annual Axle Load Distribution. Level 2 WIM data was extracted from binary and processed into a usable form. Figure 45 shows tandem axle load spectra for vehicle class 9 from Section 185022 for five years of data. As shown, the tandem axle load spectra for vehicle class 9 have the same type of distributions from year to year.

Appendix AA.4 includes the annual normalized axle load spectra for single, tandem and tridem axles for selected sites over time. Most of the other sites included in the core set of the LTPP study have similar distributions. It was concluded that there is no consistently significant change in the annual normalized axle load spectra with time. Therefore, all years were combined into average annual load spectra.

Figure 46 shows an example of the average (from the five years of data) tandem axle load spectra for vehicle classes 7, 8 and 9. As shown, the normalized tandem axle load spectra for vehicle classes 9 and 10 are approximately the same, whereas the one for vehicle class 8 is significantly different. The average annual axle load spectra for different LTPP sites are provided in Appendix AA.5 for vehicle classes 5 and 9 because these classes represent the majority of the truck traffic at each site.

An evaluation of the annual normalized single and tandem axle load spectra was completed for each appropriate vehicle class. Some of these spectra for the same axle type, but from different vehicle classes, could be combined because the difference was insignificant. However, for most of the vehicle classes, the normalized axle load spectra should be kept separate because of the difference in the spectra for the heavier load groups. The normalized axle load spectra were determined for appropriate axle types for each vehicle class. The mean values and other statistics are provided in Appendix AA.4 for all truck types for the five sites, while Appendix AA.5 provides the same information for a larger number of sites for vehicle classes 5 and 9 trucks.

It should be noted that data for a year in which no axles were counted within an axle type within a vehicle class was considered anomalous data and was not included in the determination of the axle load spectra that represents the section. It should also be noted that the axle load spectra summaries included in Appendices D and E still contain some anomalous data. This typically occurs in the tridem axle group where some single and tandem axles are incorrectly classified as tridem axles. For example, vehicle class 5 vehicles cannot be listed in tridem axle data since they have only two axles. However, a small number of tridem axles were included in the LTPP traffic database for vehicle class 5 trucks.

Monthly Axle Load Distribution. Level 3 WIM data was extracted from binary and processed to create a database with daily axle load information. A query program was then used to investigate monthly axle load spectra variations. Figure 47 shows the monthly variation in vehicle class 9 tandem axles. As shown, the normalized tandem axle load spectra are month/season independent. The complete sets of monthly axle load spectra for Section 185022, and four other example sections, are shown in Appendix AA.6. These are the same LTPP sites that were included in Appendix AA.4. In general, the normalized axle load spectra (each axle type) was found to be insensitive with time. In other words, all data at a site can be included in one data set.

Truck Axle Load spectra. The data were evaluated on a site to site or truck traffic classification basis. However, the mean average of the axle load for each axle type was found to be as variable within each TTC as between the classifications. No other parameter or highway feature was found within which to group the normalized axle load data except axle type and vehicle class. Therefore, all axle weight data were combined to determine the default normalized axle load spectra for each axle type and vehicle class. These default values are tabulated in Appendix AA.7. Table 12 lists the ε and β values calculated from each of those default axle load spectra.

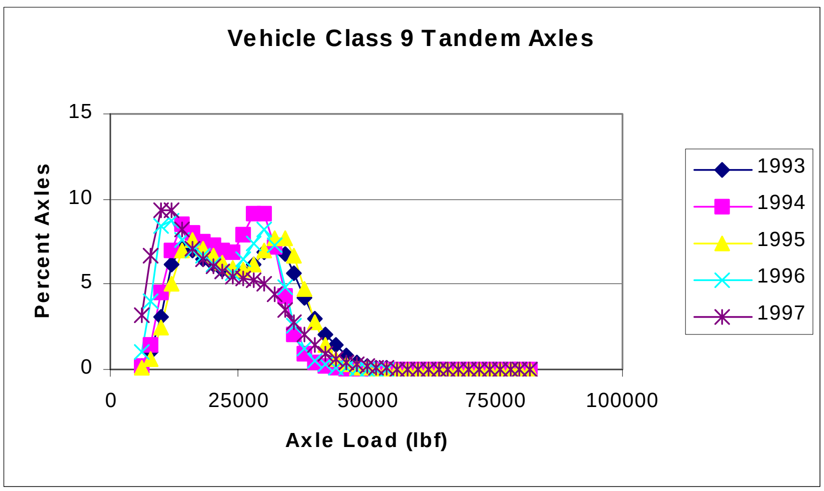

Figure 45. Single axle load spectra for Section 185022.

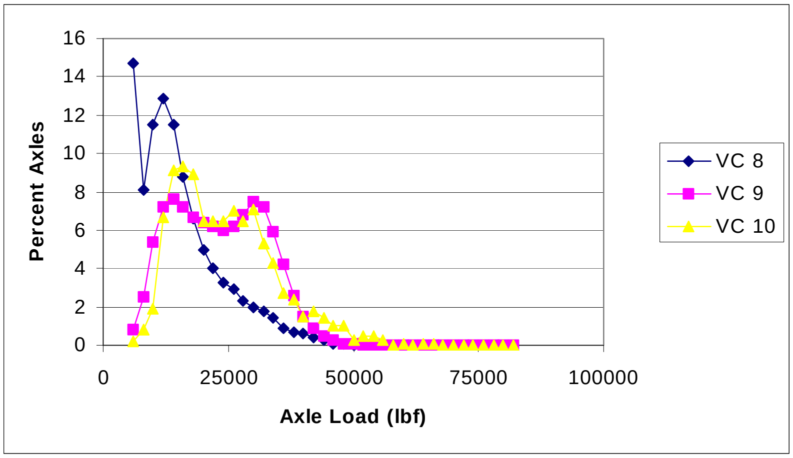

Figure 46. Tandem axle load spectra vehicle classes 8, 9 and 10 for Section 185022.

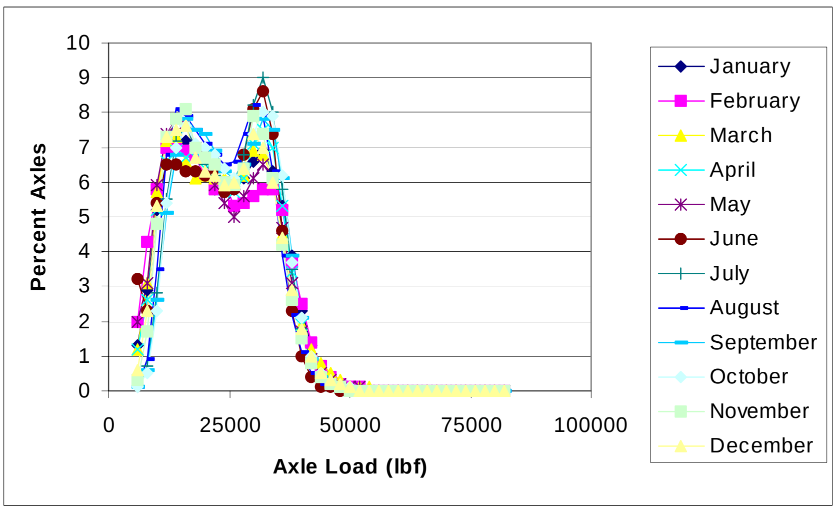

Figure 47. Monthly variation in tandem axle spectra for Vehicle Class 9 for Section 185022.

Table 12. ℯ and β values determined for each of the default axle load spectra tabulated in Appendix AA.7.

Axle Type	Vehicle Class	Beta	Rho
Single	VC 4	3.453	6427.35
	VC 5	2.998	4502.71
	VC 6	3.501	6140.66
	VC 7	3.858	7431.29
	VC 8	3.038	5280.40
	VC 9	3.823	5866.97
	VC 10	3.648	5721.31
	VC 11	3.602	6355.52
	VC 12	3.742	6041.46
	VC 13	3.634	5983.88
Tandem	VC 4	4.051	12377.22
	VC 5	3.626	9702.67
	VC 6	3.181	11827.50
	VC 7	2,875	12847.53
	VC 8	3.212	9231.41
	VC 9	3.665	12875.01
	VC 10	3.652	13974.04
	VC 11	4.997	12927.36
	VC 12	3.526	12361.48
	VC 13	3.183	13365.60
Tridem	VC 4	6.306	13526.42
	VC 5	4.492	19414.56
	VC 6	2.555	16358.41
	VC 7	3.888	23677.47
	VC 8	3.458	21232.07
	VC 9	3.743	12148.48
	VC 10	3.578	18444.41
	VC 11	4.070	15348.96
	VC 12	3.277	19608.90
	VC 13	3.281	22487.71

Evaluation of Axle Spacings in Tandem and Tridem Axle Configurations. Initial review of the individual truck record data (Level 4 WIM data) indicates a relatively large variation in the axle spacing in tandems and tridems. Table 13 shows the average tandem and tridem axle spacings by vehicle type. Table 14 shows a more detailed breakdown of drive and trailer tandem axle spacings for vehicle type 352000 (the most common single-trailer truck). The distance between two axles in tandem ranged from 0.0 to 5.24 m. However, center-to-center axle distances of less than 1.02 m appear to be unreasonable since the diameter of a commonly used truck tire is approximately 1.02 m. This inconsistency could be due to errors in the data collected by the WIM devices, or by counting tires from small trucks, which have smaller tires, but are of little significance in terms of pavement damage.

Traditionally, an axle spacing of approximately 1.25 m has been used as the distance between the two axles in a tandem axle. This distance appears to be reasonable. Based on information currently available, the following axle distances for tandem and tridem axle spacings are recommended.

Tandem Axle Spacing	1.31 m
Tridem Axle Spacing	1.25 m

Number of Axles Per Truck Type. The number of axles for each axle type were reviewed from the individual truck record data. In summary, the numbers of each axle type were summed for each vehicle class. The total number of each axle type (single, tandem and tridem axles) was divided by the total number of trucks/vehicles to determine the average number of axles for each axle type for each truck/vehicle class. The average number of axles per truck class was found to be independent of site specific conditions. The default values incorporated in the traffic module for calculating the total number of single, tandem and tridem axles per vehicle are listed in Table 15. There are too few quads to include them in the analysis so they were omitted from the table of default values.

Evaluation of Tire Dimensions and Inflation Pressures

Tire dimensions and inflation pressures are important inputs in the performance prediction models. An effort was undertaken to verify tire pressures used in the trucking industry. The Tire and Rim Association (TRA), Rubber Manufacturers' Association (RMA), American Trucking Association (ATA), Truck Trailer Manufacturers' Association (TTMA), and some representatives from the tire manufacturers industry were contacted.

John Miller of Bridgestone/Firestone provided a table of consolidated tire-usage surveys that indicated the most commonly used tire types. Table 16 lists the eight most commonly used tires and their market shares in the United States (Percent of Total Tires). The four most commonly used tire types account for 65.8 percent of the truck tires and the eight most commonly used tire types account for 80.6 percent of the truck tires. These numbers represent both original equipment tires and replacement tires. Since these eight tire types represent such a high proportion of truck tires, only these eight tire types were evaluated in this study.

Table 13. Axle spacings from Level 4 WIM data, m.

Veh Type	Frequency	Mean, m							Median, m						
		Tandem			Tridem				Tandem			Tridem			
		Drive	Trailer	Spread	Drive 1	Drive 2	Trailer 1	Trailer 2	Drive	Trailer	Spread	Drive 1	Drive 2	Trailer 1	Trailer 2
332000	61359	1.09	1.07						1.09	1.04					
322000	4406		1.12							1.02					
337000	1946	1.09		2.49					1.09		2.57				
432000	1480	1.12		2.39					1.09		2.54				
230000	4655	1.14							1.12						
333000	924	1.14					1.30	1.17	1.12					1.09	1.07
531100	787	1.09							1.09						
327000	712			2.21							2.18				
527100	689			2.41							2.41				
522100	654			2.34							2.39				
331000	442	3.91							1.09						
338000	403	1.24		1.55					1.27		1.52				
240000	349				2.41	1.17						1.09	1.14		
531200	156	1.12							1.09						
312000	127	1.07							1.09						
323000	101						0.97	1.17						0.74	0.71
532100	98	1.07		2.34					1.09		2.34				
537100	87	1.09		2.41					1.09		2.44				
423000	79	1.47	1.27						1.45	1.27					
342000	66		1.09		1.30	0.89				1.02		1.09	1.04		
632100	58	1.96							1.12						
533200	47	1.24	1.09				0.51	1.27	1.24	1.04				1.27	1.27
433000	20	1.14					2.34	1.07	1.12					1.45	1.09
440000	18				2.74	1.04						1.12	1.09		
543200	2				1.17	1.22	1.17	1.14				1.17	1.22	1.17	1.14
534000	2	1.14							1.14						

Table 14. The tandem axle spacings for various percentiles of the data that were found from an analysis of the LTPP database for vehicle type 352000.

Percentile of the Statistical Analysis	Drive Tandem Axle Spacing, m	Trailer Tandem Axle Spacing, m
Mean	1.31	1.28
Minimum	0.52	0.0
10th Percentile	1.25	1.19
25th Percentile	1.28	1.22
Median	1.31	1.25
75th Percentile	1.34	1.25
90th Percentile	1.37	1.34
Maximum	4.27	5.24

Table 15. The average number of single, tandem, tridem axles per truck type.

Vehicle Classification	Number of Single Axles per Truck	Number of Tandem Axles per Truck	Number of Tridem Axles per Truck
4	1.55	0.94	0.00
5	1.98	0.64	0.00
6	0.96	0.94	0.13
7	1.01	1.15	0.91
8	2.35	1.00	0.60
9	1.11	1.95	0.79
10	1.28	1.06	0.99
11	4.13	0.97	0.45
12	3.43	0.95	0.67
13	1.65	1.60	0.99

Table 16. List of most commonly used tires and their share of the market.

RMA Size	Ply Rating*	Percent of Total Tires
295/75R22.5	14	25.2
11R22.5	14	18.0
11R24.5	14	12.1
285/75R24.5	14	10.5
11R22.5	16	3.8
11R24.5	16	3.8
225/70R19.5	12	3.7
255/70R22.5	16	3.5

*The term "ply rating" is used to identify a given tire with its maximum recommended load when used in a specific type of service. It is an index of tire strength and does not necessarily represent the number of cord plies in the tire.

The TRA publishes a yearbook annually. This publication contains all TRA standards and related information approved by the Association for tires, rims, and allied parts for ground vehicles. Table 17 shows the section widths for new tires and overall widths for maximum grown tires as well as minimum dual spacings from the 1999 TRA yearbook. Maximum grown tires are tires that have reached their maximum possible increase in dimensions due to wear. These widths are used to determine the minimum dual spacing (spacing between tires in dual applications).

Figures 48 and 49 show the cross-section of a new tire and a maximum grown tire respectively. Table 18 lists tire diameter standards for the TRA yearbook and Table 19 lists the range of tire diameters and widths for Bridgestone/Firestone tires. It should be noted that the Bridgestone/Firestone tires models listed can also be used to replace corresponding Goodyear and Michelin tires. Therefore, the range of dimensions is likely to be representative of tires in use today. Typically, traction tread tires are used on drive axles and highway tread tires are used on drive axles and trailer axles.

Table 17. Tire widths and minimum dual spacings from TRA yearbook.

RMA Size	Ply Rating	Minimum Dual Spacing, mm	Tire Width, mm	
			Section (New)	Overall (Max. Grown)
295/75R22.5	14	335	298	313
11R22.5	14	318	279	302
11R24.5	14	318	279	302
285/75R24.5	14	318	283	297
11R22.5	16	318	279	302
11R24.5	16	318	279	302
225/70R19.5	12	254	226	237
255/70R22.5	16	287	255	268

Table 18. Tire diameters from TRA yearbook.

RMA Size	Ply Rating	New Tire, mm			Maximum Grown Tire, mm		
		Highway Thread	Traction Thread	Other* Thread	Highway Thread	Traction Thread	Other* Thread
295/75R22.5	14	1.01	1.02	-	1.03	1.04	-
11R22.5	14	1.05	1.07	1.06	1.08	1.09	1.08
11R24.5	14	1.10	1.12	1.11	1.13	1.14	1.13
285/75R24.5	14	1.05	1.06	-	1.07	1.07	-
11R22.5	16	1.05	1.07	1.06	1.08	1.09	1.08
11R24.5	16	1.10	1.12	1.11	1.13	1.14	1.13
225/70R19.5	12	0.81	0.82	0.82	0.82	0.83	0.84
255/70R22.5	16	0.93	0.94	-	0.94	0.95	-

*For 225/70R19.5, “Other” refers to deep traction tires. For 11R22.5 and 11R24.5, “Other” refers to heavy tires.

Table 19. Tire diameters and widths for Bridgestone/Firestone tires.

RMA Size	Ply Rating	Tire Diameter,* mm	Tire Width,* mm
295/75R22.5	14	1.01 – 1.04	269 – 287
11R22.5	14	1.04 – 1.08	269 – 284
11R24.5	14	1.09 – 1.12	269 – 284
285/75R24.5	14	1.04 – 1.07	269 – 284
11R22.5	16	1.05 – 1.09	269 – 284
11R24.5	16	1.10 – 1.14	269 – 284
225/70R19.5	12	0.82 – 0.86	201 – 221
255/70R22.5	16	0.92 – 0.94	249 – 262

*These dimensions are based on figures from the website, <http://www.trucktires.com>

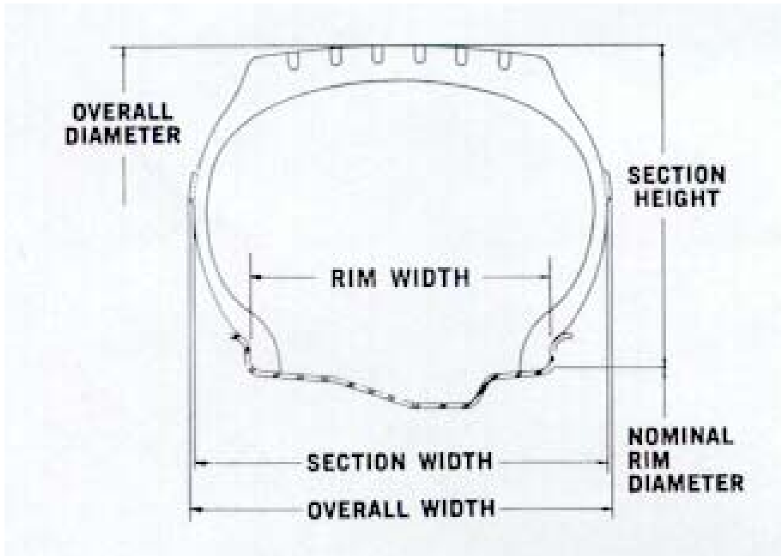

Figure 48. Cross-section of a new tire.

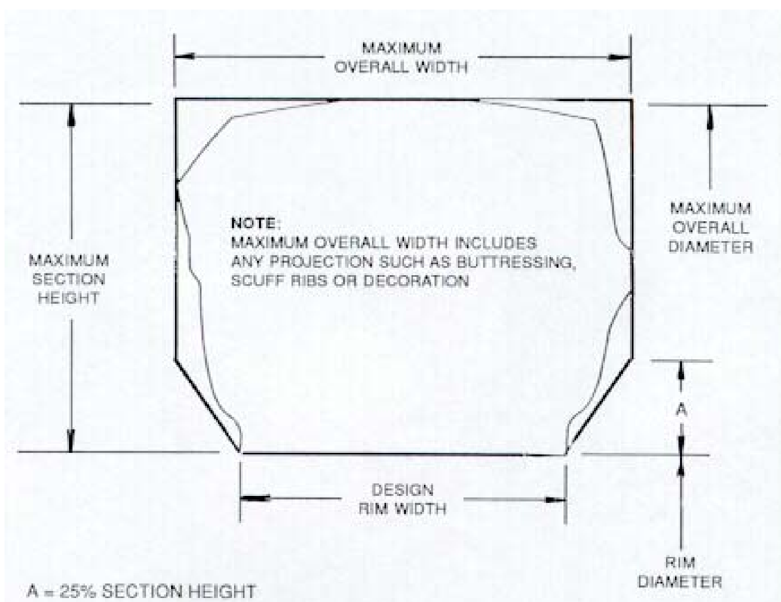

Figure 49. Cross-section of a maximum grown tire.

The TRA also has standard for tire inflation pressures. Table 20 shows the maximum load and the corresponding cold inflation pressures for the selected tire types. Cold inflation pressure shown in this section are those taken with the tires at the prevailing atmospheric temperatures and do not include any inflation pressure build-up due to vehicle operation. There are some difference between the TRA standard and the Bridgestone/Firestone maximum load limits. These differences are due to market demands and manufacturers' responses to the needs of the industry.

While Table 20 only shows the maximum allowable loads, Figures 50 and 51 show the relationship between load and cold inflation pressures for Bridgestone tires. It should be noted that tire pressures typically increase by 68.9 to 103.4 kPa when the tires heat up from friction with the pavement surface. Representatives within the tire industry have informed the team that it usually takes less than one mile of travel for the tires to start heating up and more than three hours for a tire to cool back down to the cold inflation pressures. Thus tire hot inflation pressures should be used to calculate the incremental damage.

Table 20. Maximum load and corresponding cold inflation pressures.

RMA Size	Ply Rating	Single-Usage Pressure (mPa)		Dual-Usage Pressure (mPa)		Single-Usage Load (kN)		Dual-Usage Load (kN)	
		TRA	B/F	TRA	B/F	TRA	B/F	TRA	B/F
295/75R22.5	14	.76	.76	.76	.69	27.5	27.5	25.2	25.2
11R22.5	14	.72	.72	.72	.72	27.5	27.5	26.0	25.6
11R24.5	14	.72	.72	.72	.72	29.4	28.6	26.7	26.7
285/75R24.5	14	.76	.76	.76	.69	27.5	27.5	25.2	25.2
11R22.5	16	.83	.83	.83	.76	29.4	29.4	26.7	25.8
11R24.5	16	.83	.83	.83	.76	31.8	31.3	29.4	27.4
225/70*R19.5	12	.66	.66	.66	.66	16.2	16.2	15.2	15.2
255/70*R22.5	16	.83	.83	.83	.83	24.5	24.5	22.6	22.6

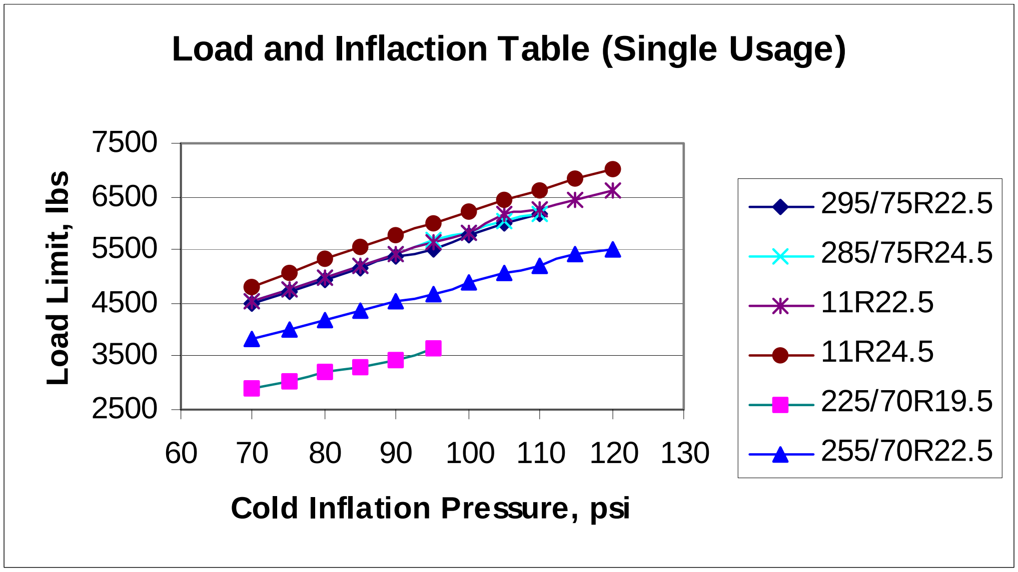

Figure 50. Relationship between load limit and cold inflation pressure for single usage.

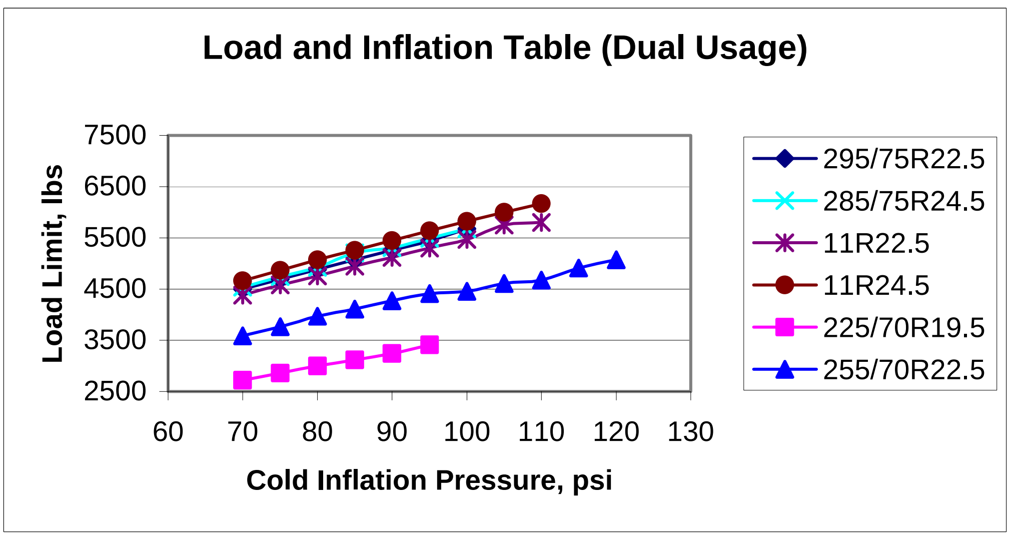

Figure 51. Relationship between load limit and cold inflation pressure for dual usage.

Wander - Lateral Distribution of Trucks

The lateral distribution of axle loads is used to represent traffic wander. There have been very few studies that have identified or measured typical standard deviations of the axle or wheel loads across the lane width of the highway. However, there have been recent studies that have shown that the amount of load related distress along a specific lane decreases with an increase in lane width. In these studies it was suggested that the wider the lanes the greater the wander or lateral distribution of trucks or the fewer the number of loads over a specific point of the pavement's surface. Therefore, it is suggested that the wander factors decrease with an increase in lane width. The following values are suggested for use:

Lane Width, ft.	Wander Factor
10	0.90
11	0.85
12	0.80

The values shown above are used typically in other studies and are suggested for use as default values in the incremental damage computation module. These values are not included as inputs to the traffic module, but should be considered as an input to the deterministic incremental damage computation module.

Growth Rate of Trucks

This factor is a convenient way to convert the total number of trucks in the first year of the design period to total trucks over the design period. Traffic growth is usually expressed as an annual compound growth rate. Specifically, Step 13 is used to estimate the growth or decay in the truck traffic. Growth rates of trucks varies widely from one highway to the next, therefore, past historical data is an important source of information.

As stated in Chapter 2, three different growth/decay functions are embedded as default values in the traffic module. However, no detailed analyses were completed on the time history data because most of the LTPP traffic sites have less than four years of data. As an added improvement to the traffic module, detailed studies should be completed on many more of the LTPP traffic sites using expanded time series data. Revised growth/decay functions should be evaluated to provide the designer with recommendations that are highway and/or area specific.

4 - Overall Accuracy in Traffic Predictions

The overall accuracy in predicting the total truck traffic population over a design period can be related to the following major items:

- Estimates of traffic data for the initial year. The more site-specific the volume and weight data, the more accurate the initial values.

- Estimates of future growth in truck volumes and weights over the design period.

Calculation of the Expected Error in the Traffic Estimates

Experience has shown that generally the traffic has been underestimated, especially on major rural and urban highways. Changes in axle weight distributions and configuration of axles are perhaps the most difficult to estimate over a long design period due to uncertainty in legislative and economic conditions. The overall error in predicting traffic over a 20-year period could easily be as great as 200 percent or as little as 25 percent, if done with great care.

The following equation was used to calculate the expected error in estimating the daily number of trucks for each vehicle class.

$$e(VC_k)_j = \frac{Z}{n^{0.5}}\left(\frac{\sigma}{\mu}\right)_{k,j}$$

where: $e(VC_k)_j$ = expected error for vehicle class *k* in season *j*

Z = confidence interval coefficient

n = number of sampling days

σ = standard deviation of the number of class *k* vehicles in the population during season *j*

μ = mean number of class k vehicles in the truck traffic population during season *j*

Traffic Sampling Plan Requirements

The traffic inputs used for pavement design and evaluation are generally estimated from historical and existing traffic levels. These levels are modified to account for future growth that reflects changes in the economic climate affecting the transport of goods and materials. While it may be possible to measure current traffic levels and axle loads along a roadway, the characteristics of the traffic stream change over time and some of these changes can be substantial and highly variable. Thus, estimating historical traffic and/or projecting future traffic levels is very difficult.

Historically, some SHAs have put forth very small efforts and have not emphasized the importance of collecting adequate traffic data for design. This is believed to be one of the reasons why the historical traffic has been found to be significantly different from the monitored traffic in the LTPP traffic database. This observation and fact must change with the use and application of M-E procedures to design and evaluate pavement structures. Stated simply, more importance and a higher level of effort must be devoted towards sampling the traffic population over time.

Major initiatives have been underway to improve on the knowledge and the quality of the traffic data for structural design and evaluation. The most important initiative has been the development of the traffic database under the LTPP program.

Two issues or areas need to be looked at to predict historical and future traffic levels. The first is to use the annual number of axle load applications within each vehicle class to evaluate any change in the traffic population in terms of axle applications from year to year. The second is to evaluate and determine if and how the axle load distribution changes within each vehicle class for each year. Thus, the two important questions to be asked and answered from the data collected for a project are:

1. How many years of data are needed to reliably estimate any systematic or uniform changes in the traffic data?

2. How many days or portions of a day are needed to estimate the annual traffic for any one year?

Tables 21 – 23 provide a recommended set of guidelines or sampling plan that can be used to estimate the number of days required to collect an adequate amount of data from the traffic population for a specific site. These data should be collected in accordance with the procedures and equipment (that has been properly calibrated) specified by LTPP. The number of days for sampling the traffic population are based on a level of confidence and an expected error considered acceptable to the designer.

Table 21. Minimum sample size (number of days) to estimate the normalized axle load distribution – WIM data.

Expected Error +/- %	Level of Confidence or Significance, % 80	90	95	97.5	99
20	1	1	1	1	1
10	1	1	2	2	3
5	2	3	5	7	10
2	8	19	30	43	61
1	32	74	122	172	242

Table 22. Minimum sample size (number of days) to estimate the normalized vehicle class distribution – AVC data.

Expected Error +/- %	Level of Confidence or Significance, % 80	90	95	97.5	99
20	1	1	1	2	2
10	1	2	3	5	6
5	3	8	12	17	24
2	20	45	74	105	148
1	78	180	295	***	***

***Continuous sampling is required for these conditions.

Table 23. Minimum sample size (number of days) to estimate the total axles per day by month or year – AVC data.

Expected Error +/- %	Level of Confidence or Significance, % 80	90	95	97.5	99
20	3	7	12	16	23
10	12	27	45	64	90
5	47	109	179	254	***
2	292	***	***	***	***
1	***	***	***	***	***

Other elements of a traffic-sampling plan that must be considered to ensure that a reliable estimation of the traffic population is obtained are listed below.

- **Minimum number of years included in traffic sample**. It is suggested that a minimum of three years be included in the traffic sample. Three years are suggested to reduce any bias of the sample caused by an anomaly that may appear in any one year of the traffic data.

- **Seasonal samples**. The sampling plan should be consistent with the time frame used for the damage computations or performance predictions. If the damage computations are made seasonally (monthly), then samples of the traffic population should be taken or obtained over the same period of time.

- **Stratified random sampling plan**. A stratified random sampling plan should be developed and implemented to identify any monthly (or seasonal) and annual differences that may be present in the traffic population.

5 – Examples/Demonstrations of the Traffic Module

As stated in Chapter 2, the hierarchical approach used for traffic inputs is divided into four levels. Level 1 inputs require site specific AVC and WIM data. Level 2 inputs require site specific AVC data and regional/state WIM data. Level 3 inputs require AADTT information and regional/state traffic distributions and axle load spectra. Level 4 inputs require only AADT and percent trucks information. This chapter of the report uses three generic sites with varying traffic volumes and shows the minimum differences that could be expected among the four levels. All of the operational functions and designer decisions (both external and internal to the traffic module software) are used for these demonstrations. For the examples, the three generic sites (roadways) will be referred to as A, B and C. However, the data for these examples represent real data because they were taken from the LTPP traffic database.

Processing and Evaluation of AVC Data

The first activity was acquisition of Level 4 AVC traffic data from the Central Traffic Database (CTDB). The Level 4 data was used to determine the time of day distribution factors. Next, a program was used to convert the hourly data into daily data. This program also calculated the normalized traffic distribution for vehicle classes 1 through 13. In this program, a check is carried out to ensure that only days with exactly 24 hours of data are sent to the AVC daily traffic master file. In addition, days without a single vehicle counted also are excluded because the lack of data on those days is highly questionable. Acceptable data are copied into an AVC daily master file. A query program is used to query the AVC daily master file based on user-selected criteria. A third program then processes the output of the query program to produce normalized truck traffic based solely on truck traffic (vehicle classes 4 through 13). The daily information is used to:

- Determine the ADTT for the base year.
- Determine outlier years within the roadways.
- Combine similar years to determine representative truck distribution spectrum.
- Determine seasonal (monthly) distribution factors.
- Determine the percentage of trucks in the traffic stream.
- Determine the truck directional distribution factor.
- Determine the truck lane distribution factor.
- Determine time of day factors.

Processing and Evaluation of WIM Data

Level 2 WIM traffic data was acquired from the Central Traffic Database (CTDB). Next, a program was used to combine the years of available data for a roadway to produce summary statistics for that roadway – mean, variance and coefficient of variation. The axle load spectra for all years were averaged to produce one set of axle load spectra that represent the roadway. This approach was chosen because the variability between years was less than or equal to the variability within a given year.

Level 1 Inputs for the Example Problems

Three generic examples were selected to demonstrate the decision-making process used to determine the correct Level 1 input data for the traffic program. It is assumed that adequate amounts of AVC and WIM data have been collected at each of the three sites. The three examples will be discussed together.

<u>STEP 1: Determination of AADTT in the Design Lane for the Base Year.</u> The first step in selecting the design inputs is the selection of the AADTT in the design lane for the user-defined base year. In this example, a base year of 1999 was selected. Figure 52 shows the AADTT in the design lane for three roadway segments by year.

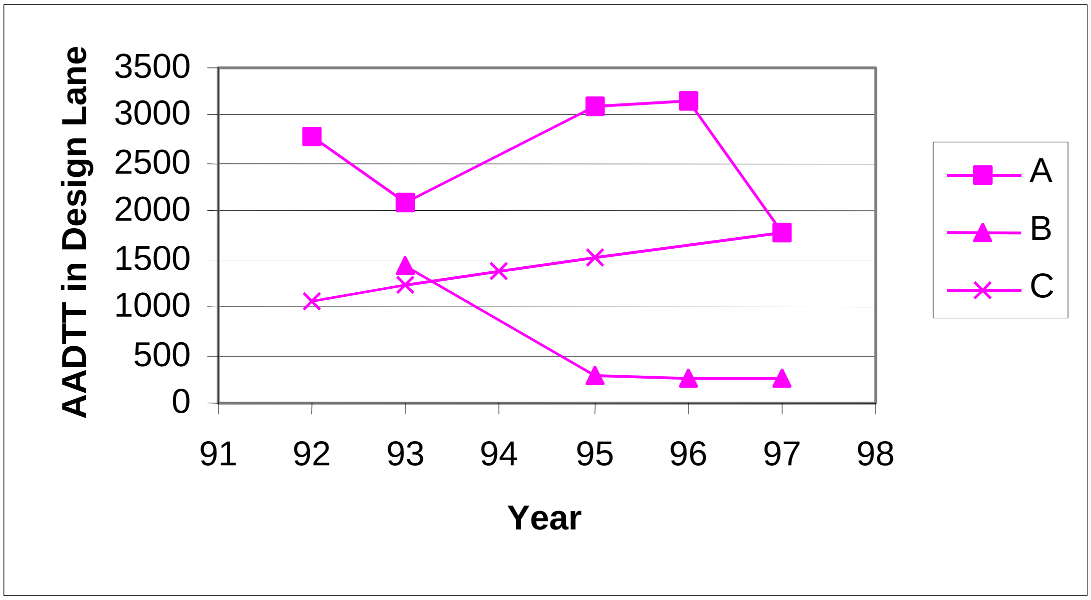

Figure 52. AADTT in design lane.

Based on site specific information from the state/local agencies, the following projections were made for a base year of 1999:

Roadway A: There are no consistent trends in truck traffic. However, there also is no logical explanation for the variation in AADTT. Therefore, the average AADTT for the five years is selected to represent the projected AADTT in 1999.

Roadway B: The AADTT in the design lane in 1993 is much higher than the other three years of available data. Upon careful evaluation of the AVC data, it was determined that there were errors in the data collection in 1993. Therefore, the AADTT for that year is considered an outlier and will not be used to project the AADTT in 1999. Because there were no appreciable differences among 1995, 1996 and 1997, the average AADTT from these three years is selected to represent the AADTT in 1999.

Roadway C: There is a steady increase in the truck traffic from 1992 to 1997. Upon closer examination, the arrival of new industries appears to have caused this increase in truck traffic. This increase is expected to continue into the future. Therefore, using the agency's discretion, a second-degree polynomial is fitted to the data to project the AADTT in the design lane for 1999.

Based on the discussion of AADTT, the projected AADTT for the example roadways are shown in Table 24.

Table 24. Projected AADTT for the three example roadways.

Roadway	Projected AADTT
A	2582
B	266
C	2016

STEP 2: Determination of Truck Distribution Spectra for the Base Year. The second step is the selection of the truck distribution spectra for the user-defined base year. Figures 53 – 55 show the annual truck distribution spectra for Roadways A, B and C, respectively.

Roadway A: The normalized vehicle distribution is relatively consistent for all five years. No clear trend is observed indicating increased or decreased percentages of any vehicle class. Therefore, the spectra from the five years are averaged to produce a spectrum that represents this roadway for the base year.

Roadway B: The normalized vehicle distribution spectra are relatively consistent from 1995 to 1997. However, the spectrum from 1993 appears to be an outlier. Upon further evaluation, as mentioned in the discussion on determining the AADTT, it was determined that there were errors in the data collection in 1993. Therefore, the spectrum from 1993 was not included in further evaluations. No clear trend is observed indicating increased or decreased percentages of any vehicle class during the remaining three years. Therefore, the spectra from the remaining three years are averaged to produce a spectrum that represents this roadway for the base year.

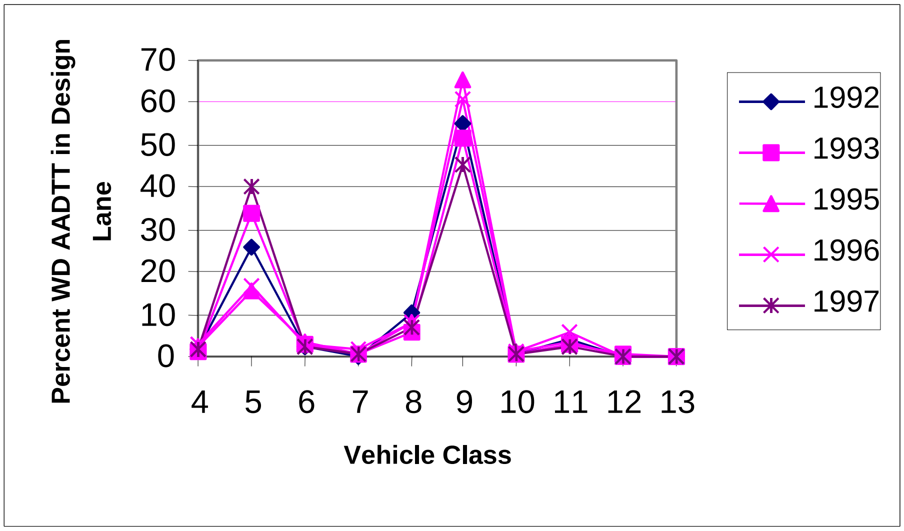

Figure 53. Annual vehicle distribution spectrum for Roadway A.

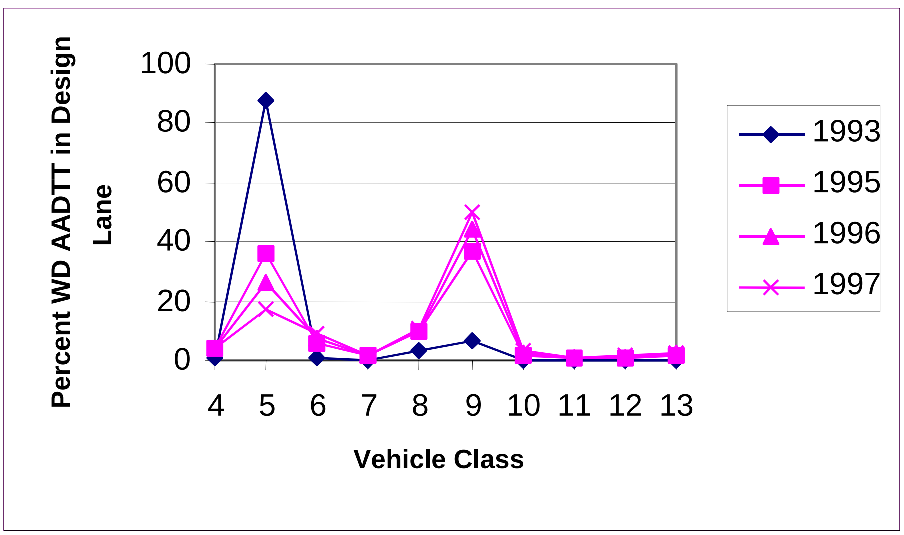

Figure 54. Annual vehicle distribution spectrum for Roadway B.

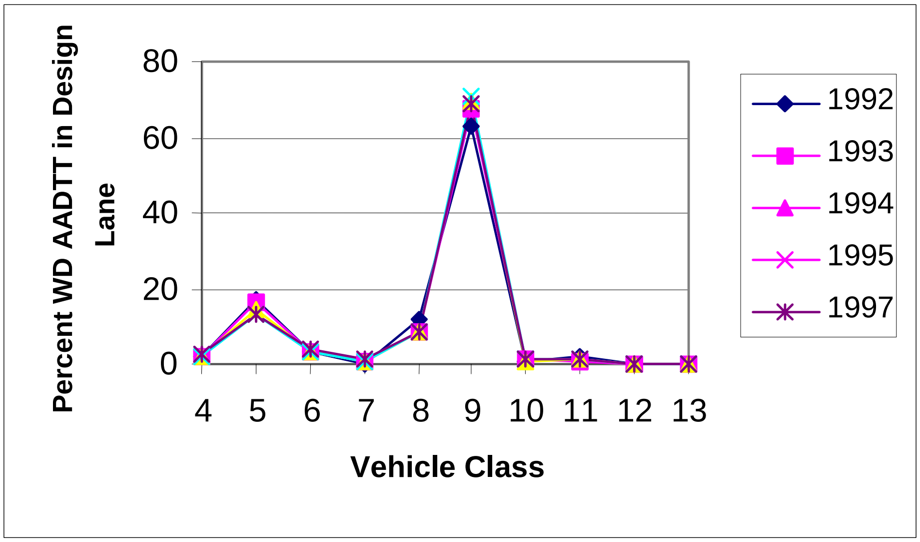

Figure 55. Annual vehicle distribution spectrum for Roadway C.

Roadway C: The normalized vehicle distribution is relatively consistent for all five years. No clear trend is observed indicating increased or decreased percentages of any vehicle class. Therefore, the spectra from each of the five years are averaged to produce a spectrum that represents this roadway for the base year.

Based on the discussion on normalized truck distribution spectra, the representative spectra are shown in Table 25 and Figure 56.

Table 25. Representative normalized truck distribution spectra used for the example problems.

Roadway	Normalized Percentage of AADTT by Vehicle Class									
	4	5	6	7	8	9	10	11	12	13
A	2.1	29.6	2.8	0.8	7.3	52.6	0.9	3.7	0.1	0.2
B	4.5	22.4	7.6	2.0	8.3	47.6	3.0	0.8	1.3	2.5
C	2.0	13.9	3.9	0.6	7.5	69.3	1.1	1.3	0.1	0.2

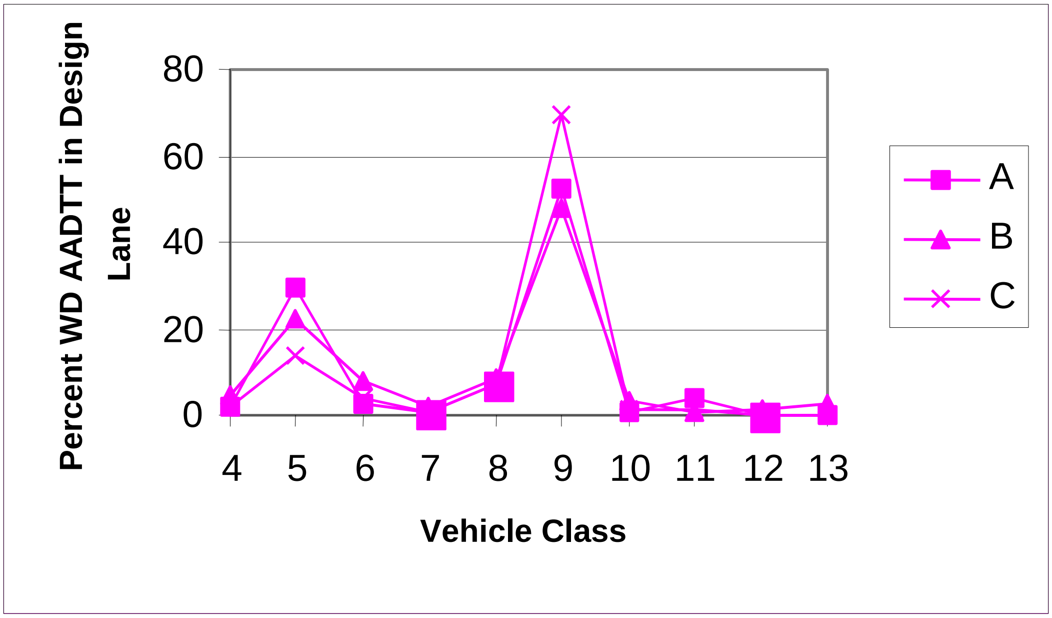

Figure 56. Representative normalized truck distribution spectra used for the example problems.

<u>STEP 3: Determination of Seasonal (Monthly) Distribution Factors.</u> The weekday daily AVC data (produced from the Level 4 AVC data) is used to determine the seasonal distribution factor. The default seasonal distribution factor is 1.0. This means that the truck traffic is evenly distributed over the course of the year and the truck volume for each month is the AADTT. However, based on the actual volume of truck traffic for each month, monthly distribution factors are calculated. The site-specific seasonal distribution factors are shown in Table 26 and Figure 57.

Table 26. Seasonal (monthly) distribution factors used for the example problems.

Month	Roadway A	Roadway B	Roadway C
January	0.96	0.49	0.93
February	0.92	0.64	0.83
March	1.05	0.94	0.99
April	1.19	1.17	1.11
May	1.18	1.26	1.08
June	0.87	1.52	1.07
July	0.86	1.53	1.04
August	1.01	1.13	1.05
September	1.08	0.91	1.03
October	0.99	0.79	0.98
November	1.02	0.77	0.97
December	0.86	0.85	0.93

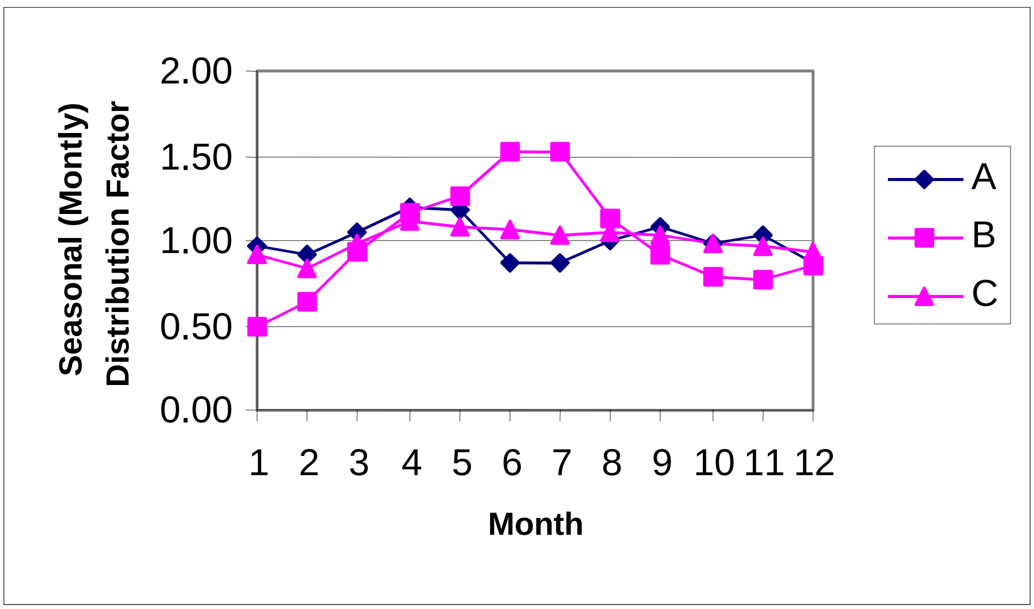

Figure 57. Seasonal (monthly) distribution factors used for the example problems.

<u>STEP 4: Determination of Time of Day Distribution Factors.</u> The weekday hourly data (a processed form of the Level 4 AVC data) is used to determine the time of day distribution factors. Each day is divided into five time periods. The time of day distribution factors in the design lane for the example roadways are shown in Table 27.

Table 27. Time of day distribution factors.

Time Period	Roadway A	Roadway B	Roadway C
0000 – 0600	0.09	0.04	0.06
0600 – 1000	0.24	0.25	0.24
1000 – 1600	0.25	0.28	0.27
1600 – 2000	0.27	0.30	0.29
2000 – 0000	0.15	0.13	0.14

STEP 5: Determination of Axle Load Spectra. First, the Level 2 WIM data is extracted from binary form. Then it is run through a program to manipulate the data into usable form. The axle load spectra from all the years for the specific roadway were averaged to produce axle load spectra for each vehicle class and axle type because the variation between years is less than or equal to the variation within a year. The set of axle load spectra for the example roadways are shown in Appendix AA.8.

Level 2 Inputs for the Example Problems

The only difference between levels 1 and 2 is that Level 2 uses regional/state axle load spectra instead of site-specific axle load spectra. Steps 1 through 4 are identical for Levels 1 and 2. Step 5 is described below for Roadways A, B and C.

STEP 5: Determination of Axle Load Spectra. Regional/state sets of axle load spectra are used to derive a set of axle load spectra that represents the design roadway.

Roadway A: Example sets of axle load spectra from other similar roadways in the same region (Roadways J, K and L) are used to represent the axle load spectra for Roadway A, which is shown in Appendix AA.9. The representative set of regional axle load spectra (averaged from Roadways J, K and L) is shown in Appendix AA.10.

Roadways B and C: Example sets of axle load spectra (Roadways M and N) are used to represent the axle load spectra for Roadway B. Other example sets of axle load spectra (Roadways P and Q) are used to represent the axle load spectra for Roadway C. These example regional roadways are shown in Appendix AA.9. The representative sets of regional axle load spectra (average from Roadways M and N for Roadway B, average from Roadways P and Q for Roadway C) are shown in Appendix AA.10.

Level 3 Inputs for the Example Problems

The only difference between Levels 2 and 3 is that Level 3 uses regional truck distribution spectra instead of site-specific truck distribution spectra. Step 5 is the same for both Levels 2 and 3. Steps 1 through 4 are described below.

STEP 1: Determination of AADTT in the Design Lane for the Base Year. In Level 3, percent trucks, truck directional distribution and lane distribution factors are applied to the AADT to determine the AADTT in the design lane. These factors are determined by examining traffic data from roadways in the area and making decisions based on engineering judgment. In these examples, the average factors from similar roadways (shown in Table 28) in the area are used to determine representative factors (summary shown in Table 29) for example Roadways A, B and C.

Table 28a. Truck directional and lane distribution factors from the region for Roadway A.

Factor	Distribution Factors			
	Roadway J	Roadway K	Roadway L	Ave. for Roadway A
Directional Distribution Factor	0.70	0.67	0.64	0.67
Lane Distribution Factor	0.55	0.57	0.63	0.58

Table 28b. Truck directional and lane distribution factors from the region for Roadway B.

Factor	Distribution Factors		
	Roadway M	Roadway N	Ave. for Roadway B
Directional Distribution Factor	0.55	0.51	0.53
Lane Distribution Factor	0.86	0.83	0.84

Table 28c. Truck directional and lane distribution factors from the region for Roadway C.

Factor	Distribution Factors		
	Roadway P	Roadway Q	Ave. for Roadway C
Directional Distribution Factor	0.52	0.55	0.54
Lane Distribution Factor	0.70	0.86	0.78

Table 29. Traffic characteristics for Example Problems.

Traffic Characteristic	Roadway A	Roadway B	Roadway C
AADT (vehicles per day)	19500	1300	13400
Percent Truck Factor (vehicles per day)	0.327	0.429	0.413
Directional Distribution Factor	0.67	0.55	0.52
Lane Distribution Factor	0.58	0.86	0.70
ADTT (vehicles per day)	2582	264	2014

STEP 2: Determination of Truck Distribution Spectra for the Base Year. The second step is the selection of the truck distribution spectra for the user-defined base year. Similar truck distribution spectra from the region/state (shown in Table 30 and Figure 58) are averaged to determine the representative truck distribution spectra for the example roadways. The representative truck distributions for Roadways A, B and C are shown in Table 31 and Figure 59.

Table 30a. Normalized truck distribution spectra from the region/state for Roadway A.

Roadway	Normalized Percentage of ADTT by Vehicle Class									
	4	5	6	7	8	9	10	11	12	13
J	1.7	26.6	5.2	0.6	9.3	54.9	0.5	1.1	0.1	0.1
K	1.2	26.1	4.0	1.3	6.6	57.0	1.2	2.3	0.3	0.1
L	2.1	29.6	2.8	0.8	7.3	52.6	0.9	3.7	0.1	0.2

Table 30b. Normalized truck distribution spectra from the region/state for Roadway B.

Roadway	Normalized Percentage of ADTT by Vehicle Class									
	4	5	6	7	8	9	10	11	12	13
M	4.5	22.4	7.6	2.0	8.3	47.6	3.0	0.8	1.3	2.5
N	3.0	16.4	3.6	2.6	8.9	59.2	2.1	2.4	0.2	1.7

Table 30c. Normalized truck distribution spectra from the region/state for Roadway C.

Roadway	Normalized Percentage of ADTT by Vehicle Class									
	4	5	6	7	8	9	10	11	12	13
P	2.0	13.9	3.9	0.6	7.5	69.3	1.1	1.3	0.1	0.2
Q	4.6	16.5	4.9	0.7	8.3	62.3	0.9	1.7	0.0	0.1

Table 31. Representative truck distribution spectrum for Roadways A, B and C.

Roadway	Normalized Percentage of ADTT by Vehicle Class									
	4	5	6	7	8	9	10	11	12	13
A	1.7	27.4	4.0	0.9	7.7	54.8	0.9	2.4	0.2	0.1
B	3.8	19.4	5.6	2.3	8.6	53.4	2.6	1.6	0.8	2.1
C	3.3	15.2	4.4	0.7	7.9	65.8	1.0	1.5	0.1	0.2

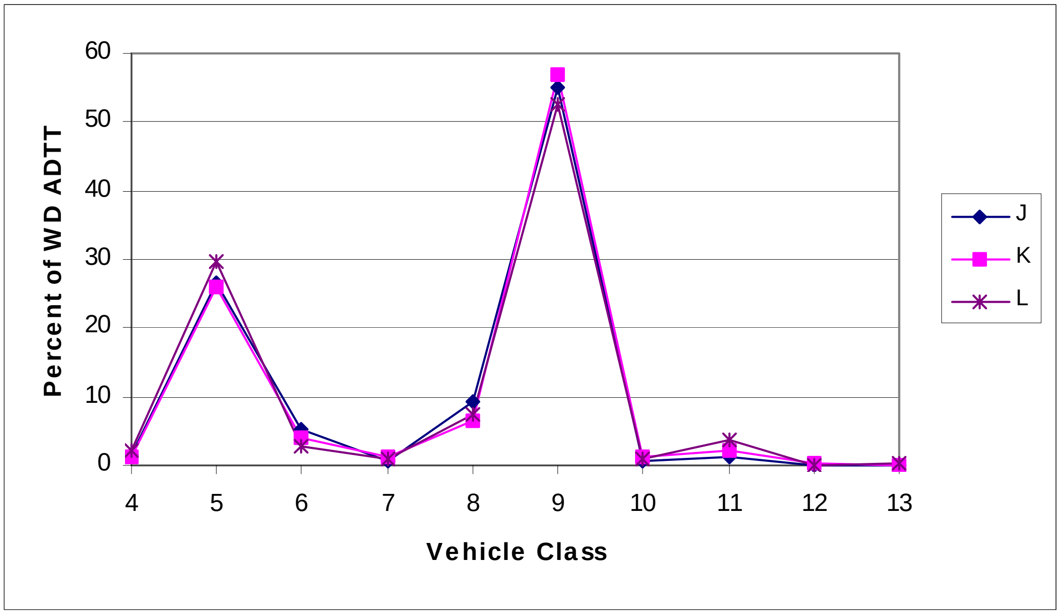

Figure 58a. Normalized truck distribution spectra for the region for Roadway A.

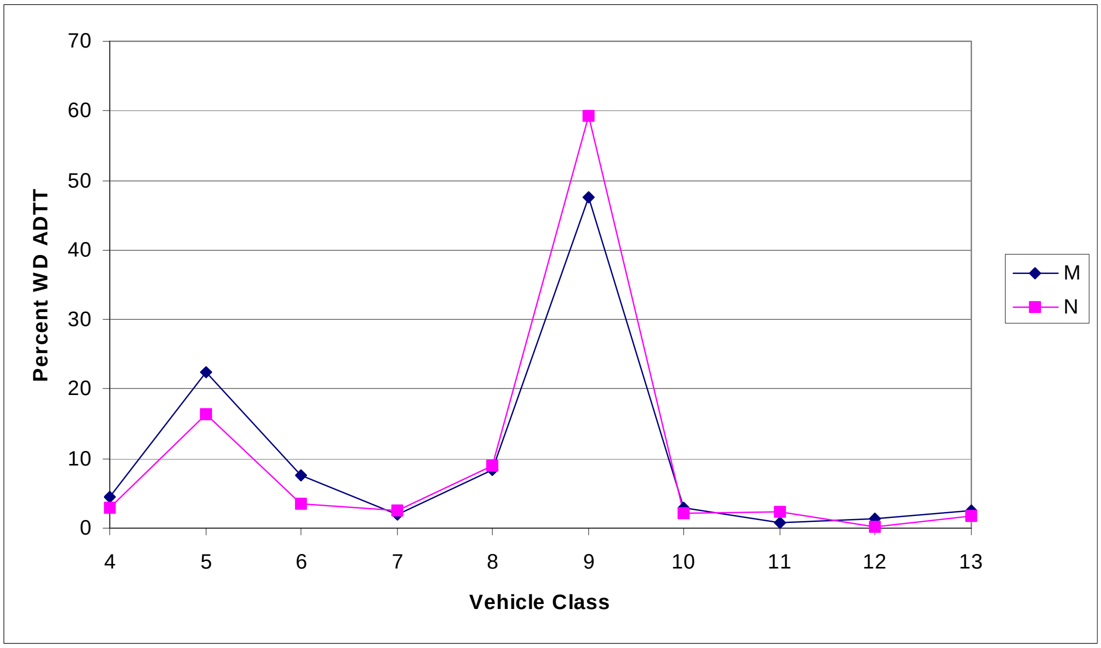

Figure 58b. Normalized truck distribution spectra for the region for Roadway B.

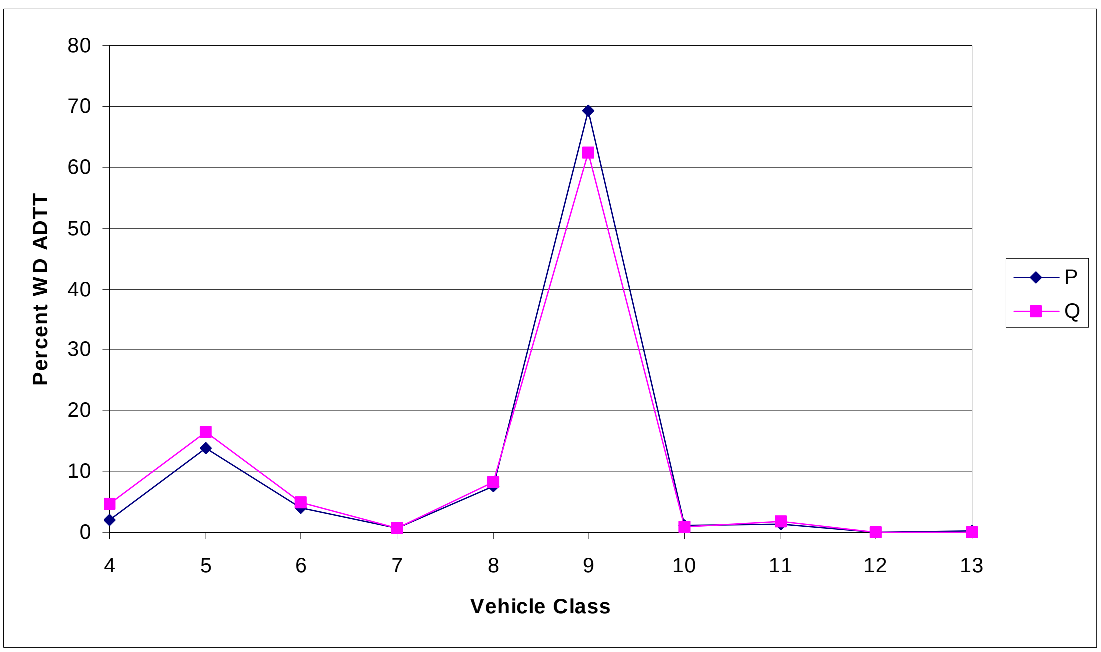

Figure 58c. Normalized truck distribution spectra for the region for Roadway C.

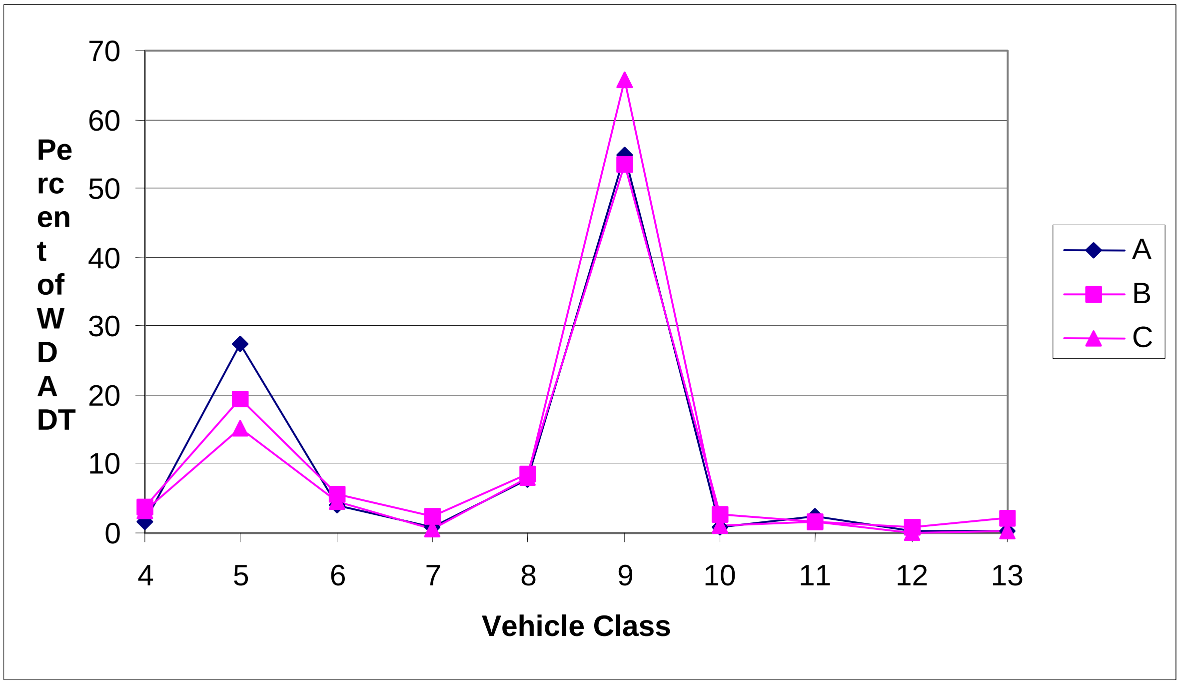

Figure 59. Representative truck distribution for the example problems.

<u>STEP 3: Determination of Seasonal (Monthly) Distribution Factors.</u> The weekday daily AVC data (produced from the Level 4 AVC data) is used to determine the seasonal distribution factor. Regional roadways with similar truck traffic distributions as well as their averages (used to represent the example roadways) are shown in Table 32. The seasonal distribution (monthly) factors for the three regions/states (Roadways A, B and C) are shown in Figure 60. The representative seasonal distribution factors for Roadways A, B and C are shown in Figure 61.

Table 32a. Seasonal (monthly) distribution factors from the region for Roadway A.

Month	Seasonal (Monthly) Distribution Factors			
	Roadway J	Roadway K	Roadway L	Ave. for Roadway A
January	0.91	1.35	0.96	1.07
February	1.20	1.20	0.92	1.11
March	0.99	1.21	1.05	1.08
April	0.84	1.41	1.19	1.15
May	0.82	0.59	1.18	0.86
June	0.62	0.70	0.87	0.73
July	0.72	0.78	0.86	0.79
August	0.58	0.29	1.01	0.63
September	0.76	0.48	1.08	0.77
October	2.23	1.24	0.99	1.49
November	1.35	1.39	1.02	1.25
December	0.98	1.36	0.86	1.07

Table 32b. Seasonal (monthly) distribution factors from the region for Roadway B.

Month	Seasonal (Monthly) Distribution Factors		
	Roadway M	Roadway N	Ave. for Roadway B
January	0.49	0.78	0.64
February	0.64	0.76	0.70
March	0.94	0.90	0.92
April	1.17	1.09	1.13
May	1.26	1.14	1.20
June	1.52	1.26	1.39
July	1.53	1.22	1.37
August	1.13	1.29	1.21
September	0.91	1.37	1.14
October	0.79	0.79	0.79
November	0.77	0.67	0.72
December	0.85	0.72	0.79

Table 32c. Seasonal (monthly) distribution factors from the region for Roadway C.

Month	Seasonal (Monthly) Distribution Factors		
	Roadway P	Roadway Q	Ave. for Roadway C
January	0.93	0.87	0.90
February	0.83	0.87	0.85
March	0.99	0.85	0.92
April	1.11	1.20	1.15
May	1.08	1.20	1.14
June	1.07	1.11	1.09
July	1.04	0.99	1.01
August	1.05	1.13	1.09
September	1.03	1.02	1.03
October	0.98	0.86	0.92
November	0.97	0.94	0.95
December	0.93	0.90	0.92

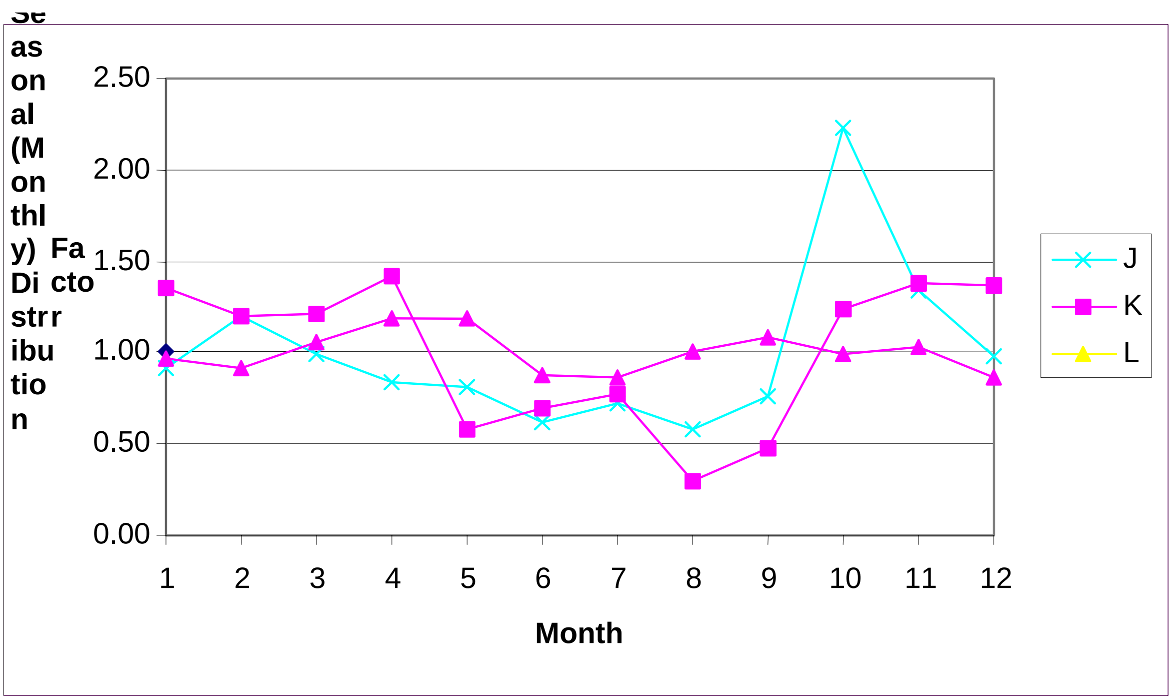

Figure 60a. Seasonal (monthly) distribution factors from the region for Roadway A.

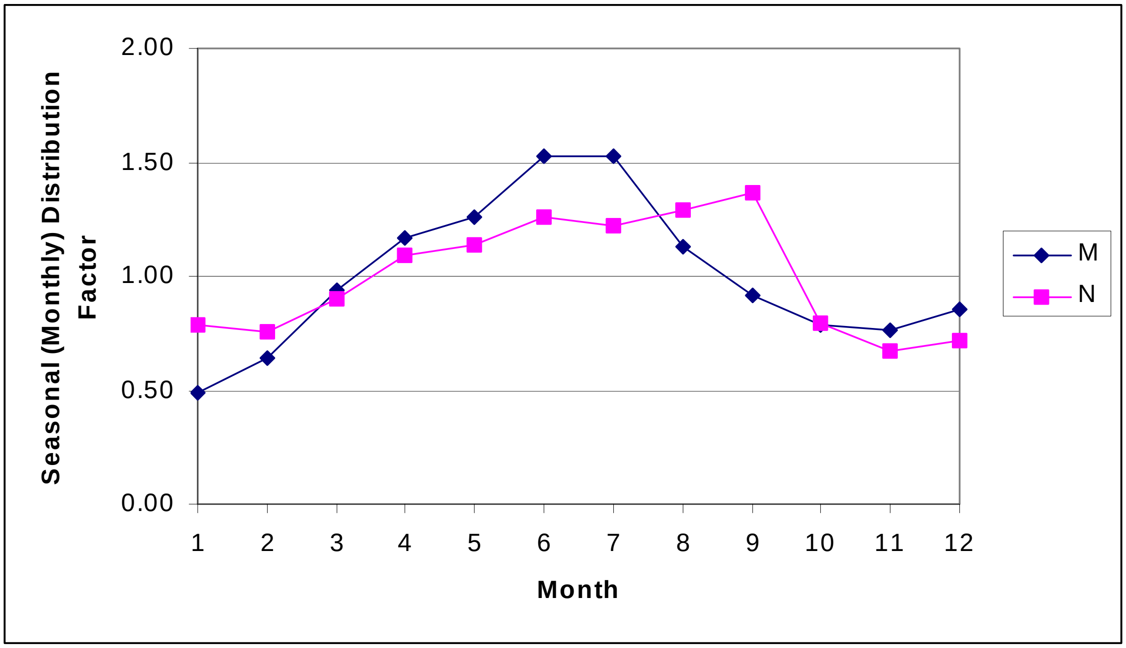

Figure 60b. Seasonal (monthly) distribution factors from the region for Roadway B.

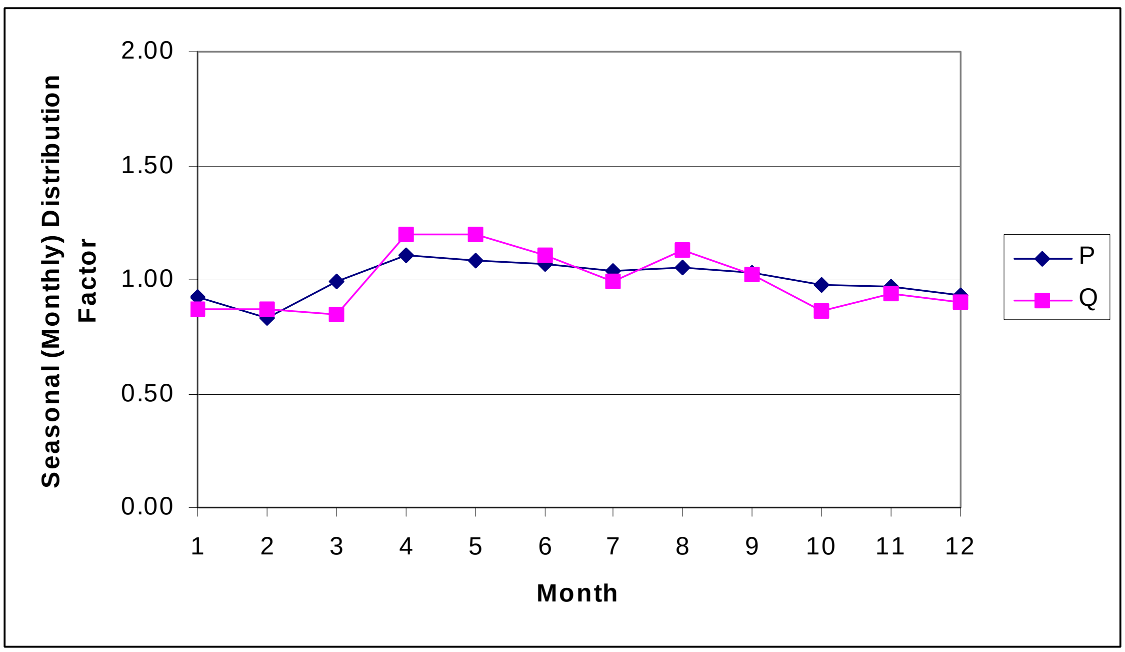

Figure 60c. Seasonal (monthly) distribution factors from the region for Roadway C.

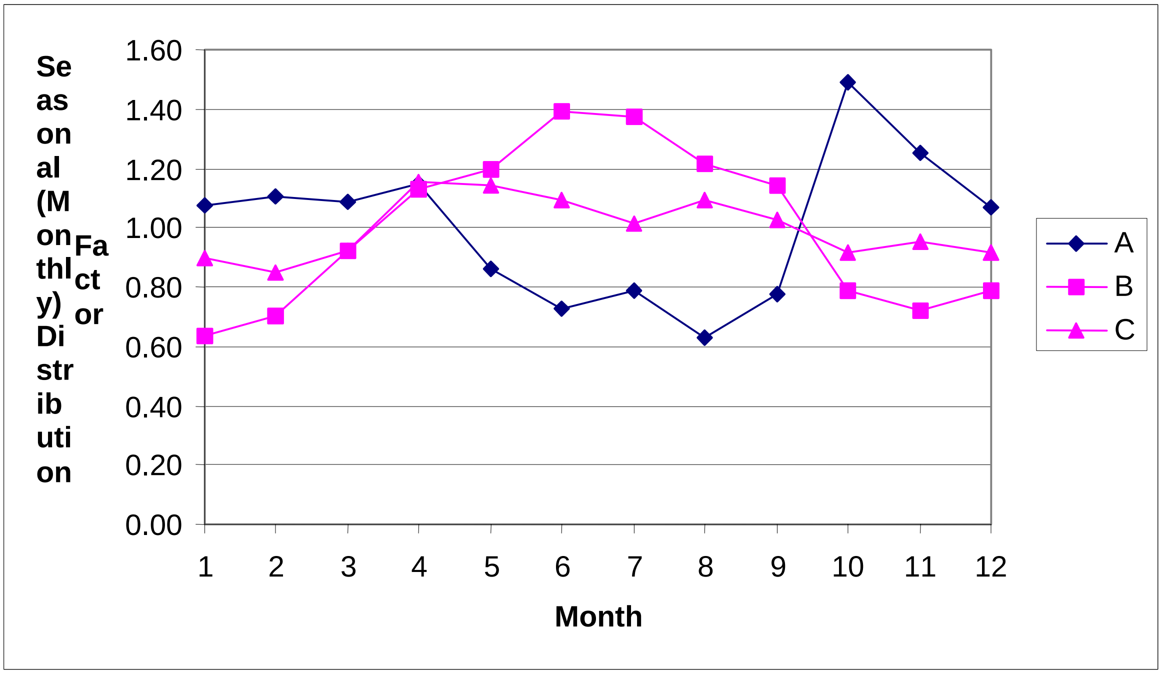

Figure 61. Representative region seasonal (monthly) distribution factors for the example problems.

STEP 4: Determination of Time of Day Distribution Factors. The weekday hourly data (a processed form of the Level 4 AVC data) is used to determine the time of day distribution factors. Each day is divided into five time periods. The time of day distribution factors in the design lane from roadways in the region/state and the their average (used as the regional/state factors) are shown in Table 33 for the three example Roadways.

Table 33a. Time of day distribution factors for Level 3 design for Roadways A

Time of Day	Time of Day Distribution Factors			
	Roadway J	Roadway K	Roadway L	Ave. for Roadway A
0000 – 0600	0.14	0.17	0.18	0.16
0600 – 1000	0.20	0.18	0.16	0.18
1000 – 1600	0.35	0.32	0.31	0.32
1600 – 2000	0.19	0.19	0.19	0.19
2000 – 0000	0.12	0.14	0.17	0.14

Table 33b. Time of day distribution factors for Level 3 design for Roadway B.

Time of Day	Time of Day Distribution Factors		
	Roadway M	Roadway N	Ave. for Roadway B
0000 – 0600	0.08	0.12	0.10
0600 – 1000	0.20	0.22	0.21
1000 – 1600	0.38	0.33	0.36
1600 – 2000	0.23	0.20	0.22
2000 – 0000	0.10	0.12	0.11

Table 33c. Time of day distribution factors for Level 3 design for Roadway C.

Time of Day	Time of Day Distribution Factors		
	Roadway P	Roadway Q	Ave. for Roadway C
0000 – 0600	0.12	0.12	0.12
0600 – 1000	0.18	0.23	0.21
1000 – 1600	0.35	0.32	0.34
1600 – 2000	0.22	0.20	0.21
2000 – 0000	0.13	0.13	0.13

Level 4 Inputs for the Example Problems

The Level 4 examples will be based on the three example roadways discussed in the first three levels. In Level 4, only AADT and percent truck information is required to determine the AADTT. Default factors applied to the AADTT to generate the necessary traffic input data.

<u>STEP 1: Determination of AADTT for the Base Year.</u> The first step in selecting the design inputs is the selection of the design lane ADTT for the user-defined base year. In the Level 4 examples, a base year of 1999 was selected.

<u>Roadway A:</u> In this example, an AADT of 19500 vehicles per day and a percent trucks factor of 0.35 are selected based on data available to the local agency. The default truck directional and lane distribution factors for a six-lane roadway are 0.55 and 0.6, respectively. Table 34 shows the AADT, traffic factors and calculated AADTT for example Roadway A.

<u>Roadway B:</u> In this example, an AADT of 1300 vehicles per day and a percent trucks factor of 0.45 are selected based on data available to the local agency. The default truck directional and lane distribution factors for a four-lane roadway

are 0.55 and 0.9, respectively. Table 34 shows the AADT, traffic factors and calculated AADTT for example Roadway B.

Roadway C: In this example, an AADT of 13400 vehicles per day and a percent trucks factor of 0.40 are selected based on data available to the local agency. The default truck directional and lane distribution factors for a six-lane roadway are 0.55 and 0.6, respectively. Table 34 shows the AADT, traffic factors and calculated AADTT for example Roadway C.

Table 34. Traffic characteristics used for Level 4 inputs for example problems.

Traffic Characteristic	Roadway A	Roadway B	Roadway C
AADT	19500	1300	13400
Percent Truck Factor	0.35	0.45	0.40
Directional Distribution Factor (default)	0.55	0.55	0.55
Lane Distribution Factor (default)	0.6	0.9	0.6
Calculated ADTT (based on default factors)	2252	290	1769

STEP 2: Determination of Truck Distribution Spectra for the Base Year. The second step is the selection of the truck distribution spectra for the user-defined base year. In Level 4, there is no data available on the vehicle or truck distribution spectra; therefore the user goes into the program to select one of the default truck distribution spectra.

Roadway A: In this example, the roadway is classified as a Functional Class 11. The user selects the Functional Class 11 option and is presented with a choice of truck distribution spectra from the TTCs. These were provided in tables 9 and 10 and in Appendix AA.3. Based on engineering judgment, the truck traffic distribution along the roadway is best described by TTC 4.

Roadway B: In this example, the roadway is classified as a Functional Class 2. The user selects the Functional Class 2 option and is presented with a choice of truck distribution spectra from the TTCs shown previously in Tables 9 and 10 and in Appendix AA.3. Based on engineering judgment, the truck traffic distribution along the roadway is best described by TTC 6.

Roadway C: In this example, the roadway is classified as a Functional Class 1. The user selects the Functional Class 1 option and is presented with a choice of truck distribution spectra from the TTCs. Based on engineering judgment, the truck traffic distribution along the roadway is best described by TTC 2.

STEP 3: Determination of Seasonal (Monthly) Distribution Factors. The use of seasonal distribution factors is discouraged for Level 4 because so little traffic data exists. Seasonal variations are site specific and meaningful default values could not be established for use in Level 4.

STEP 4: Determination of Time of Day Distribution Factors. Because there is insufficient traffic to determine time of day distribution factors, the default factors are recommended. These factors were shown in Table 6.

STEP 5: Determination of Axle Load Spectra. Because site specific or regional/state axle load spectra are unavailable for Level 4, the default axle load spectra is recommended. The set of default axle load spectra is shown in Appendix AA.7.

Program Execution and Output

A series of tables are included as the output files for each problem. These tables include the daily number of single, tandem and tridem axles for each load group for each year and season. The traffic module software was used to compute the total number of single, tandem and tridem axles within each load group for each time period from the base year. The output files are large, but were developed to support the incremental damage concept that forms the basis of the 2002 design guide.

For simplicity of comparison among the different levels of inputs, the average daily number of axles within each axle weight group was determined. Appendix AA.11 includes a tabular listing of the cumulative average daily number of axles for each axle type and axle weight group. The difference between each of the levels of input also is tabulated for Years 1, 5 and 10 (assuming that Level 1 is the correct value). As tabulated in Appendix AA.11, the difference between the four levels is highly variable. Table 35 provides an overall comparison summary of the differences in the truck traffic estimates between the different levels for Years 1, 5 and 10 for the three examples (Roadways A, B and C). For the load levels selected and included in Table 35, the differences between input Levels 1 and 2 and Levels 1 and 3 are about the same, while the difference between Levels 1 and 4 are much greater. These differences, however, are load group-dependent.

The AASHTO load equivalency factors were also used to calculate the number of 80kN Equivalent Single Axle Loads (ESALs) for each example problem to simplify the overall differences between the truck traffic estimates for each of the four levels. Table 36 tabulates the number of ESALs for each of the four input levels. As shown, input Levels 3 and 4 are almost equal for Roadway A and Levels 2, 3 and 4 are all greater than Level 1. On the other hand, Levels 2 and 3 are almost equal for Roadway C and Levels 2, 3 and 4 are all less than Level 1. Obviously, these differences between the truck traffic estimates determined for each input level will be site-specific. In order to evaluate the significance of these differences between the different input levels, the distress prediction models should be used to compare the distresses predicted with the truck traffic determined using each of the four input levels.

Table 35. Comparison of the differences among the levels of inputs for selected axle load groups using the average daily traffic.

Roadway /Example	Axle Type	Axle Load Group, lbs.	Year								
			1			5			10		
			Levels (L)			Level (L)			Levels (L)		
			L1 – L2	L1 – L3	L1 – L4	L1 – L2	L1 – L3	L1 – L4	L1 – L2	L1 – L3	L1 – L4
A	Single	10,000	-11	12	94	-13	14	109	-15	17	133
		11,000	-42	1	70	-49	1	82	-59	1	100
		12,000	-10	29	51	-11	33	59	-14	41	72
	Tandem	26,000	32	43	35	38	50	41	46	61	50
		30,000	33	48	44	39	56	52	47	68	63
		34,000	-12	-14	14	-14	-16	16	-17	-19	20
B	Single	10,000	3	2	-14	3	3	-16	4	3	-20
		11,000	1	1	-10	2	1	-12	2	2	-15
		12,000	10	8	10	11	10	12	14	12	14
	Tandem	20,000	11	10	17	13	12	20	15	14	24
		30,000	8	7	12	9	8	14	11	9	16
		34,000	-2	-3	-8	-3	-4	-10	-3	-4	-12
C	Single	10,000	-27	-22	14	-31	-26	16	-38	-32	20
		11,000	3	9	83	3	11	97	4	13	118
		12,000	7	12	100	9	14	117	11	17	142
	Tandem	20,000	-8	-5	-36	-9	-6	-42	-11	-7	-51
		32,000	54	59	63	63	69	74	77	83	90
		36,000	72	79	156	84	93	182	102	113	221

Table 36. Number of 80kN Equivalent Single Axle Loads computed (using the AASHTO load equivalency factors) for the first year for the four input levels for each example problem.

Example/ Roadway	Input Level			
	1	2	3	4
A	2,146	2,616	2,320	2,354
B	314	266	282	249
C	3,771	3,002	2,943	1,948

Note: The number of ESALs were computed for a structural number of 5.0 and a terminal serviceability index of 2.5. More importantly, only the single and tandem axle loads were used to calculate the ESALs. The tridem axle loads were excluded for the comparisons between the different input levels.

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1. Rauhut, J.B., R.L. Lytton, and M.I. Darter, “Pavement Damage Functions for Cost Allocation Volume 1, Damage Functions and Load Equivalence Factors,” Report No. FHWA/RD-84/018, Federal Highway Administration, June 1984.

2. Hajek, J.J., “General Axle Load Equivalency Factors,” Transportation Research Board Record No. 1482, TRB, National Research Council, Washington, D.C., 1995, pp 57-68.

3. ERES Consultants, Inc. “Development of LTPP Traffic Backcasting Procedure,” LTPP DATA – Work Order No. 12, Task 1 – Interim Report, March 1999.

4. “Traffic Monitoring Guide,” U.S. Department of Transportation, FHWA, Third Edition, February 1995.

5. “Long-Term Pavement Performance Traffic Monitoring Protocol: Revised Data Collection Plan for LTPP Test Sites,” February 27, 1998.

6. “Researcher’s Guide to the Long-Term Pavement Performance Data,” Science Application International Corporation et al, Federal Highway Administration, June 1997.

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DEVELOPMENT OF THE 2002 GUIDE FOR THE DESIGN OF NEW AND REHABILITATED PAVEMENT STRUCTURES

DETERMINATION OF TRAFFIC INFORMATION AND DATA FOR PAVEMENT STRUCTURAL DESIGN AND EVALUATION

Interim Report
Appendices

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Transportation Research Board
National Research Council

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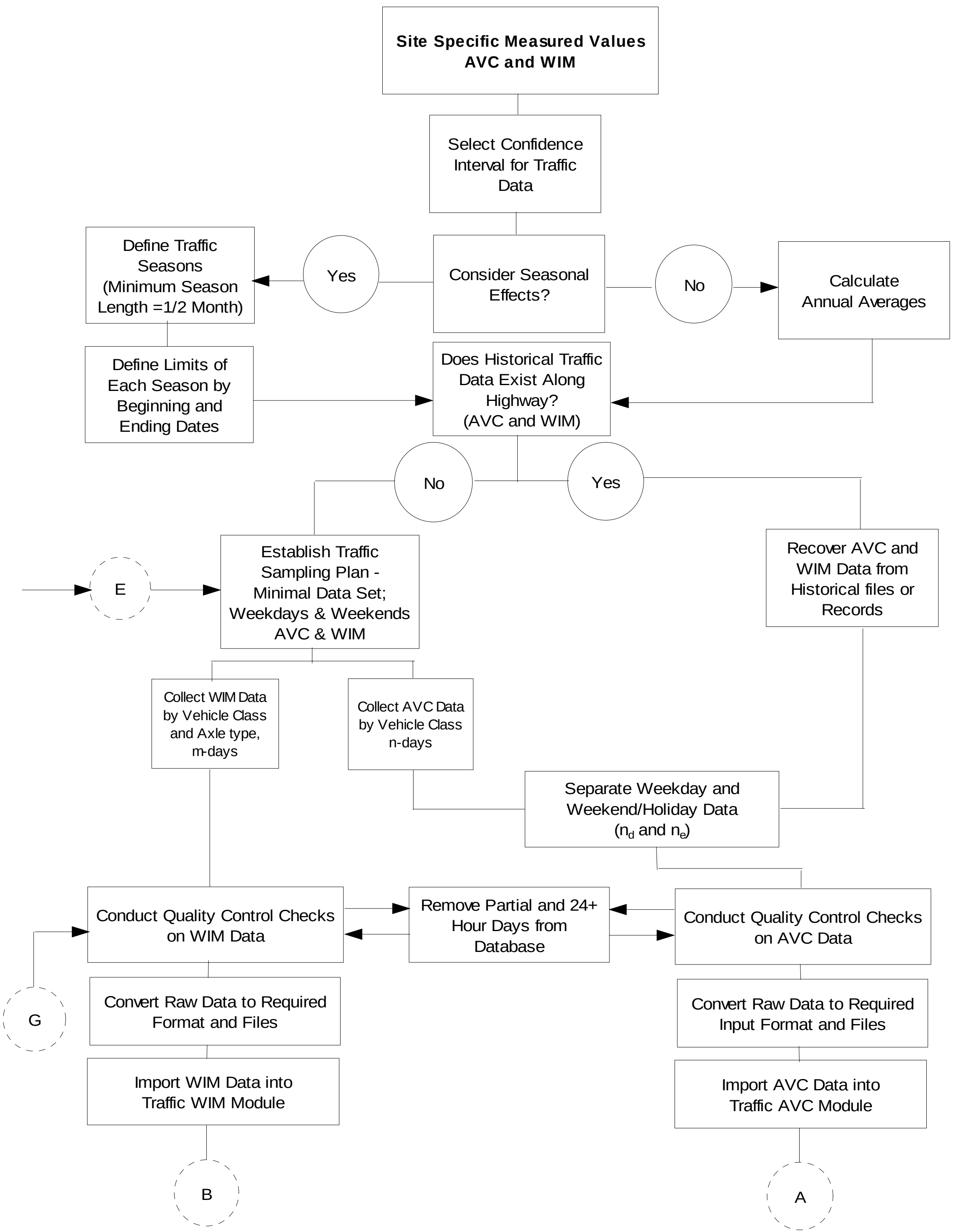
December 1999

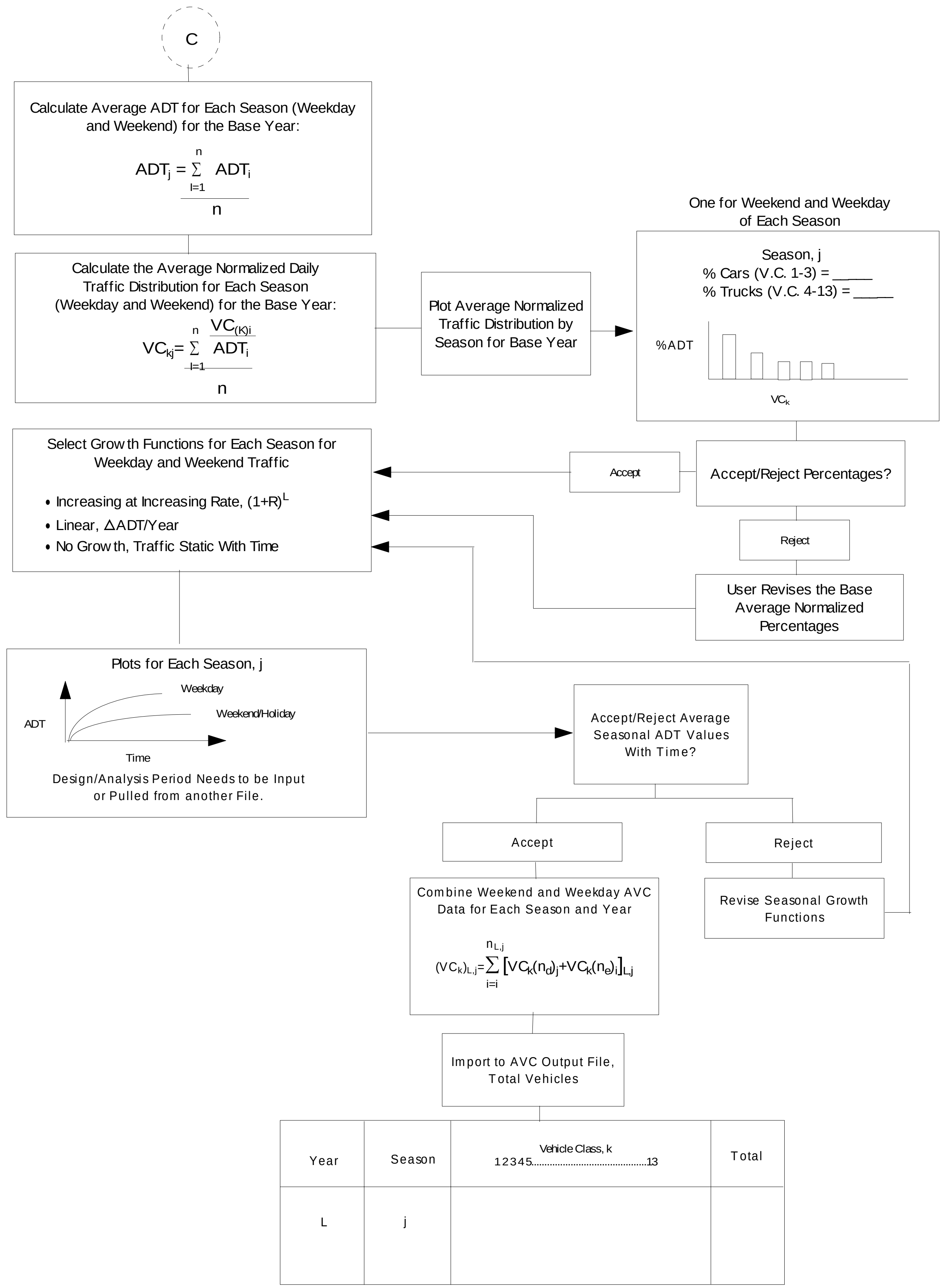
APPENDIX AA.1 – Flowchart Illustrating the Traffic Analyses

Appendix AA.1 includes the flowchart showing the different steps and details of the analyses conducted as well as decisions on data recovered from a core set of sites from the LTPP traffic database. This flowchart represents the initial operational and major decision functions, both external and internal to the software, for developing the traffic module.

FLOWCHART FOR THE TRAFFIC ANALYSES



A
Upload AVC Data
Initial Program QC Checks
Weekday, n_d
Weekend/Holidays, n_e
Combine All Years for Each Season When More than One Year
Combine All Years for Each Season When More than One Year
Season
Days
Vehicle Class, k
1 2 3 4 5 .... 13 or more
Total Vehicles
j
1
2
3
4
.
.
.
n_d
Actual Data - Number of Vehicles that were Measured
ADT_i
Season
Days
Vehicle Class, k
1 2 3 4 5 .... 13 or more
Total Vehicles
j
1
2
3
4
.
.
.
n_e
Actual Data - Number of Vehicles that were Measured
ADT_i
Go To E
Calculate Probable or Expected Error at Selected Confidence Interval for Each Vehicle Class, k
$\pm e(VC_k)_j,\% = \frac{Z\text{-Value}}{n_j^{1/2}}(COV,\%)_{k,j}$
Collect Additional Traffic Data
Is Expected Error Reasonable?
No
Yes
Decision of User Select Traffic Forecast Parameters
Forecast ADT or Traffic Volumes
(Assumes that the normalized traffic distribution does not change in the future.)
Forecast Individual Vehicle Classes (k)
(Assumes that the traffic distribution changes over time.)
C
D


C
Calculate Average ADT for Each Season (Weekday and Weekend) for the Base Year:
$$ADT_j = \frac{\sum_{I=1}^{n} ADT_i}{n}$$
Calculate the Average Normalized Daily Traffic Distribution for Each Season (Weekday and Weekend) for the Base Year:
$$VC_{kj} = \frac{\sum_{I=1}^{n} \frac{VC_{(K)i}}{ADT_i}}{n}$$
Plot Average Normalized Traffic Distribution by Season for Base Year
One for Weekend and Weekday of Each Season
Season, j
% Cars (V.C. 1-3) = _____
% Trucks (V.C. 4-13) = _____
%ADT
VC_k
Accept/Reject Percentages?
Accept
Reject
User Revises the Base Average Normalized Percentages
Select Growth Functions for Each Season for Weekday and Weekend Traffic
• Increasing at Increasing Rate, $(1+R)^L$
• Linear, ΔADT/Year
• No Growth, Traffic Static With Time
Plots for Each Season, j
Weekday
Weekend/Holiday
ADT
Time
Design/Analysis Period Needs to be Input or Pulled from another File.
Accept/Reject Average Seasonal ADT Values With Time?
Accept
Reject
Combine Weekend and Weekday AVC Data for Each Season and Year
$$(VC_k)_{L,j} = \sum_{i=i}^{n_{L,j}} [VC_k(n_d)_j + VC_k(n_e)_i]_{L,j}$$
Revise Seasonal Growth Functions
Import to AVC Output File, Total Vehicles
Year
Season
Vehicle Class, k
12345...13
Total
L
j

D

Calculate Average Daily Vehicles for Each Vehicle Class, k, in Each Season, j, for the Base Year (Weekday and Weekend)

$$VC_{k,j} = \sum_{i=i}^{n} VC_{k,i}$$

Select Growth Functions for Each Season and Vehicle Class for Weekday and Weekend Traffic

- Increasing at Increasing Rate, $(1+R)^L$
- Linear, ΔVC_k/Year
- No Growth, Traffic Static With Time

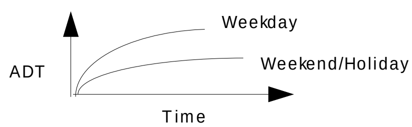
Revise Growth Functions

Calculate Average ADT for Each Season,j, and Year,L.

$$ADT_{j,L} = \sum_{k=i}^{13} (VC_k)_{j,i}$$

Reject

Plots for Each Season



Accept/Reject Seasonal ADT Values With Time

Accept

Combine Weekday and Weekend Vehicle Class Data for Each Season,j, and year,L.

$$(VC_k)_{L,j} = \sum_{i=1}^{n_{L,j}} \left[VC_k(n_d)_i + VC_k(n_e)_i\right]_{L,j}$$

Import to AVC Output File, Total Vehicles

Year	Season	Vehicle Class,k 1 2 3 4 5..13 Total
L	j	

Notes/Issues:

- Nightime versus daytime traffic distribution - input this percentage.
- Input vehicle class axle configuration.
- Input tire pressures and type.
- Lane distribution.
- Directional distribution.
- Wander-lateral distribution of wheel loads.

B

Upload WIM Data

Initial Program QC Checks

Axle Type for Each Vehicle Class
(See Attached table)
Axle Load Groups, Magnitude

Combine All Years for Each Season for More than One Year of Data

(Note: The number of seasons does not have to equal the number of seasons used for the AVC data, but the beginning/ending dates should correspond.)

Season	Vehicle Class	Days,i	Single Axle Load Groups $S1,S2...S_T$	Total Axles Single	Tandem Axle Load Groups $T1,T2,T_3...T_T$	Total Axles	Tridem Axle Load Groups $D1,D2...D_T$	Total Axles	Qaud Axle Load Groups $Q1,Q2...Q_T$	Total Axles
j	k	1 2 3 . . . m	See Table 1	S_{T1} S_{T2} . . . S_{Tm}	See Table 2	T_{T1} T_{T2} . . . T_{Tm}	See Table 3	D_{T1} D_{T2} . . . D_{Tm}	See Table 4	Q_{T1} Q_{T2} . . . Q_{Tm}

Calculate Percentage of Total Axles Weighed within Each Axle Type for Each Vehicle Class

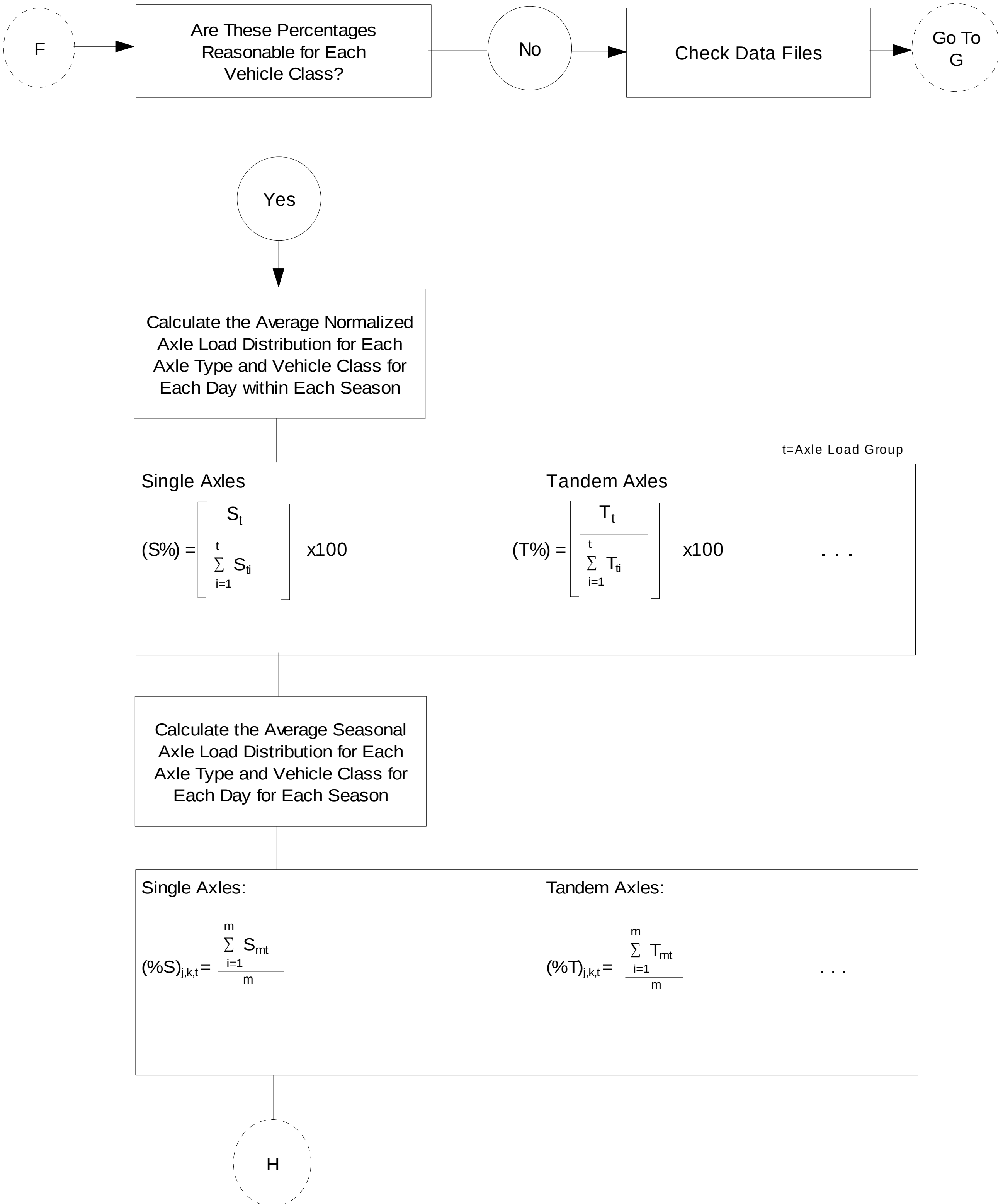
Single Axles:

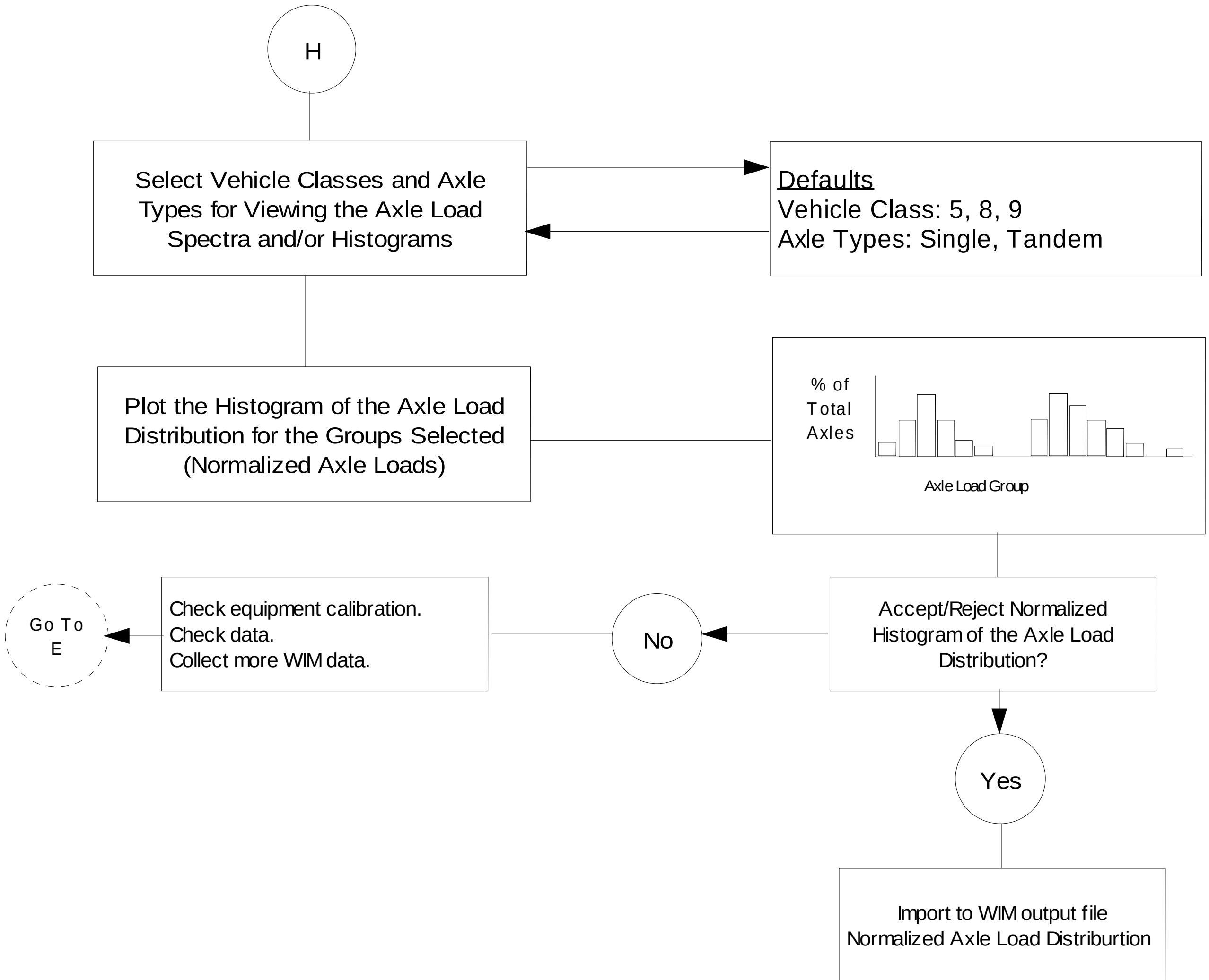
$$\%S_{j,k} = \frac{\sum_{i=1}^{m} S_i}{\sum_{i=1}^{m} (S_i+T_i+D_i+Q_i)}$$

Tandem Axles:

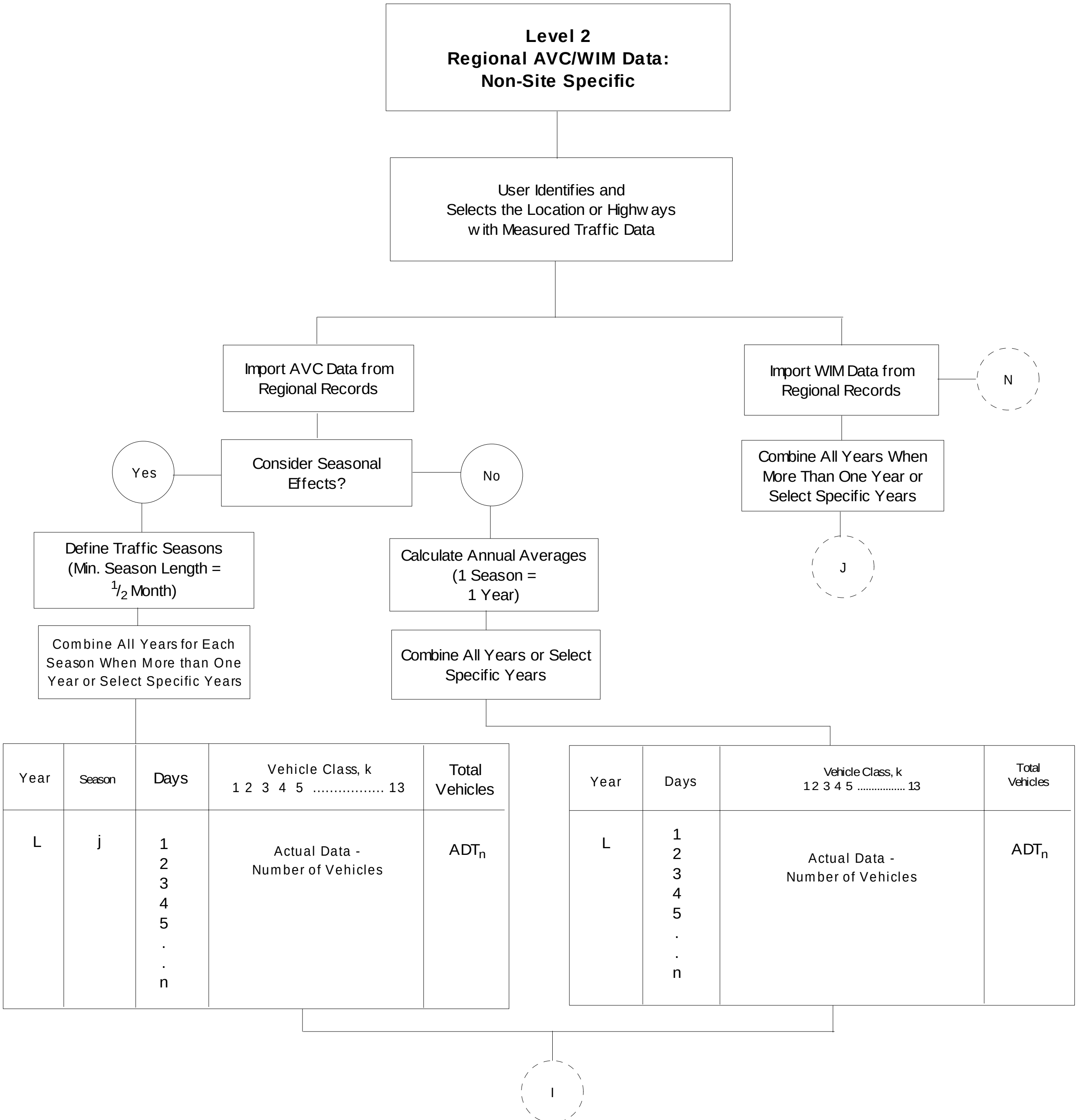
$$\%T_{j,k} = \sum_{i=1}^{m} \left(\frac{T}{S+T+D+Q}\right)_i$$

F

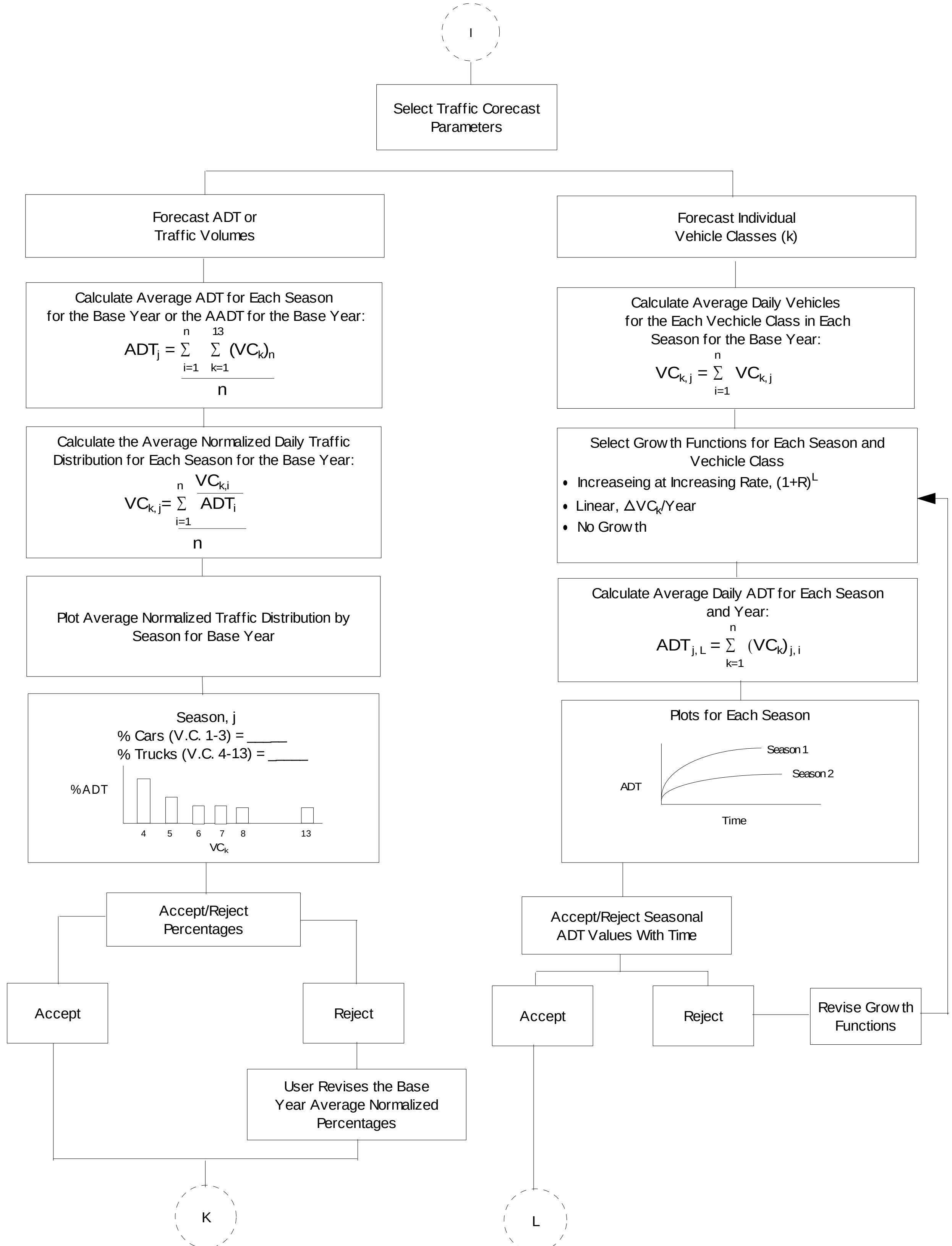

F
Are These Percentages Reasonable for Each Vehicle Class?
No
Check Data Files
Go To G
Yes
Calculate the Average Normalized Axle Load Distribution for Each Axle Type and Vehicle Class for Each Day within Each Season
t=Axle Load Group
Single Axles
$(S\%) = \left[\frac{S_t}{\sum_{i=1}^{t} S_{ti}} \right] x100$
Tandem Axles
$(T\%) = \left[\frac{T_t}{\sum_{i=1}^{t} T_{ti}} \right] x100$
. . .
Calculate the Average Seasonal Axle Load Distribution for Each Axle Type and Vehicle Class for Each Day for Each Season
Single Axles:
$(\%S)_{j,k,t} = \frac{\sum_{i=1}^{m} S_{mt}}{m}$
Tandem Axles:
$(\%T)_{j,k,t} = \frac{\sum_{i=1}^{m} T_{mt}}{m}$
. . .
H



Season	Vehicle Class	Single Axle Load Groups $S_1, S_2, S_3 \ldots S_T$	Tandem Axle Load Groups $T_1, T_2, T_3 \ldots T_T$	. . .
j	K			



Level 2
Regional AVC/WIM Data:
Non-Site Specific
User Identifies and
Selects the Location or Highw ays
w ith Measured Traffic Data
Import AVC Data from
Regional Records
Import WIM Data from
Regional Records
N
Consider Seasonal
Effects?
Yes
No
Combine All Years When
More Than One Year or
Select Specific Years
J
Define Traffic Seasons
(Min. Season Length =
1/2 Month)
Calculate Annual Averages
(1 Season =
1 Year)
Combine All Years for Each
Season When More than One
Year or Select Specific Years
Combine All Years or Select
Specific Years
Year
Season
Days
Vehicle Class, k
1 2 3 4 5 13
Total
Vehicles
L
j
1
2
3
4
5
.
.
n
Actual Data -
Number of Vehicles
ADTn
Year
Days
Vehicle Class, k
1 2 3 4 5 13
Total
Vehicles
L
1
2
3
4
5
.
.
n
Actual Data -
Number of Vehicles
ADTn
I



I
Select Traffic Corecast Parameters
Forecast ADT or Traffic Volumes
Forecast Individual Vehicle Classes (k)
Calculate Average ADT for Each Season for the Base Year or the AADT for the Base Year:
$ADT_j = \frac{\sum_{i=1}^{n} \sum_{k=1}^{13} (VC_k)_n}{n}$
Calculate Average Daily Vehicles for the Each Vechicle Class in Each Season for the Base Year:
$VC_{k,j} = \sum_{i=1}^{n} VC_{k,j}$
Calculate the Average Normalized Daily Traffic Distribution for Each Season for the Base Year:
$VC_{k,j} = \frac{\sum_{i=1}^{n} \frac{VC_{k,i}}{ADT_i}}{n}$
Select Growth Functions for Each Season and Vechicle Class
• Increaseing at Increasing Rate, $(1+R)^L$
• Linear, ΔVC_k/Year
• No Growth
Plot Average Normalized Traffic Distribution by Season for Base Year
Calculate Average Daily ADT for Each Season and Year:
$ADT_{j,L} = \sum_{k=1}^{n} (VC_k)_{j,i}$
Season, j
% Cars (V.C. 1-3) = _____
% Trucks (V.C. 4-13) = _____
%ADT
4
5
6
7
8
13
VC_k
Plots for Each Season
ADT
Season 1
Season 2
Time
Accept/Reject Percentages
Accept/Reject Seasonal ADT Values With Time
Accept
Reject
Accept
Reject
Revise Growth Functions
User Revises the Base Year Average Normalized Percentages
K
L

J

Year, L	Vehicle Class,k	Days,i	Single Axle Load Groups S1,S2...S_T	Total Axles Single	Tandem Axle Load Groups T1,T2...T_T	Total Axles	Tridem Axle Load Groups D1,D2...D_T	Total Axles	Qaud Axle Load Groups Q1,Q2...Q_T	Total Axles
L	k	1 2 3 . . . m	See Table 1	S_{T1} S_{T2} . . . S_{Tm}	See Table 2	T_{T1} T_{T2} . . . T_{Tm}	See Table 3	D_{T1} D_{T2} . . . D_{Tm}	See Table 4	Q_{T1} Q_{T2} . . . Q_{Tm}

Calculate Percentage of Total Axles Weighted Within Each Axle Type for Each Vehicle Class

Single Axles

$$\%S_k = \sum_{i=1}^{m} \left[\frac{S}{S+T+D+Q} \right]_i$$

Tandem Axles

$$\%T_k = \sum_{i=1}^{m} \left[\frac{T}{S+T+D+Q} \right]_i$$

. . .

Calculate the Averge Normalized Axle Load Distribution for Each Axle Type and Vehicle Class for Each Day

Single Axles

$$S(\%) = \left[\frac{S_t}{\sum_{i=1}^{t} S_{ti}} \right] \times 100$$

Tandem Axles

$$T(\%) = \left[\frac{T_t}{\sum_{i=1}^{t} T_{ti}} \right] \times 100$$

. . .

Calculate the Average Axle Load Distribution for Each Axle Type and Vehicle Class for Each Day

Single Axles

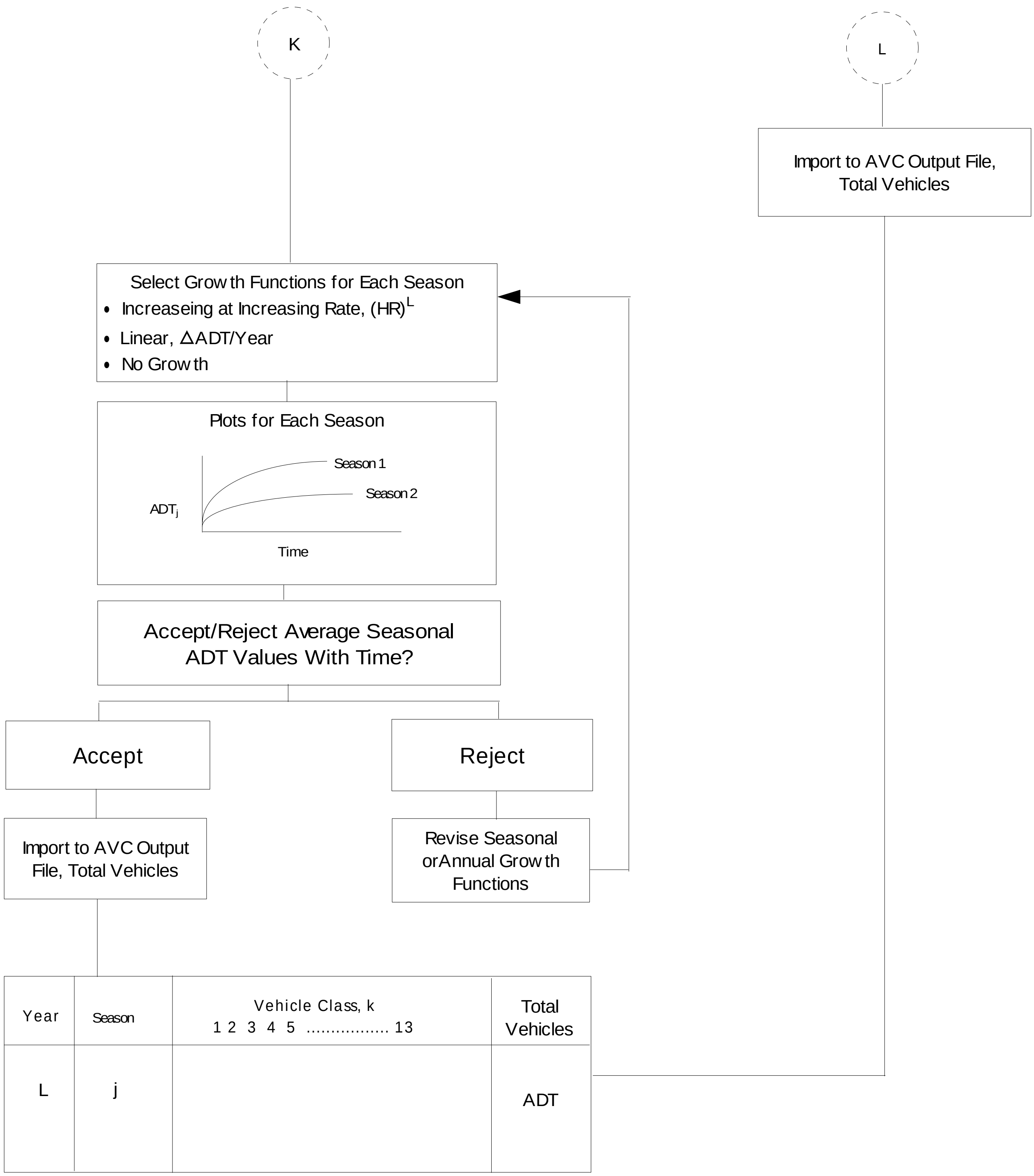
$$(\%S)_{k,t} = \frac{\sum_{i=1}^{m} S_{mt}}{m}$$

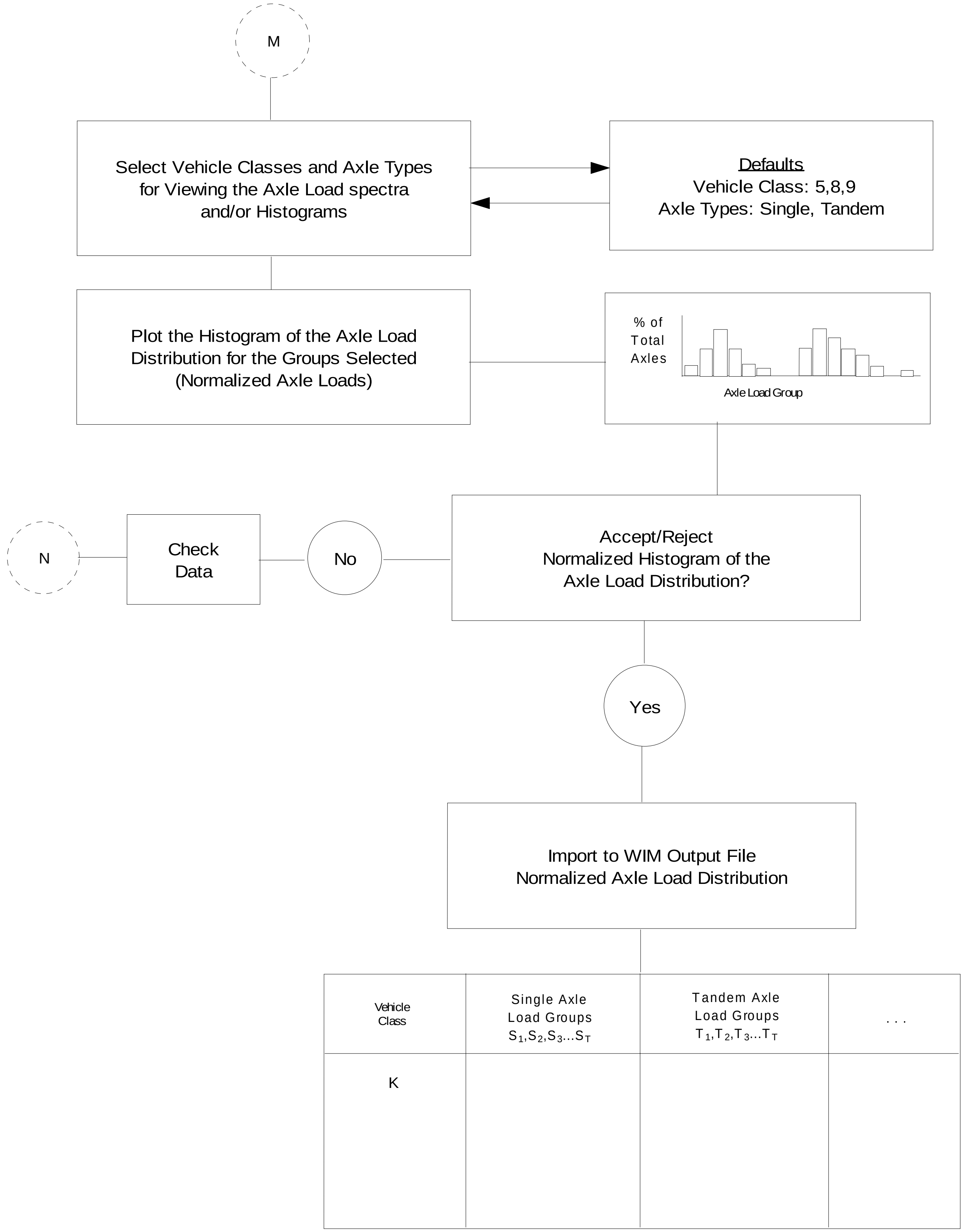
Tandem Axles

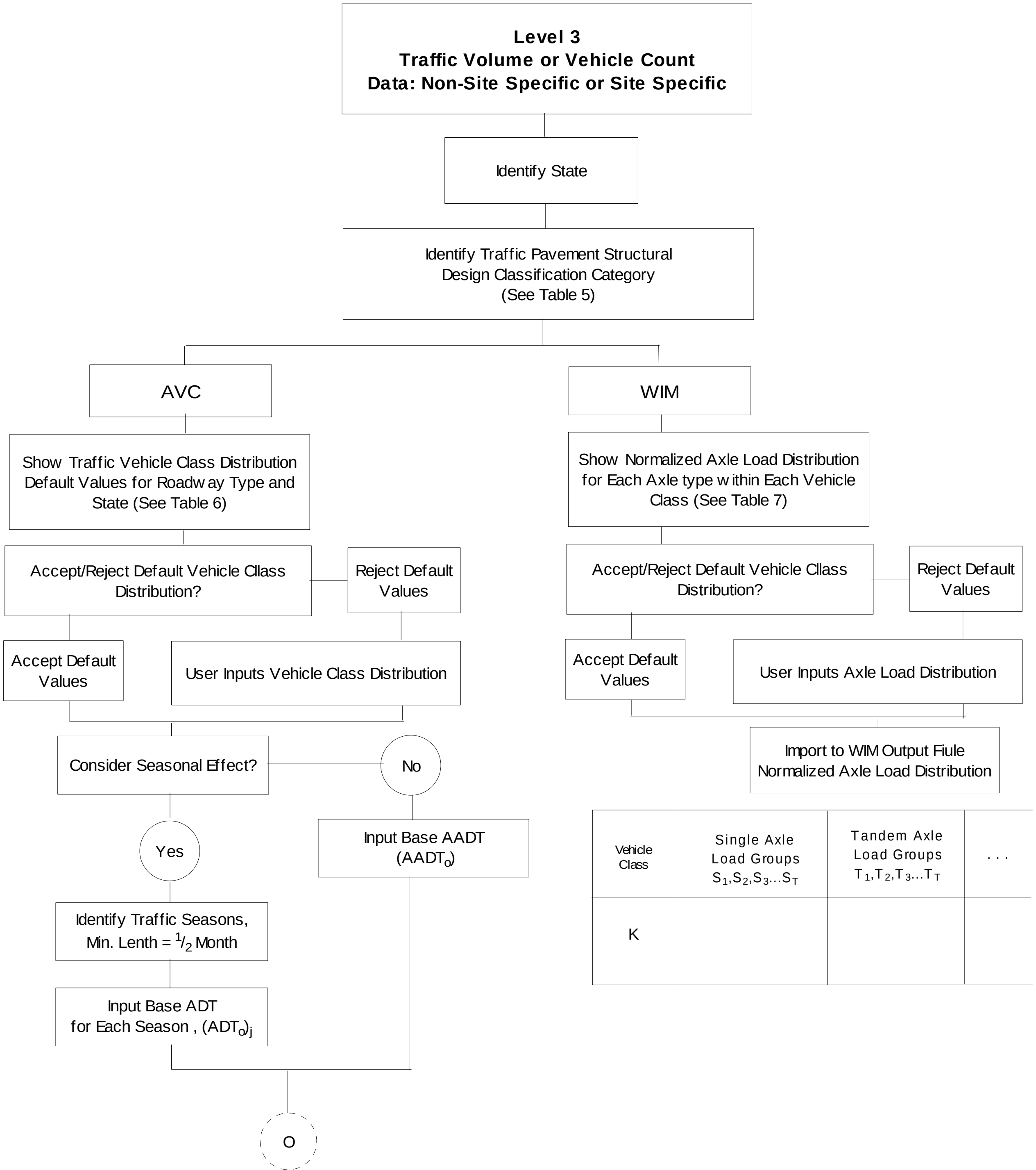
$$(\%T) = \frac{\sum_{i=1}^{m} T_{mt}}{m}$$

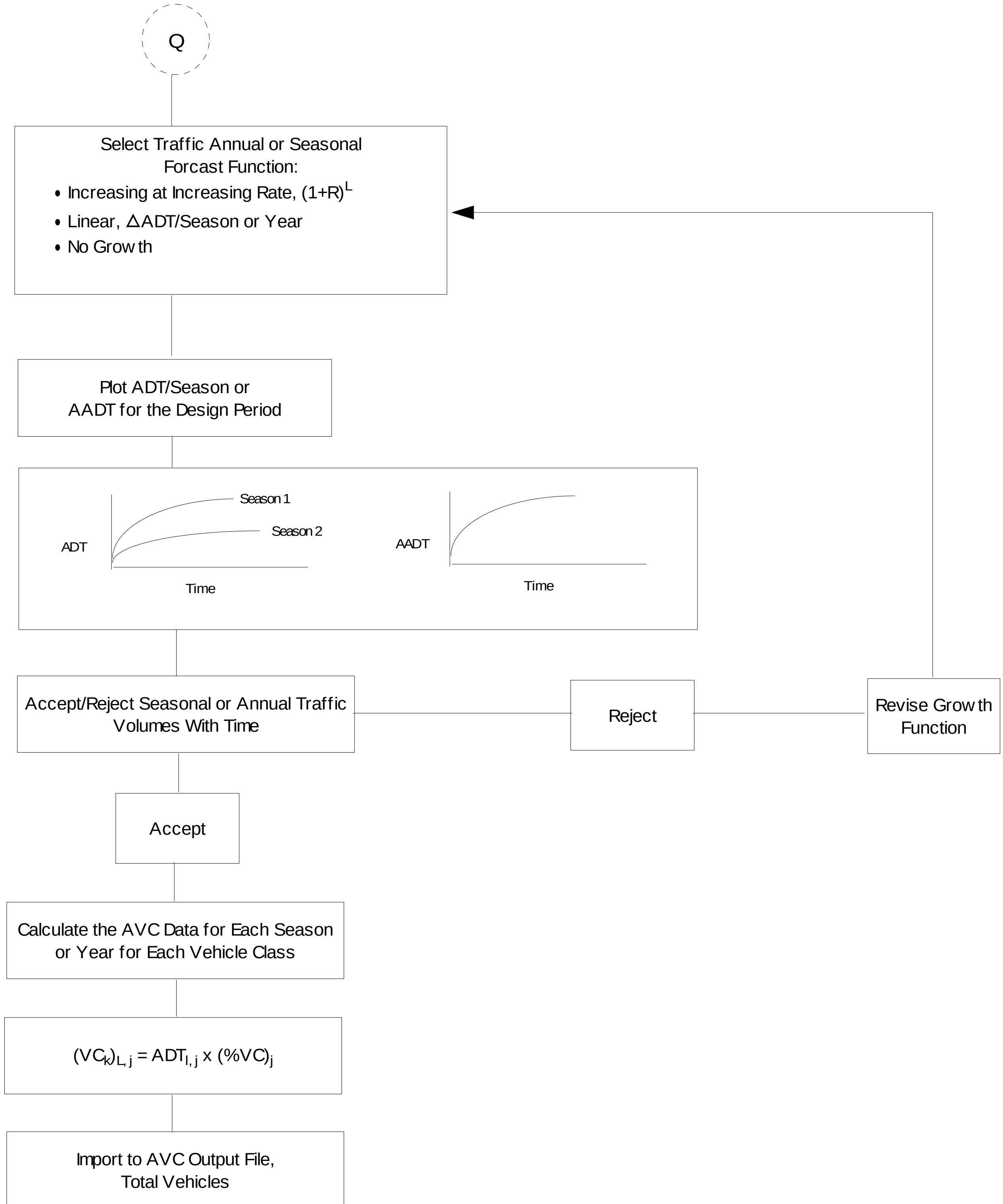
. . .

M

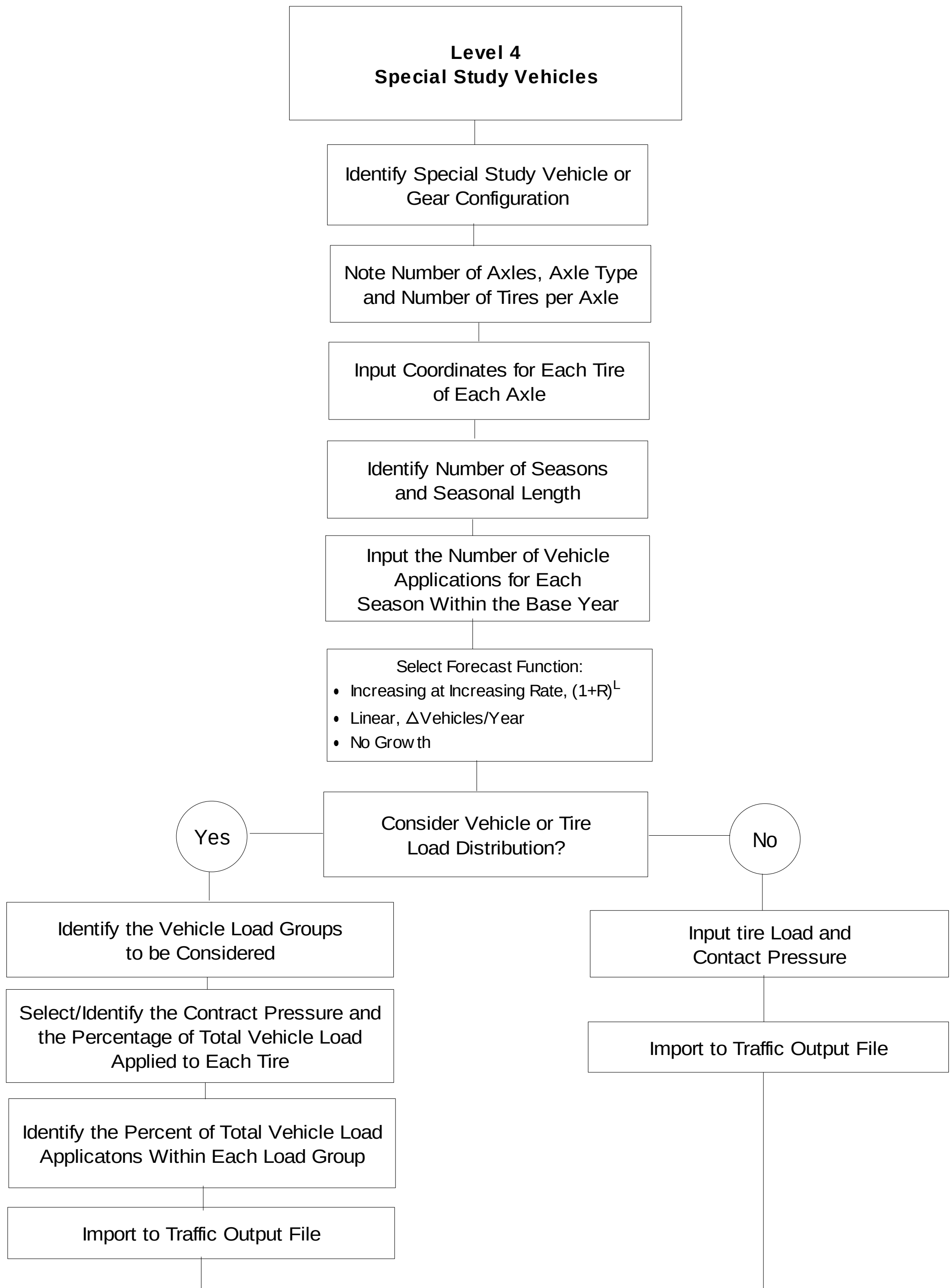

K
L
Import to AVC Output File, Total Vehicles
Select Growth Functions for Each Season
• Increaseing at Increasing Rate, (HR)L
• Linear, ΔADT/Year
• No Growth
Plots for Each Season
Season 1
Season 2
ADTj
Time
Accept/Reject Average Seasonal ADT Values With Time?
Accept
Reject
Import to AVC Output File, Total Vehicles
Revise Seasonal or Annual Growth Functions
Year
Season
Vehicle Class, k
1 2 3 4 5 13
Total Vehicles
L
j
ADT


M
Select Vehicle Classes and Axle Types for Viewing the Axle Load spectra and/or Histograms
Defaults
Vehicle Class: 5,8,9
Axle Types: Single, Tandem
Plot the Histogram of the Axle Load Distribution for the Groups Selected (Normalized Axle Loads)
% of Total Axles
Axle Load Group
N
Check Data
No
Accept/Reject Normalized Histogram of the Axle Load Distribution?
Yes
Import to WIM Output File Normalized Axle Load Distribution
Vehicle Class
Single Axle Load Groups $S_1, S_2, S_3 \ldots S_T$
Tandem Axle Load Groups $T_1, T_2, T_3 \ldots T_T$
. . .
K


Level 3
Traffic Volume or Vehicle Count
Data: Non-Site Specific or Site Specific
Identify State
Identify Traffic Pavement Structural
Design Classification Category
(See Table 5)
AVC
Show Traffic Vehicle Class Distribution
Default Values for Roadw ay Type and
State (See Table 6)
Accept/Reject Default Vehicle Cllass
Distribution?
Reject Default
Values
Accept Default
Values
User Inputs Vehicle Class Distribution
Consider Seasonal Effect?
No
Input Base AADT
(AADTo)
Yes
Identify Traffic Seasons,
Min. Lenth = 1/2 Month
Input Base ADT
for Each Season , (ADTo)j
O
WIM
Show Normalized Axle Load Distribution
for Each Axle type w ithin Each Vehicle
Class (See Table 7)
Accept/Reject Default Vehicle Cllass
Distribution?
Reject Default
Values
Accept Default
Values
User Inputs Axle Load Distribution
Import to WIM Output Fiule
Normalized Axle Load Distribution
Vehicle
Class
Single Axle
Load Groups
S1,S2,S3...ST
Tandem Axle
Load Groups
T1,T2,T3...TT
. . .
K



Year	Season	Vehicle Class, k 1 2 3 4 5 13	Total Vehicles
L	j		



Total Vehicle Load	Axle Type	Load Per Tire	Contact Pressure	Year	Number of Applications

APPENDIX AA.2 – Normalized Truck Class Distribution

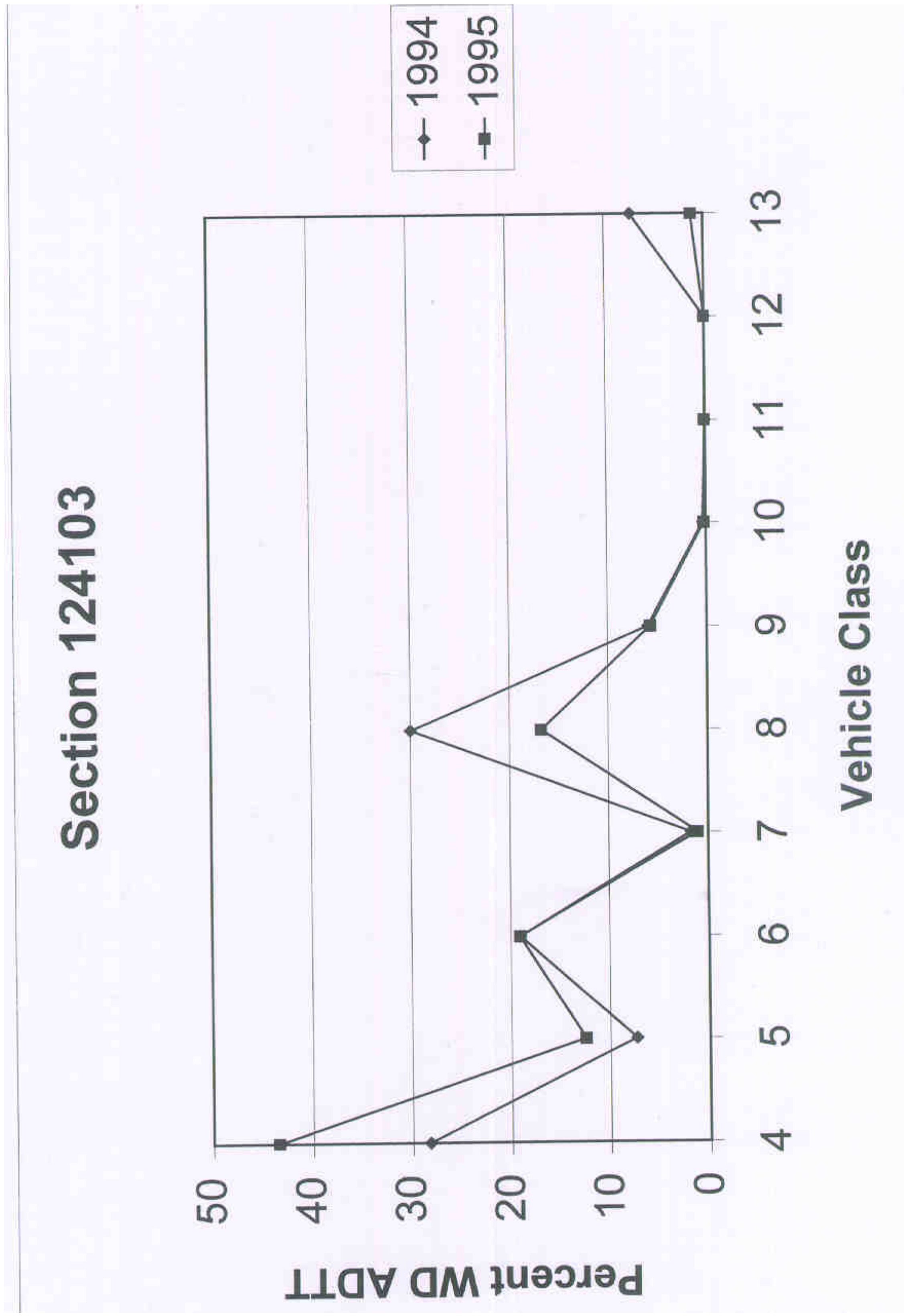
Appendix AA.2 is a summary of the vehicle/truck class distributions (or spectra) for selected sites recovered from the LTPP traffic database. Included are three different sets of information that were used for developing the default values for the Level 4 inputs for the normalized truck traffic distributions. The first and second sets are graphical summaries of the normalized truck traffic distribution versus time at a few selected sites. These graphical summaries show the change in the normalized truck traffic distributions by year and by season (or month) on a site-specific basis. The third set of information is a tabulation of the mean, variance and coefficient of variation of the normalized truck traffic distribution for each site. All days sampled at each site were combined to determine the means and other statistics.

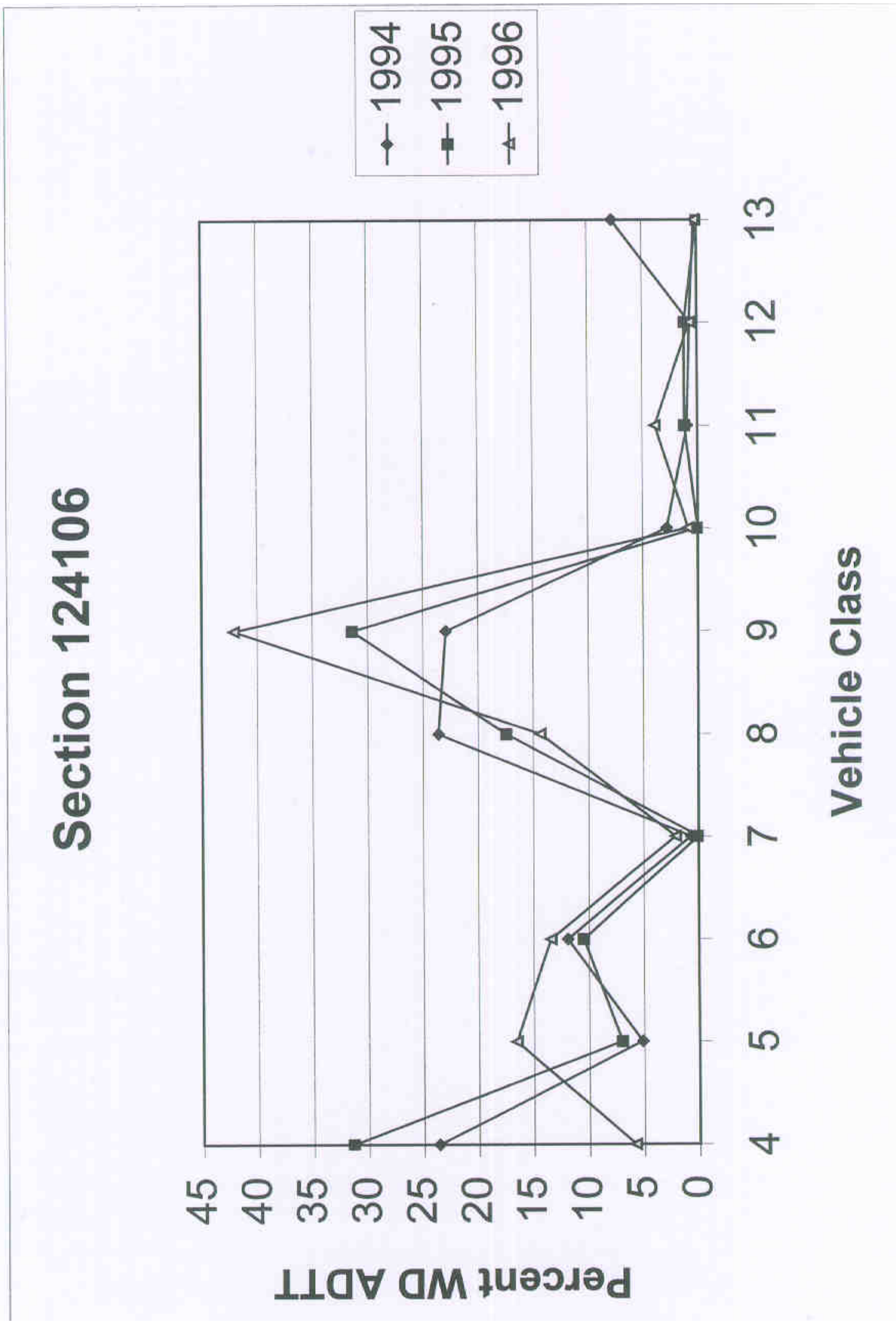
The annual normalized truck traffic distributions are shown first. Nearly all of the LTPP sites included in the core set of sites have between two and five years of traffic data, with most of the sites containing two or three years of data. This represents a relatively short time period in the life of the pavement structures. As shown, however, the annual normalized truck traffic spectra do not change over time for most of the sites (e.g., LTPP sites 274037, 283099 and 515010). There are some sites where these normalized truck traffic spectra do change from year to year, but for nearly all of those sites there is no consistent change from year to year. In other words, this represents more of a random variation than a variation due to changing truck site conditions.

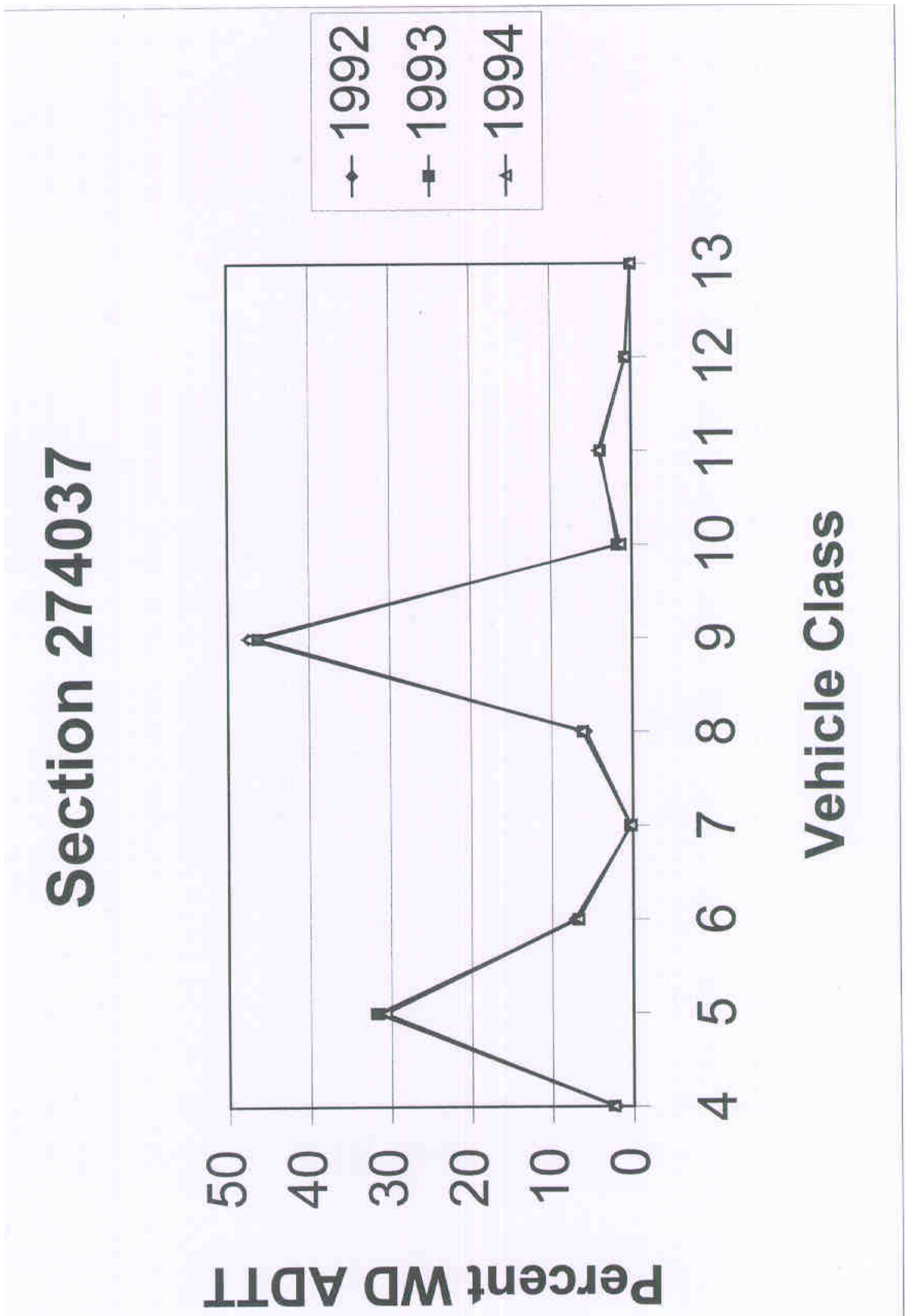
The monthly normalized and AADTT truck traffic distributions follow the annual distributions. For the majority of the LTPP sites included in the core set, there is no significant difference in the monthly distributions (e.g., LTPP sites 274037, 283099, 344942 and 395010). For some of the other LTPP sites, there are significant differences in the monthly distributions (e.g., LTPP sites 14103, 511417 and 851801). However, these monthly changes in the distribution were found to be site specific. As a result, all data at a site was combined into one set for developing the default normalized truck traffic distributions.

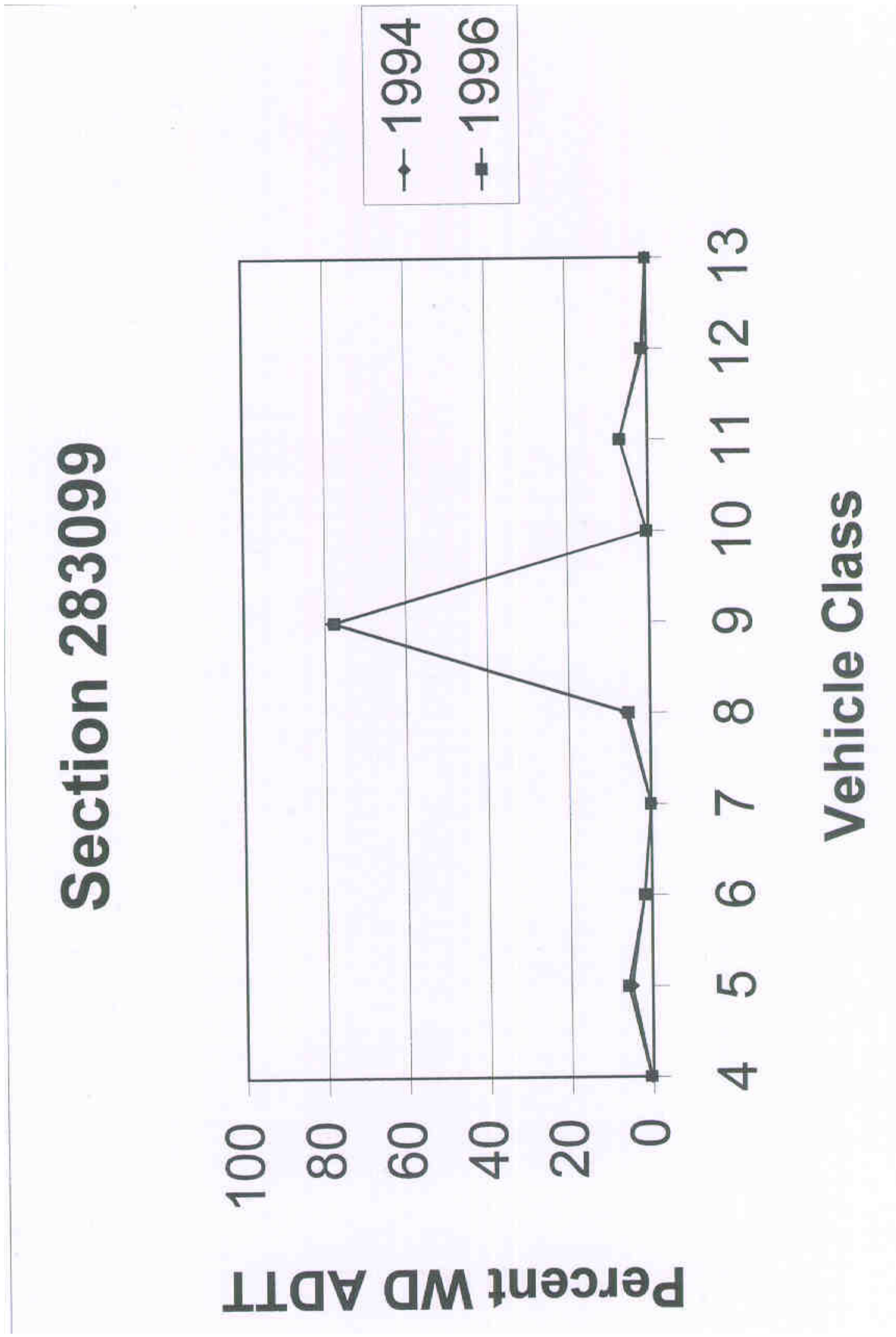
The means and other statistical values for the average normalized truck traffic distributions for each site follow the monthly variations. The following summarizes the information included in this appendix:

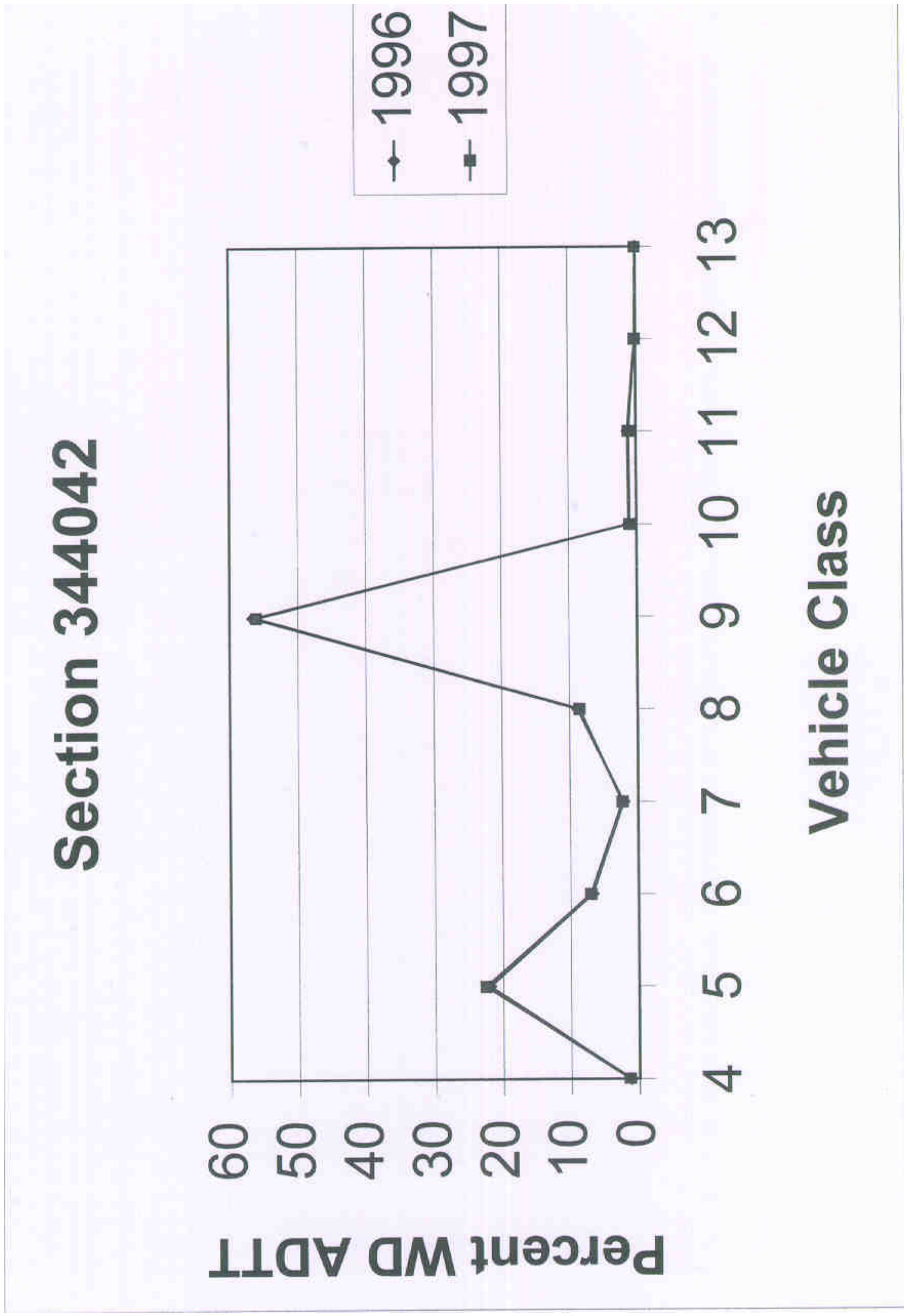
- Examples of the yearly/annual normalized truck traffic spectra (pages AA.2-2 thru AA.2-12)
- Examples of the monthly normalized truck traffic spectra (pages AA.2-13 thru AA.2-36)
- Percent of ADTT—Normalized means at selected sites (pages AA.2-37 thru AA.2-40)
- Percent of ADTT—Normalized variance at selected sites (pages AA.2-41 thru AA.2-44)
- Percent of ADTT—Normalized coefficient of variations at selected sites (pages AA.2-45 thru AA.2-48)

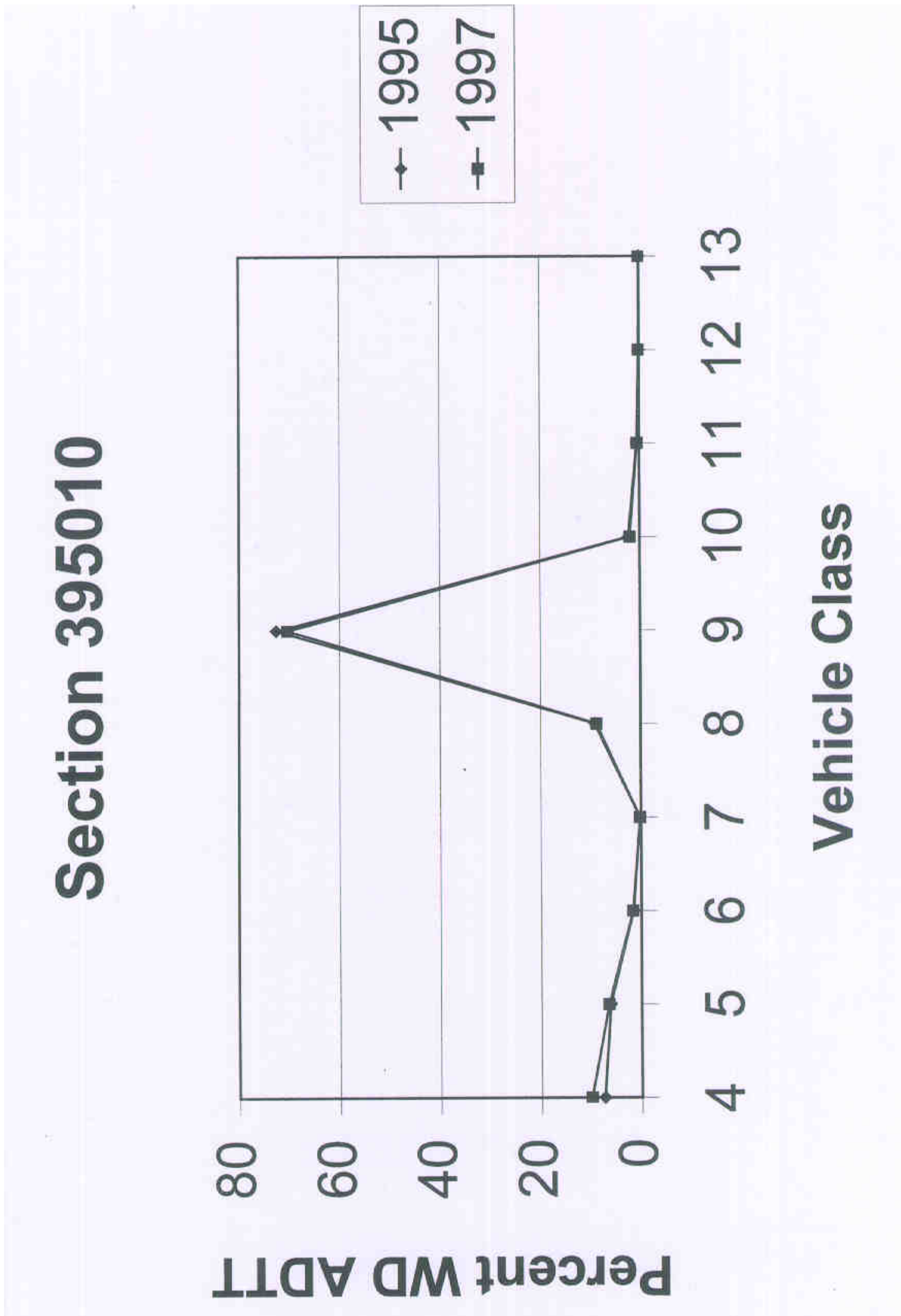

Section 1241103
Percent WD ADTT
Vehicle Class
1994
1995
0
10
20
30
40
50
4
5
6
7
8
9
10
11
12
13

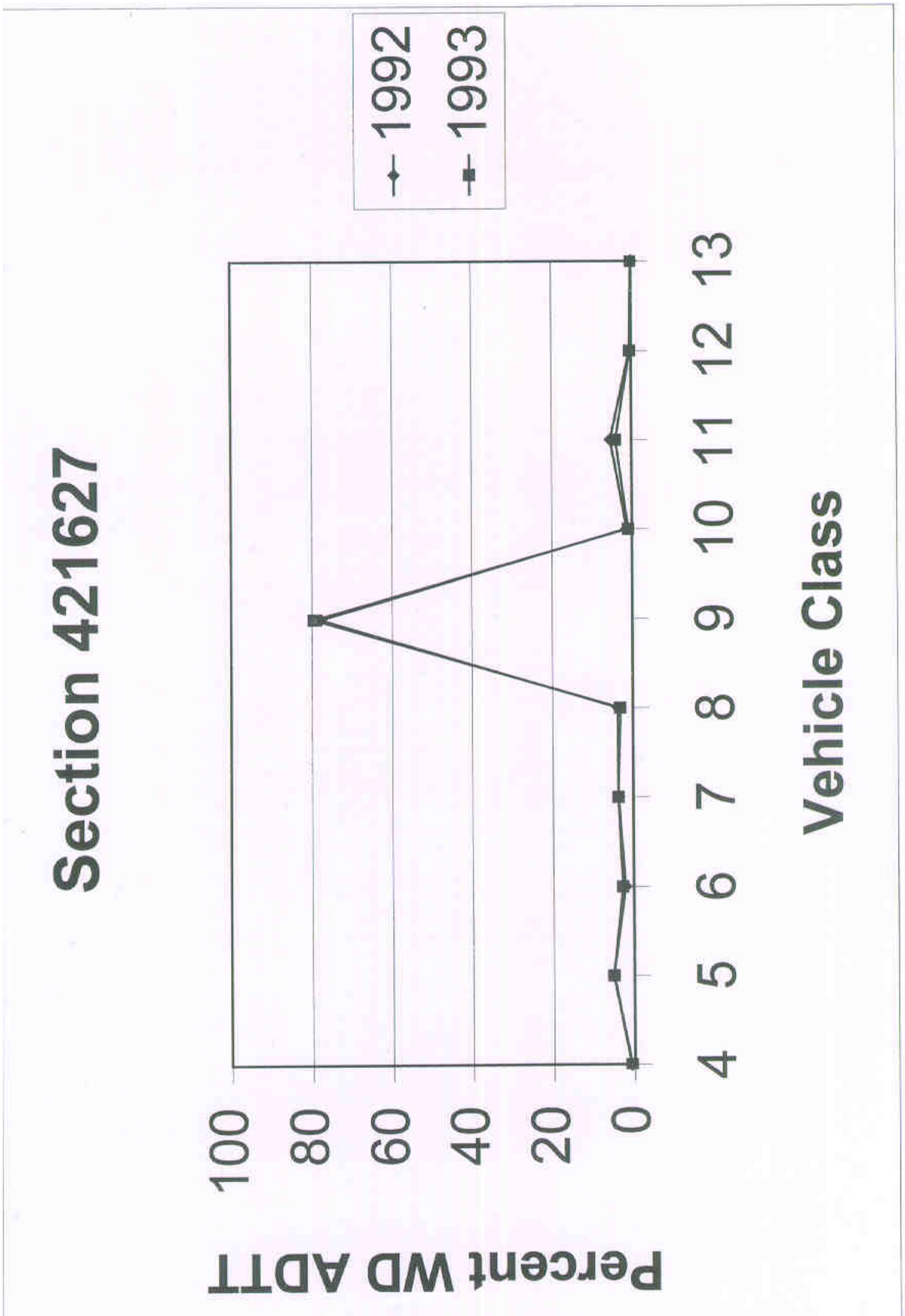

Section 1241106
Percent WD ADTT
Vehicle Class
45
40
35
30
25
20
15
10
5
0
4
5
6
7
8
9
10
11
12
13
1994
1995
1996

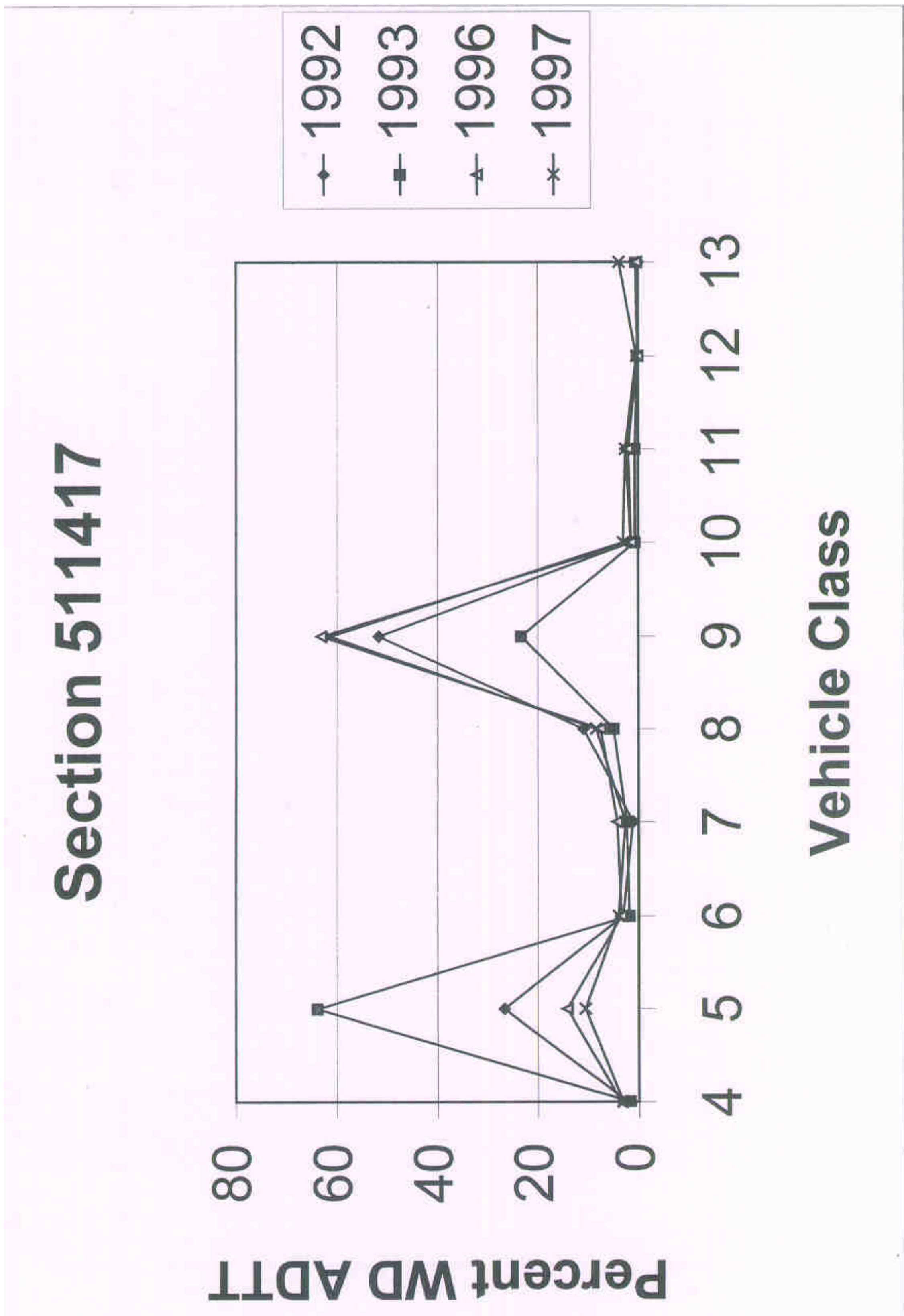

Section 274037
Percent WD ADTT
Vehicle Class
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
1992
1993
1994


Section 283099
Percent WD ADTT
100
80
60
40
20
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1994
1996

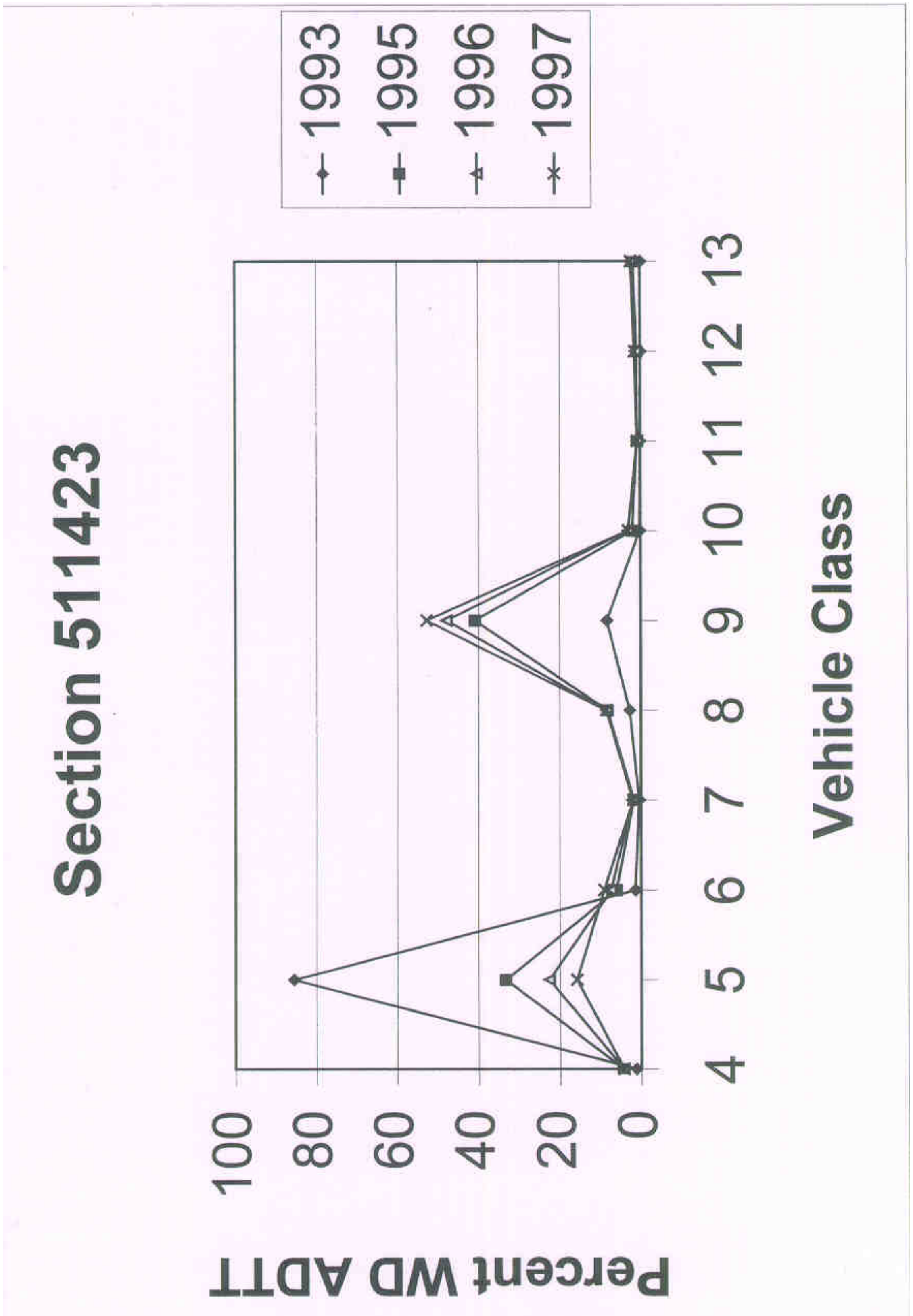

Section 3444042
Percent WD ADTT
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1996
1997

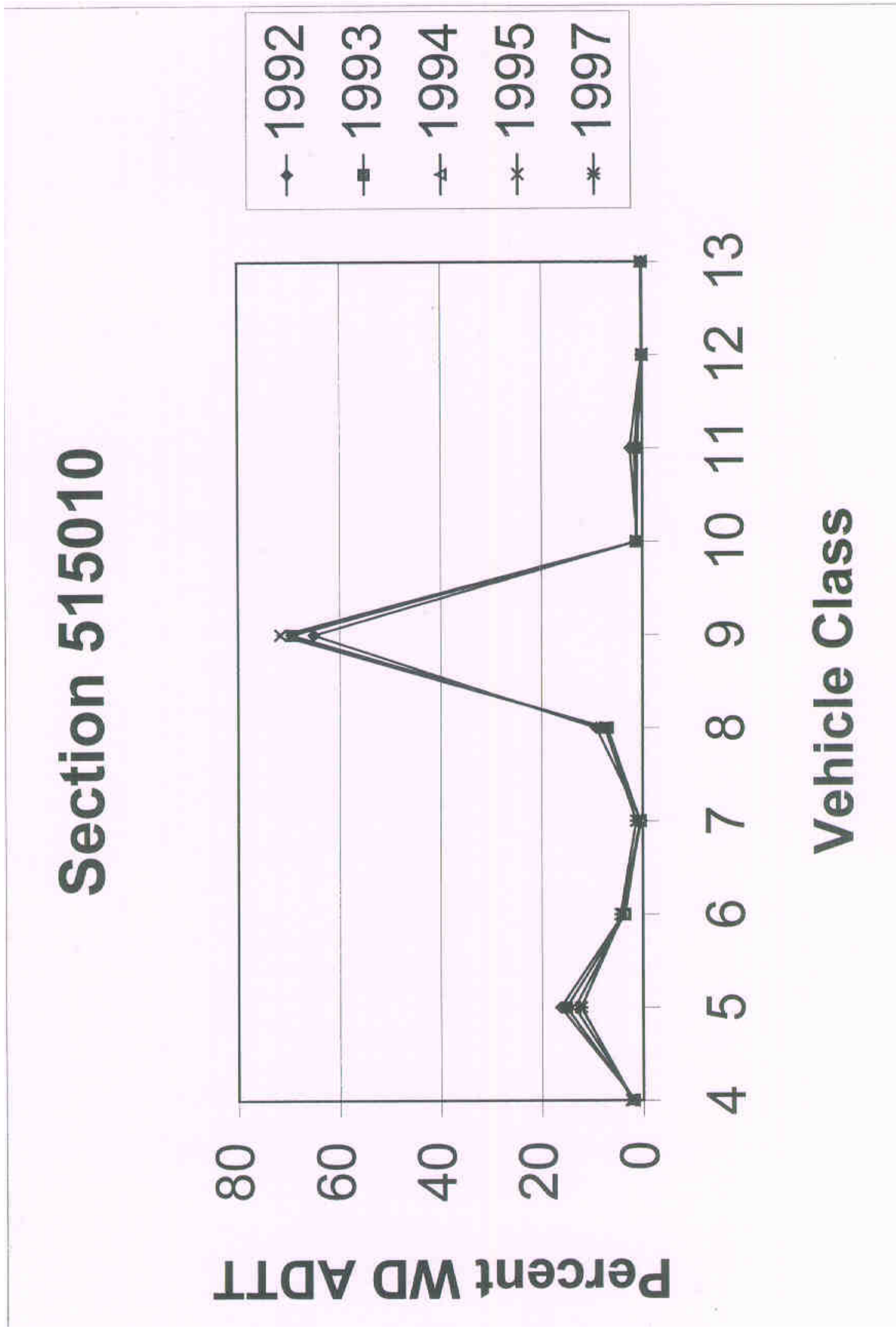

Section 395010
Percent WD ADTT
80
60
40
20
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1995
1997


Section 421627
Percent WD ADTT
0
20
40
60
80
100
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1992
1993

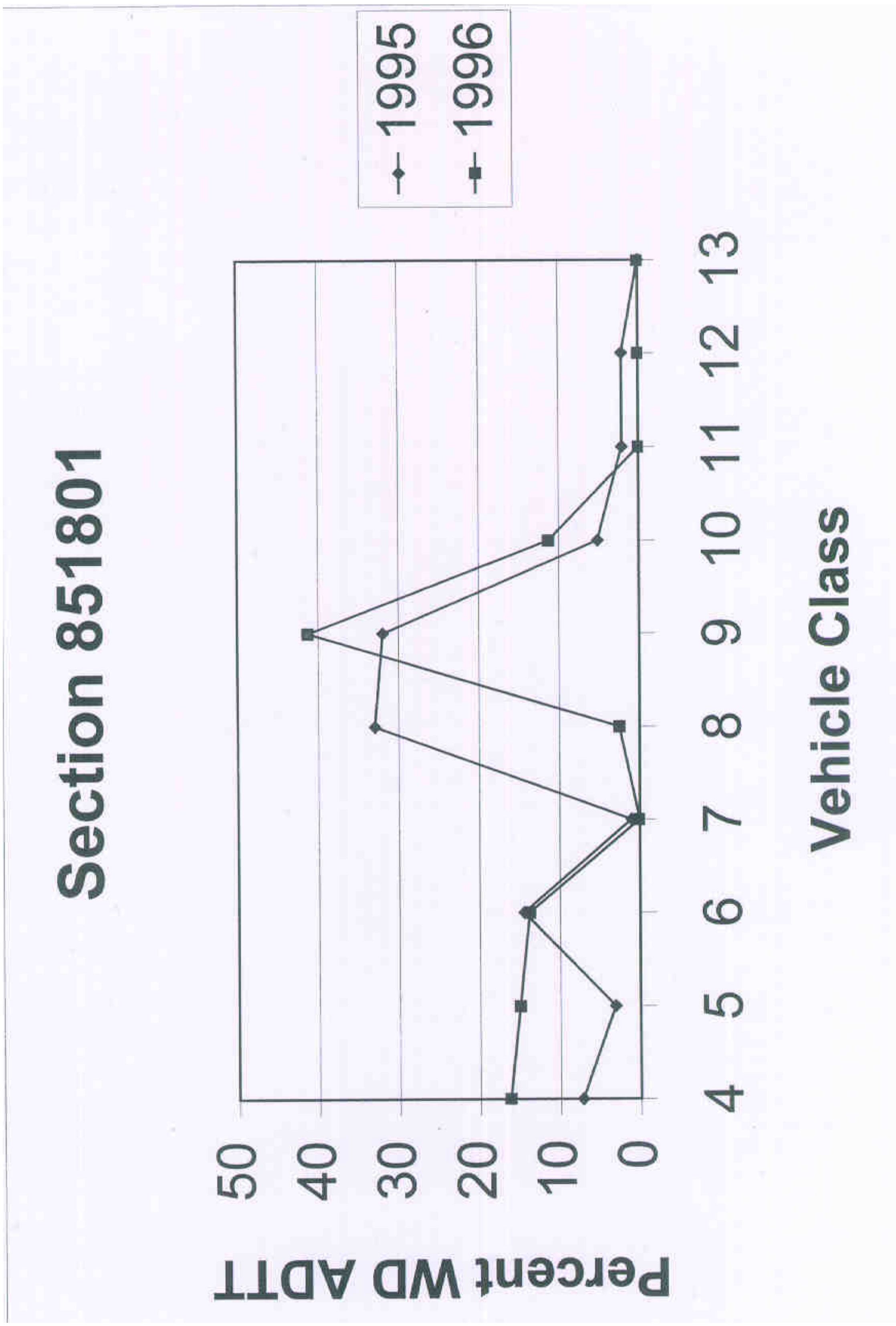


Section 511417
Percent WD ADTT
80
60
40
20
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1992
1993
1996
1997

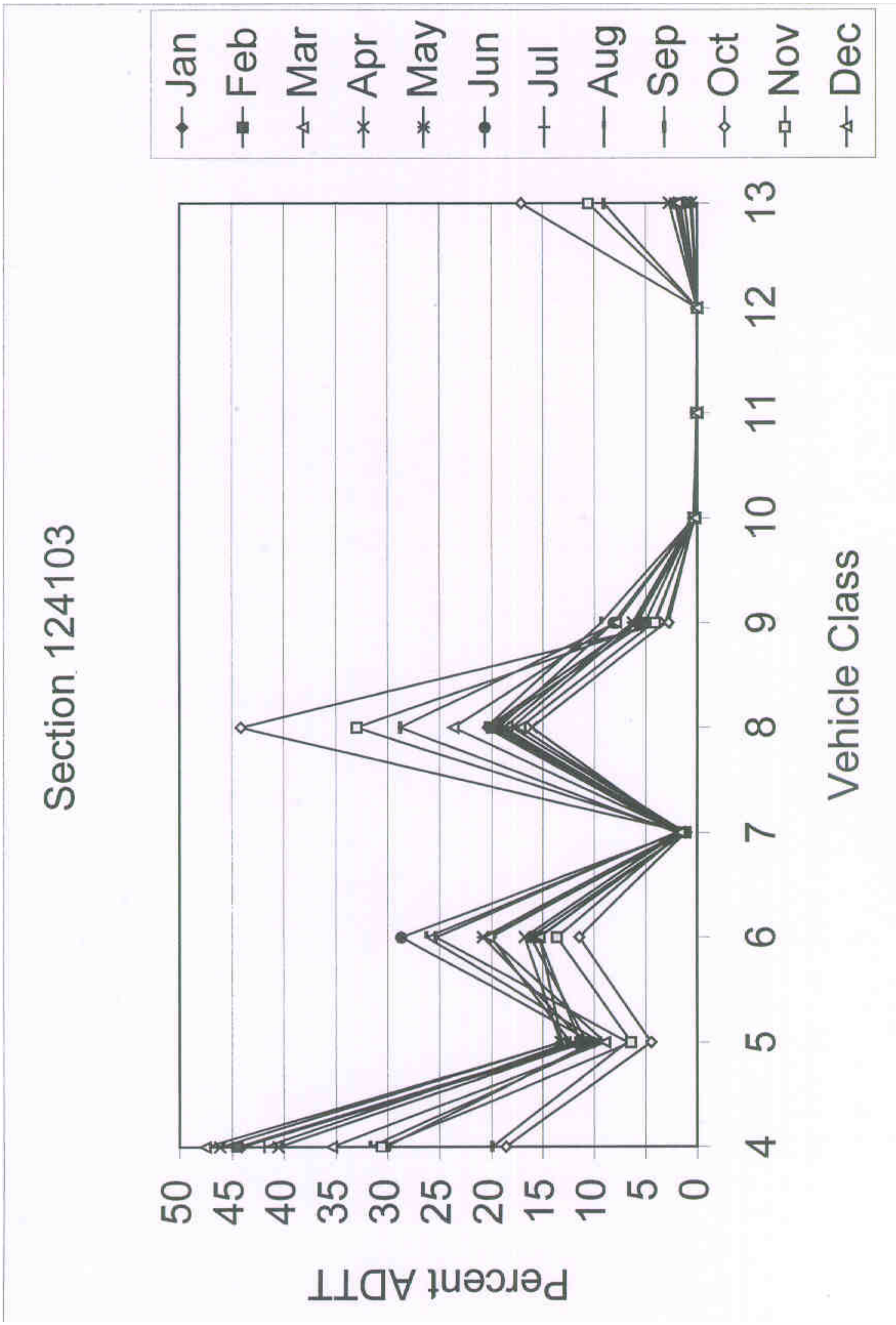

Section 511423
Percent WD ADTT
100
80
60
40
20
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1993
1995
1996
1997



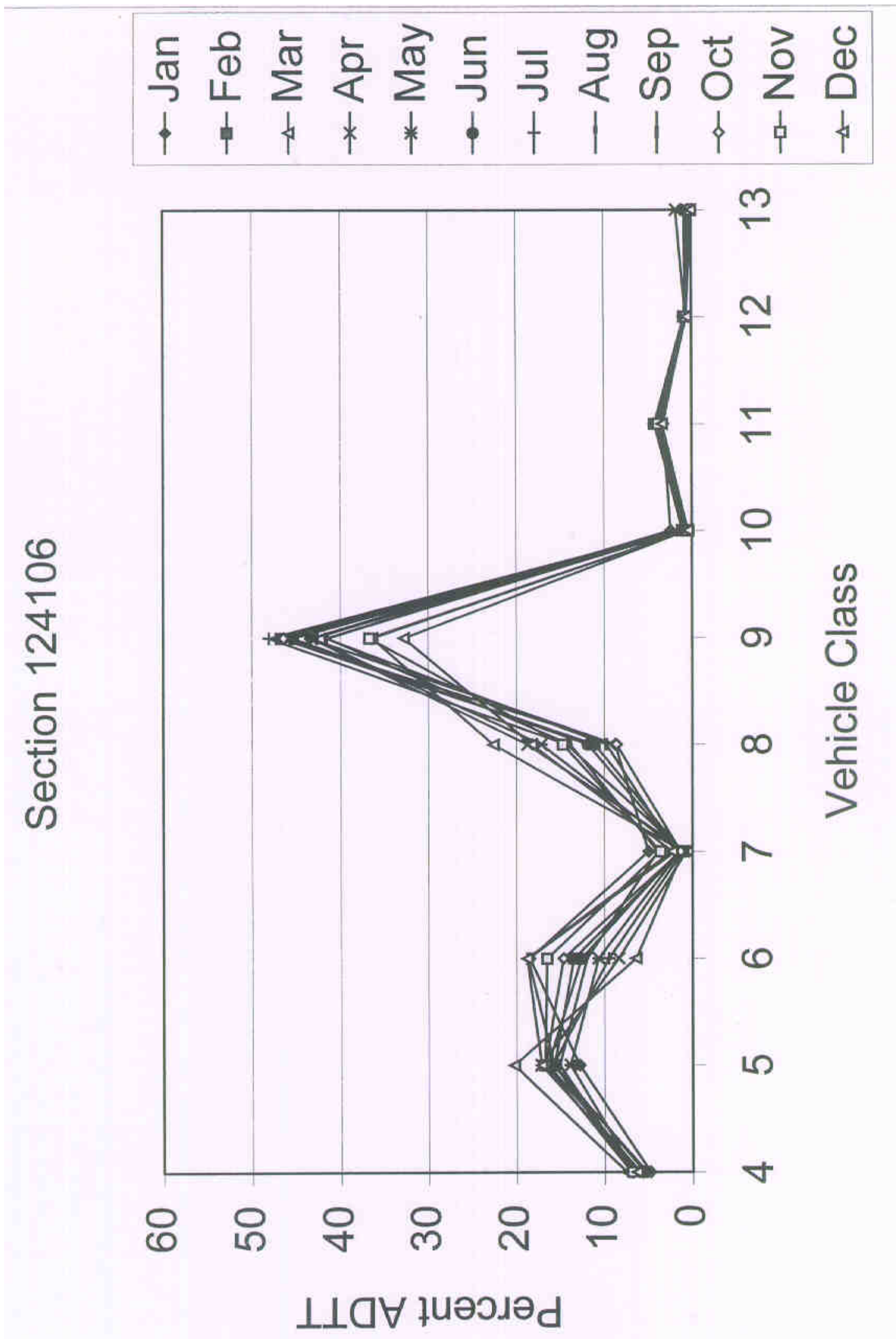
Section 515010
Percent WD ADTT
Vehicle Class
80
60
40
20
0
4
5
6
7
8
9
10
11
12
13
1992
1993
1994
1995
1997



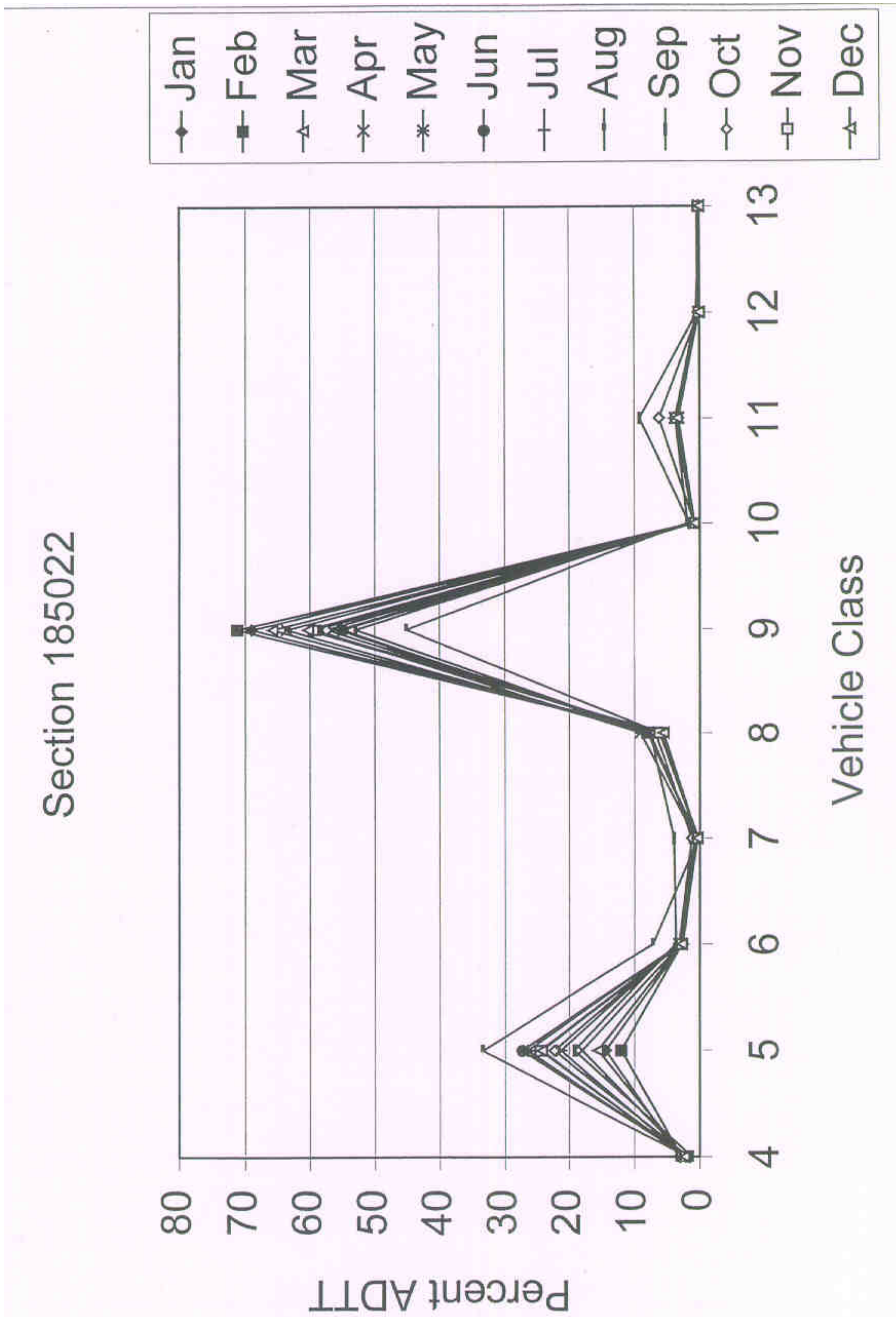
Section 851801
Percent WD ADTT
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
1995
1996

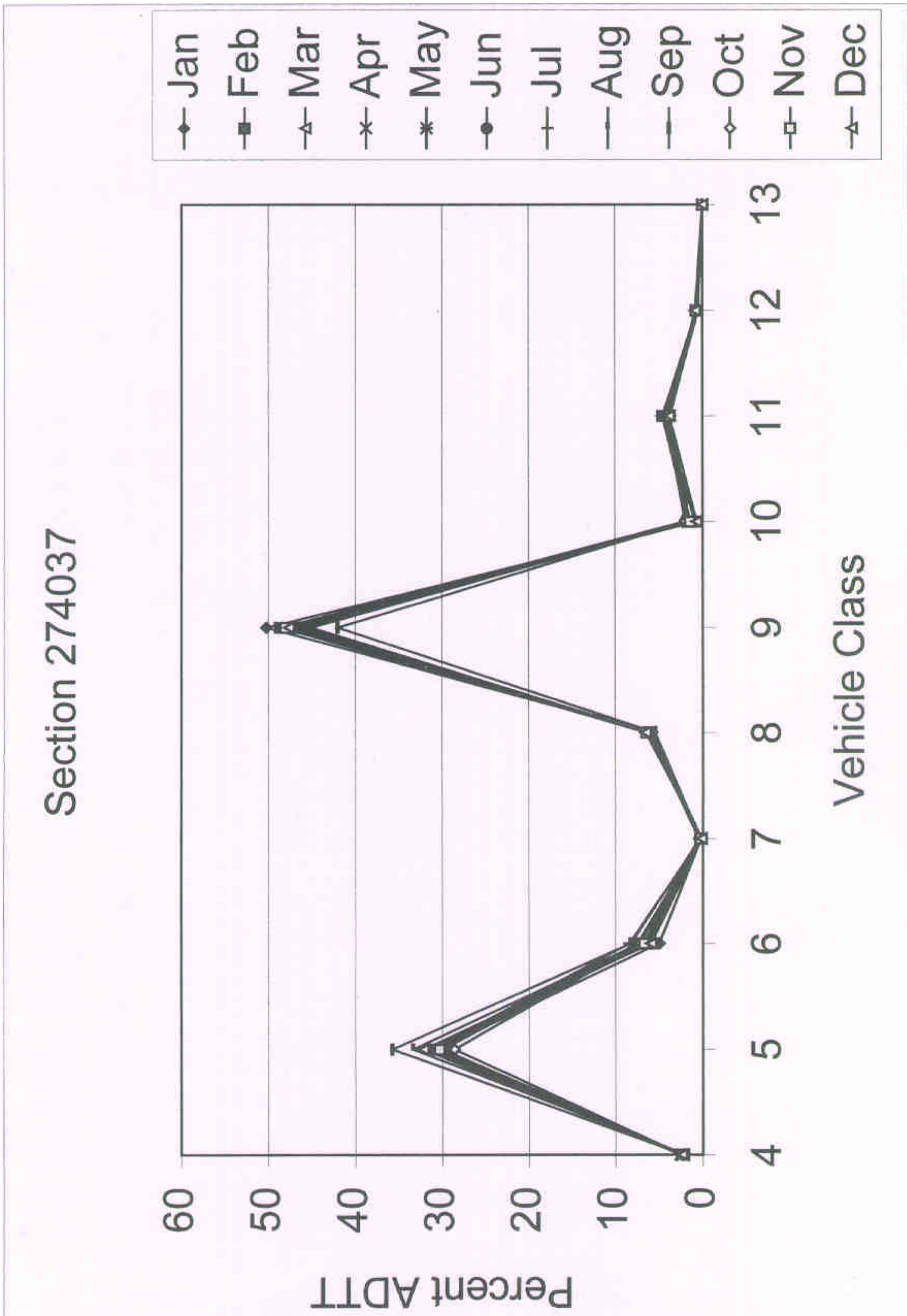


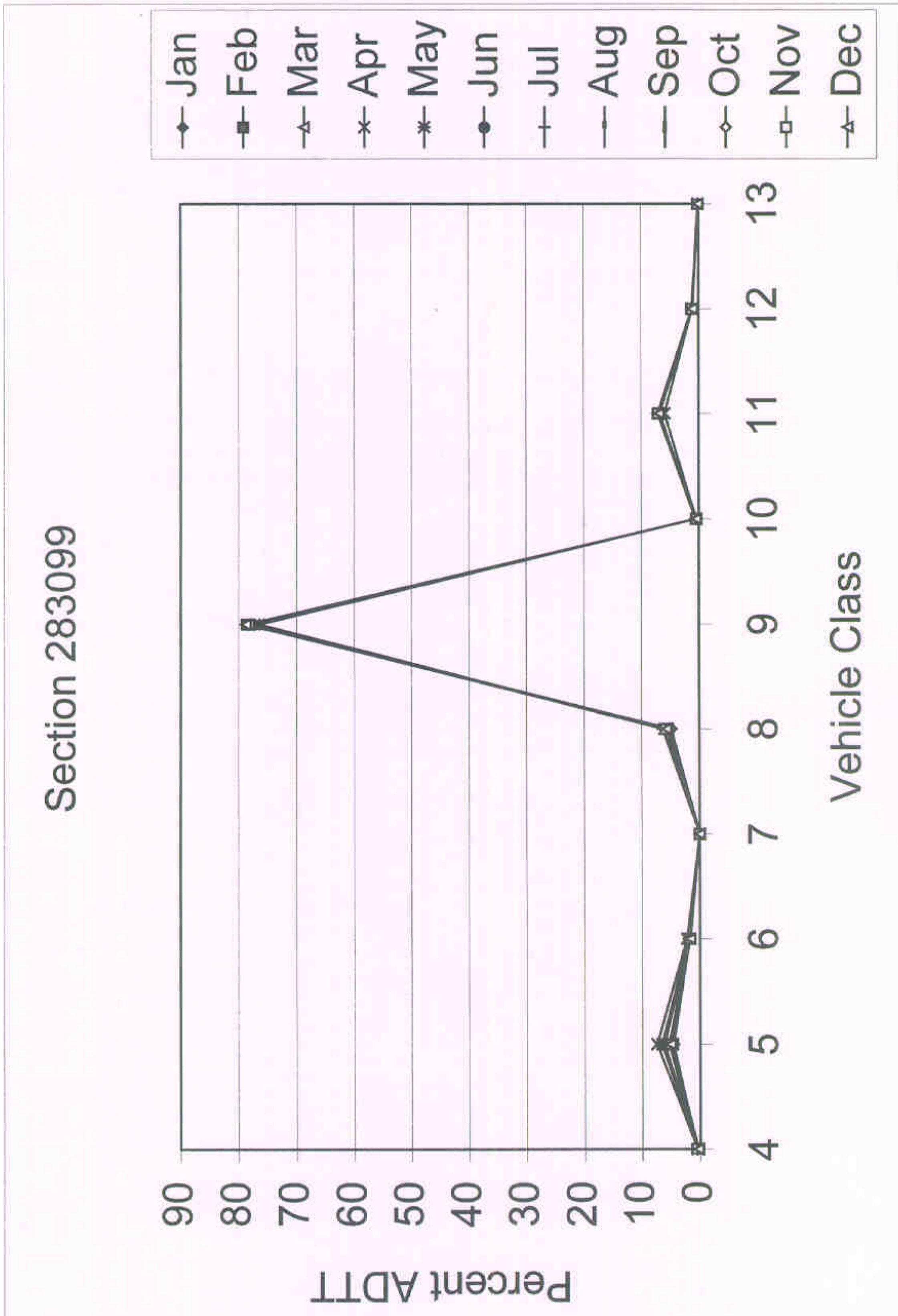
Section 124103
Percent ADTT
Vehicle Class
0
5
10
15
20
25
30
35
40
45
50
4
5
6
7
8
9
10
11
12
13
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec



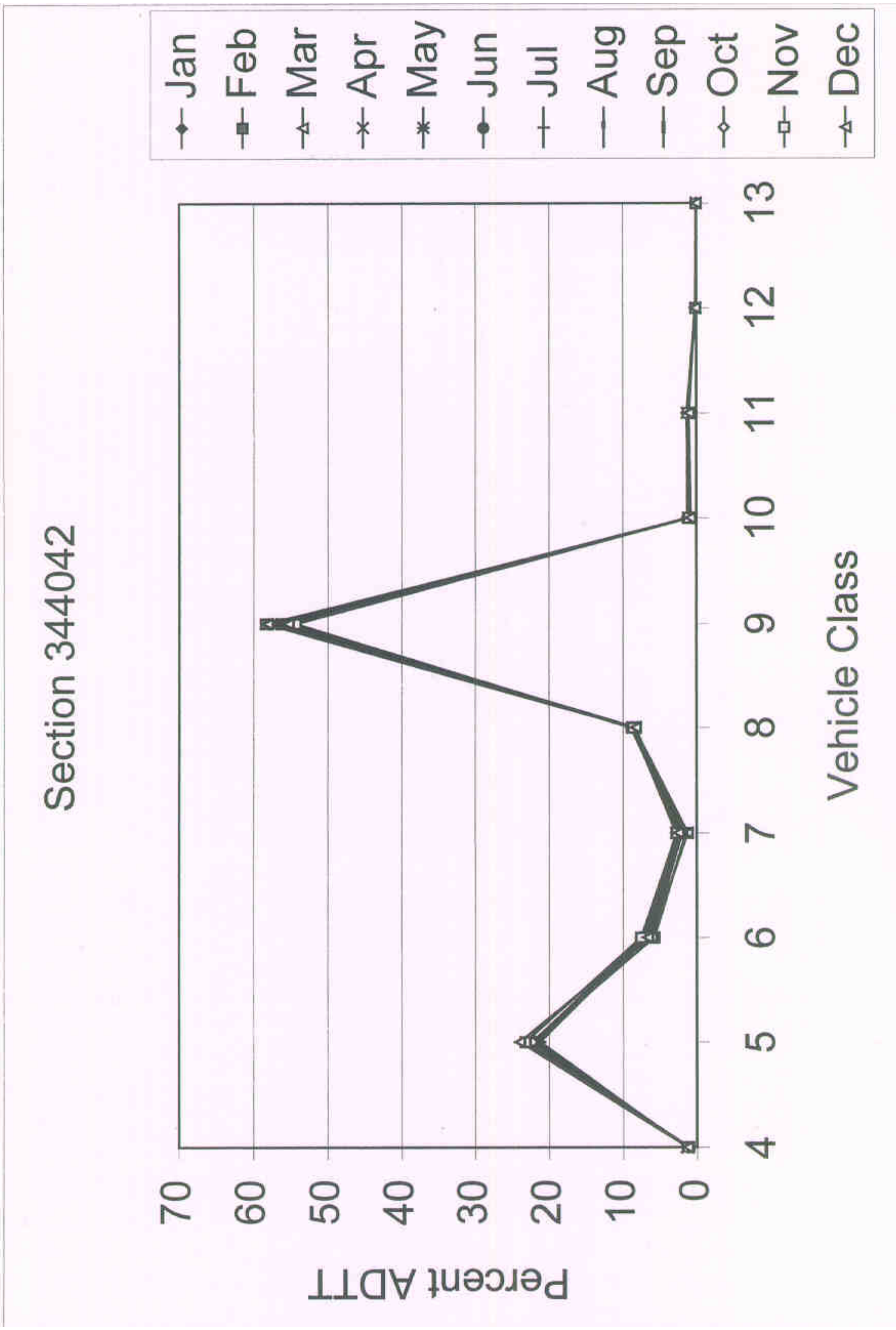
Section 124106
Percent ADTT
0
10
20
30
40
50
60
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 185022
Percent ADTT
0
10
20
30
40
50
60
70
80
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

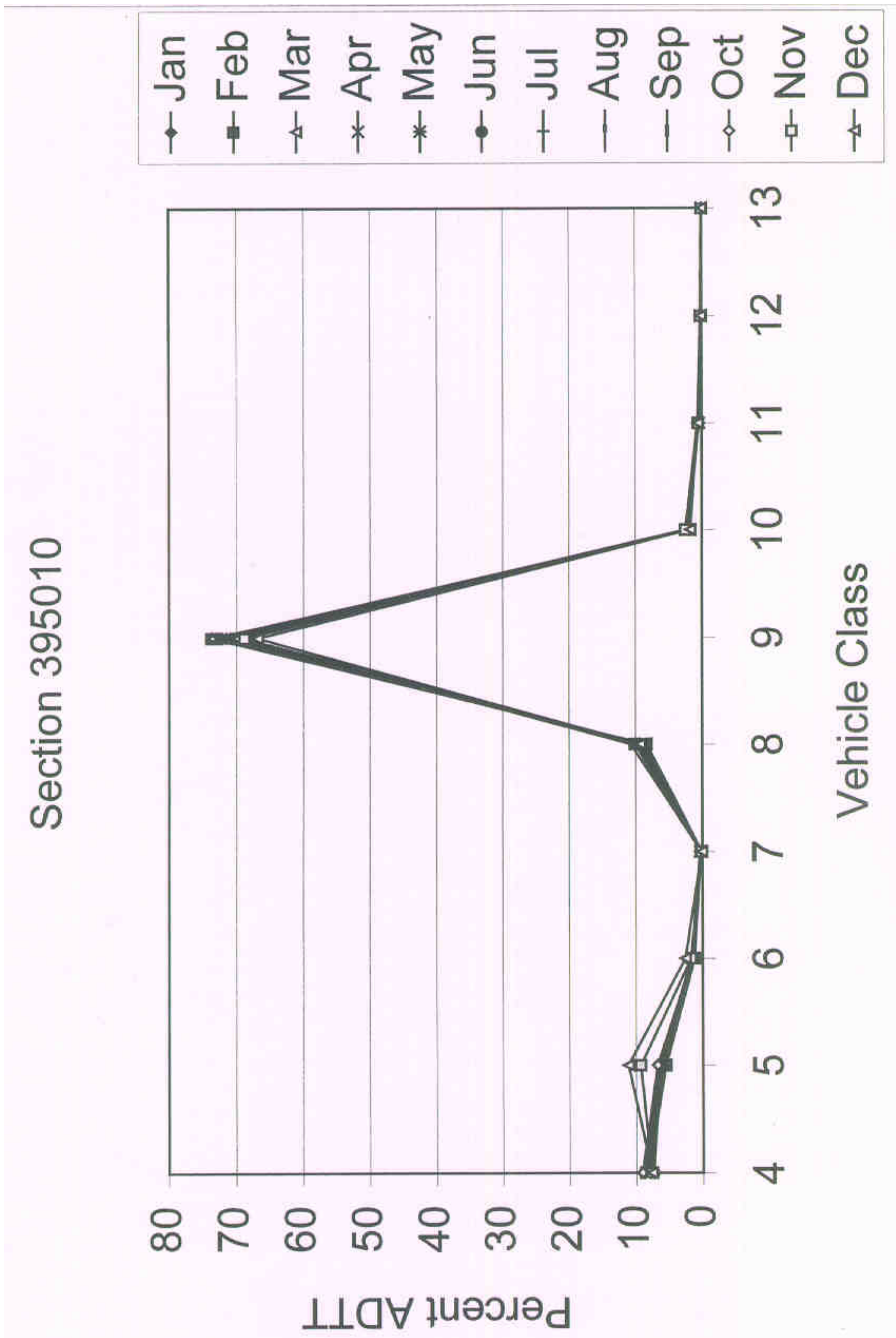

Section 274037
Percent ADTT
Vehicle Class
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

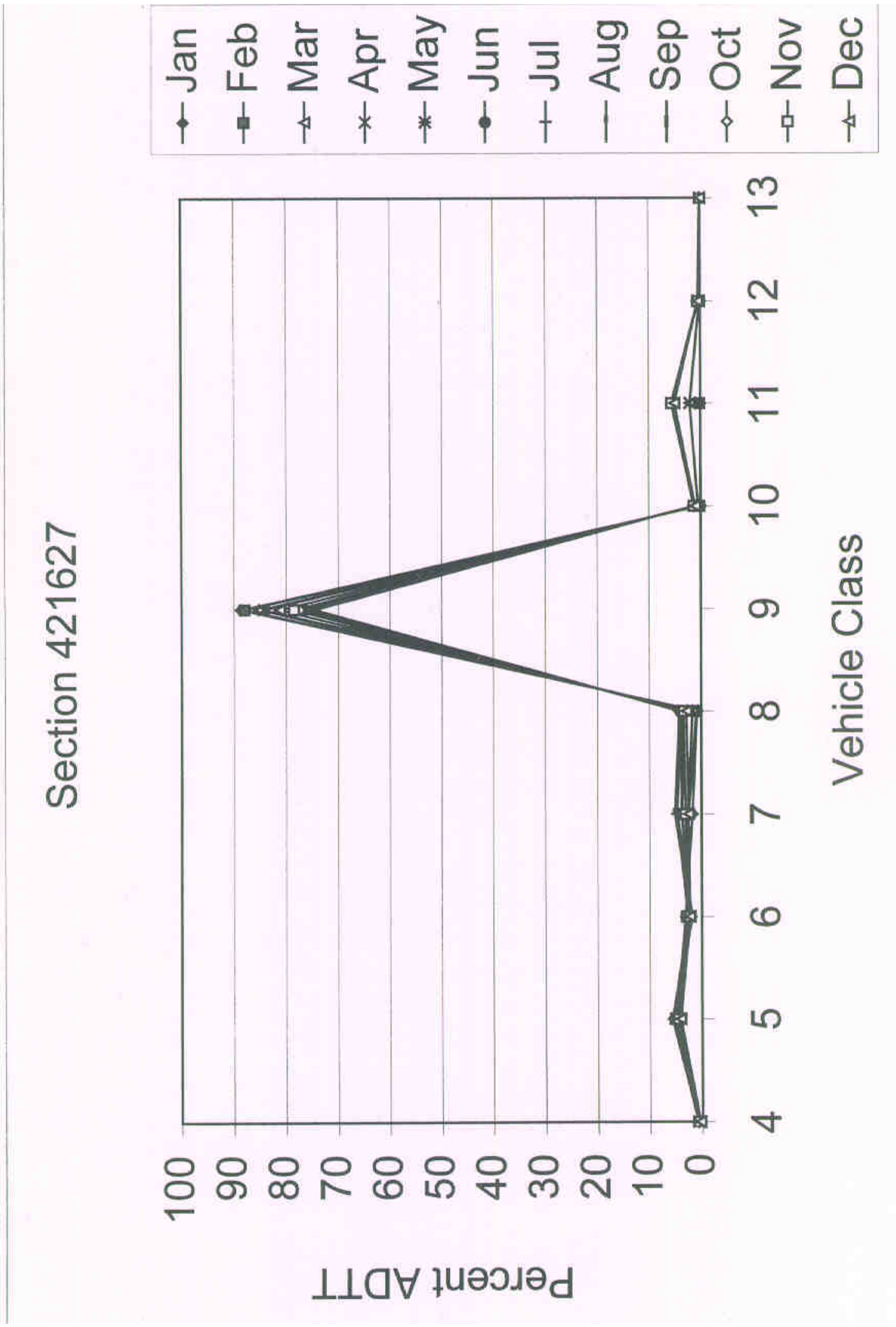


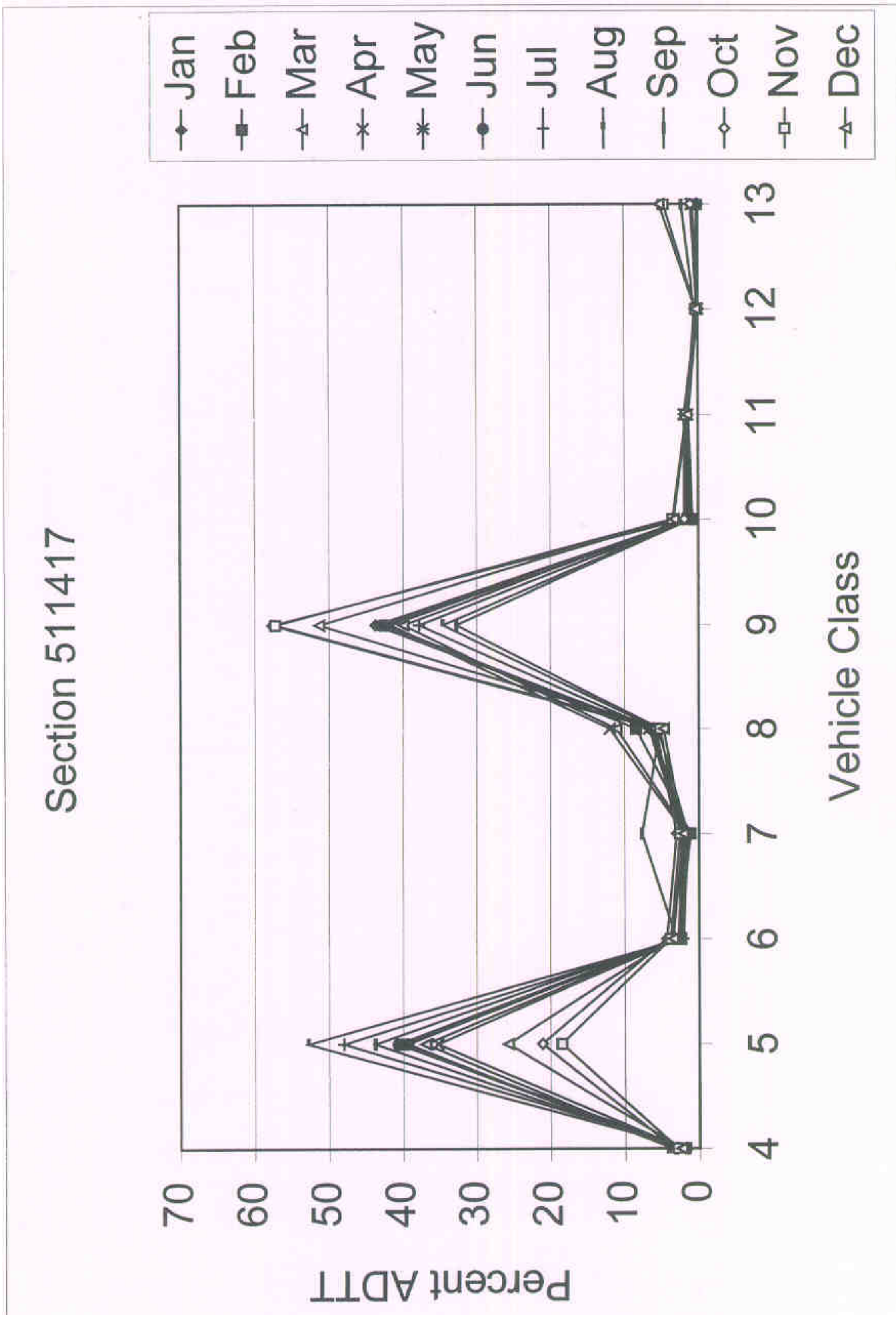
Section 283099
Percent ADTT
90
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

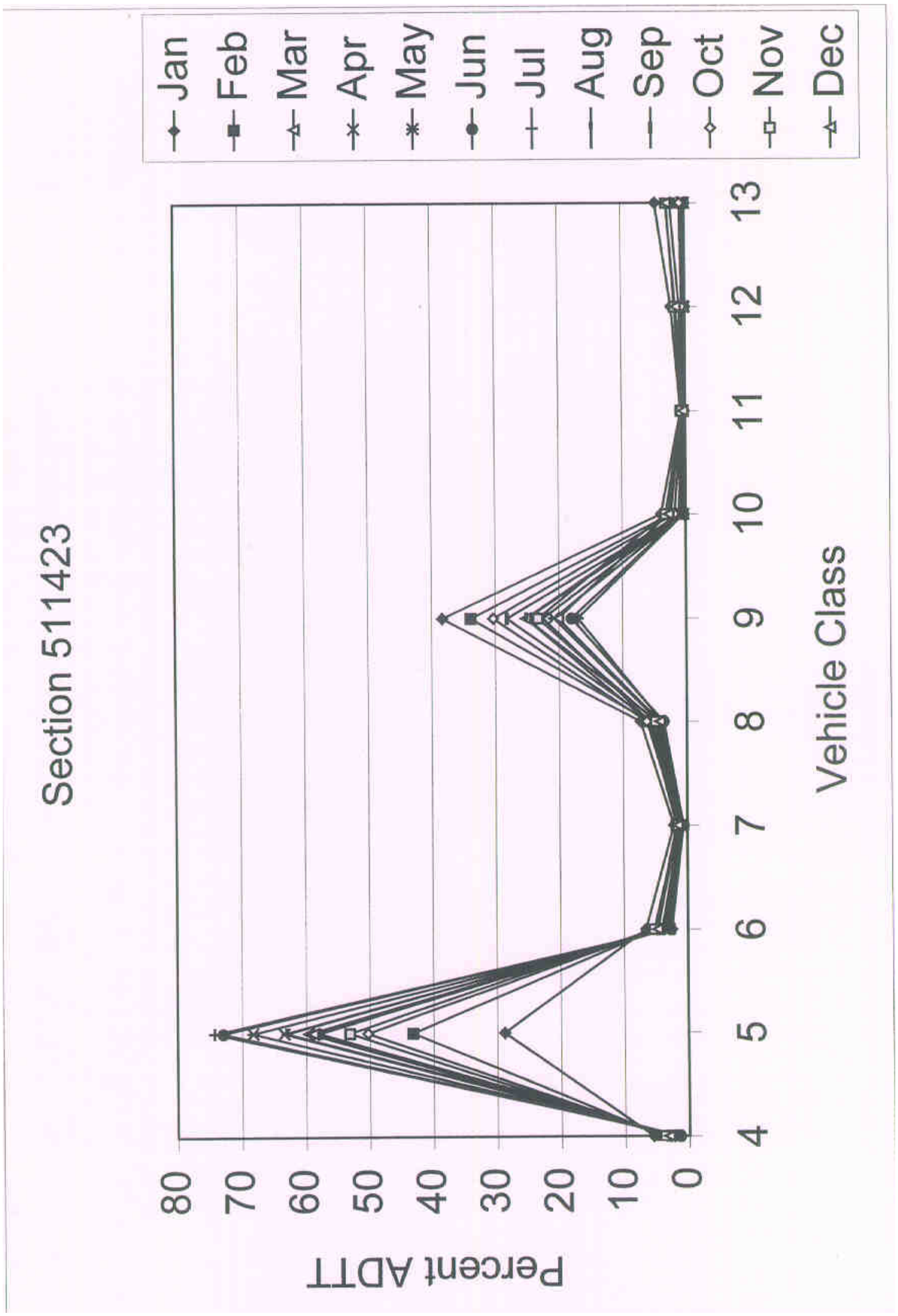


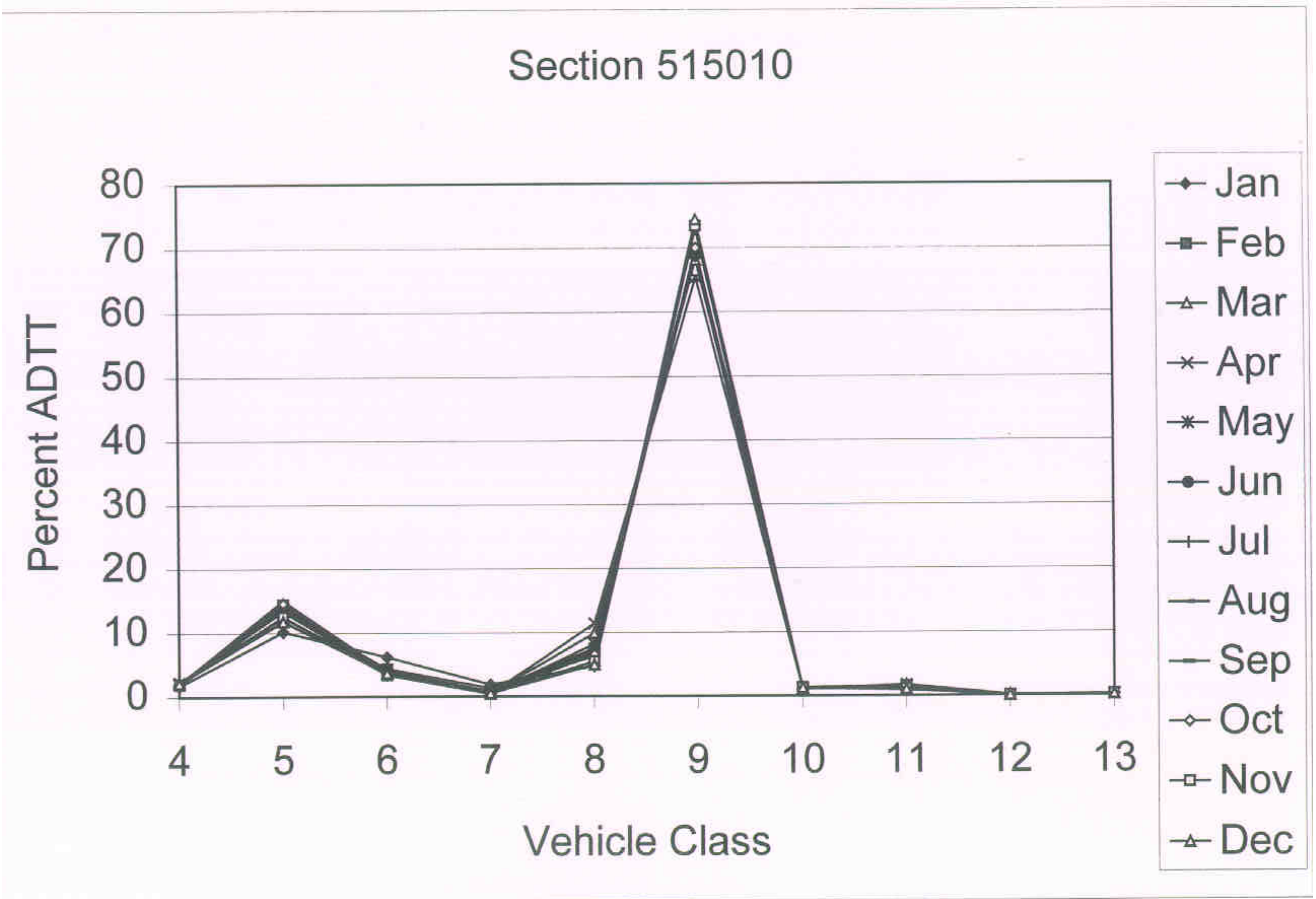
Section 3444042
Percent ADTT
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

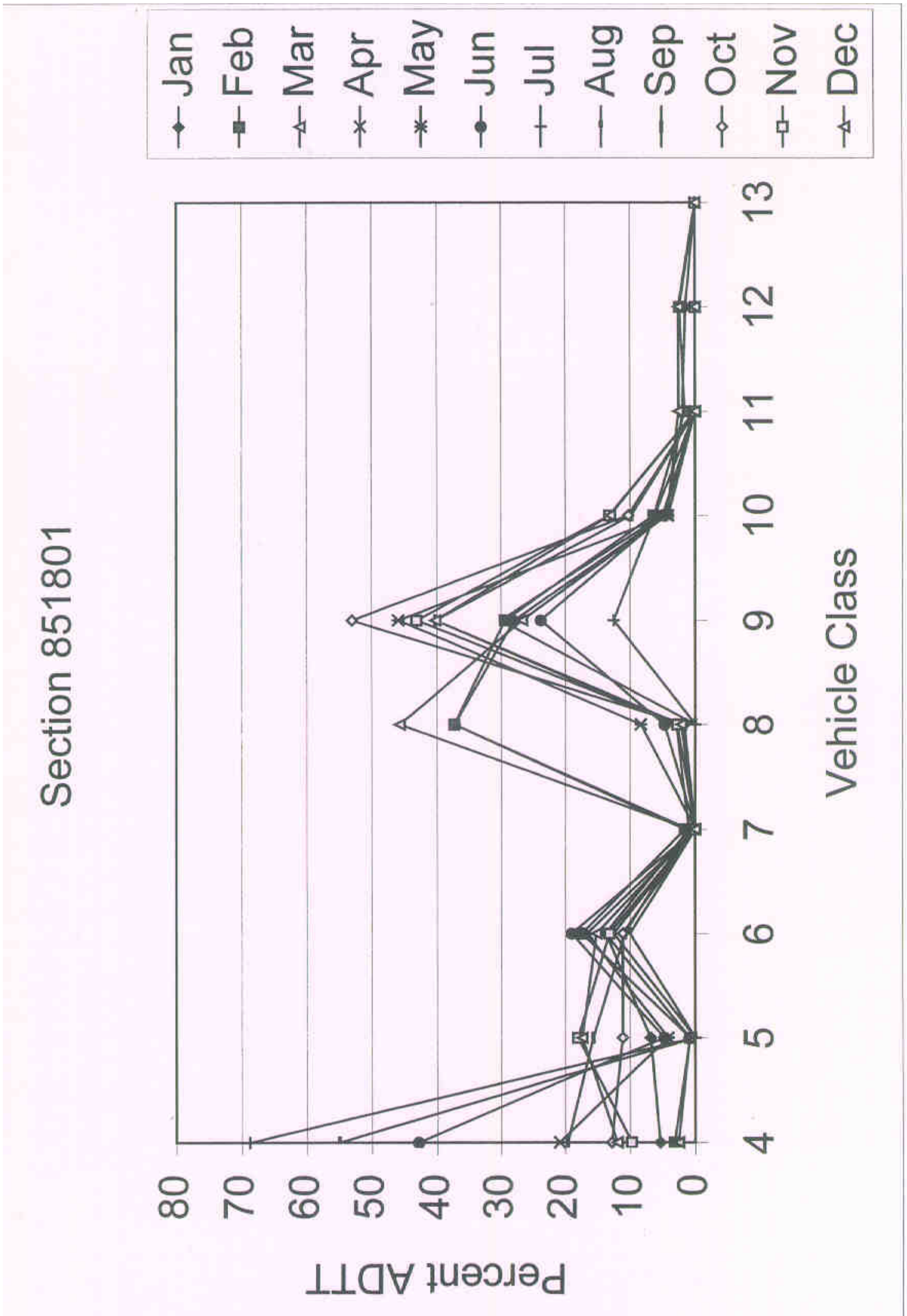

Section 395010
Percent ADTT
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 421627
Percent ADTT
100
90
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

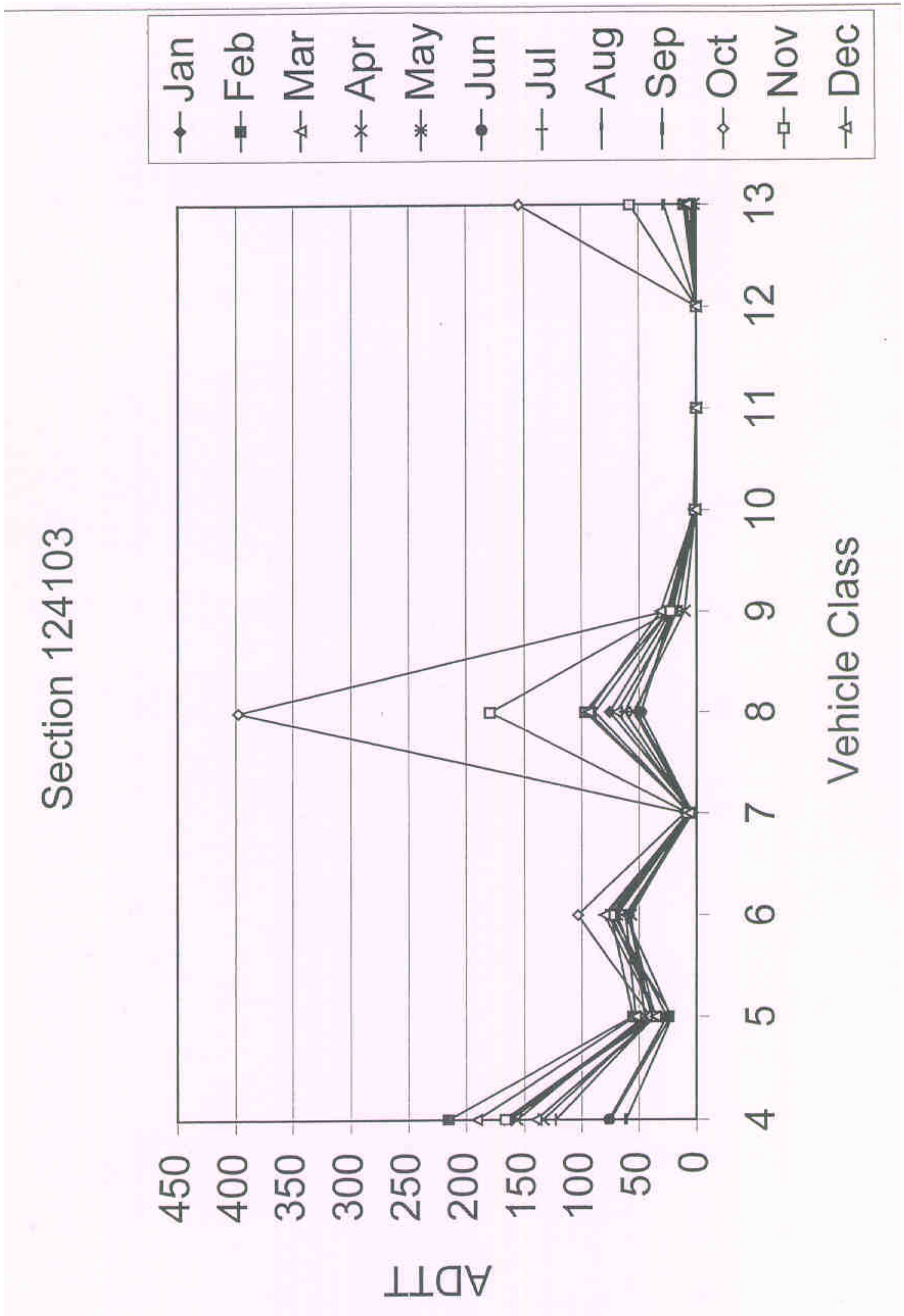

Section 511417
Percent ADTT
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 511423
Percent ADTT
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 515010
Percent ADTT
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec



Section 851801
Percent ADTT
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 1124103
ADTT
450
400
350
300
250
200
150
100
50
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
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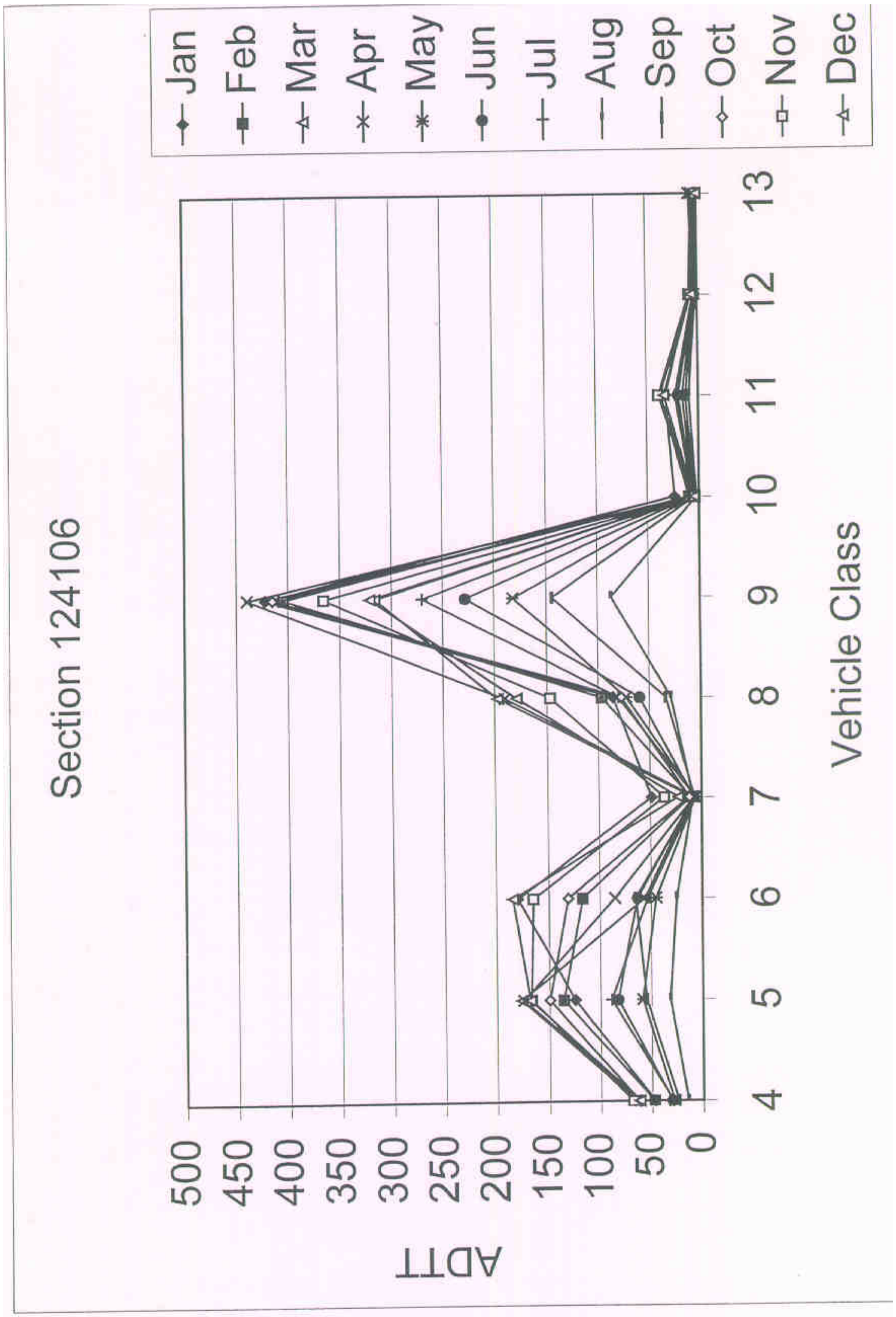
Jul
Aug
Sep
Oct
Nov
Dec



Section 124106
ADTT
500
450
400
350
300
250
200
150
100
50
0
4
5
6
7
8
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13
Vehicle Class
Jan
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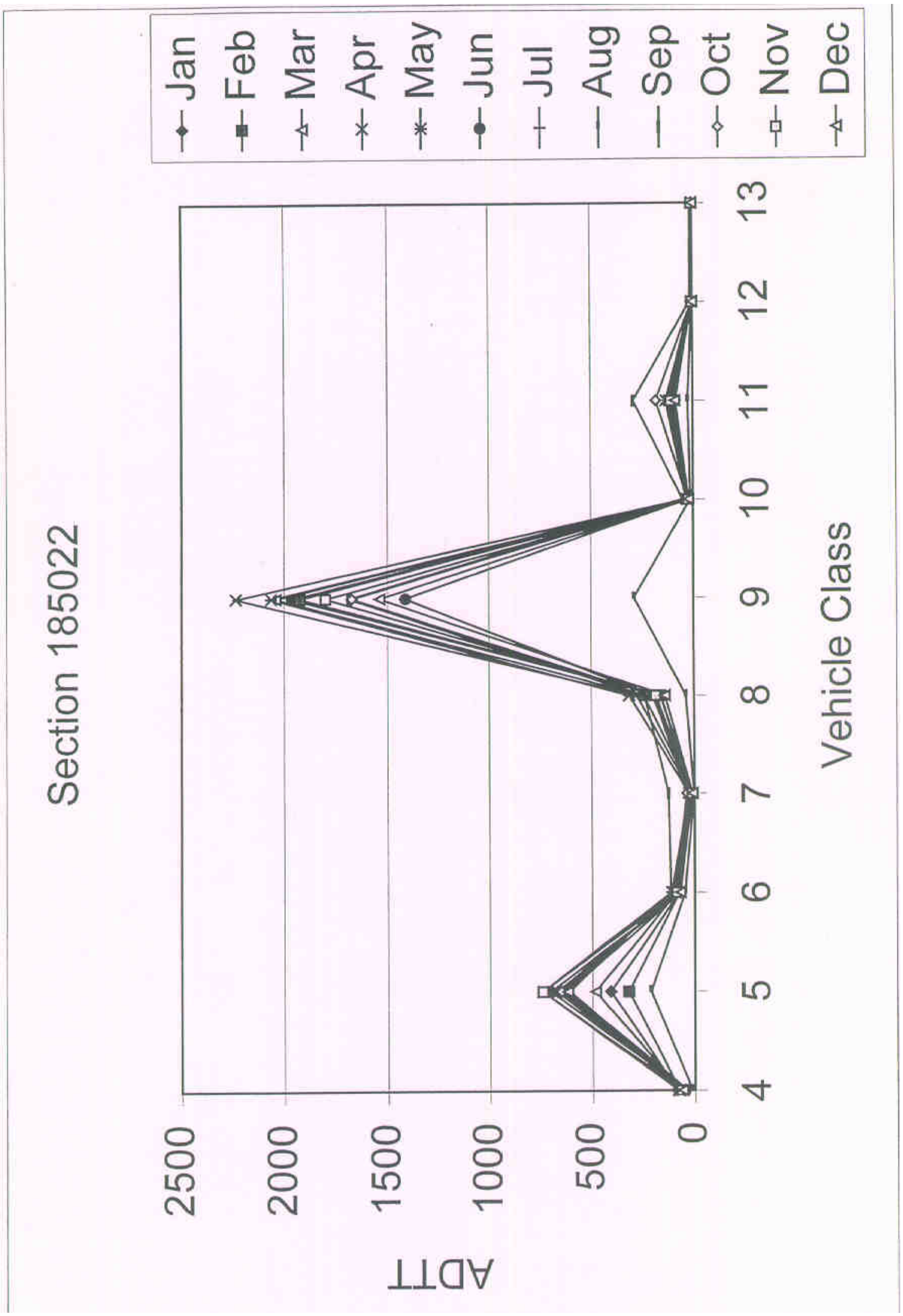
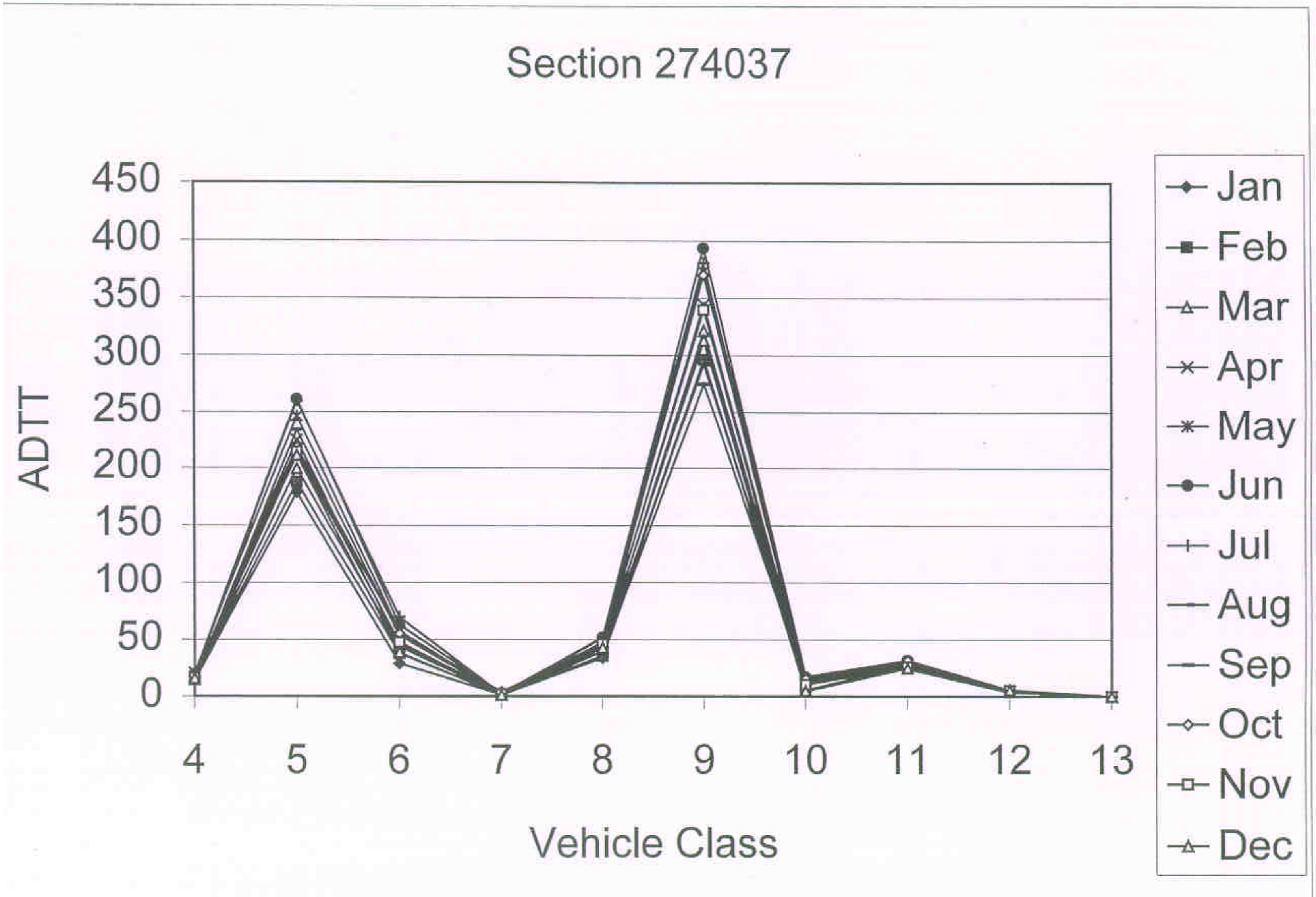
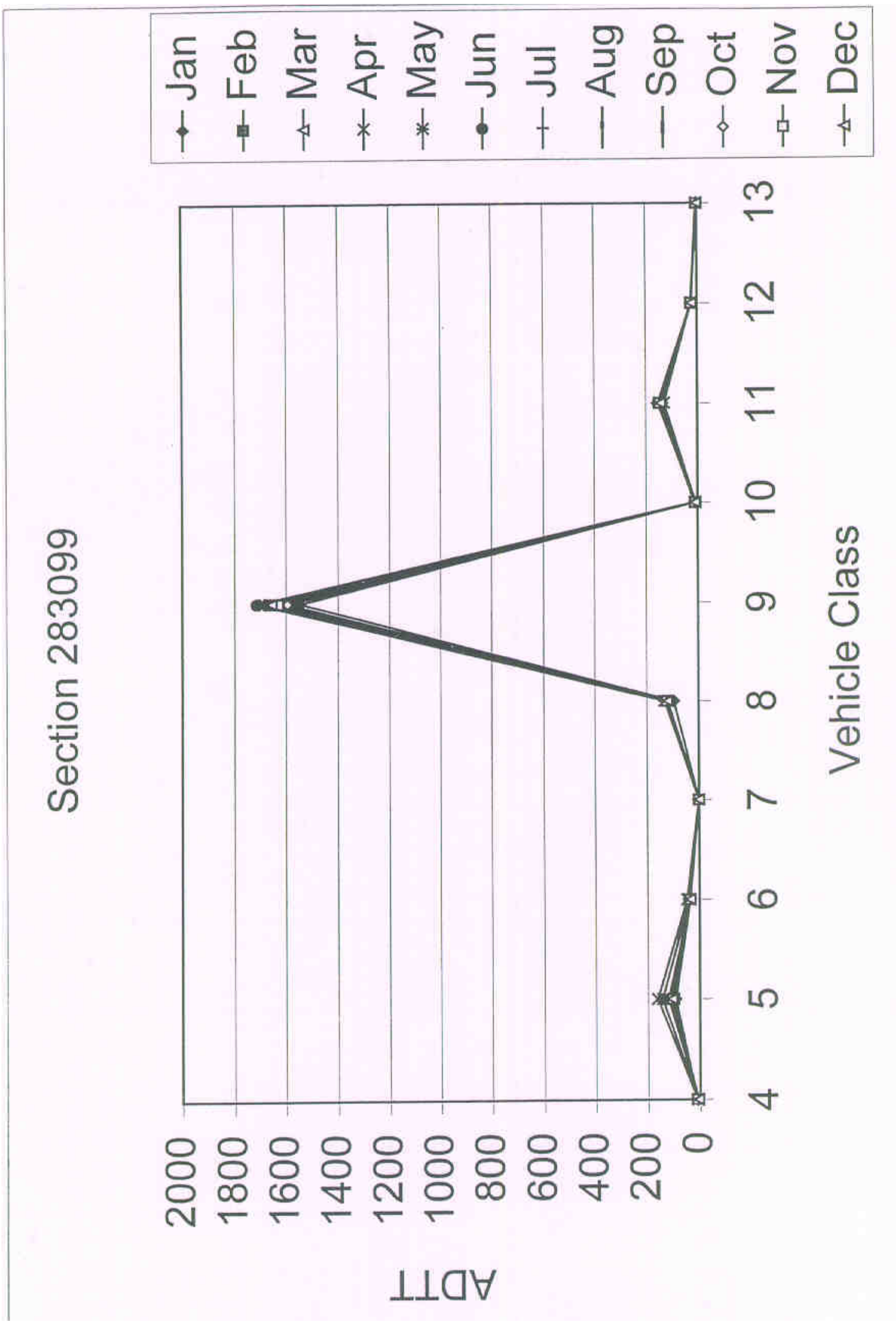
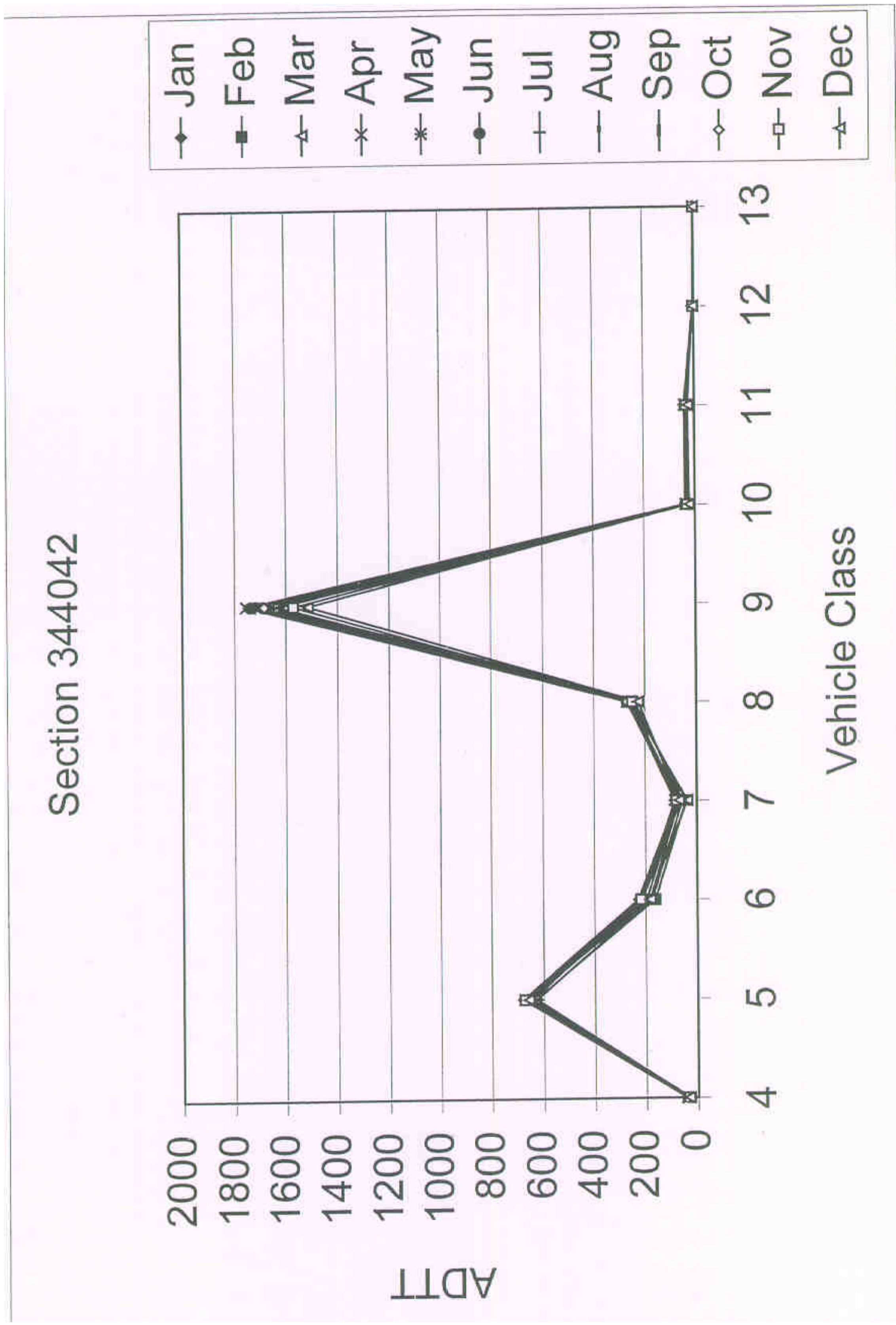
Aug
Sep
Oct
Nov
Dec


Section 185022
ADTT
2500
2000
1500
1000
500
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

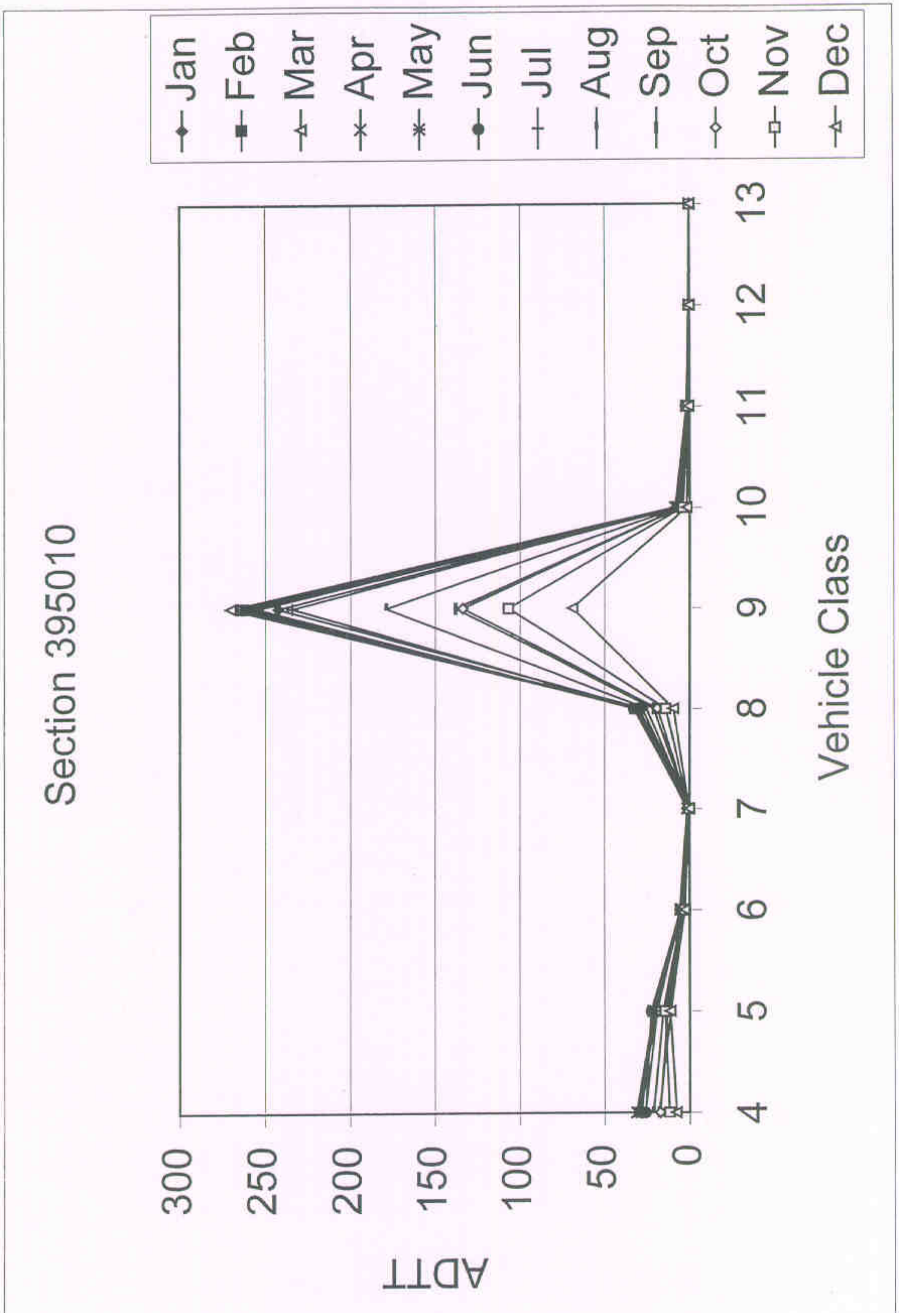


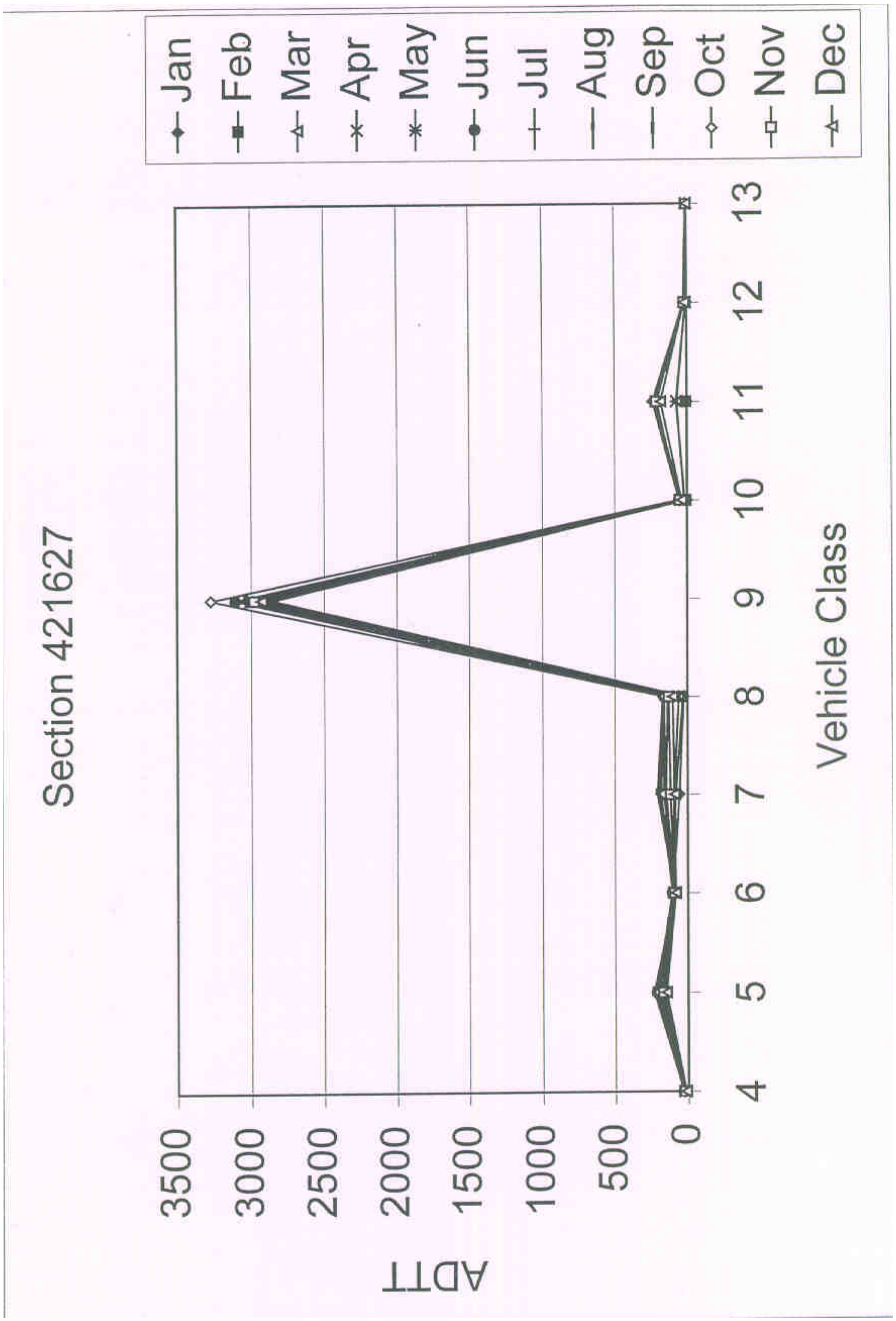
Section 274037
ADTT
450
400
350
300
250
200
150
100
50
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 283099
ADTT
2000
1800
1600
1400
1200
1000
800
600
400
200
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

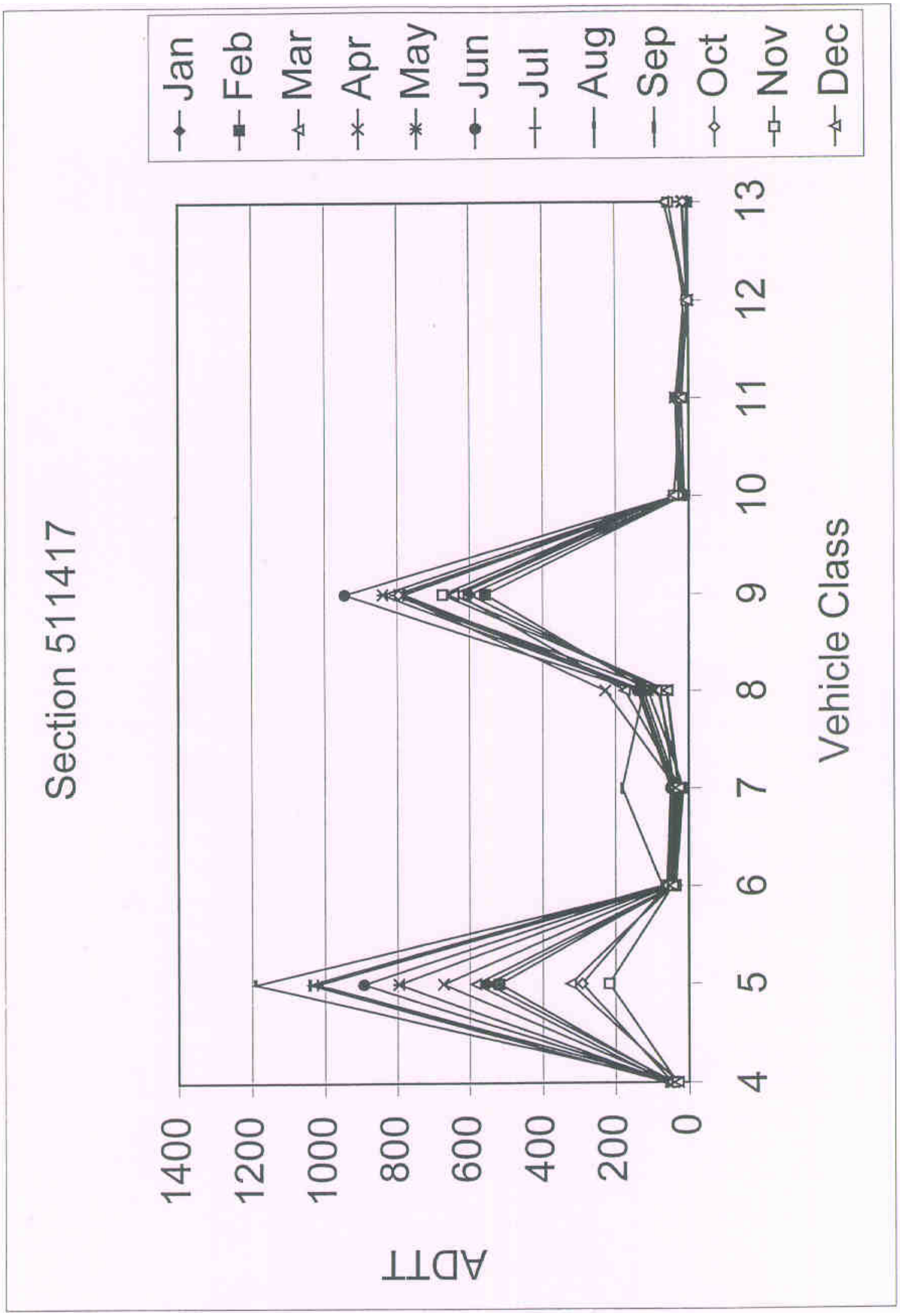


Section 344042
ADTT
2000
1800
1600
1400
1200
1000
800
600
400
200
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

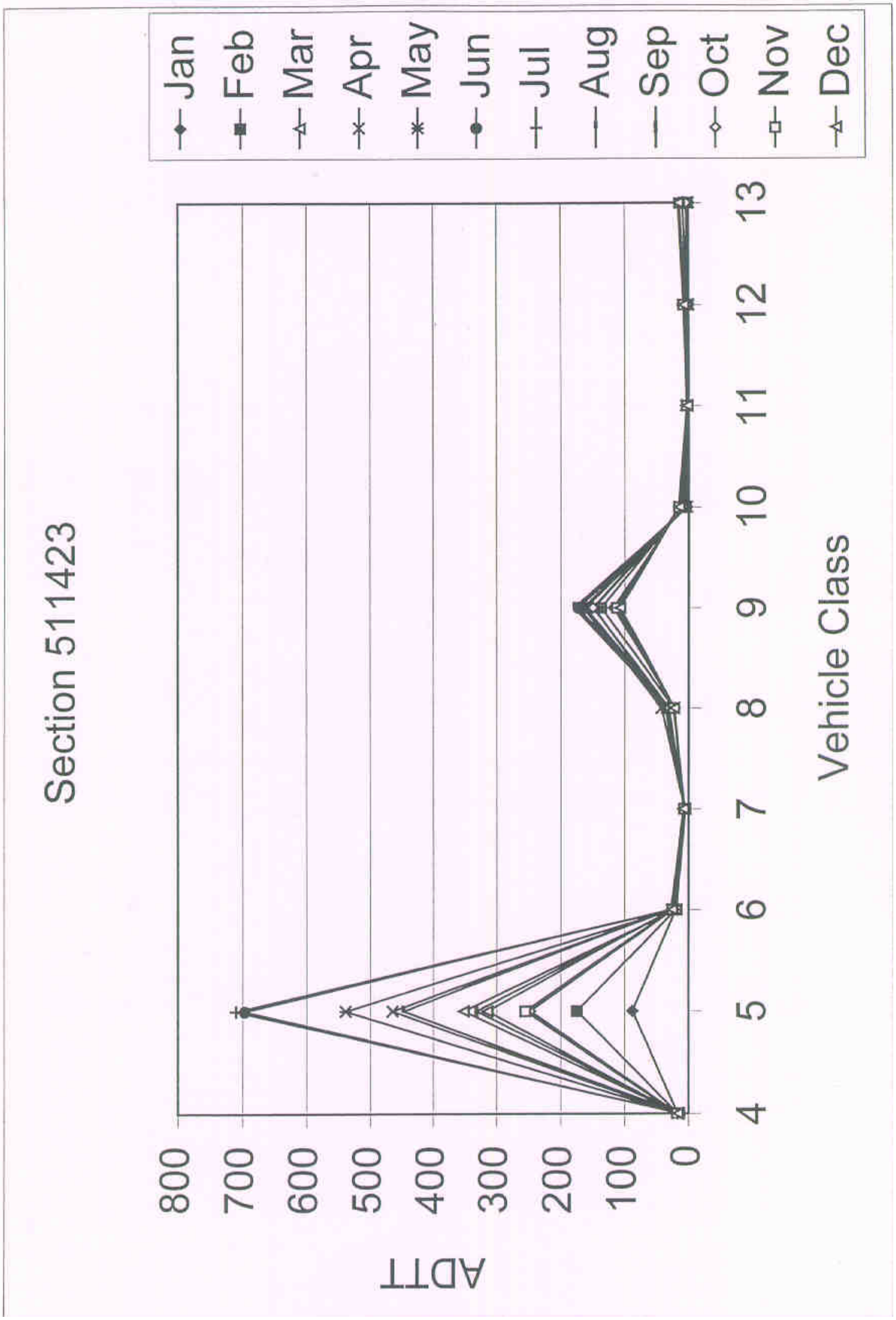

Section 395010
ADTT
300
250
200
150
100
50
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec



Section 421627
ADTT
3500
3000
2500
2000
1500
1000
500
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec



Section 511417
ADTT
0
200
400
600
800
1000
1200
1400
4
5
6
7
8
9
10
11
12
13
Vehicle Class
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Section 511423
ADTT
800
700
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Vehicle Class
Jan
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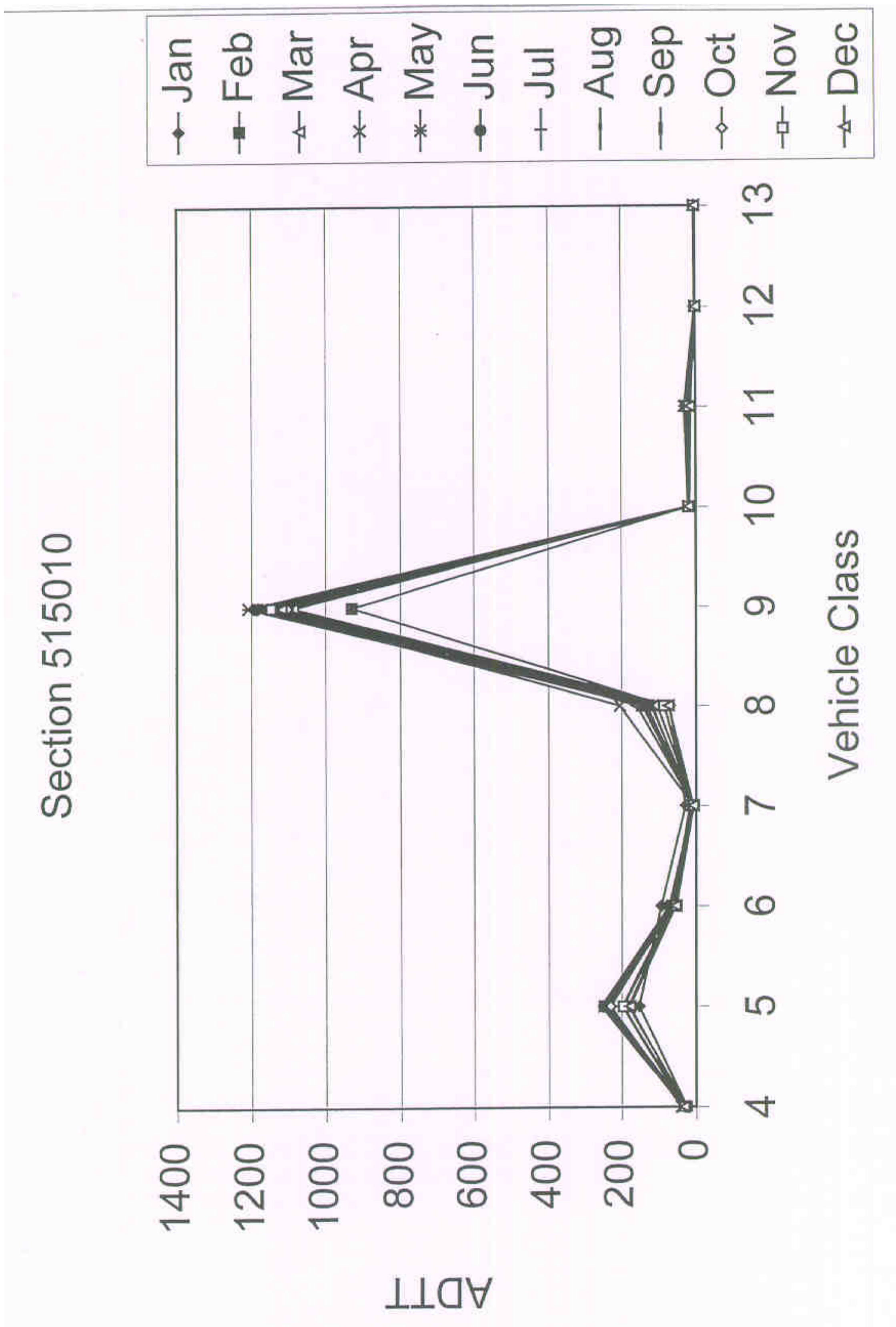
Oct
Nov
Dec


Section 515010
ADTT
1400
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Vehicle Class
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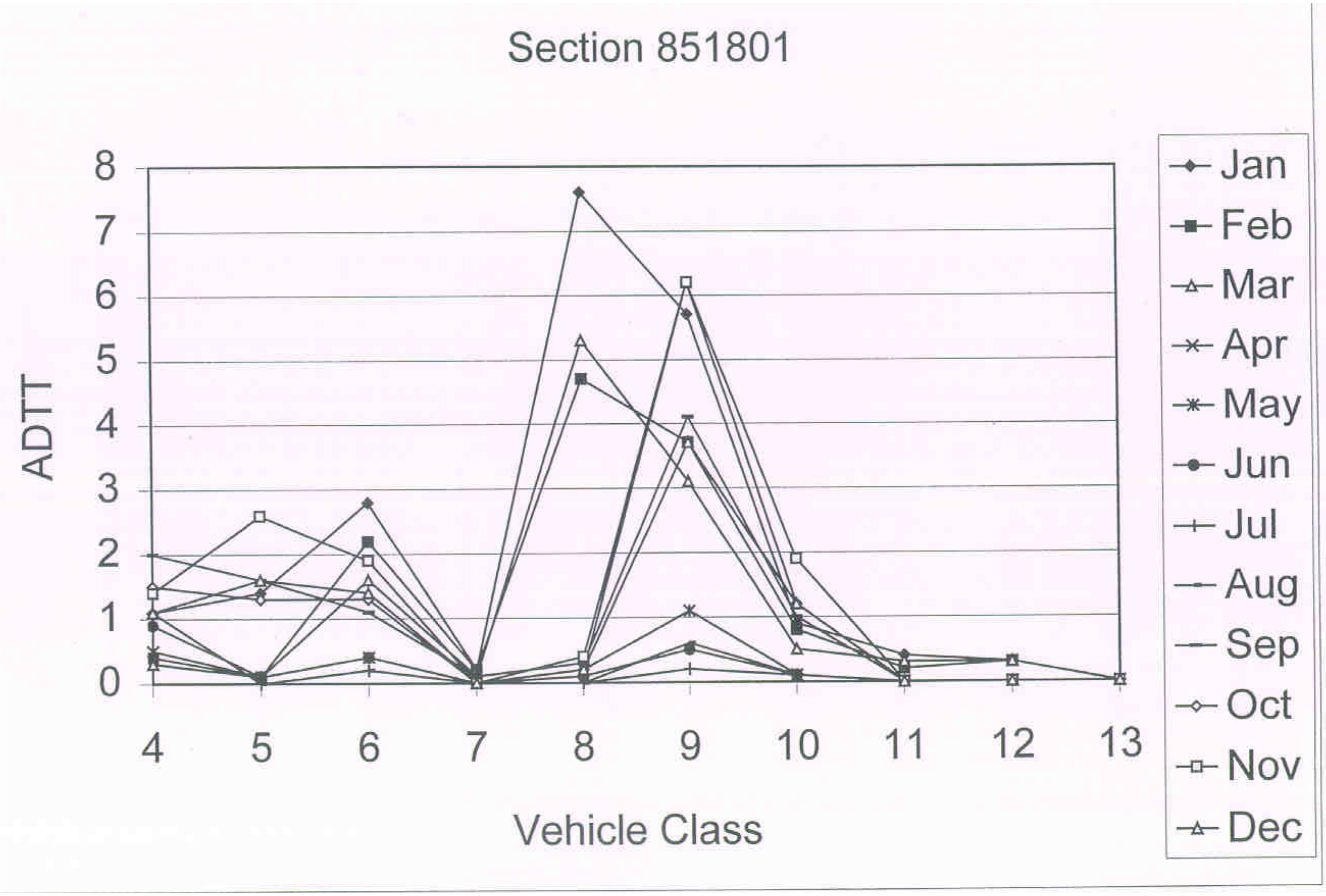
Section 851801
ADTT
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Vehicle Class
Jan
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Percent of ADTT

Section	# of Days	Normalized Mean									
		VC 4	VC 5	VC 6	VC 7	VC 8	VC 9	VC 10	VC 11	VC 12	VC 13
29035	207	2.1	32.4	8.0	0.5	1.6	15.7	5.5	0.0	0.0	34.2
62040	934	0.6	31.5	15.6	0.0	9.0	38.6	0.1	4.3	0.3	0.1
81029	260	0.6	47.5	14.4	23.7	2.5	6.9	0.6	0.1	1.8	1.8
83032	253	1.9	27.9	4.1	0.1	5.8	55.3	1.1	2.1	1.6	0.1
87780	261	4.9	67.3	10.0	0.2	5.1	11.8	0.7	0.0	0.0	0.0
87783	253	1.4	24.1	4.5	0.4	5.1	57.3	1.2	2.2	1.6	2.1
91803	598	0.3	76.9	9.7	4.7	1.8	6.1	0.3	0.1	0.0	0.0
94008	656	0.6	20.5	4.7	1.9	9.9	55.0	1.3	6.2	0.0	0.1
94020	424	2.9	41.0	9.4	2.4	9.6	33.2	0.9	0.6	0.0	0.1
95001	636	2.9	15.7	4.6	1.3	9.8	58.8	1.3	5.5	0.0	0.1
121370	154	9.5	5.4	11.7	1.0	19.5	52.2	0.6	0.0	0.0	0.1
123995	363	5.6	5.3	10.4	0.4	55.3	20.8	0.2	0.9	0.6	0.5
124000	828	2.6	46.4	13.4	2.1	13.1	21.8	0.4	0.2	0.0	0.0
124059	BAD	4.9	45.1	25.1	0.5	10.9	10.3	0.4	0.0	0.0	2.8
124096	418	10.9	18.2	17.8	8.1	20.0	22.8	1.5	0.2	0.0	0.6
124100	346	1.5	3.4	57.9	3.4	23.5	8.2	1.0	0.0	0.0	1.0
124102	BAD	8.6	22.0	17.1	3.6	23.9	23.4	0.4	0.7	0.2	0.1
124103	352	35.4	10.2	22.7	1.5	20.2	6.9	0.3	0.0	0.0	2.6
124106	347	37.6	6.2	12.7	0.3	18.8	20.2	0.9	0.6	0.4	2.3
124107	358	7.9	9.5	14.6	1.0	40.8	25.0	0.6	0.0	0.0	0.5
124109	BAD	4.8	50.7	21.4	0.4	10.3	10.0	0.3	0.0	0.0	2.0
124137	353	4.5	3.6	6.6	0.1	17.4	66.0	0.4	0.9	0.4	0.2
124138	578	2.9	47.3	14.3	2.2	13.8	18.9	0.4	0.2	0.0	0.0
124154	359	1.5	3.0	36.4	6.9	25.2	17.4	2.7	0.0	0.0	6.9
129054	307	7.0	2.4	9.1	2.6	7.9	16.1	1.9	0.1	0.0	53.0
174074	405	4.0	16.1	6.2	1.0	6.7	63.6	0.7	1.1	0.5	0.2
175849	330	5.3	11.9	3.2	0.9	4.8	68.8	1.0	3.3	0.5	0.4
175908	541	7.4	37.1	9.2	0.4	8.3	35.8	1.7	0.1	0.1	0.0
177937	409	4.8	29.4	13.3	1.0	5.8	43.0	2.5	0.1	0.1	0.0
181028	425	2.0	10.1	3.5	3.1	8.6	66.6	1.5	3.2	0.4	0.9
181037	959	1.7	26.6	5.2	0.6	9.3	54.9	0.5	1.1	0.1	0.1
182008	963	1.2	26.1	4.0	1.3	6.6	57.0	1.2	2.3	0.3	0.1
182009	463	2.1	31.1	10.6	2.2	12.6	38.5	0.8	2.0	0.0	0.1
183002	696	0.8	25.4	7.2	0.8	2.3	58.4	1.3	3.5	0.3	0.1
183003	482	3.7	16.6	3.1	1.2	9.9	59.7	1.7	3.2	0.4	0.6
183030	738	3.8	62.8	5.6	1.4	9.6	15.2	0.4	0.7	0.3	0.3
183031	748	2.1	37.8	6.2	0.9	6.3	45.0	0.5	1.1	0.1	0.1
184021	679	4.7	20.8	9.9	3.1	13.9	39.5	1.4	3.9	0.6	2.1
184042	554	2.9	38.8	6.2	1.0	6.7	42.5	0.5	1.3	0.1	0.2
185022	979	2.1	29.6	2.8	0.8	7.3	52.6	0.9	3.7	0.1	0.2
185043	BAD	3.5	36.8	18.9	1.4	13.8	23.1	0.5	2.0	0.1	0.0
185518	939	1.1	9.8	3.1	1.0	4.1	71.3	3.5	4.5	1.0	0.7
185528	455	2.2	42.0	7.7	1.5	11.5	32.1	1.3	1.4	0.2	0.2
185538	405	2.7	39.9	9.1	1.2	16.3	26.8	1.4	2.0	0.4	0.2
186012	475	1.6	11.4	2.4	3.2	6.8	69.0	1.1	3.6	0.2	0.6

189020	449	2.7	7.1	1.6	0.5	5.6	77.6	1.1	3.1	0.3	0.5
213016	BAD	7.3	9.1	7.5	14.6	29.8	26.6	1.8	2.9	0.3	0.0
216043	409	4.5	26.4	8.1	0.5	8.3	41.2	10.4	0.4	0.0	0.1
261001	924	0.4	52.1	11.2	2.7	5.4	12.9	4.8	0.0	0.0	10.5
261004	753	0.5	45.8	10.9	3.0	4.8	19.6	9.3	0.0	0.0	6.1
261010	1019	2.8	64.5	6.7	0.9	7.3	9.9	2.5	0.0	0.0	5.4
261012	727	0.4	25.1	2.9	0.5	8.9	42.8	7.7	3.5	0.2	8.0
261013	457	0.6	32.3	3.2	0.2	8.0	40.2	3.9	2.5	0.2	8.9
263069	912	0.4	24.5	3.2	0.3	6.8	44.9	6.6	0.7	0.1	12.5
264015	511	1.0	15.1	3.6	0.2	4.1	64.4	5.9	0.1	0.1	5.4
265363	994	0.2	11.9	3.9	0.8	7.1	55.5	4.4	1.7	0.2	14.1
267072	1014	0.7	21.0	4.1	1.0	8.6	48.9	4.4	0.9	0.2	10.2
269029	233	1.2	14.1	8.7	0.3	8.8	51.9	2.3	2.5	0.3	9.7
269030	1007	0.8	14.5	4.5	0.2	6.5	60.1	4.9	2.7	0.4	5.4
271016	759	2.9	35.4	8.7	0.7	5.1	43.4	3.1	0.1	0.5	0.0
271019	413	1.6	37.0	8.1	0.7	6.2	42.0	4.0	0.3	0.1	0.0
271023	507	1.8	17.9	6.2	2.9	3.0	63.9	3.4	0.5	0.5	0.0
271085	731	0.8	27.4	9.1	1.3	5.0	52.2	3.7	0.4	0.1	0.0
274033	487	1.9	32.3	5.4	0.7	6.7	46.2	1.8	3.6	1.2	0.0
274037	648	2.3	33.1	6.9	0.2	5.8	45.7	1.5	3.8	0.7	0.0
274040	755	1.1	18.0	5.0	0.5	3.7	67.9	3.7	0.0	0.2	0.0
274055	482	1.2	17.0	2.9	0.2	4.5	68.2	2.3	3.2	0.5	0.0
276251	754	1.7	17.1	7.1	1.1	2.7	66.7	2.9	0.4	0.3	0.0
279075	739	4.4	22.1	4.9	1.6	7.8	55.6	3.0	0.4	0.1	0.0
281001	483	2.6	17.3	7.3	0.4	18.2	40.6	5.6	1.8	0.1	6.1
281802	756	0.3	12.3	4.8	0.0	6.0	73.6	1.8	1.1	0.0	0.2
282807	742	4.3	12.2	6.0	0.2	11.4	64.8	0.6	0.3	0.0	0.1
283018	349	0.4	5.0	2.2	0.1	6.8	80.5	2.4	1.2	0.3	1.1
283019	407	0.5	5.2	2.2	0.1	7.0	79.8	2.5	1.1	0.3	1.3
283083	703	3.3	48.1	8.7	0.2	9.6	28.9	1.1	0.0	0.0	0.1
283085	703	3.3	48.1	8.7	0.2	9.6	28.9	1.1	0.0	0.0	0.1
283087	494	0.8	23.8	3.9	0.0	9.5	60.9	0.6	0.1	0.0	0.3
283089	742	4.3	12.2	6.0	0.2	11.4	64.8	0.6	0.3	0.0	0.1
283091	430	0.1	11.1	5.1	0.1	9.7	72.2	1.3	0.2	0.0	0.2
283093	471	1.1	9.9	4.4	0.0	8.9	71.8	0.6	2.5	0.6	0.2
283094	471	1.1	9.9	4.4	0.0	8.9	71.8	0.6	2.5	0.6	0.2
283099	451	0.5	5.4	1.8	0.0	5.8	78.0	0.5	6.9	1.1	0.1
284024	513	36.3	23.1	7.4	0.1	7.8	23.3	0.4	1.5	0.0	0.0
285006	498	0.4	7.1	2.6	0.0	13.3	68.1	0.4	6.8	1.1	0.1
285025	495	6.4	15.1	14.9	0.0	6.5	53.9	0.5	0.0	0.0	2.6
285803	461	0.7	5.9	2.7	0.0	8.3	73.6	0.4	7.0	1.2	0.1
285805	506	1.7	11.8	6.3	0.1	9.2	67.1	0.8	2.3	0.5	0.2
287012	433	0.9	6.4	3.4	0.0	6.3	74.6	0.7	5.7	1.0	1.0
289030	667	1.1	7.0	3.4	0.0	6.4	75.5	0.5	5.2	0.9	0.1
291002	BAD	5.9	50.8	11.4	0.1	16.0	15.3	0.2	0.2	0.0	0.0
291005	BAD	2.7	32.4	7.0	0.2	19.0	35.9	0.5	2.0	0.2	0.1
291010	224	2.0	7.0	2.6	0.1	9.8	71.4	0.8	6.0	0.3	0.0
294036	465	1.4	11.1	4.3	0.4	6.6	71.3	1.0	2.8	1.0	0.1
295000	490	0.9	7.4	2.9	0.1	6.9	61.7	2.6	4.8	2.3	10.5

295473	999	1.1	9.2	1.5	0.0	9.2	69.0	0.9	8.3	0.7	0.1
295503	488	0.9	7.3	3.1	0.0	11.4	62.3	5.7	3.1	2.1	4.0
297054	937	1.0	5.8	1.2	0.0	11.3	71.7	1.2	7.1	0.6	0.1
341011	643	3.4	35.3	9.1	2.6	8.4	39.2	0.9	0.9	0.1	0.1
344042	438	1.3	22.4	6.8	2.2	8.6	56.3	1.0	1.2	0.1	0.0
394018	226	6.2	8.0	0.6	5.7	7.9	57.6	11.1	1.0	0.3	1.5
395010	415	8.5	16.3	3.6	0.2	8.6	60.4	1.9	0.4	0.1	0.0
404162	490	2.7	16.2	4.0	0.0	24.9	47.5	1.6	1.7	0.2	1.1
405021	481	0.4	23.2	5.6	0.1	5.9	62.1	0.6	1.4	0.2	0.4
406010	485	1.4	37.7	7.8	0.9	8.6	41.5	1.6	0.3	0.2	0.1
412002	495	3.1	41.6	10.0	0.3	9.1	14.7	3.2	1.4	0.2	16.5
415008	475	0.9	9.4	1.9	0.1	7.5	53.7	7.0	4.5	0.1	14.9
415022	730	1.7	15.3	5.5	0.2	7.6	43.5	7.0	4.6	0.0	14.4
416011	432	2.0	12.9	2.6	0.2	7.6	48.4	9.1	4.8	0.0	12.4
417081	305	0.9	10.5	2.9	0.9	6.7	53.7	10.1	3.3	0.1	10.9
421627	393	0.7	5.1	2.5	3.6	3.2	79.0	1.0	4.4	0.4	0.1
447401	749	1.9	24.3	6.2	0.2	17.3	48.3	0.7	1.0	0.1	0.0
472008	450	0.8	16.9	6.1	4.8	13.7	55.7	0.7	1.1	0.1	0.0
481123	271	1.0	8.8	1.8	0.0	14.2	71.2	0.7	1.6	0.5	0.2
482172	421	1.2	6.3	1.6	0.0	8.1	73.3	0.4	6.3	2.6	0.1
485336	441	0.9	11.5	3.7	0.0	9.2	72.2	0.5	1.4	0.4	0.1
501002	1041	3.9	37.2	15.4	1.6	8.1	32.4	1.1	0.2	0.1	0.0
501004	496	1.6	58.6	11.0	0.3	8.9	17.9	1.3	0.1	0.3	0.0
501681	964	2.8	27.3	7.3	0.3	9.5	49.9	2.3	0.3	0.2	0.0
501682	965	2.7	28.9	7.2	0.7	10.4	47.3	2.1	0.3	0.4	0.0
501683	965	2.7	28.9	7.2	0.7	10.4	47.3	2.1	0.3	0.4	0.0
511002	931	8.3	28.5	15.1	4.0	20.9	20.5	1.1	1.0	0.2	0.4
511023	904	2.8	11.6	1.5	0.1	8.4	73.7	0.8	1.0	0.0	0.1
511417	557	3.0	16.4	3.6	2.6	8.9	59.2	2.1	2.4	0.2	1.7
511419	893	3.7	32.9	7.8	1.4	10.3	41.5	1.2	0.9	0.1	0.1
511423	713	4.5	22.4	7.6	2.0	8.3	47.6	3.0	0.8	1.3	2.5
511464	223	4.6	16.5	4.9	0.7	8.3	62.3	0.9	1.7	0.0	0.1
515010	1088	2.0	13.9	3.9	0.6	7.5	69.3	1.1	1.3	0.1	0.2
515021	743	1.5	14.4	5.5	0.1	7.3	46.3	6.4	4.4	0.0	13.9
51A300	1082	2.7	9.4	1.5	0.0	7.6	76.6	0.9	1.1	0.0	0.1
531002	677	0.7	28.7	5.5	0.1	8.6	38.1	3.7	1.6	5.6	7.4
531005	730	1.2	15.3	2.0	0.0	5.0	56.8	3.9	3.3	4.6	7.9
531006	BAD	0.9	38.4	7.3	0.4	5.4	37.0	3.7	0.2	0.7	6.0
531007	1037	0.1	9.8	3.7	0.1	2.9	46.7	7.9	3.7	5.9	19.2
531801	725	0.7	31.2	10.2	0.3	3.7	30.3	10.0	0.4	1.3	11.9
533013	246	1.5	33.0	5.1	0.3	8.7	26.0	6.7	2.2	3.2	13.1
533014	216	1.1	15.2	3.2	0.1	4.9	47.3	7.7	3.8	5.4	11.4
533812	496	2.5	42.4	5.2	0.8	9.1	29.8	2.5	1.4	1.6	4.7
533813	519	0.8	31.7	10.8	0.1	11.5	24.4	9.5	0.4	2.4	8.4
536020	324	0.9	35.1	9.8	0.2	6.2	36.3	3.6	0.6	2.2	5.2
536048	519	1.1	42.2	12.2	0.7	7.2	21.7	6.8	0.2	0.7	7.2
536056	1037	0.6	34.7	4.2	0.1	5.8	27.0	11.9	1.6	3.6	10.5
537322	515	0.9	27.9	4.2	0.1	5.5	30.4	15.4	1.7	3.0	10.9
537409	474	0.6	24.4	4.3	1.1	8.6	42.2	4.3	1.5	3.4	9.7

851801	BAD	25.0	5.8	17.9	0.9	8.7	33.5	7.0	0.6	0.5	0.0
871622	587	2.0	24.0	8.7	0.8	3.5	31.0	7.3	0.6	5.0	17.2
872811	163	1.5	8.3	2.0	0.2	2.0	66.8	4.6	0.8	7.1	6.9
872812	516	1.9	10.1	3.0	0.2	4.8	59.1	5.1	5.3	2.6	8.0
87B300	731	2.0	23.2	8.1	0.7	3.4	31.8	7.1	0.6	5.8	17.4
881647	367	5.7	28.9	21.8	0.6	4.7	24.2	13.8	0.1	0.0	0.1
892011	502	4.3	24.8	3.9	0.0	13.1	23.8	23.2	3.5	0.2	3.1
906410	437	4.2	13.0	4.6	0.5	11.0	33.8	11.1	1.0	0.4	20.5
906412	BAD	5.4	21.7	4.1	0.0	13.9	28.4	8.5	1.2	0.3	16.3

Percent of ADTT

Section	# of Days	Normalized Variance									
		VC 4	VC 5	VC 6	VC 7	VC 8	VC 9	VC 10	VC 11	VC 12	VC 13
29035	207	4	306	248	11	11	71	26	0	0	299
62040	934	0	18	32	0	9	29	0	2	0	0
81029	260	1	933	244	1126	10	71	2	0	12	11
83032	253	0	15	2	0	2	18	0	1	0	0
87780	261	3	54	16	0	3	11	0	0	0	0
87783	253	0	15	3	0	1	21	0	1	0	1
91803	598	0	152	30	36	2	24	0	0	0	0
94008	656	0	6	1	1	2	14	0	3	0	0
94020	424	1	30	5	2	3	13	0	0	0	0
95001	636	46	19	2	2	6	45	0	3	0	0
121370	154	29	7	51	3	45	77	1	0	0	0
123995	363	60	3	61	0	81	44	0	0	0	1
124000	828	3	53	20	10	11	46	0	0	0	0
124059	BAD	27	190	132	3	26	27	1	0	0	158
124096	418	132	157	144	71	210	432	4	0	0	3
124100	346	17	45	283	13	153	69	6	0	0	3
124102	BAD	37	220	73	32	188	194	0	1	0	0
124103	352	418	20	207	4	109	31	0	0	0	66
124106	347	955	111	281	2	385	444	5	3	2	33
124107	358	46	28	54	4	188	113	1	0	0	1
124109	BAD	21	218	135	3	22	23	1	0	0	112
124137	353	9	3	5	0	17	23	0	1	0	0
124138	578	2	42	17	11	11	14	0	0	0	0
124154	359	44	14	345	29	158	132	3	0	0	57
129054	307	79	12	73	15	59	646	20	0	0	1073
174074	405	2	16	3	0	4	34	0	0	0	0
175849	330	36	40	36	1	9	160	3	6	0	1
175908	541	3	16	9	0	7	30	1	0	0	0
177937	409	5	52	105	1	5	163	4	0	0	0
181028	425	1	42	9	70	13	265	2	1	1	5
181037	959	2	66	12	1	5	53	0	1	0	0
182008	963	1	187	13	3	9	222	3	2	0	0
182009	463	9	197	79	16	70	189	4	16	0	0
183002	696	1	944	145	1	16	1133	7	6	0	0
183003	482	43	51	1	2	27	146	1	7	1	23
183030	738	11	570	45	14	70	158	1	2	1	2
183031	748	16	182	9	2	28	169	4	1	0	1
184021	679	5	68	79	38	32	162	2	5	5	89
184042	554	19	188	11	2	33	157	5	1	0	1
185022	979	3	773	3	3	14	583	1	11	0	1
185043	BAD	19	440	79	19	87	133	1	4	0	0
185518	939	0	44	2	5	4	151	41	2	1	7
185528	455	9	235	16	1	18	133	1	1	0	0
185538	405	9	157	23	1	58	91	1	1	0	0
186012	475	0	22	2	58	7	135	1	1	0	9

189020	449	6	41	1	1	5	139	0	27	0	3
213016	BAD	62	6	43	285	59	578	3	7	0	0
216043	409	9	67	6	1	8	30	15	0	0	0
261001	924	1	279	173	5	9	52	17	0	0	58
261004	753	1	193	39	12	11	37	32	0	0	13
261010	1019	7	231	18	1	13	23	5	0	0	23
261012	727	0	84	1	0	4	58	3	1	0	16
261013	457	0	199	1	0	8	149	3	1	0	45
263069	912	0	142	2	0	9	92	6	0	0	24
264015	511	0	41	2	0	5	54	3	0	0	6
265363	994	0	98	3	0	9	108	4	1	0	88
267072	1014	0	103	3	1	11	132	3	1	0	52
269029	233	0	14	68	0	13	145	1	1	0	10
269030	1007	0	37	42	0	4	135	5	1	0	9
271016	759	6	139	23	2	6	141	12	0	1	0
271019	413	1	91	13	1	4	67	20	0	0	0
271023	507	1	26	4	2	1	39	8	0	0	0
271085	731	1	53	27	1	9	68	19	1	0	0
274033	487	1	157	5	0	4	116	1	1	0	0
274037	648	1	139	7	0	3	104	1	2	0	0
274040	755	0	24	9	1	2	45	3	0	0	0
274055	482	0	23	1	0	1	37	3	0	0	0
276251	754	1	30	7	1	1	41	3	0	0	0
279075	739	23	48	10	4	25	105	10	0	0	0
281001	483	6	48	5	1	21	125	18	1	0	123
281802	756	0	45	45	0	3	85	2	0	0	0
282807	742	27	61	6	0	6	57	0	0	0	0
283018	349	0	1	1	0	3	13	3	0	0	2
283019	407	0	2	1	0	4	19	3	0	0	3
283083	703	17	310	71	1	91	323	7	0	0	0
283085	703	17	310	71	1	91	323	7	0	0	0
283087	494	1	25	3	0	8	43	1	0	0	0
283089	742	27	61	6	0	6	57	0	0	0	0
283091	430	0	5	3	0	5	13	0	0	0	0
283093	471	0	3	10	0	2	18	0	0	0	0
283094	471	0	3	10	0	2	18	0	0	0	0
283099	451	0	4	0	0	1	8	0	1	0	0
284024	513	404	113	14	0	12	91	0	1	0	0
285006	498	0	1	0	0	3	5	0	2	0	0
285025	495	128	23	87	0	5	232	0	0	0	145
285803	461	1	10	20	0	2	55	0	2	0	0
285805	506	6	5	1	0	2	10	0	0	0	0
287012	433	0	9	1	0	2	40	1	1	0	33
289030	667	1	7	5	0	2	14	0	1	0	0
291002	BAD	10	219	164	0	56	50	1	5	0	0
291005	BAD	3	228	50	0	154	121	0	1	0	0
291010	224	44	7	2	0	32	55	0	2	0	0
294036	465	1	24	3	0	12	26	3	2	8	0
295000	490	1	49	14	0	34	640	11	19	10	313

295473	999	0	16	5	0	16	37	0	2	1	0
295503	488	0	12	1	0	25	176	29	1	7	51
297054	937	0	5	0	0	18	19	0	2	1	0
341011	643	17	75	6	2	16	38	0	0	0	0
344042	438	0	6	1	1	1	8	0	0	0	0
394018	226	2	4	4	9	2	30	15	0	0	0
395010	415	47	703	68	0	27	659	2	0	0	0
404162	490	2	21	4	0	30	42	2	1	0	4
405021	481	0	70	2	0	2	53	0	0	0	0
406010	485	1	22	8	5	3	27	1	0	0	0
412002	495	2	43	11	0	14	10	1	0	0	26
415008	475	0	8	1	0	8	44	4	3	0	8
415022	730	1	7	2	0	4	13	1	1	0	5
416011	432	3	7	2	0	6	13	1	1	0	4
417081	305	0	14	5	4	6	31	7	0	0	6
421627	393	0	1	1	3	2	31	0	6	0	0
447401	749	1	13	2	0	7	13	0	0	0	0
472008	450	0	15	3	10	3	12	1	0	0	0
481123	271	0	4	1	0	14	28	0	0	0	0
482172	421	0	2	0	0	3	10	0	1	0	0
485336	441	1	42	3	0	3	62	0	0	0	0
501002	1041	3	48	36	3	5	20	1	0	0	0
501004	496	2	281	56	0	15	59	3	0	1	0
501681	964	2	13	5	0	3	11	1	0	0	0
501682	965	2	14	6	0	4	14	1	0	0	0
501683	965	2	14	6	0	4	14	1	0	0	0
511002	931	18	55	37	24	50	35	2	2	1	2
511023	904	1	114	0	0	6	111	0	0	0	0
511417	557	1	77	1	5	19	72	4	1	0	20
511419	893	2	60	6	2	13	50	1	0	0	0
511423	713	3	127	11	2	8	113	9	0	4	20
511464	223	1	17	1	1	1	24	0	0	0	0
515010	1088	0	18	3	1	8	38	0	1	0	0
515021	743	0	8	2	0	5	22	1	1	0	5
51A300	1082	1	51	0	0	11	66	0	0	0	0
531002	677	1	83	13	0	21	27	5	1	6	12
531005	730	0	29	1	0	5	22	1	1	1	3
531006	BAD	1	135	9	1	6	119	6	0	0	13
531007	1037	0	19	8	0	4	46	21	2	10	19
531801	725	0	113	14	1	9	35	20	0	1	20
533013	246	1	41	10	1	22	21	4	1	3	10
533014	216	0	25	6	0	10	13	3	1	1	4
533812	496	1	48	1	1	19	7	0	0	0	2
533813	519	0	65	6	0	30	13	7	0	1	8
536020	324	0	88	6	0	18	62	2	0	1	2
536048	519	1	38	4	1	11	10	5	0	0	6
536056	1037	1	86	4	0	7	20	17	1	7	15
537322	515	0	23	6	0	4	25	20	1	2	11
537409	474	0	101	2	2	8	118	11	1	5	102

851801	BAD	1301	139	763	62	353	927	229	13	4	0
871622	587	1	93	108	1	3	57	7	0	6	27
872811	163	0	4	0	0	0	13	2	0	2	2
872812	516	1	6	0	0	14	45	4	20	2	4
87B300	731	1	79	89	1	2	51	6	0	8	22
881647	367	17	42	26	0	5	28	18	0	0	0
892011	502	13	113	6	0	99	50	70	7	0	7
906410	437	2	66	3	1	39	38	7	0	1	30
906412	BAD	21	378	6	0	49	108	20	1	0	46

Percent of ADTT

		Normalized COV, %									
Section	# of Days	VC 4	VC 5	VC 6	VC 7	VC 8	VC 9	VC 10	VC 11	VC 12	VC 13
29035	207	90	54	196	677	202	54	93	0	1046	51
62040	934	57	13	36	250	33	14	123	29	65	148
81029	260	194	64	109	142	124	123	215	307	194	186
83032	253	30	14	36	304	22	8	35	47	30	116
87780	261	36	11	41	196	32	27	77	263	306	301
87783	253	34	16	38	131	23	8	36	45	30	42
91803	598	172	16	56	126	79	80	188	368	2049	969
94008	656	76	12	23	54	14	7	28	28	1072	182
94020	424	30	13	24	55	19	11	49	63	358	108
95001	636	232	28	28	99	25	11	24	29	234	153
121370	154	56	50	61	156	35	17	137	439	0	233
123995	363	137	35	75	134	16	32	108	58	63	162
124000	828	66	16	33	150	25	31	114	142	994	333
124059	BAD	107	31	46	366	47	51	220	519	528	449
124096	418	105	69	68	105	72	91	138	208	913	308
124100	346	276	198	29	105	53	101	241	741	1088	171
124102	BAD	70	68	50	156	57	59	161	126	239	364
124103	352	58	44	63	130	52	80	197	295	422	308
124106	347	82	171	132	555	104	105	250	277	369	244
124107	358	85	56	50	205	34	43	136	868	976	180
124109	BAD	95	29	54	365	46	48	241	594	635	540
124137	353	66	47	34	263	24	7	115	80	128	139
124138	578	54	14	29	149	24	20	114	131	984	340
124154	359	428	126	51	78	50	66	65	557	1111	109
129054	307	127	141	94	152	98	158	237	491	823	62
174074	405	32	25	30	61	29	9	63	50	77	106
175849	330	112	53	190	99	63	18	181	76	113	320
175908	541	25	11	33	106	31	15	51	179	176	284
177937	409	47	25	77	102	39	30	83	449	314	627
181028	425	44	64	86	271	42	24	102	27	203	250
181037	959	83	31	66	190	24	13	76	96	232	351
182008	963	60	52	91	131	46	26	135	62	185	330
182009	463	138	45	84	178	66	36	241	202	347	197
183002	696	86	121	168	134	172	58	203	68	126	269
183003	482	179	43	30	124	52	20	41	83	225	798
183030	738	86	38	121	263	87	83	267	207	274	409
183031	748	189	36	48	146	85	29	385	107	648	821
184021	679	45	40	90	198	41	32	97	58	377	452
184042	554	150	35	53	139	87	30	415	87	538	724
185022	979	84	94	65	190	51	46	101	89	289	532
185043	BAD	125	57	47	315	68	50	195	106	529	907
185518	939	37	68	48	228	49	17	184	29	78	414
185528	455	135	37	52	77	37	36	67	75	187	153
185538	405	111	31	53	91	47	36	67	52	120	138
186012	475	32	42	60	240	38	17	61	26	260	470

189020	449	87	90	46	236	40	15	52	169	251	319
213016	BAD	108	27	87	116	26	90	100	87	84	250
216043	409	68	31	29	132	34	13	37	71	273	226
261001	924	259	32	117	83	56	56	86	1169	1249	73
261004	753	218	30	58	112	68	31	61	390	1208	59
261010	1019	90	24	64	123	50	48	86	647	1443	90
261012	727	78	37	29	115	23	18	24	27	83	50
261013	457	68	44	29	158	36	30	46	42	97	75
263069	912	92	49	49	148	45	21	38	53	116	39
264015	511	46	43	42	80	56	11	28	85	104	45
265363	994	165	83	41	82	42	19	44	66	77	67
267072	1014	67	48	41	70	38	24	40	113	212	71
269029	233	48	26	94	141	41	23	37	28	54	33
269030	1007	49	42	146	72	31	19	45	39	46	57
271016	759	86	33	55	173	46	27	113	301	127	0
271019	413	66	26	45	161	32	20	113	112	251	0
271023	507	64	28	31	48	33	10	86	59	83	0
271085	731	122	27	56	94	61	16	118	254	493	0
274033	487	42	39	41	91	28	23	56	31	52	0
274037	648	38	36	39	125	30	22	79	34	63	0
274040	755	54	27	59	164	37	10	47	249	145	0
274055	482	38	28	28	169	22	9	69	21	47	0
276251	754	57	32	37	72	33	10	60	61	107	0
279075	739	108	31	64	117	64	18	102	163	300	0
281001	483	93	40	32	173	25	28	75	65	189	182
281802	756	158	55	140	544	30	13	73	63	431	157
282807	742	120	64	42	307	22	12	80	112	391	243
283018	349	100	22	35	177	25	4	73	47	81	121
283019	407	96	25	36	193	28	5	71	51	84	118
283083	703	123	37	98	451	99	62	243	1396	0	704
283085	703	123	37	98	451	99	62	243	1396	0	704
283087	494	88	21	45	642	30	11	120	306	534	114
283089	742	120	64	42	307	22	12	80	112	391	243
283091	430	179	20	31	387	23	5	53	118	326	130
283093	471	41	17	71	222	14	6	33	19	36	60
283094	471	41	17	71	222	14	6	33	19	36	60
283099	451	44	37	25	336	17	4	43	16	33	82
284024	513	55	46	51	469	43	41	141	57	470	380
285006	498	57	16	22	369	13	3	44	20	28	91
285025	495	176	32	63	343	34	28	100	231	572	469
285803	461	121	53	165	395	15	10	49	22	30	94
285805	506	135	18	18	93	15	5	30	18	33	52
287012	433	40	48	34	707	21	8	137	20	31	576
289030	667	71	38	66	204	22	5	40	21	36	70
291002	BAD	53	29	112	570	47	46	301	965	1493	1873
291005	BAD	66	47	100	315	65	31	68	46	103	190
291010	224	332	38	57	160	58	10	47	24	156	108
294036	465	62	44	37	109	53	7	153	54	282	493
295000	490	97	94	127	218	85	41	127	89	136	169

295473	999	33	44	143	226	43	9	57	18	97	220
295503	488	45	48	39	184	44	21	94	24	123	180
297054	937	33	39	41	607	37	6	45	18	112	84
341011	643	122	24	27	47	47	16	38	36	135	162
344042	438	27	11	16	43	12	5	37	28	63	101
394018	226	24	26	294	52	16	10	35	38	55	45
395010	415	80	163	227	232	61	43	72	132	206	449
404162	490	47	28	49	485	22	14	79	49	271	193
405021	481	83	36	24	122	25	12	58	36	97	50
406010	485	48	13	36	237	20	13	63	91	153	202
412002	495	49	16	33	122	41	21	33	43	80	31
415008	475	41	30	55	79	38	12	28	39	126	19
415022	730	46	17	25	67	26	8	13	20	175	15
416011	432	80	20	61	104	31	8	12	22	236	17
417081	305	44	35	76	225	36	10	27	19	125	22
421627	393	36	23	33	47	42	7	57	56	60	68
447401	749	52	15	23	205	15	8	60	53	129	420
472008	450	78	23	30	66	13	6	119	41	170	261
481123	271	43	24	41	292	26	7	51	40	62	102
482172	421	31	21	31	275	20	4	49	17	24	85
485336	441	104	56	42	331	19	11	69	28	57	347
501002	1041	44	19	39	108	27	14	69	203	180	333
501004	496	95	29	68	134	43	43	125	290	244	1134
501681	964	49	13	32	80	18	7	35	166	105	323
501682	965	48	13	33	88	18	8	39	161	79	284
501683	965	48	13	33	88	18	8	39	161	79	284
511002	931	51	26	40	122	34	29	139	139	330	393
511023	904	28	92	31	182	28	14	31	31	231	101
511417	557	38	54	32	81	49	14	94	39	200	270
511419	893	35	24	30	94	35	17	59	71	177	147
511423	713	38	50	44	78	34	22	103	82	153	175
511464	223	23	25	23	125	14	8	28	21	313	76
515010	1088	30	30	41	139	37	9	35	61	180	83
515021	743	26	20	25	74	31	10	11	17	226	15
51A300	1082	35	75	35	196	43	11	29	37	190	85
531002	677	124	32	65	423	53	14	57	65	42	46
531005	730	45	35	33	533	43	8	31	35	25	21
531006	BAD	76	30	42	189	44	29	64	144	85	61
531007	1037	239	45	79	719	71	15	58	38	53	23
531801	725	86	34	36	274	81	20	45	160	62	38
533013	246	69	19	62	256	53	18	29	47	50	24
533014	216	47	33	75	153	64	8	24	20	22	17
533812	496	47	16	22	99	48	9	26	41	38	31
533813	519	76	26	22	560	47	15	28	107	38	34
536020	324	57	27	25	119	69	22	39	56	39	26
536048	519	68	15	15	101	47	15	32	108	60	34
536056	1037	120	27	49	306	46	17	34	56	74	37
537322	515	74	17	58	323	35	16	29	51	42	30
537409	474	89	41	35	127	32	26	76	65	68	105

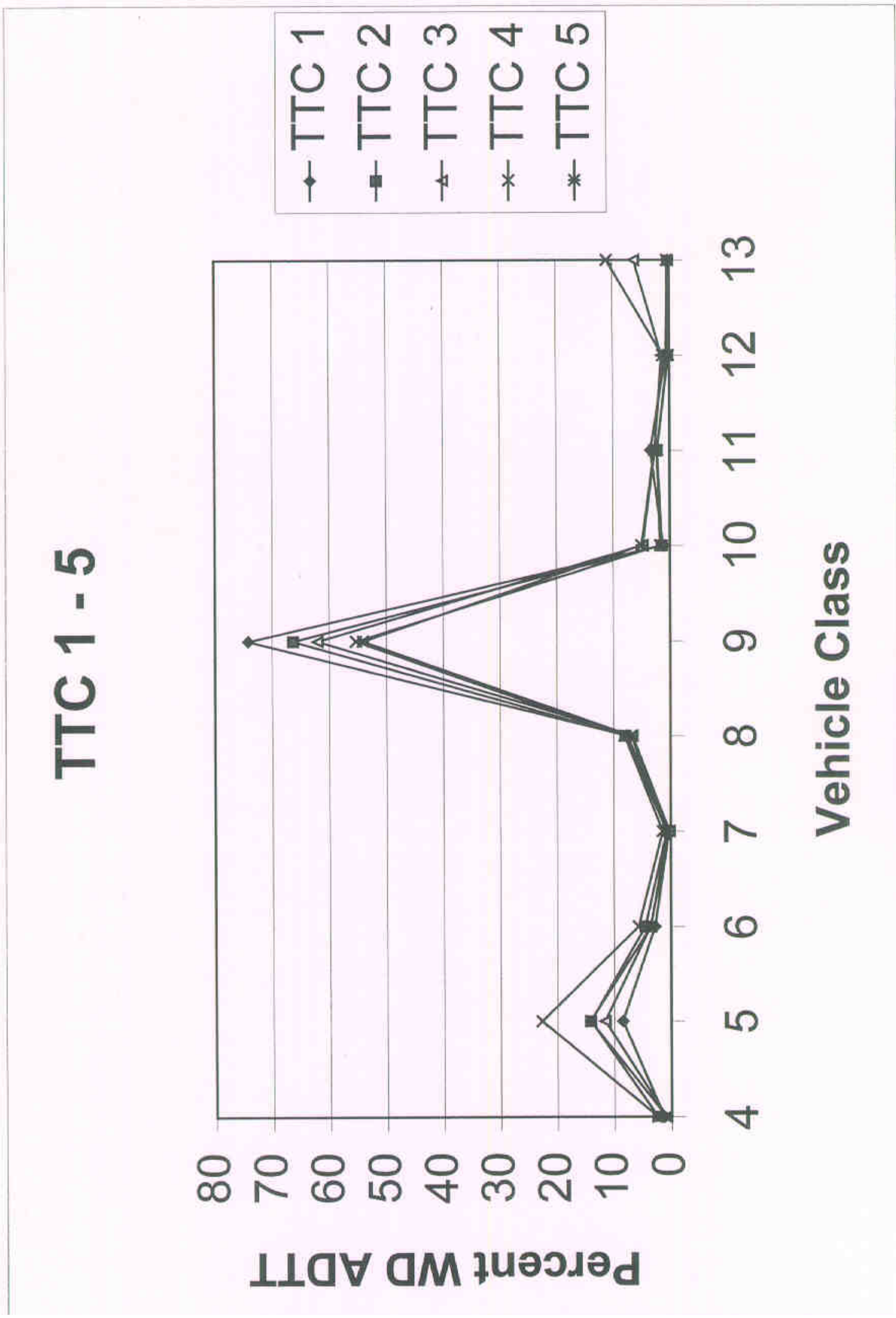
851801	BAD	144	201	154	846	217	91	216	551	435	0
871622	587	51	40	119	140	46	25	36	74	50	30
872811	163	32	23	25	74	27	6	28	29	19	20
872812	516	36	23	22	180	77	11	37	85	52	25
87B300	731	48	38	116	152	45	23	34	70	49	27
881647	367	71	23	23	114	48	22	30	242	585	269
892011	502	83	43	60	1122	76	30	36	75	251	82
906410	437	37	63	39	170	57	18	25	58	202	27
906412	BAD	85	89	58	378	50	37	52	59	152	42

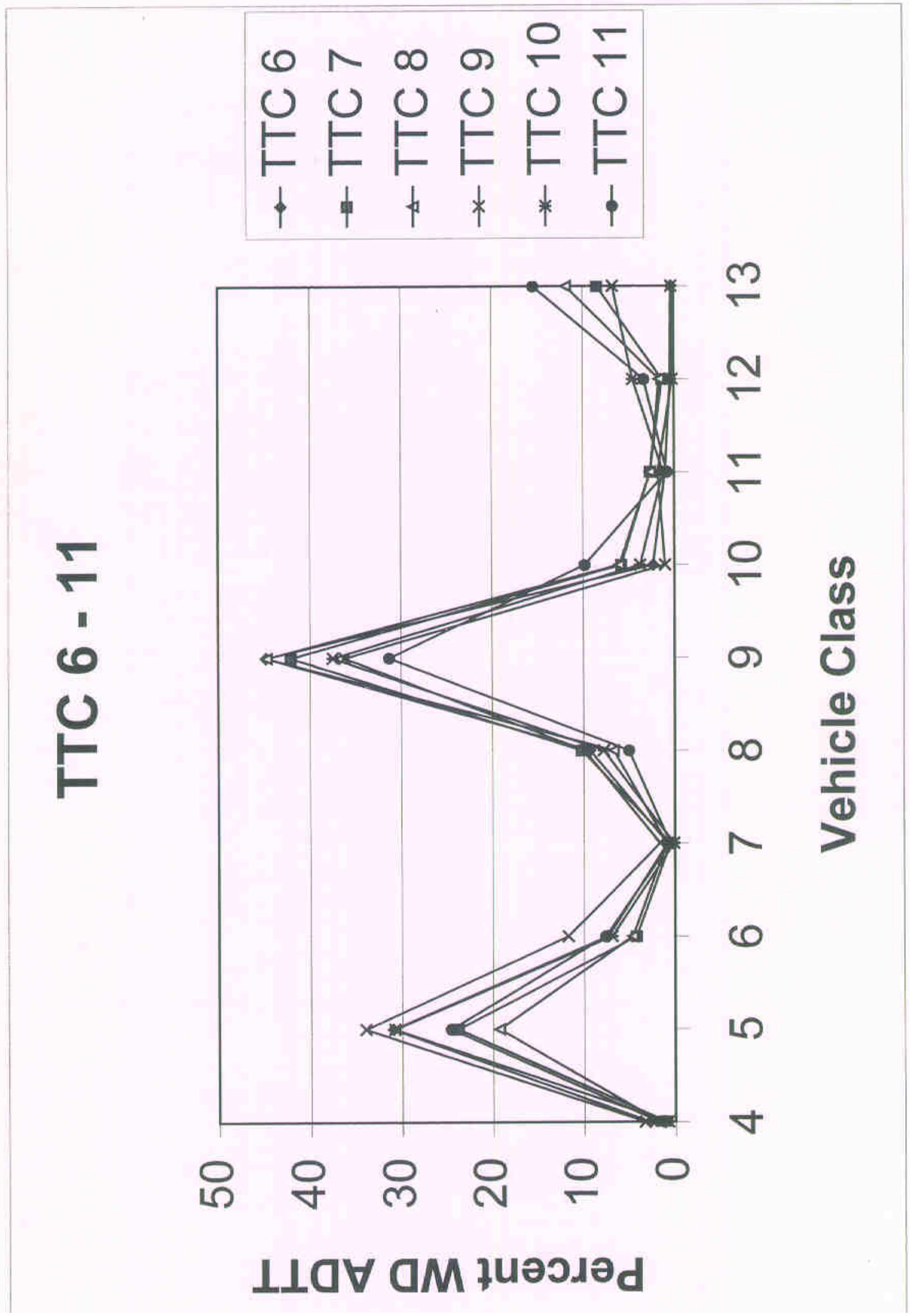
APPENDIX AA.3 – Default Values Suggested for Use for Each Truck Traffic Classification

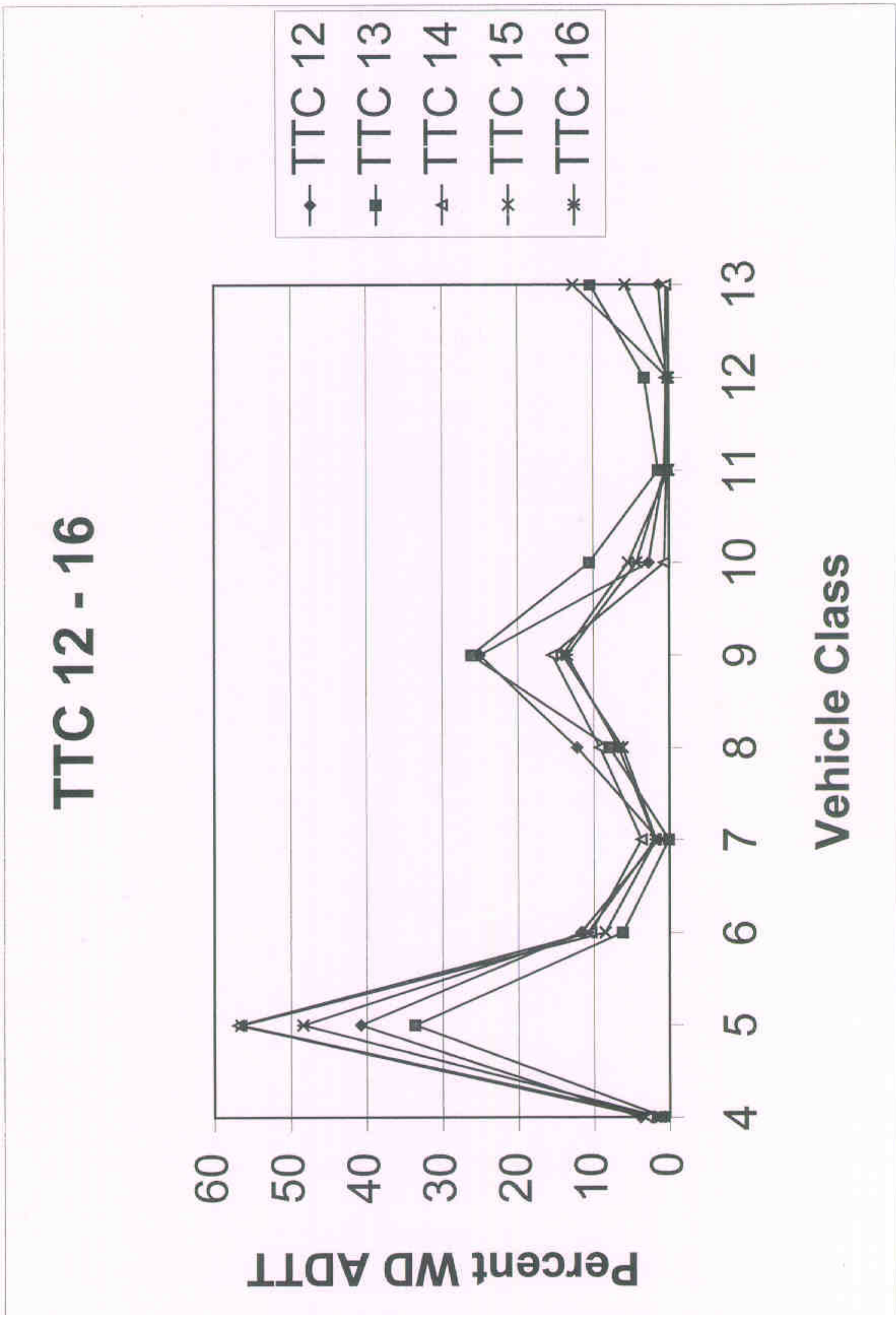
Appendix AA.3 provides a summary of the seventeen default normalized truck traffic distributions or spectra to be used with the Level 4 inputs. A definition and description of each truck traffic classification for these default distributions was included in Chapter 3.

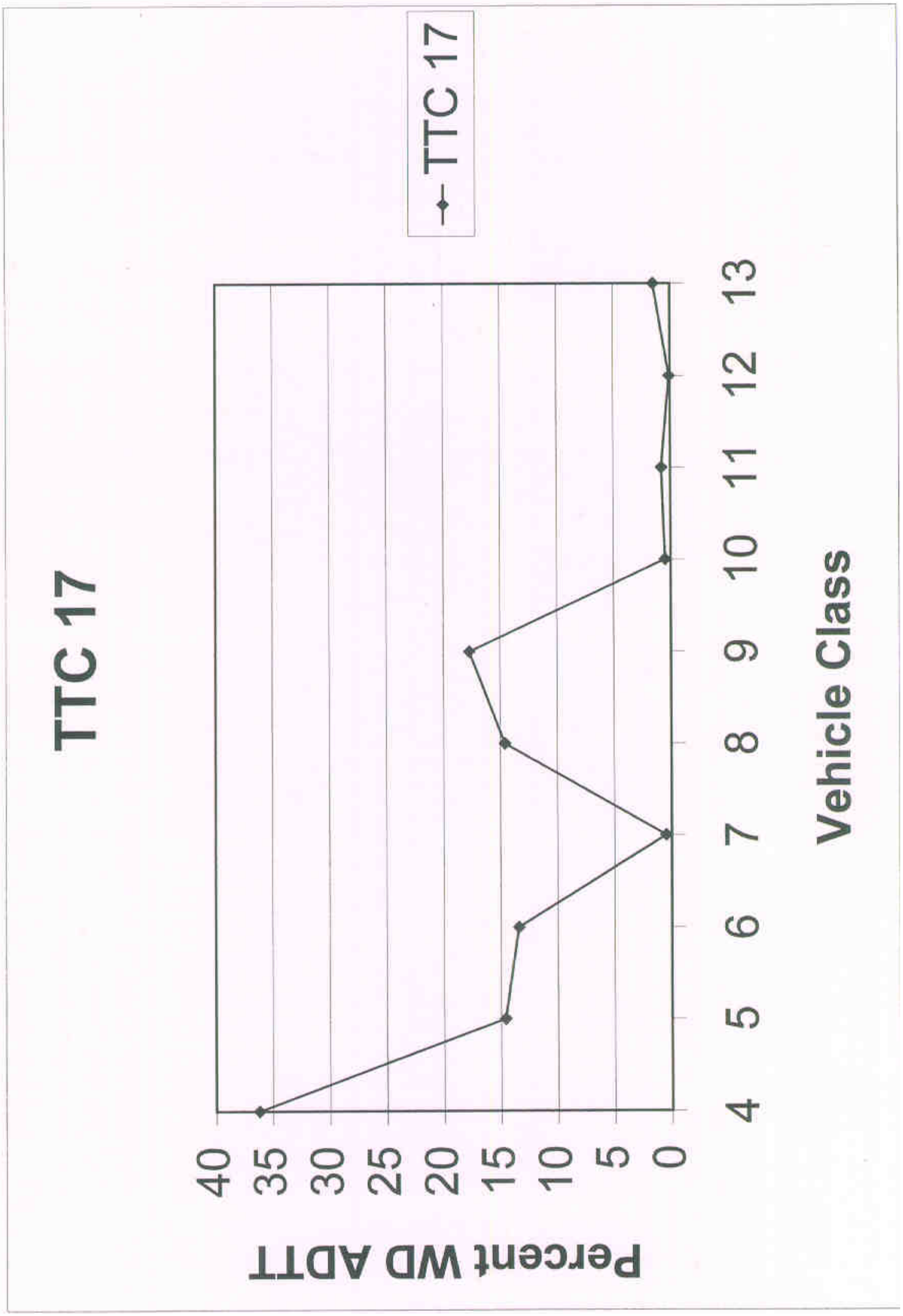
A graphical presentation of each of the seventeen distributions is included in this appendix. These graphical summaries are followed by a tabulation of the mean values and other statistics for each default distribution. In addition, the number of sampling days used to determine the default distributions is included in the tabulation of values. As shown, most default distributions have a significant number of sampling days.

The other important point to note is that the coefficient of variations for those vehicle classes with a relatively few number of trucks in the distribution are very high. However, the coefficient of variation for the vehicle classes that account for the majority of trucks in the traffic stream (vehicle classes 5 and 9) are reasonable considering the other truck site factors that can vary from day to day season to season and year to year.


TTC 1 - 5
Percent WD ADTT
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
TTC 1
TTC 2
TTC 3
TTC 4
TTC 5


TTC 6 - 11
Percent WD ADTT
0
10
20
30
40
50
4
5
6
7
8
9
10
11
12
13
Vehicle Class
TTC 6
TTC 7
TTC 8
TTC 9
TTC 10
TTC 11


TTC 12 - 16
Percent WD ADTT
Vehicle Class
60
50
40
30
20
10
0
4
5
6
7
8
9
10
11
12
13
TTC 12
TTC 13
TTC 14
TTC 15
TTC 16



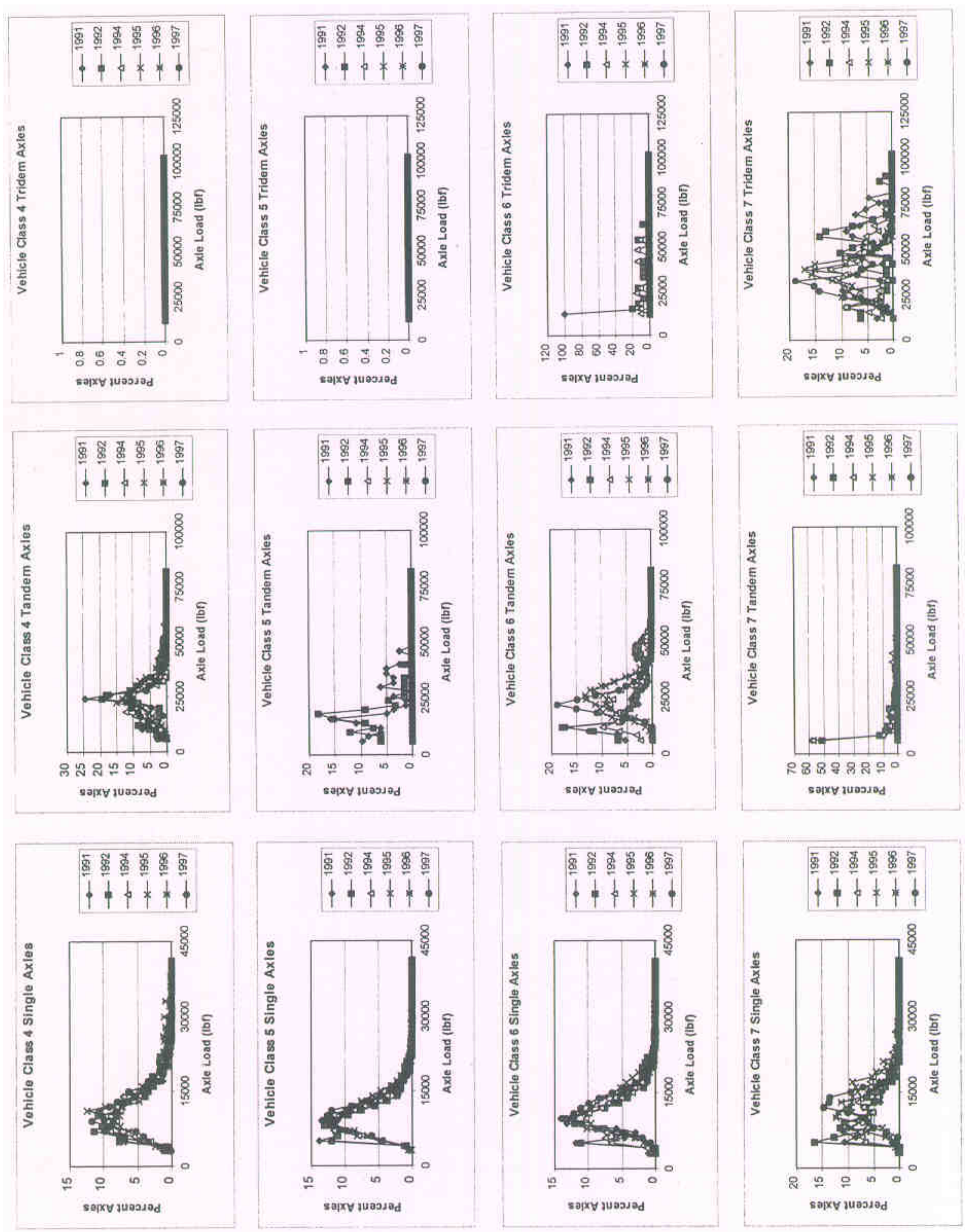
TTC 17
Percent WD ADTT
40
35
30
25
20
15
10
5
0
4
5
6
7
8
9
10
11
12
13
Vehicle Class
TTC 17

PDC	# of days	Statistic	VC 4	VC 5	VC 6	VC 7	VC 8	VC 9	VC 10	VC 11	VC 12	VC 13
PDC 01	11422	mean	1.3	8.5	2.8	0.3	7.6	74.2	1.2	3.4	0.6	0.3
		variance	2.1	33.5	7.5	1.1	11.3	62.5	4.7	7.5	0.8	1.8
		COV, %	115	68	99	382	44	11	181	81	155	476
PDC 02	10505	mean	2.4	14.1	4.5	0.7	7.9	66.3	1.4	2.2	0.3	0.2
		variance	11.2	76.5	10.6	6.8	19.1	87.1	2.4	7.3	0.2	0.7
		COV, %	138	62	72	370	55	14	111	123	149	486
PDC 03	2659	mean	0.9	11.6	3.6	0.2	6.7	62.0	4.8	2.6	1.4	6.2
		variance	0.3	46.2	19.7	0.0	20.3	215.9	11.1	6.2	6.1	76.5
		COV, %	60	59	124	108	67	24	70	97	174	142
PDC 04	10630	mean	2.4	22.7	5.7	1.4	8.1	55.3	1.7	2.2	0.2	0.4
		variance	16.4	206.1	28.1	3.6	17.7	201.6	6.1	5.8	0.2	11.1
		COV, %	169	63	93	140	52	26	143	111	222	851
PDC 05	4267	mean	0.9	14.2	3.5	0.6	6.9	54.1	5.0	2.7	1.2	11.0
		variance	0.5	73.3	7.9	0.7	11.1	92.2	6.4	5.8	3.5	42.5
		COV, %	78	60	81	149	48	18	51	89	154	59
PDC 06	10261	mean	2.8	31.0	7.3	0.8	9.3	44.8	2.3	1.0	0.4	0.3
		variance	5.2	118.0	15.0	1.4	31.5	82.7	9.0	1.7	0.6	2.2
		COV, %	82	35	53	149	60	20	132	131	204	542
PDC 07	2360	mean	1.0	23.8	4.2	0.5	10.2	42.1	5.8	2.6	1.3	8.4
		variance	2.0	127.4	5.2	0.7	27.6	102.0	10.1	1.8	4.5	61.8
		COV, %	143	47	55	169	51	24	55	51	166	93
PDC 08	3999	mean	1.7	19.3	4.6	0.9	6.7	44.7	6.0	2.6	1.6	11.8
		variance	3.8	137.4	7.7	4.6	12.1	59.4	15.2	4.4	9.1	57.9
		COV, %	118	61	60	226	52	17	65	82	192	64
PDC 09	5180	mean	3.3	34.0	11.7	1.6	9.9	36.2	1.0	1.8	0.2	0.3
		variance	8.9	110.9	43.1	8.6	21.9	77.0	1.1	5.2	0.7	12.1
		COV, %	90	31	56	180	47	24	107	126	434	1026
PDC 10	1001	mean	0.8	30.8	6.9	0.1	7.8	37.5	3.7	1.2	4.5	6.7
		variance	0.6	93.4	14.5	0.1	21.5	38.8	3.8	0.9	6.6	9.6
		COV, %	100	31	55	253	59	17	53	78	57	46
PDC 11	2995	mean	1.8	24.6	7.6	0.5	5.0	31.3	9.8	0.8	3.3	15.4
		variance	2.2	111.2	52.9	0.8	16.3	43.4	20.7	0.5	7.9	33.4
		COV, %	83	43	96	192	81	21	46	93	85	38
PDC 12	4952	mean	3.9	40.8	11.7	1.5	12.2	25.0	2.7	0.6	0.3	1.3
		variance	16.1	191.6	52.7	8.6	70.6	130.9	17.3	0.9	0.4	7.1
		COV, %	102	34	62	202	69	46	155	172	205	198
PDC 13	1802	mean	0.8	33.6	6.2	0.1	7.9	26.1	10.5	1.4	3.2	10.3
		variance	0.6	75.4	14.1	0.2	21.9	19.2	15.4	1.1	5.0	14.4
		COV, %	104	26	60	428	60	17	38	76	70	37
PDC 14	2333	mean	2.9	56.9	10.4	3.7	9.2	15.4	0.6	0.3	0.4	0.3
		variance	6.5	416.0	72.3	183.0	41.3	89.1	1.2	0.7	2.0	2.1
		COV, %	90	36	82	363	70	61	179	285	382	457
PDC 15	1772	mean	1.8	56.5	8.5	1.8	6.2	14.0	5.4	0.0	0.0	5.7
		variance	5.6	300.3	31.2	6.7	13.7	51.8	27.4	0.0	0.0	18.8
		COV, %	128	31	66	142	59	51	97	492	1447	77
PDC 16	1419	mean	1.3	48.4	10.8	1.9	6.7	13.5	4.3	0.5	0.1	12.6
		variance	3.1	221.8	116.7	4.8	13.6	37.7	12.0	0.6	0.0	55.1
		COV, %	132	31	100	117	55	45	82	153	214	59
PDC 17	1211	mean	36.2	14.6	13.4	0.5	14.6	17.7	0.5	0.8	0.1	1.5
		variance	558.3	145.9	187.2	2.2	179.7	221.6	1.9	1.5	0.6	30.1
		COV, %	65	83	102	274	92	84	251	153	613	377

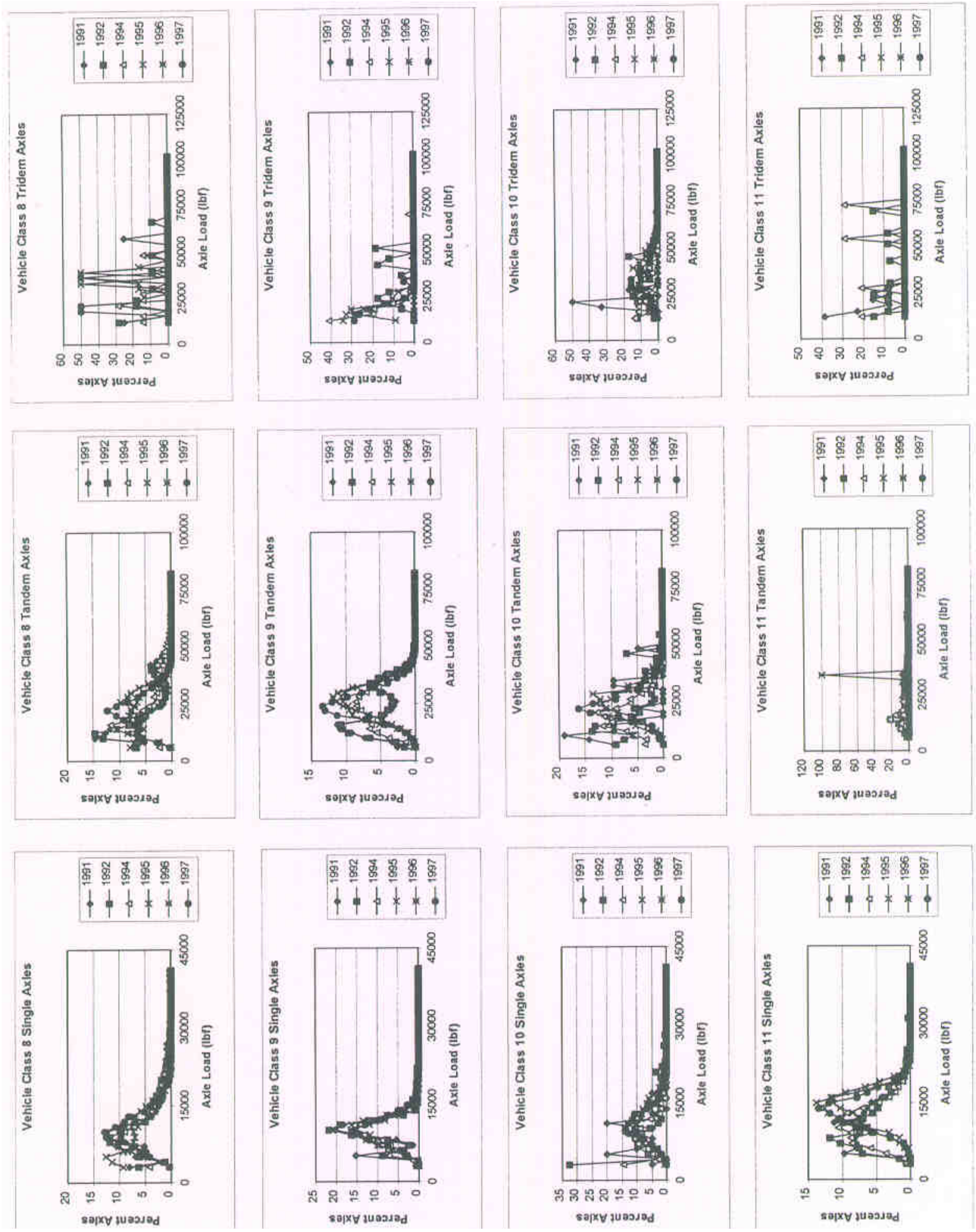
APPENDIX AA.4 – Normalized Annual Axle Weight Distributions/Spectra

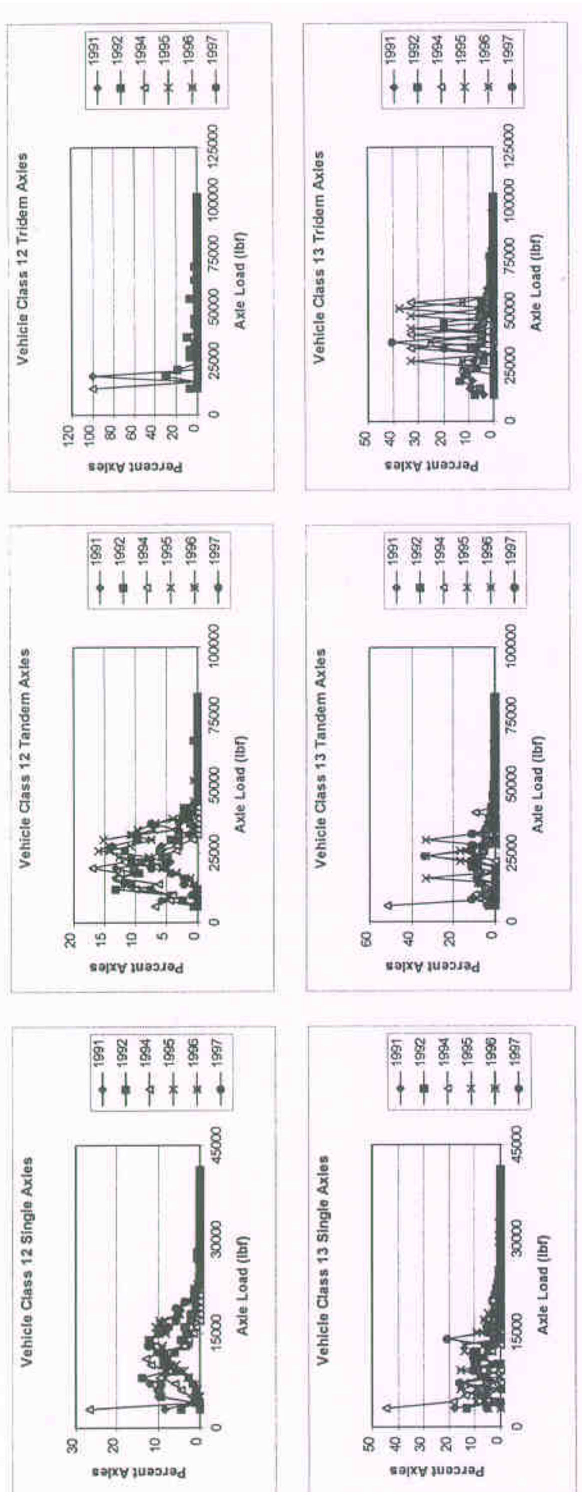
Appendix AA.4 includes the annual normalized axle load spectra for five of the LTPP core set of sites. These five sites are 123995, 185022, 344042, 395010 and 515010. A graphical illustration of the annual normalized axle load spectra for each axle type and each vehicle class is included in the appendix for each year of data that was recovered from the LTPP database. As shown, there is substantial variation among the years, but there is not consistent different from year to year. These annual plots are followed by a tabulation of the overall mean value and other statistics of the annual normalized axle load spectra for each axle type, for each vehicle class and each axle load group included in the database. The following summarizes the page numbers for the five sites included in this appendix:

Section 123995



Vehicle Class 4 Single Axles
Vehicle Class 4 Tandem Axles
Vehicle Class 4 Tridem Axles
Vehicle Class 5 Single Axles
Vehicle Class 5 Tandem Axles
Vehicle Class 5 Tridem Axles
Vehicle Class 6 Single Axles
Vehicle Class 6 Tandem Axles
Vehicle Class 6 Tridem Axles
Vehicle Class 7 Single Axles
Vehicle Class 7 Tandem Axles
Vehicle Class 7 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1994
1995
1996
1997


Vehicle Class 8 Single Axles
Vehicle Class 8 Tandem Axles
Vehicle Class 8 Tridem Axles
Vehicle Class 9 Single Axles
Vehicle Class 9 Tandem Axles
Vehicle Class 9 Tridem Axles
Vehicle Class 10 Single Axles
Vehicle Class 10 Tandem Axles
Vehicle Class 10 Tridem Axles
Vehicle Class 11 Single Axles
Vehicle Class 11 Tandem Axles
Vehicle Class 11 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1994
1995
1996
1997


Vehicle Class 12 Single Axles
Vehicle Class 12 Tandem Axles
Vehicle Class 12 Tridem Axles
Vehicle Class 13 Single Axles
Vehicle Class 13 Tandem Axles
Vehicle Class 13 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1994
1995
1996
1997

Section 123995 Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
12	3995	4	0.8	1.1	5.0	6.6	8.3	9.1	9.2	9.5	9.1	8.3	6.7	5.7	4.5	3.5	2.6	2.4	1.6	1.2	1.1	0.7
12	3995	5	0.4	1.0	7.4	8.5	10.4	12.0	12.3	11.0	9.3	7.4	5.4	3.9	3.1	2.4	1.7	1.1	0.8	0.6	0.4	0.3
12	3995	6	0.4	0.4	5.6	4.3	5.3	8.3	11.5	12.7	10.7	9.0	7.3	6.1	5.0	3.7	2.6	1.9	1.6	1.2	0.9	0.6
12	3995	7	0.1	0.3	6.1	5.6	6.3	7.7	8.0	7.6	7.9	9.1	8.5	7.4	6.2	5.5	4.1	2.8	2.4	1.5	1.3	0.4
12	3995	8	4.8	3.3	6.7	6.9	8.0	9.8	10.5	10.1	8.3	6.5	5.2	4.1	3.6	2.7	2.0	1.7	1.3	0.9	0.8	0.6
12	3995	9	0.3	0.5	6.8	5.3	6.3	9.6	14.6	17.5	15.4	11.1	5.8	2.8	1.5	0.8	0.5	0.3	0.3	0.1	0.2	0.1
12	3995	10	8.9	0.9	6.3	5.4	7.2	8.6	11.1	9.8	11.6	6.8	6.2	3.9	4.5	2.1	2.4	1.2	0.9	0.7	0.8	0.3
12	3995	11	0.2	0.7	3.6	3.9	5.1	6.1	6.0	7.6	8.9	8.8	9.0	9.1	8.7	7.0	5.3	4.2	2.4	1.5	0.7	0.4
12	3995	12	6.6	0.5	3.7	4.5	5.3	6.8	5.9	8.3	9.2	9.0	7.1	8.0	6.0	5.8	4.7	2.9	2.7	1.7	0.7	0.5
12	3995	13	14.3	6.4	8.6	6.2	7.1	5.6	8.4	4.3	8.4	8.7	5.8	4.2	3.3	2.6	1.6	1.9	0.4	1.0	0.3	0.3

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
12	3995	4	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
12	3995	5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	6	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	7	0.5	0.3	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	8	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	10	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	11	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	12	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	13	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 123995 Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
12	3995	4	0.8	1.6	3.5	5.3	5.0	5.1	6.1	7.1	10.9	14.9	13.3	8.5	6.4	3.8	2.2	1.3	1.1	0.9	0.6	0.5
12	3995	5	7.9	7.3	9.1	6.8	10.1	15.6	11.5	6.4	2.2	2.9	2.6	0.7	3.8	2.6	2.6	2.4	2.4	2.0	0.0	0.0
12	3995	6	2.4	2.8	5.2	7.7	4.3	5.4	7.6	8.6	9.1	8.7	8.4	6.9	5.3	3.8	2.6	1.9	1.5	1.1	1.1	1.1
12	3995	7	55.7	10.9	5.6	5.7	3.1	3.4	3.4	3.1	1.7	0.8	1.0	0.4	0.3	0.0	0.3	0.5	1.2	1.1	0.2	1.1
12	3995	8	4.1	4.4	8.6	9.4	8.5	7.8	7.1	7.1	6.9	5.5	5.1	4.4	3.9	3.2	2.7	2.0	2.0	1.9	1.7	1.3
12	3995	9	0.9	1.4	3.2	4.7	5.9	6.9	6.6	7.2	7.7	8.1	8.1	7.9	7.7	6.9	5.6	4.3	3.1	1.8	1.0	0.5
12	3995	10	3.7	4.4	5.5	6.1	7.5	6.8	7.0	8.8	9.6	7.8	6.6	6.4	4.2	4.9	4.2	1.6	1.4	0.8	0.4	0.3
12	3995	11	1.8	1.8	6.9	7.5	12.8	10.4	5.0	2.8	3.9	4.0	2.6	2.3	3.3	1.9	27.7	1.8	1.0	0.8	0.3	0.1
12	3995	12	1.2	2.1	2.3	5.2	5.3	7.3	7.3	9.7	8.0	8.0	9.5	8.5	6.7	5.9	3.9	4.2	2.1	1.1	1.2	0.1
12	3995	13	9.8	2.5	3.0	1.4	3.7	11.4	2.6	5.0	9.6	16.4	11.2	5.0	7.0	4.7	1.5	1.0	0.8	2.0	0.4	0.2

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
12	3995	4	0.3	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	6	1.1	1.1	0.9	0.7	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	7	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	8	0.8	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	10	1.2	0.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	11	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	12	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	13	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 123995 Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
12	3995	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	6	37.0	10.4	8.1	2.2	5.2	8.1	0.0	2.2	2.2	2.2	7.0	0.0	4.8	0.0	8.1	0.0
12	3995	7	2.0	2.5	4.5	4.1	6.4	7.1	6.3	7.5	7.0	9.5	6.1	5.3	5.5	4.7	3.0	4.8
12	3995	8	11.2	2.4	8.3	16.1	5.4	2.4	4.3	11.1	16.6	9.8	2.8	0.0	3.9	0.0	0.0	4.2
12	3995	9	22.5	21.5	20.2	11.1	8.0	4.2	0.3	1.0	1.2	0.0	3.5	2.5	0.0	3.7	0.0	0.0
12	3995	10	5.3	3.9	10.2	14.6	7.6	10.3	8.2	7.7	6.3	7.2	4.9	6.6	3.0	1.7	1.4	0.8
12	3995	11	24.9	10.4	2.5	7.9	7.6	12.2	2.3	0.0	0.0	0.0	2.3	0.0	0.0	2.7	9.7	2.7
12	3995	12	35.6	0.0	43.2	6.4	0.0	2.2	2.2	1.0	3.2	0.0	1.0	1.0	0.0	0.0	2.2	0.0
12	3995	13	2.0	2.5	3.6	3.7	4.6	9.6	1.5	11.5	12.5	7.0	10.8	4.7	6.9	7.6	8.7	0.7

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
12	3995	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	6	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	7	4.2	3.0	1.4	1.8	1.1	0.7	0.7	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0
12	3995	8	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	10	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	11	0.0	0.0	0.0	5.0	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	12	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	13	0.6	0.3	0.3	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

Section 123995 Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
12	3995	4	0	1	3	2	5	1	2	2	4	1	1	1	1	0	1	0	0	0	0	0
12	3995	5	0	0	19	5	1	0	1	2	2	2	2	2	1	0	0	0	0	0	0	0
12	3995	6	0	0	25	4	2	2	1	2	1	2	3	2	1	2	1	1	0	0	0	0
12	3995	7	0	0	42	22	10	10	5	5	8	10	14	12	5	4	8	4	2	0	2	0
12	3995	8	14	16	9	3	4	3	5	4	3	2	4	1	1	0	0	0	0	0	0	0
12	3995	9	0	0	24	2	12	8	3	7	8	4	3	2	1	0	0	0	0	0	0	0
12	3995	10	166	1	48	9	5	5	4	16	30	12	12	10	3	5	2	1	0	0	2	0
12	3995	11	0	1	16	13	19	17	4	3	2	3	7	12	17	15	10	3	1	0	0	0
12	3995	12	108	0	21	20	22	22	2	4	4	3	18	20	16	14	15	6	6	3	0	0
12	3995	13	264	47	8	36	41	8	29	19	3	16	23	69	13	5	6	4	1	3	1	0

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 123995 Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
12	3995	4	1	1	7	6	3	11	15	11	6	32	11	5	6	8	6	1	1	1	1	0
12	3995	5	258	216	349	185	409	968	619	181	21	39	29	3	68	29	29	36	36	16	0	0
12	3995	6	9	11	35	69	7	2	5	15	33	21	17	18	13	9	3	1	0	0	1	2
12	3995	7	4672	182	53	51	14	21	21	20	5	2	2	1	0	0	0	1	2	5	0	5
12	3995	8	13	4	17	12	9	4	2	4	9	11	12	9	7	4	2	0	1	2	2	1
12	3995	9	1	2	10	16	16	11	1	7	13	16	17	13	7	2	1	1	1	0	0	0
12	3995	10	21	31	49	23	21	6	17	31	18	33	23	25	7	9	7	1	1	1	0	0
12	3995	11	4	8	53	65	227	125	30	9	19	19	10	7	17	10	2841	5	2	1	0	0
12	3995	12	8	7	5	33	25	37	14	23	9	9	26	26	27	24	14	10	2	1	1	0
12	3995	13	425	19	15	5	17	128	17	31	30	178	21	20	171	20	6	3	2	14	0	0

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	10	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
12	3995	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 123995 Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	5062	262	151	22	121	151	0	22	22	22	127	0	104	0	151	0
12	3995	7	7	6	14	2	11	23	31	55	30	37	30	13	6	4	4	29
12	3995	8	170	34	417	417	71	34	50	407	664	400	46	0	39	0	0	105
12	3995	9	432	281	184	41	51	31	0	5	7	0	64	28	0	71	0	0
12	3995	10	36	17	136	315	29	25	43	28	19	24	13	31	7	4	1	0
12	3995	11	1077	300	29	154	143	279	24	0	0	0	24	0	0	33	425	33
12	3995	12	5022	0	5439	185	0	22	22	4	46	0	4	4	0	0	22	0
12	3995	13	10	17	33	33	29	158	6	167	278	171	175	59	172	220	167	1

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	7	29	12	4	7	4	1	3	0	0	1	0	0	0	0	0
12	3995	8	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12	3995	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	0	0	0	114	425	0	0	0	0	0	0	0	0	0	0
12	3995	12	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0
12	3995	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 123995 Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
12	3995	4	59	70	36	21	28	11	14	14	22	11	17	21	25	19	29	24	18	40	46	71
12	3995	5	38	22	59	26	11	5	8	12	17	19	29	39	33	25	23	28	37	50	68	67
12	3995	6	118	117	90	48	29	17	10	11	8	16	23	26	24	34	40	47	34	45	53	56
12	3995	7	165	104	107	84	51	41	27	30	37	35	44	48	37	38	69	72	52	43	106	75
12	3995	8	79	124	45	23	26	17	21	21	21	22	36	28	23	22	24	20	42	60	69	81
12	3995	9	98	88	72	29	56	29	12	16	18	18	28	56	64	70	46	47	61	85	102	141
12	3995	10	145	116	111	54	30	25	18	41	47	51	56	79	37	102	63	68	69	87	161	171
12	3995	11	138	107	113	95	84	67	32	21	16	20	29	39	47	55	59	42	49	34	29	40
12	3995	12	158	105	122	100	88	69	25	25	21	19	59	56	67	65	83	87	93	95	92	120
12	3995	13	113	108	33	97	91	52	64	102	20	46	82	200	108	87	151	101	230	156	212	194

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
12	3995	4	61	42	102	153	188	191	160	193	0	245	207	245	245	157	0	245	245	0	0
12	3995	5	71	101	100	116	117	127	130	100	155	176	245	245	157	157	0	245	245	245	0
12	3995	6	35	68	94	94	121	196	144	131	153	132	160	0	245	0	0	0	0	0	0
12	3995	7	108	138	0	163	179	245	245	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	8	80	90	98	118	131	105	100	134	129	163	78	134	73	135	211	227	220	171	245
12	3995	9	129	117	130	156	245	156	156	136	0	136	0	245	0	245	245	245	245	0	0
12	3995	10	110	163	162	245	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	67	123	156	127	180	245	0	245	192	245	0	0	0	0	0	0	0	0	0
12	3995	12	245	168	245	245	245	245	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	13	171	245	245	0	0	0	245	245	245	0	245	245	0	0	0	0	0	245	0

Section 123995 Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
12	3995	4	125	62	75	47	37	64	63	47	23	38	25	26	39	76	114	83	95	78	170	114
12	3995	5	203	201	205	201	200	200	216	209	210	216	209	245	218	209	209	245	245	203	0	0
12	3995	6	124	117	113	107	60	26	30	45	64	53	49	61	68	81	69	42	29	38	101	123
12	3995	7	123	123	131	124	123	134	135	142	126	182	154	212	154	0	154	212	123	212	212	212
12	3995	8	86	48	48	37	35	26	19	27	44	59	68	68	69	61	47	24	51	73	91	92
12	3995	9	120	108	97	85	69	49	15	36	46	50	50	46	35	20	18	24	32	38	37	41
12	3995	10	123	128	128	79	62	36	59	63	44	74	73	79	62	61	65	70	85	98	120	164
12	3995	11	106	155	106	107	118	108	110	107	110	111	123	116	126	165	193	129	149	106	147	216
12	3995	12	224	121	94	111	95	83	52	49	37	37	54	60	78	84	97	77	62	90	84	245
12	3995	13	211	175	127	156	110	100	156	111	57	81	41	90	187	93	156	159	156	188	167	176

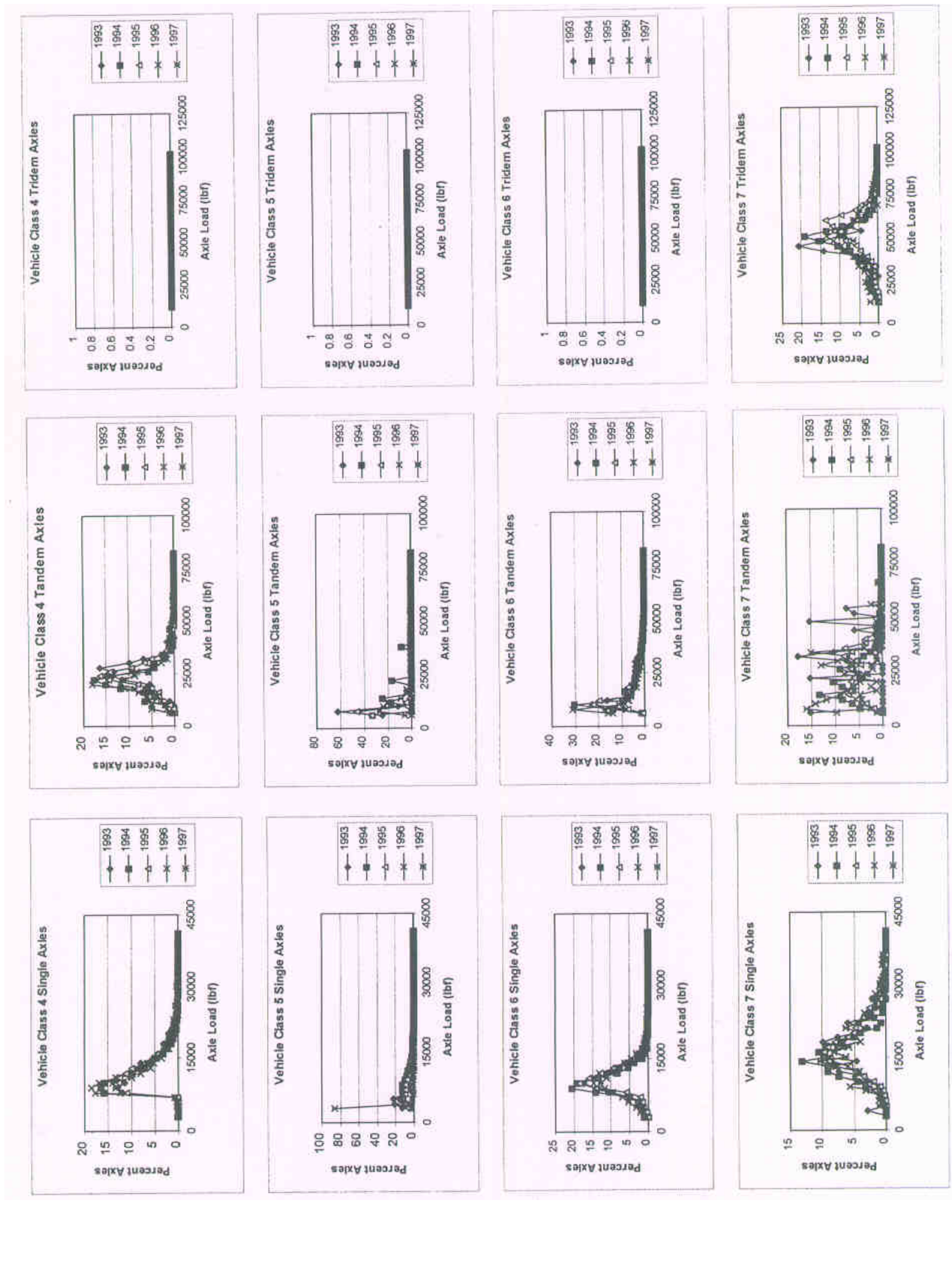
STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
12	3995	4	165	189	245	245	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	129	124	117	112	111	106	126	114	175	245	245	0	0	245	0	0	0	0	0
12	3995	7	0	0	212	212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	8	104	116	126	158	144	132	189	245	174	245	0	245	245	155	245	245	0	0	0
12	3995	9	40	46	51	85	104	95	136	0	131	146	175	245	206	135	245	206	245	0	0
12	3995	10	238	216	245	245	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	216	143	0	0	0	0	0	216	216	0	216	0	0	0	0	0	0	0	0
12	3995	12	0	0	0	245	0	0	0	0	0	0	245	0	0	0	0	0	0	0	0
12	3995	13	188	245	245	245	0	0	245	245	245	245	245	0	0	0	0	0	0	0	0

Section 123995 Tridem Axles (COV)

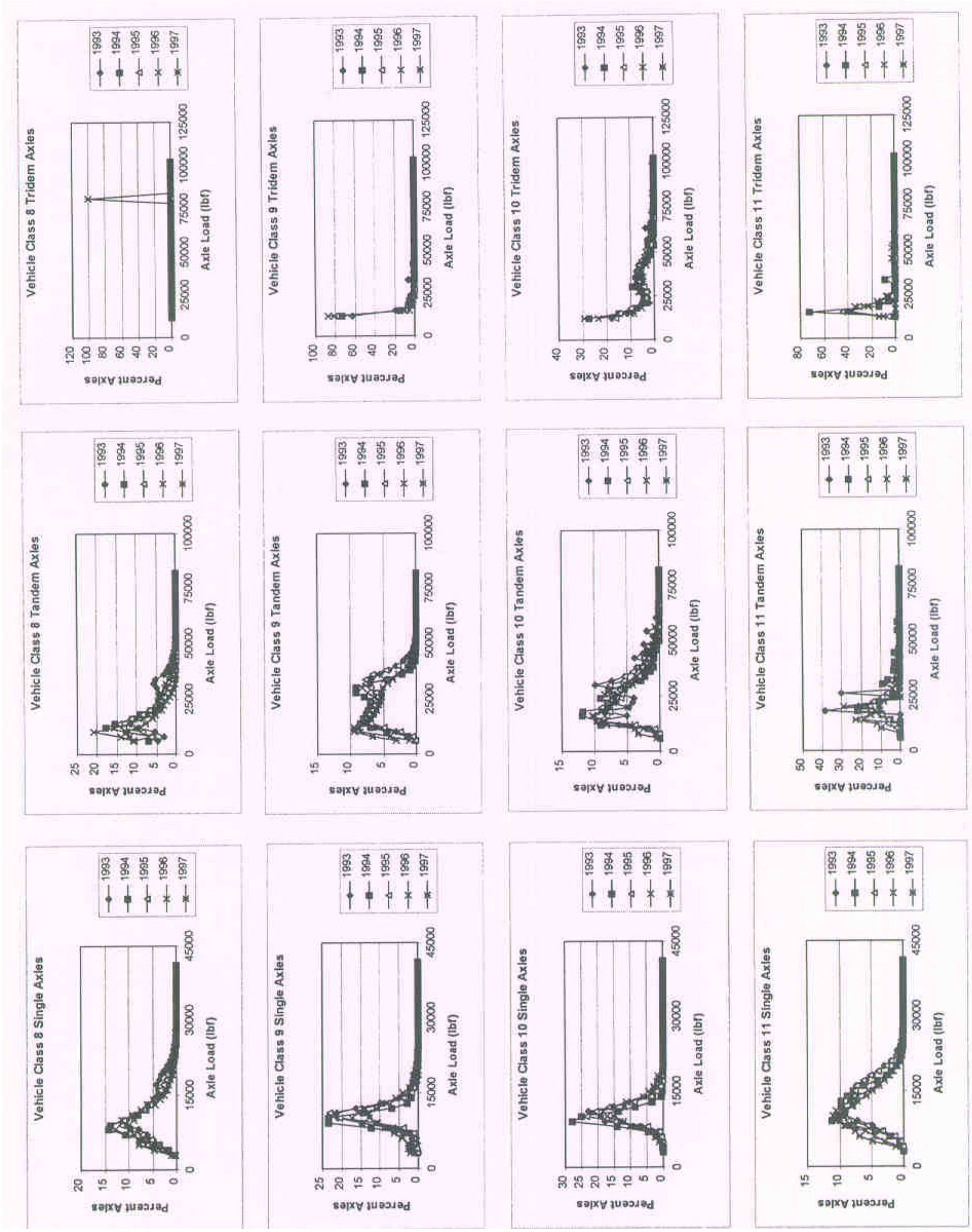
STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	192	156	151	212	212	151	0	212	212	212	160	0	212	0	151	0
12	3995	7	129	98	83	36	52	67	88	100	77	64	90	68	44	41	67	113
12	3995	8	117	245	245	127	157	245	165	182	155	203	245	0	161	0	0	245
12	3995	9	92	78	67	58	90	133	229	229	229	0	229	213	0	229	0	0
12	3995	10	113	108	114	121	71	49	81	69	68	67	75	85	88	118	64	85
12	3995	11	132	166	212	157	158	137	212	0	0	0	212	0	0	212	212	212
12	3995	12	199	0	171	212	0	212	212	212	212	0	212	212	0	0	212	0
12	3995	13	164	162	161	156	117	131	161	113	134	187	122	164	189	195	148	157

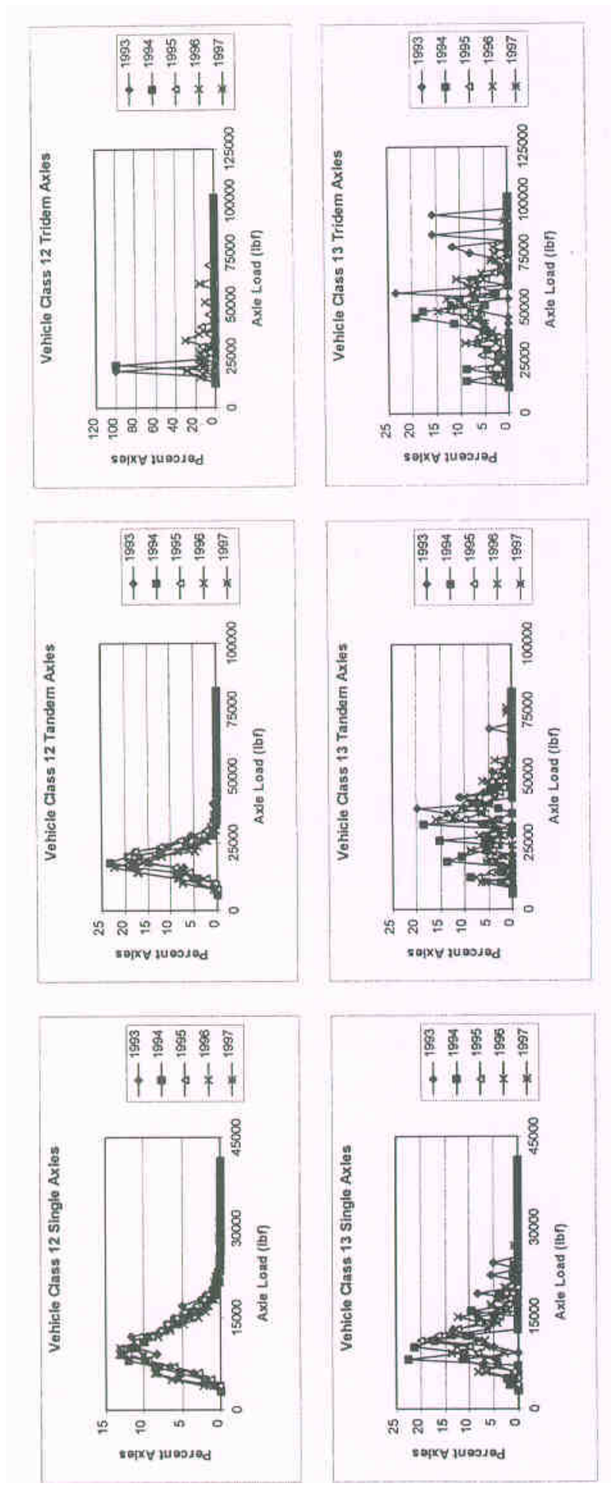
STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
12	3995	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	6	0	212	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	7	127	114	134	151	188	151	245	0	0	245	166	0	0	0	0
12	3995	8	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	229	0	0	0	0	0	0	0	0	0	0	0
12	3995	10	111	0	0	245	0	0	0	0	0	0	0	0	0	0	0
12	3995	11	0	0	0	212	212	0	0	0	0	0	0	0	0	0	0
12	3995	12	0	212	0	212	0	0	0	0	0	0	0	0	0	0	0
12	3995	13	169	161	161	245	157	245	245	0	0	0	0	0	245	0	0

Section 185002



Vehicle Class 4 Single Axles
Vehicle Class 4 Tandem Axles
Vehicle Class 4 Tridem Axles
Vehicle Class 5 Single Axles
Vehicle Class 5 Tandem Axles
Vehicle Class 5 Tridem Axles
Vehicle Class 6 Single Axles
Vehicle Class 6 Tandem Axles
Vehicle Class 6 Tridem Axles
Vehicle Class 7 Single Axles
Vehicle Class 7 Tandem Axles
Vehicle Class 7 Tridem Axles
Percent Axles
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 8 Tridem Axles
Vehicle Class 9 Tridem Axles
Vehicle Class 10 Tridem Axles
Vehicle Class 11 Tridem Axles
Vehicle Class 8 Tandem Axles
Vehicle Class 9 Tandem Axles
Vehicle Class 10 Tandem Axles
Vehicle Class 11 Tandem Axles
Vehicle Class 8 Single Axles
Vehicle Class 9 Single Axles
Vehicle Class 10 Single Axles
Vehicle Class 11 Single Axles
Percent Axles
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 12 Single Axles
Vehicle Class 12 Tandem Axles
Vehicle Class 12 Tridem Axles
Vehicle Class 13 Single Axles
Vehicle Class 13 Tandem Axles
Vehicle Class 13 Tridem Axles
Percent Axles
Axle Load (lbf)
1993
1994
1995
1996
1997

Section 185022 Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
18	5022	4	0.1	0.1	0.3	1.4	2.5	13.6	14.2	13.3	11.8	10.0	7.7	6.4	4.6	3.5	2.5	2.1	1.6	1.2	0.9	0.6
18	5022	5	20.7	14.7	15.4	9.8	8.0	7.5	5.9	4.5	3.4	2.5	1.8	1.3	1.0	0.8	0.6	0.4	0.3	0.3	0.2	0.2
18	5022	6	0.6	1.2	1.9	3.3	5.3	10.3	14.9	16.7	14.1	10.8	7.1	4.9	2.9	2.0	1.1	0.7	0.5	0.3	0.3	0.2
18	5022	7	0.1	0.7	0.3	0.6	0.7	1.5	2.9	3.9	4.5	5.5	7.0	8.9	8.7	10.0	9.6	7.5	6.0	4.3	3.6	3.6
18	5022	8	5.5	4.9	5.7	6.2	8.2	10.2	11.0	9.7	7.8	6.4	5.0	4.1	3.2	2.6	2.3	1.8	1.5	1.1	0.8	0.6
18	5022	9	0.7	1.1	1.4	1.6	3.1	7.7	15.5	20.5	18.3	12.4	7.1	3.8	2.1	1.4	1.0	0.8	0.5	0.3	0.2	0.1
18	5022	10	0.1	0.2	0.6	1.1	2.5	9.1	17.7	21.3	18.3	12.6	8.1	3.4	2.4	1.1	0.6	0.5	0.2	0.1	0.1	0.0
18	5022	11	0.1	0.4	1.7	3.2	4.6	7.0	9.4	10.3	9.6	9.1	8.3	7.5	6.7	5.9	4.7	3.8	2.8	1.9	1.2	0.7
18	5022	12	0.2	0.9	3.2	5.7	7.4	10.0	11.4	12.1	10.4	9.6	7.5	6.1	4.9	3.5	2.7	1.6	1.0	0.7	0.4	0.3
18	5022	13	2.6	1.0	1.0	3.0	4.9	10.2	7.1	11.8	13.1	11.6	8.9	4.3	5.3	4.0	2.6	1.8	2.7	1.4	0.2	1.2

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
18	5022	4	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	7	2.3	2.0	1.1	1.1	1.2	0.7	0.5	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
18	5022	8	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	11	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	12	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	13	0.2	1.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 185022 Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
18	5022	4	0.3	1.2	1.8	3.6	3.8	5.3	7.8	11.3	14.4	15.2	11.9	8.6	5.4	3.5	2.0	1.0	0.6	0.5	0.3	0.4
18	5022	5	26.7	38.8	8.9	8.7	7.2	0.9	1.2	0.3	3.6	0.0	0.2	0.1	0.0	0.2	0.2	0.1	1.8	0.2	0.2	0.0
18	5022	6	5.6	15.3	20.3	11.6	7.0	6.3	4.9	4.3	4.0	3.5	3.2	2.8	2.4	2.0	1.5	1.2	1.0	0.8	0.5	0.4
18	5022	7	5.4	5.0	5.8	6.1	6.9	4.4	4.6	4.6	6.9	4.0	4.7	5.2	5.8	7.6	7.0	2.8	1.9	1.1	0.5	1.8
18	5022	8	14.7	8.1	11.5	12.9	11.5	8.8	6.6	5.0	4.0	3.3	2.9	2.3	2.0	1.8	1.4	0.9	0.7	0.6	0.4	0.3
18	5022	9	0.8	2.5	5.4	7.2	7.6	7.2	6.7	6.4	6.2	6.0	6.2	6.8	7.5	7.2	5.9	4.2	2.6	1.5	0.9	0.5
18	5022	10	0.2	0.8	1.9	6.7	9.1	9.3	8.9	6.5	6.5	6.5	7.0	6.5	7.1	5.3	4.3	2.7	2.4	1.5	1.8	1.4
18	5022	11	0.1	0.3	2.1	3.2	9.4	8.6	16.9	16.3	9.0	3.4	8.4	3.3	6.2	5.2	2.6	1.8	1.1	0.8	0.2	0.5
18	5022	12	0.5	0.3	2.3	5.1	10.0	14.6	17.8	16.6	13.0	8.7	5.0	2.9	1.4	0.6	0.5	0.3	0.1	0.3	0.0	0.1
18	5022	13	1.5	0.0	3.3	3.4	1.9	2.2	5.2	4.7	5.9	4.1	6.6	3.9	3.1	6.6	8.7	7.2	7.6	6.1	5.5	3.0

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
18	5022	4	0.5	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.1	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	6	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	7	0.6	3.4	0.1	1.3	1.5	0.5	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	10	1.0	1.0	0.3	0.5	0.5	0.3	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	11	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	13	2.1	2.8	0.9	1.0	0.6	0.9	0.0	0.0	0.0	0.1	0.0	0.8	0.0	0.0	0.2	0.2	0.0	0.0	0.0

Section 185022 Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
18	5022	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	7	0.4	0.5	1.2	1.7	2.3	1.6	1.9	2.3	3.6	5.4	8.9	12.2	12.2	11.7	9.7	7.8
18	5022	8	1.3	0.9	0.9	0.3	0.6	0.6	0.6	1.6	2.7	4.6	6.5	9.4	9.4	5.0	1.9	2.2
18	5022	9	77.7	11.3	4.1	2.8	1.1	0.5	0.3	1.2	0.2	0.1	0.3	0.2	0.0	0.1	0.0	0.1
18	5022	10	22.4	12.1	6.9	4.0	3.9	4.4	6.6	5.6	6.8	6.9	5.6	3.9	2.6	2.2	1.7	1.2
18	5022	11	7.3	48.4	25.2	9.8	4.2	0.4	0.2	2.3	0.0	0.0	0.2	0.8	0.1	0.6	0.4	0.0
18	5022	12	0.0	5.5	30.4	27.5	7.5	4.2	4.0	6.0	4.7	2.7	0.0	1.3	0.0	2.0	0.0	0.0
18	5022	13	0.0	2.4	1.3	2.3	0.7	1.5	1.6	7.3	2.1	3.1	5.0	6.9	14.0	12.0	6.7	11.5

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
18	5022	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	7	5.6	4.0	2.7	1.5	1.1	0.6	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
18	5022	8	0.6	0.3	0.6	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	10	0.8	1.1	0.5	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	11	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	12	2.9	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	13	3.7	5.0	1.7	0.4	1.1	1.8	2.5	0.0	2.6	0.0	0.1	2.7	0.0	0.0	0.0

Section 185022 Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
18	5022	4	0	0	0	9	27	7	8	8	2	1	2	1	1	1	0	1	0	0	0	0
18	5022	5	1043	77	68	17	19	20	13	7	4	2	1	1	0	0	0	0	0	0	0	0
18	5022	6	0	0	1	2	4	7	10	6	3	4	3	2	2	1	0	0	0	0	0	0
18	5022	7	0	1	0	0	0	1	3	1	3	5	3	8	1	4	22	4	2	0	3	4
18	5022	8	150	25	3	1	4	8	8	7	5	3	2	1	1	1	1	1	1	1	0	0
18	5022	9	1	1	1	2	3	8	24	26	20	12	9	4	1	1	0	0	0	0	0	0
18	5022	10	0	0	0	1	3	11	35	25	14	14	13	4	2	1	0	0	0	0	0	0
18	5022	11	0	0	3	5	3	4	2	1	0	1	1	1	1	3	2	2	1	1	0	0
18	5022	12	0	1	5	6	1	1	4	1	0	1	0	1	1	1	2	0	0	0	0	0
18	5022	13	40	0	1	13	8	45	26	37	33	15	27	9	20	10	6	3	10	2	0	5

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	13	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section **185022 Tandem Axles (Variance)**

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
18	5022	4	0	4	3	5	2	3	9	22	8	25	29	24	6	4	1	0	0	0	0	0
18	5022	5	326	1024	109	102	124	3	3	0	56	0	0	0	0	0	0	0	14	0	0	0
18	5022	6	49	72	76	27	1	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0
18	5022	7	52	47	36	29	37	17	17	23	34	13	19	31	18	54	47	12	3	2	1	6
18	5022	8	220	17	28	11	11	6	4	2	1	1	2	2	3	5	4	1	1	1	0	0
18	5022	9	1	6	8	3	0	0	0	0	0	0	1	2	2	3	4	4	2	1	1	0
18	5022	10	0	2	1	5	0	6	2	3	2	3	1	1	8	4	2	1	1	0	1	0
18	5022	11	0	0	16	24	85	43	151	81	13	12	115	18	44	63	32	7	2	1	0	1
18	5022	12	1	0	8	7	34	36	10	10	29	14	5	3	1	0	0	0	0	0	0	0
18	5022	13	13	0	6	15	3	12	21	19	20	6	18	9	3	39	25	24	48	10	22	5

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	0	46	0	6	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	10	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	13	4	7	2	3	1	2	0	0	0	0	0	4	0	0	0	0	0	0	0

Section 185022 Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	1	0	1	1	1	2	1	3	2	3	10	38	17	16	9	8
18	5022	8	11	5	5	1	2	2	2	15	42	126	254	530	530	150	22	30
18	5022	9	77	24	1	2	2	0	0	6	0	0	0	0	0	0	0	0
18	5022	10	28	7	3	1	0	2	3	1	2	3	2	1	1	1	1	1
18	5022	11	69	1828	507	82	23	0	0	23	0	0	0	1	0	1	1	0
18	5022	12	0	65	1851	1863	75	45	40	189	59	37	0	9	0	21	0	0
18	5022	13	0	11	2	12	1	5	5	75	7	6	20	52	50	50	31	105

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	19	9	5	3	1	0	0	0	0	0	0	0	0	0	0
18	5022	8	2	1	2	0	0	0	0	15000	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	12	43	0	0	9	0	0	0	0	0	0	0	0	0	0	0
18	5022	13	17	19	5	0	3	10	22	0	41	0	0	40	0	0	0

Section 185022 Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
18	5022	4	60	116	148	221	205	19	20	21	12	11	17	16	18	26	25	37	28	39	47	57
18	5022	5	156	60	53	42	54	60	61	59	60	58	61	59	58	65	64	63	62	64	68	64
18	5022	6	71	46	40	48	39	27	21	15	12	18	25	28	42	44	46	42	30	63	46	22
18	5022	7	175	171	130	78	44	74	62	30	35	41	25	32	14	21	49	28	21	12	47	57
18	5022	8	222	103	29	18	26	28	25	26	29	26	27	25	29	34	46	55	64	63	67	66
18	5022	9	118	87	57	79	60	36	31	25	24	28	42	50	55	57	55	61	77	91	93	91
18	5022	10	148	78	102	74	66	36	33	24	21	29	45	60	63	84	104	126	94	78	85	245
18	5022	11	245	101	104	68	40	29	15	7	6	9	11	14	18	27	32	40	41	46	49	56
18	5022	12	245	85	69	42	14	10	17	7	5	12	8	14	25	30	48	41	62	48	66	76
18	5022	13	245	73	86	119	56	66	72	51	44	34	58	69	85	80	95	101	115	103	192	175

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
18	5022	4	76	58	92	108	81	123	144	192	115	188	238	212	199	245	226	230	245	245	245
18	5022	5	62	56	66	59	68	56	79	66	67	110	105	113	144	151	164	180	194	245	245
18	5022	6	33	48	36	56	63	77	28	110	167	120	126	245	156	159	0	214	245	159	0
18	5022	7	54	71	84	65	83	92	86	114	88	122	110	138	211	152	245	245	0	245	0
18	5022	8	65	59	67	77	70	68	95	94	86	92	127	119	111	245	245	155	159	245	0
18	5022	9	94	92	104	118	118	93	139	128	92	132	167	167	0	167	0	0	245	0	0
18	5022	10	245	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	11	70	75	93	97	101	127	148	198	144	245	121	245	245	0	0	0	0	0	0
18	5022	12	75	81	121	162	155	174	245	0	245	0	0	0	0	0	0	0	0	245	0
18	5022	13	245	201	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 185022 Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
18	5022	4	139	166	105	65	39	33	39	41	19	33	45	57	46	58	43	54	89	119	102	72
18	5022	5	67	83	117	116	155	197	156	142	210	229	229	197	229	167	204	211	204	204	229	0
18	5022	6	124	55	43	44	13	20	26	14	13	14	15	25	31	31	18	27	22	38	41	35
18	5022	7	132	137	103	89	87	94	89	104	84	89	92	106	73	97	98	120	99	130	151	132
18	5022	8	101	51	46	26	29	28	30	29	26	34	43	62	85	119	139	126	131	138	140	143
18	5022	9	142	94	53	22	9	9	8	7	8	8	15	20	20	22	34	46	59	73	86	105
18	5022	10	99	157	62	33	7	26	16	29	21	26	16	16	39	37	32	37	40	37	64	50
18	5022	11	245	138	188	151	98	76	73	55	41	100	128	127	106	153	218	147	121	113	161	189
18	5022	12	245	118	123	53	58	41	17	19	42	44	47	60	58	83	99	90	118	125	155	133
18	5022	13	245	0	76	115	91	160	87	93	75	61	64	75	53	95	57	68	92	51	85	75

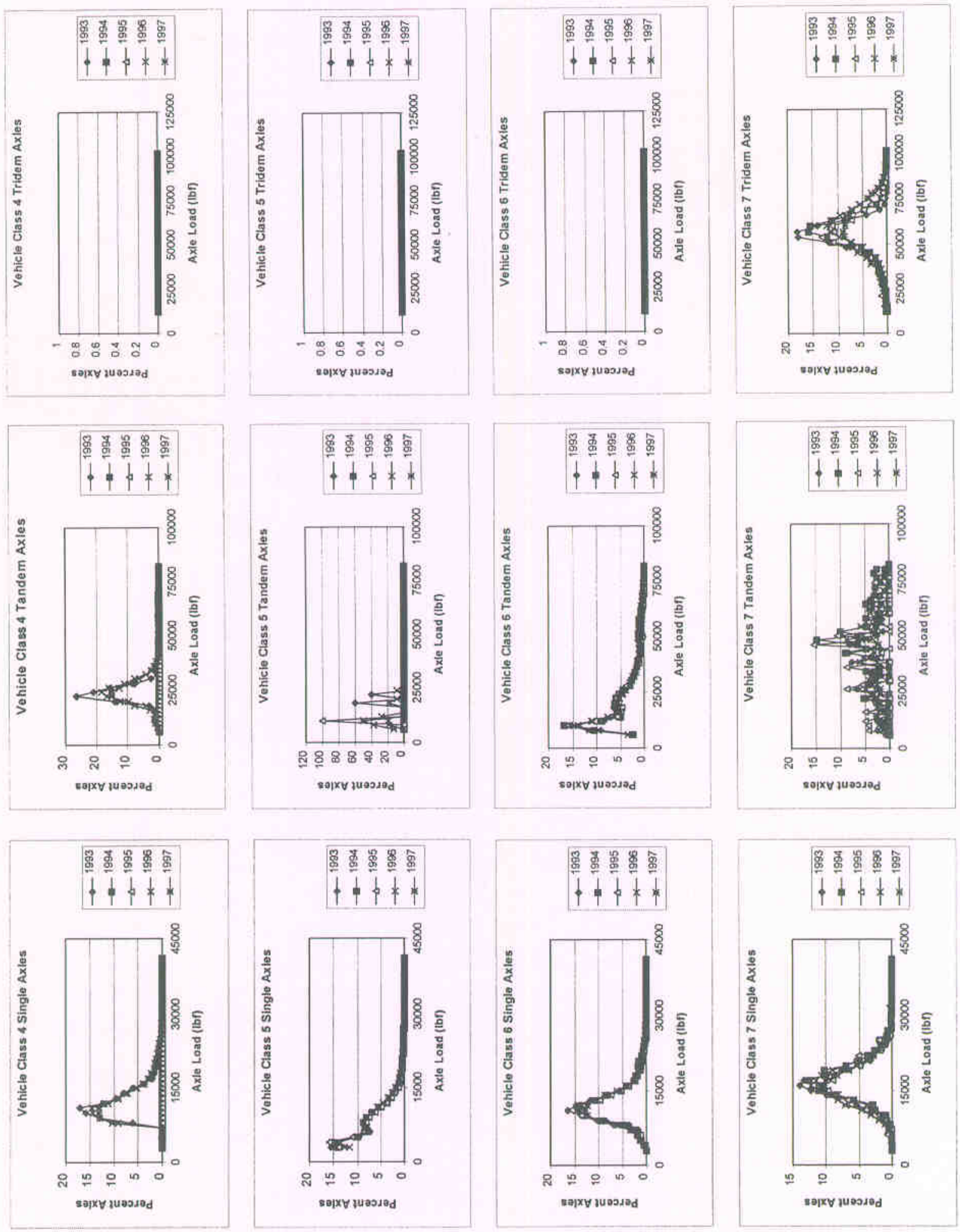
STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
18	5022	4	62	85	176	156	245	165	245	203	213	245	0	245	245	0	0	0	0	0	0
18	5022	5	229	0	0	229	229	229	0	0	0	0	0	0	229	0	0	0	0	0	0
18	5022	6	64	52	49	68	73	93	70	112	104	133	121	156	245	182	0	245	0	0	0
18	5022	7	114	197	157	189	224	180	229	229	229	229	229	0	0	0	0	0	0	0	0
18	5022	8	152	140	176	179	134	145	132	159	159	0	161	0	0	0	0	0	0	0	0
18	5022	9	111	110	111	107	110	112	111	84	103	147	90	155	155	245	0	0	0	0	0
18	5022	10	50	80	91	71	157	109	155	128	245	156	142	0	0	0	0	0	0	0	0
18	5022	11	141	245	0	0	245	245	188	245	245	0	0	0	0	0	0	0	0	0	0
18	5022	12	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	13	89	93	167	170	118	160	0	0	0	245	0	245	245	0	245	245	0	0	0

Section 185022 Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	186	101	88	46	37	79	52	75	34	30	35	51	34	34	31	36
18	5022	8	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245
18	5022	9	11	43	29	47	140	72	155	204	124	115	170	177	245	245	0	194
18	5022	10	23	21	26	27	18	32	26	20	23	27	24	26	33	38	54	64
18	5022	11	113	88	89	93	114	144	216	211	216	216	216	155	216	185	216	0
18	5022	12	0	146	142	157	115	159	157	229	164	229	0	229	0	229	0	0
18	5022	13	0	142	98	151	161	149	129	118	122	80	90	104	50	59	82	90

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
18	5022	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	7	77	74	80	121	64	116	107	193	118	117	245	245	245	0	0
18	5022	8	245	245	245	0	0	0	0	245	0	0	0	0	0	0	0
18	5022	9	0	245	245	245	0	0	0	0	0	0	0	0	0	0	0
18	5022	10	58	105	88	71	120	177	192	183	245	0	0	0	0	245	0
18	5022	11	216	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	12	229	0	0	229	0	0	0	0	0	0	0	0	0	0	0
18	5022	13	111	88	137	156	146	179	189	0	245	0	245	238	0	0	0

Section 344042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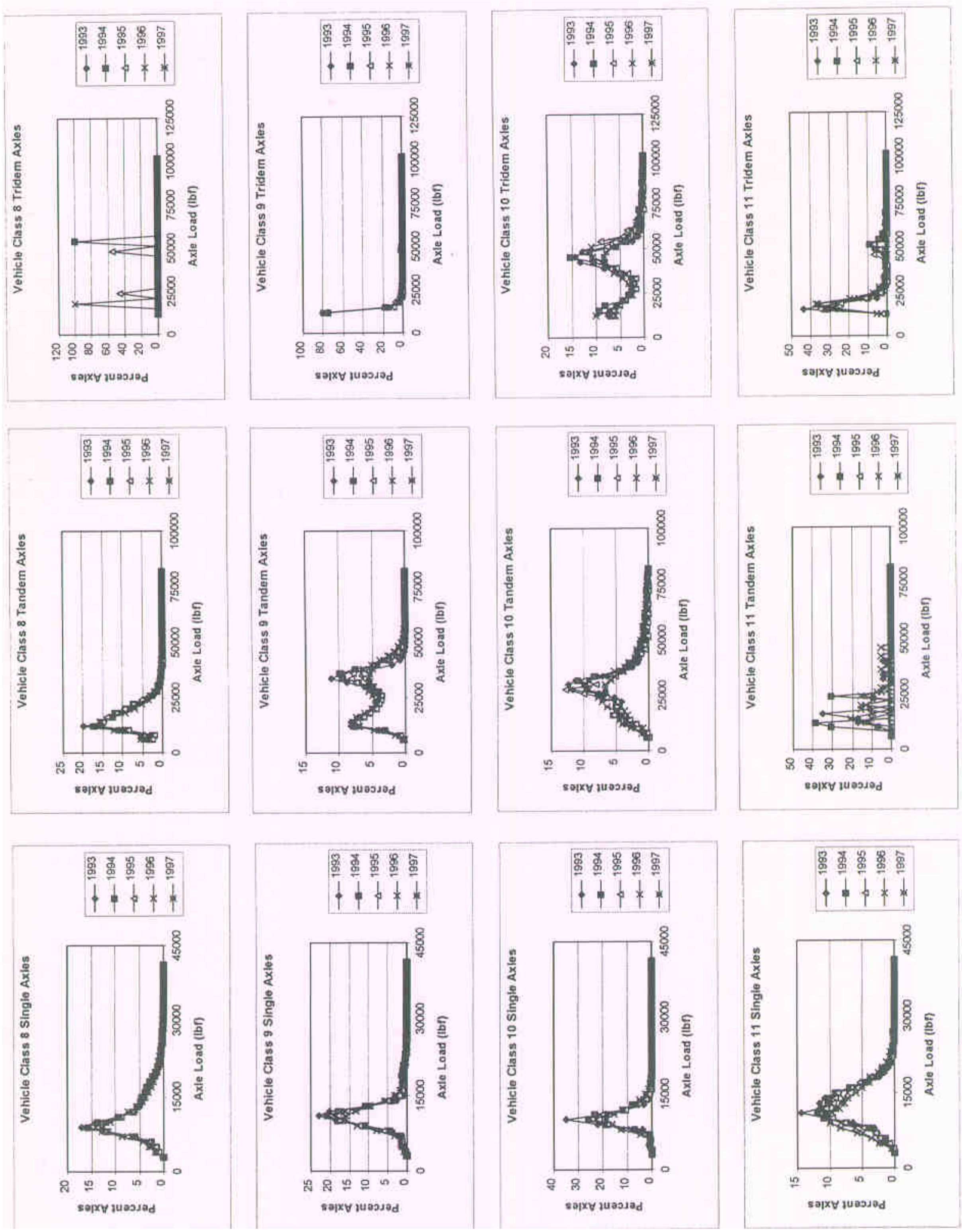
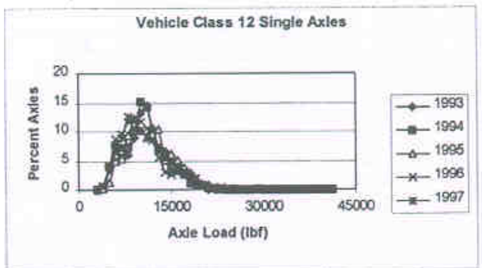
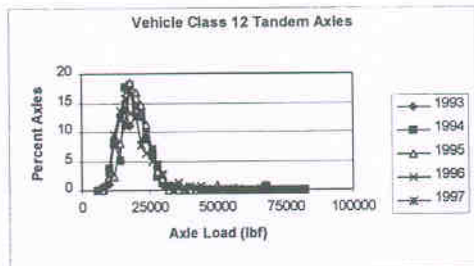
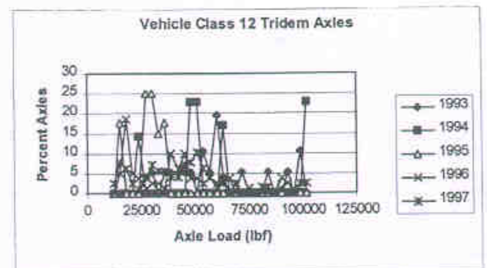
Vehicle Class 4 Tandem Axles
Vehicle Class 4 Tridem Axles
Vehicle Class 5 Single Axles
Vehicle Class 5 Tandem Axles
Vehicle Class 5 Tridem Axles
Vehicle Class 6 Single Axles
Vehicle Class 6 Tandem Axles
Vehicle Class 6 Tridem Axles
Vehicle Class 7 Single Axles
Vehicle Class 7 Tandem Axles
Vehicle Class 7 Tridem Axles
Percent Axles
Axle Load (lbf)
1993
1994
1995
1996
1997

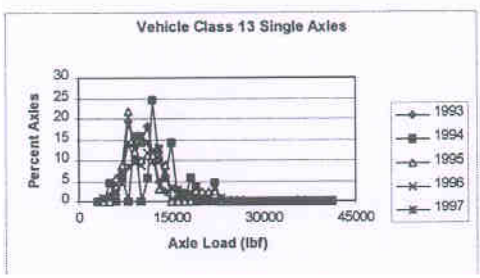


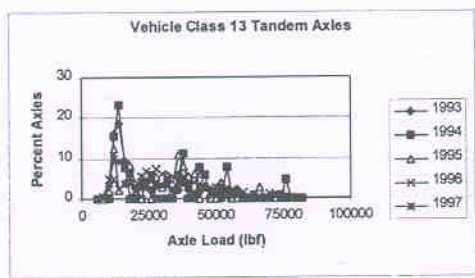
Vehicle Class 8 Single Axles
Vehicle Class 8 Tandem Axles
Vehicle Class 8 Tridem Axles
Vehicle Class 9 Single Axles
Vehicle Class 9 Tandem Axles
Vehicle Class 9 Tridem Axles
Vehicle Class 10 Single Axles
Vehicle Class 10 Tandem Axles
Vehicle Class 10 Tridem Axles
Vehicle Class 11 Single Axles
Vehicle Class 11 Tandem Axles
Vehicle Class 11 Tridem Axles
Percent Axles
Axle Load (lbf)
1993
1994
1995
1996
1997

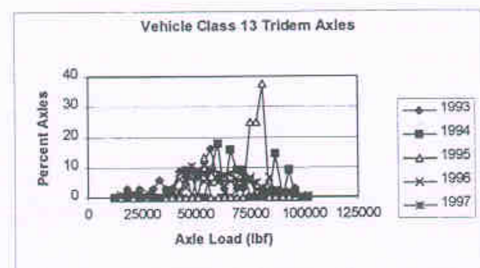

Vehicle Class 12 Single Axles
Percent Axles
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 12 Tandem Axles
Percent Axles
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 12 Tridem Axles
Percent Axles
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 13 Single Axles
Percent Axles
30
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 13 Tandem Axles
Percent Axles
30
20
10
0
0
25000
50000
75000
100000
Axle Load (lbf)
1993
1994
1995
1996
1997


Vehicle Class 13 Tridem Axles
Percent Axles
40
30
20
10
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
1993
1994
1995
1996
1997

Section 344042 Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
34	4042	4	0.0	0.0	0.1	0.0	0.0	8.5	12.8	14.4	14.9	11.7	9.2	7.6	5.7	3.8	2.6	2.0	1.6	1.3	1.1	0.8
34	4042	5	13.5	14.8	10.3	8.0	8.3	8.6	7.9	6.8	5.4	4.1	3.0	2.2	1.6	1.2	0.9	0.7	0.5	0.4	0.4	0.3
34	4042	6	0.1	0.4	1.1	1.7	2.7	5.3	9.5	13.0	14.3	13.4	10.6	8.0	5.5	3.8	2.5	2.0	1.4	1.3	1.0	0.7
34	4042	7	0.0	0.0	0.1	0.2	0.2	0.7	1.3	1.9	3.5	5.2	6.7	9.2	10.8	11.5	11.3	9.6	8.0	5.8	4.5	3.5
34	4042	8	0.1	1.4	2.2	3.1	6.9	12.1	14.6	12.6	9.2	6.5	5.3	4.6	4.1	3.7	3.0	2.5	2.0	1.5	1.1	0.9
34	4042	9	0.1	0.5	1.3	1.5	2.1	5.6	11.8	17.4	19.3	16.6	10.0	4.5	2.1	1.2	1.1	1.0	1.0	0.9	0.7	0.5
34	4042	10	0.0	0.1	0.9	0.8	2.5	8.9	18.7	25.0	19.1	11.5	6.4	2.9	1.5	0.8	0.4	0.3	0.1	0.1	0.0	0.0
34	4042	11	0.0	0.3	1.4	2.7	3.9	5.3	8.0	10.5	11.4	10.1	9.4	9.0	8.0	6.3	4.6	3.2	2.1	1.5	0.8	0.5
34	4042	12	0.0	0.3	3.3	6.9	7.3	9.3	10.9	12.1	11.5	9.4	7.4	5.1	4.2	3.9	3.2	1.9	1.3	0.7	0.4	0.2
34	4042	13	0.0	0.2	1.7	3.5	6.7	12.8	12.2	9.8	12.3	14.0	8.7	5.6	4.1	1.3	0.9	1.9	1.0	0.7	0.7	1.4

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
34	4042	4	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	6	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	7	2.1	1.4	1.2	0.5	0.4	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	8	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	11	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	12	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	13	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

Section 344042 Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
34	4042	4	0.0	0.3	0.7	1.1	1.2	2.2	5.2	12.0	19.4	18.2	14.8	9.5	5.7	3.0	1.9	1.1	0.7	0.4	0.3	0.1
34	4042	5	3.1	13.9	42.0	6.8	0.0	0.0	19.5	2.3	10.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	6	2.7	10.5	15.8	9.9	6.0	5.3	5.6	5.7	5.6	4.9	4.1	3.2	2.7	2.2	1.9	1.5	1.3	1.2	0.9	0.9
34	4042	7	0.2	1.8	1.6	2.0	1.1	1.9	1.0	1.5	3.2	2.2	5.0	4.3	2.0	2.2	3.3	3.1	3.3	3.1	5.0	2.8
34	4042	8	3.9	3.3	10.1	16.9	15.3	12.9	10.7	8.3	6.4	4.3	2.8	1.8	1.2	0.7	0.5	0.4	0.2	0.1	0.1	0.1
34	4042	9	0.3	1.0	3.8	7.4	7.9	7.0	5.8	4.8	4.2	3.9	4.0	4.5	5.4	6.9	8.1	7.9	6.1	4.1	2.7	1.7
34	4042	10	0.2	0.6	1.7	2.9	3.6	4.6	4.4	5.1	5.3	6.7	7.9	10.0	9.4	9.4	6.5	4.5	3.3	2.7	2.0	1.4
34	4042	11	0.0	0.0	11.2	20.7	12.2	11.1	6.7	7.2	2.4	14.0	3.2	2.3	0.0	1.1	2.0	1.3	0.5	1.6	1.3	0.0
34	4042	12	0.0	0.3	3.0	7.4	10.3	13.9	15.7	13.9	11.4	9.1	6.4	3.6	1.9	0.5	0.5	0.5	0.1	0.3	0.1	0.2
34	4042	13	0.0	0.2	2.7	11.7	11.1	6.5	4.8	1.9	2.6	4.9	3.6	3.9	3.1	3.7	2.9	5.4	6.8	2.9	2.5	3.2

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
34	4042	4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	6	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
34	4042	7	7.7	7.5	5.7	3.5	3.2	2.5	2.7	1.6	2.2	2.4	1.9	2.1	0.9	1.2	1.6	1.0	0.8	0.8	0.0
34	4042	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	1.0	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	10	1.2	1.2	0.9	0.6	0.7	0.6	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
34	4042	11	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	12	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	13	3.5	0.9	1.1	1.6	3.0	0.6	0.9	0.4	0.1	0.4	0.7	0.1	0.2	0.4	0.4	1.1	0.1	0.0	0.0

Section 344042 Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
34	4042	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	7	0.1	0.2	0.3	0.5	0.5	0.8	1.0	1.3	1.6	2.4	3.1	4.7	6.4	9.7	12.3	13.1
34	4042	8	0.0	0.0	33.3	0.0	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	0.0	33.3	0.0
34	4042	9	78.4	13.3	5.0	1.5	0.6	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.4	0.0	0.0
34	4042	10	7.3	7.1	5.9	4.2	2.9	2.1	2.4	2.8	4.6	6.6	9.8	11.8	11.1	7.4	5.3	2.6
34	4042	11	2.6	32.6	30.5	12.3	4.5	2.2	0.6	0.8	0.1	0.3	0.5	2.0	3.1	4.5	1.6	1.1
34	4042	12	0.5	6.1	5.0	1.5	3.8	6.8	8.0	4.6	5.9	3.8	3.1	4.4	7.9	7.4	3.8	2.6
34	4042	13	0.0	0.3	0.6	0.3	0.7	0.4	1.0	1.2	0.9	1.5	3.4	5.4	5.2	4.4	7.6	7.6

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
34	4042	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	7	12.3	9.3	7.2	4.9	3.3	1.9	1.3	0.9	0.4	0.2	0.1	0.1	0.0	0.0	0.0
34	4042	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	10	1.9	1.1	0.9	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
34	4042	11	0.2	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	12	4.7	5.2	0.7	0.5	1.0	0.2	0.0	0.3	1.4	0.0	0.9	1.5	0.0	3.0	5.5
34	4042	13	7.3	3.1	5.9	4.6	4.7	8.6	6.4	9.3	1.6	3.8	0.7	2.5	0.9	0.1	0.1

Section 344042 Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
34	4042	4	0	0	0	0	0	77	164	208	225	138	85	58	32	15	7	4	3	2	1	1
34	4042	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	2	1	0	2	1	0	0	0	0	0	0	0	0	0	0
34	4042	7	0	0	0	0	0	0	0	1	1	3	1	1	1	2	3	1	3	1	1	1
34	4042	8	0	0	0	0	1	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	1	2	1	1	7	7	0	2	1	0	0	0	0	0	0	0
34	4042	10	0	0	0	0	2	14	4	39	8	1	3	2	1	0	0	0	0	0	0	0
34	4042	11	0	0	1	1	2	4	2	0	3	1	2	2	2	1	0	0	0	0	0	0
34	4042	12	0	0	1	2	4	8	2	5	7	1	3	2	2	1	0	1	0	0	0	0
34	4042	13	0	0	3	6	2	77	7	39	21	37	21	5	34	2	1	6	2	1	1	4

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 344042 Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
34	4042	4	0	0	1	1	1	5	33	149	413	339	222	93	40	13	5	2	1	0	0	0
34	4042	5	42	385	2509	201	0	0	928	22	433	22	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	0	3	3	4	2	4	2	2	4	2	8	1	4	2	1	11	13	2	11	4
34	4042	8	1	2	2	3	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	4	1	1	2	1
34	4042	10	0	0	0	1	0	1	0	1	1	1	2	6	5	5	2	0	0	0	0	0
34	4042	11	0	0	223	290	133	311	78	89	24	232	18	9	0	5	7	8	1	5	8	0
34	4042	12	0	0	1	8	13	8	11	3	11	3	1	1	1	0	0	0	0	0	0	0
34	4042	13	0	0	4	21	90	6	10	3	7	3	6	8	5	5	4	11	8	4	7	8

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	24	21	11	15	5	1	2	3	3	3	4	2	1	2	1	1	2	1	0
34	4042	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	11	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	13	2	1	1	3	7	1	1	0	0	0	2	0	0	0	0	4	0	0	0

Section 344042 Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	0	0	0	0	0	0	0	0	0	1	1	1	2	5	13	15
34	4042	8	0	0	4444	0	918	0	0	0	0	0	0	0	1322	0	4444	0
34	4042	9	4	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	10	2	2	2	0	0	0	0	1	1	1	4	8	4	4	7	2
34	4042	11	4	52	32	28	4	2	1	0	0	0	0	7	8	18	3	1
34	4042	12	1	52	65	5	37	106	98	39	48	17	8	19	78	93	20	6
34	4042	13	0	0	2	0	2	0	2	7	1	2	15	14	24	17	27	35

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	7	3	4	5	5	3	2	1	0	0	0	0	0	0	0
34	4042	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	12	69	47	3	1	5	0	0	0	5	0	3	5	0	18	95
34	4042	13	43	11	43	11	12	88	108	253	8	37	1	14	1	0	0

Section 344042 Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
34	4042	4	149	109	124	115	106	103	100	100	101	100	100	100	100	100	101	101	101	101	100	103
34	4042	5	11	6	5	5	2	4	3	4	7	9	10	12	15	15	13	12	13	12	10	14
34	4042	6	9	44	13	13	26	26	8	4	9	7	7	6	7	7	7	8	8	18	23	13
34	4042	7	193	158	116	136	87	40	35	47	25	35	15	9	9	13	16	10	20	18	21	27
34	4042	8	22	17	28	22	15	4	12	10	4	7	5	4	6	8	11	11	15	13	16	18
34	4042	9	32	23	12	7	36	27	9	6	14	15	5	28	47	37	14	4	12	16	24	36
34	4042	10	150	70	29	22	63	43	11	25	15	7	28	47	50	56	58	36	106	78	180	138
34	4042	11	0	49	50	38	38	39	16	5	16	12	16	16	17	12	13	20	17	31	41	45
34	4042	12	138	47	35	21	26	30	13	18	24	10	24	25	34	22	14	47	47	31	84	67
34	4042	13	0	158	94	68	23	69	22	64	37	43	53	41	143	105	102	121	152	140	140	147

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
34	4042	4	109	114	116	120	132	135	113	133	155	133	158	134	200	166	155	200	200	200	0
34	4042	5	9	11	14	14	19	26	35	37	47	50	50	52	53	88	80	85	107	149	0
34	4042	6	29	29	47	68	55	57	124	115	137	108	137	163	163	0	0	0	0	0	0
34	4042	7	21	22	53	49	55	91	48	101	162	137	142	224	224	224	0	224	0	0	0
34	4042	8	17	22	21	28	26	33	36	31	42	56	58	57	60	50	61	97	109	106	224
34	4042	9	49	59	62	61	63	62	74	55	64	59	65	52	78	71	114	82	224	56	224
34	4042	10	125	166	146	146	224	224	0	224	176	137	199	160	137	166	137	224	0	137	0
34	4042	11	46	54	65	60	61	59	89	110	127	173	224	0	224	224	0	184	0	0	0
34	4042	12	70	190	137	0	0	0	139	224	144	146	0	224	224	99	0	0	0	224	0
34	4042	13	224	137	224	224	0	0	0	0	0	0	0	0	0	224	0	0	0	0	0

Section 344042 Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
34	4042	4	144	137	116	106	102	104	111	102	105	101	101	102	110	120	114	114	108	104	104	112
34	4042	5	208	141	119	208	0	0	156	208	208	208	0	0	0	0	0	0	0	0	0	0
34	4042	6	15	11	8	12	17	8	10	6	7	7	6	9	8	7	3	6	8	15	3	8
34	4042	7	224	88	113	95	129	104	124	94	67	62	57	27	95	65	35	108	108	46	68	67
34	4042	8	28	39	14	11	3	4	9	12	15	14	13	19	13	22	24	28	25	51	63	45
34	4042	9	16	33	15	6	4	6	6	5	5	9	13	14	10	20	28	24	18	29	46	59
34	4042	10	74	51	41	31	16	21	10	15	21	13	16	24	23	23	22	12	15	22	16	23
34	4042	11	0	0	133	82	95	159	133	130	208	109	132	132	0	208	130	208	208	144	208	0
34	4042	12	0	102	37	39	35	20	21	13	29	20	14	24	43	70	57	104	92	107	137	128
34	4042	13	0	143	70	39	85	39	67	97	97	33	70	71	70	62	73	62	42	70	101	88

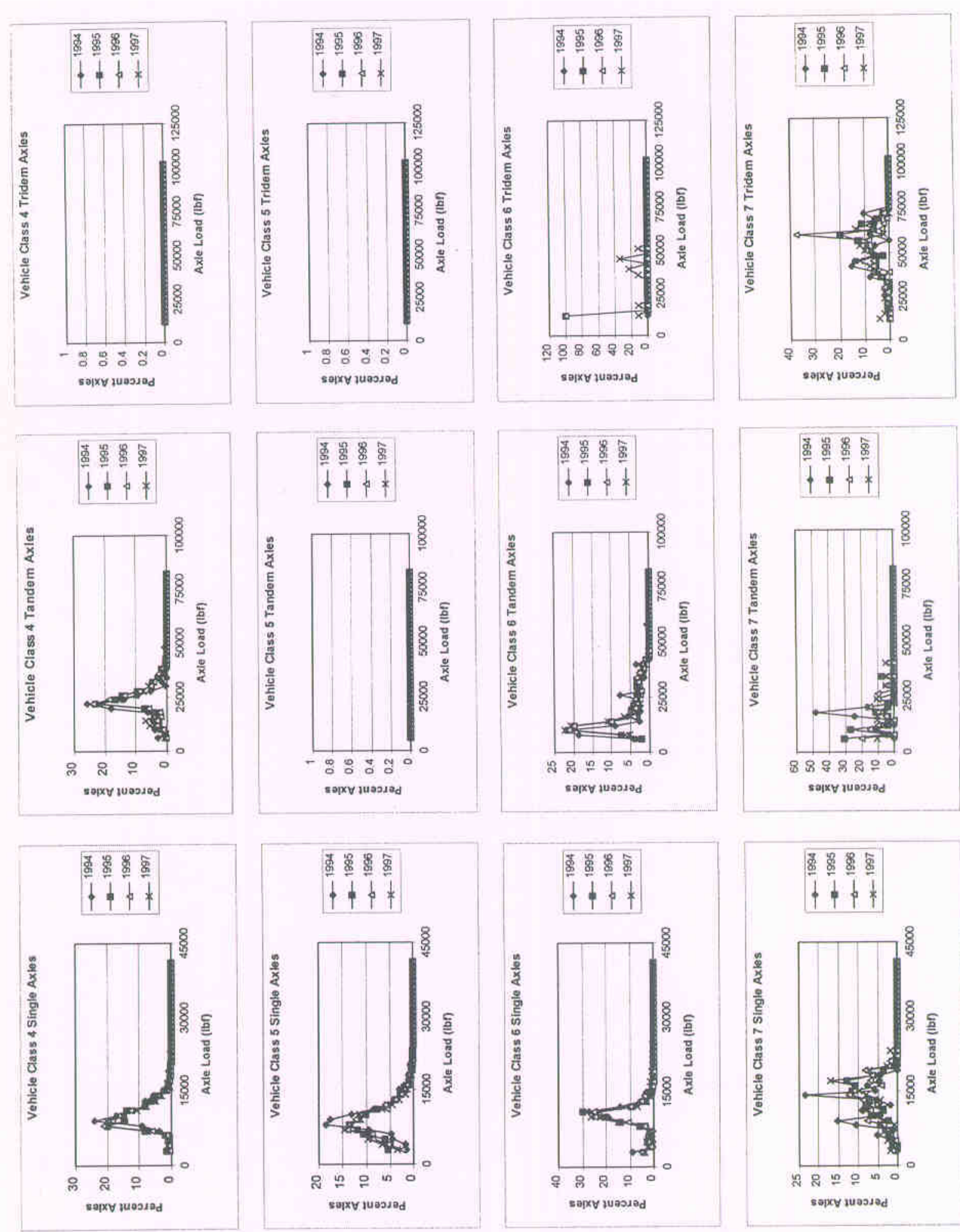
STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
34	4042	4	120	106	132	107	109	152	144	120	120	113	114	126	133	108	200	166	200	200	200
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	14	24	31	29	24	23	29	14	23	50	61	69	75	88	88	95	79	143	0
34	4042	7	63	61	58	111	68	43	46	106	72	79	99	61	125	119	63	109	165	136	0
34	4042	8	78	77	77	177	137	140	224	173	137	0	224	0	0	0	0	0	0	0	0
34	4042	9	67	73	75	76	71	75	70	72	58	58	62	48	99	87	71	137	224	0	0
34	4042	10	43	21	34	56	27	45	52	50	71	25	71	44	28	76	105	81	20	146	0
34	4042	11	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	12	143	139	201	139	0	224	224	0	0	0	143	224	0	0	0	0	0	0	0
34	4042	13	40	104	106	111	89	150	104	180	138	139	191	224	224	138	108	187	138	0	0

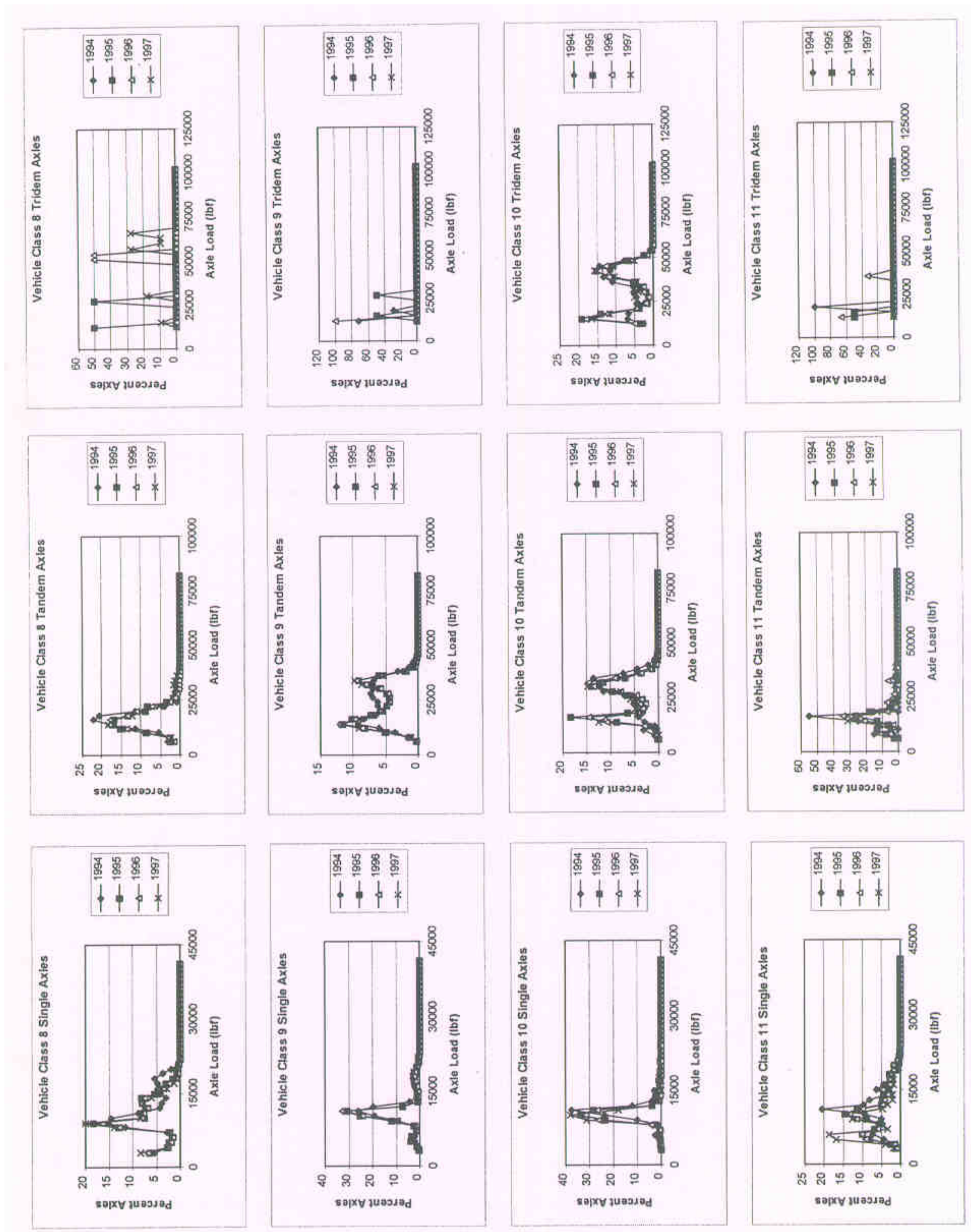
Section 344042 Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	127	109	24	78	45	39	29	31	18	32	25	24	21	23	30	29
34	4042	8	0	0	200	0	200	0	0	0	0	0	0	0	200	0	200	0
34	4042	9	3	22	29	70	88	106	177	0	157	0	224	174	158	131	0	224
34	4042	10	21	19	21	8	12	22	21	37	23	18	21	25	17	28	49	53
34	4042	11	76	22	19	43	45	61	115	74	224	150	101	139	88	94	108	76
34	4042	12	224	119	162	150	162	151	125	136	118	108	95	99	111	131	117	94
34	4042	13	0	140	224	152	194	174	141	207	134	93	114	70	94	94	68	77

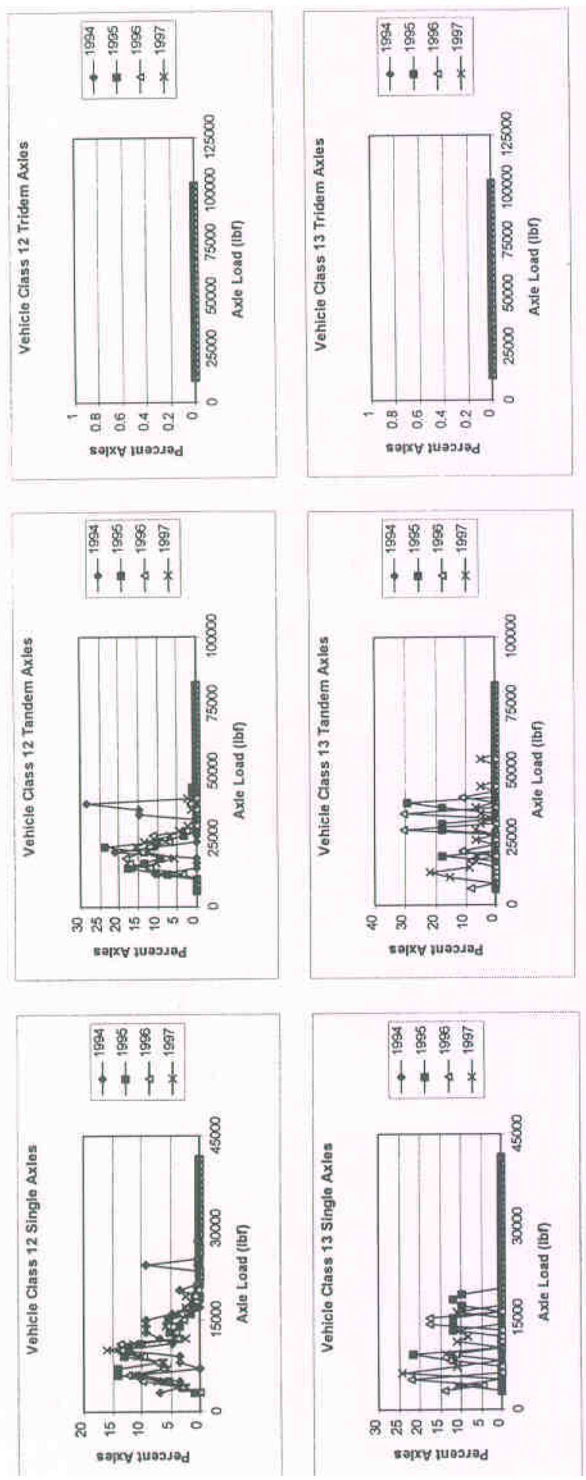
STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
34	4042	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	7	22	19	27	47	66	93	98	93	110	86	106	109	139	199	93
34	4042	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	10	60	48	47	26	66	30	52	37	115	20	79	92	137	152	224
34	4042	11	224	138	224	180	0	0	0	0	0	0	0	0	0	0	0
34	4042	12	177	132	224	224	224	224	0	224	166	0	179	151	0	141	176
34	4042	13	91	104	112	73	73	110	163	171	177	160	140	150	128	224	224

Section 395010


Vehicle Class 4 Single Axles
Vehicle Class 4 Tandem Axles
Vehicle Class 4 Tridem Axles
Vehicle Class 5 Single Axles
Vehicle Class 5 Tandem Axles
Vehicle Class 5 Tridem Axles
Vehicle Class 6 Single Axles
Vehicle Class 6 Tandem Axles
Vehicle Class 6 Tridem Axles
Vehicle Class 7 Single Axles
Vehicle Class 7 Tandem Axles
Vehicle Class 7 Tridem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997



Vehicle Class 8 Single Axles
Vehicle Class 8 Tandem Axles
Vehicle Class 8 Tridem Axles
Vehicle Class 9 Single Axles
Vehicle Class 9 Tandem Axles
Vehicle Class 9 Tridem Axles
Vehicle Class 10 Single Axles
Vehicle Class 10 Tandem Axles
Vehicle Class 10 Tridem Axles
Vehicle Class 11 Single Axles
Vehicle Class 11 Tandem Axles
Vehicle Class 11 Tridem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997


Vehicle Class 12 Single Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997
Vehicle Class 12 Tandem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997
Vehicle Class 12 Tridem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997
Vehicle Class 13 Single Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997
Vehicle Class 13 Tandem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997
Vehicle Class 13 Tridem Axles
Percent Axles
Axle Load (lbf)
1994
1995
1996
1997

Section 395010 Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
39	5010	4	1.1	0.8	0.8	1.5	6.3	17.5	19.2	16.4	12.5	8.0	6.2	4.2	2.1	1.0	0.8	0.5	0.4	0.3	0.2	0.1
39	5010	5	3.2	4.7	7.2	8.6	12.5	14.7	13.2	11.5	7.1	5.4	3.7	2.4	2.0	1.2	0.8	0.8	0.4	0.4	0.2	0.1
39	5010	6	5.5	1.5	2.2	1.9	1.4	4.5	13.3	22.6	26.1	9.9	4.3	2.6	2.1	0.7	0.4	0.1	0.2	0.0	0.1	0.2
39	5010	7	0.9	0.5	1.5	2.7	2.1	4.9	7.2	6.0	6.9	5.2	6.5	14.0	9.6	8.3	10.5	5.6	4.8	1.4	0.8	0.2
39	5010	8	6.8	2.7	2.1	1.7	2.3	12.8	18.6	9.5	8.0	6.4	6.9	6.1	4.8	3.8	2.8	2.2	1.3	0.8	0.2	0.1
39	5010	9	0.3	1.1	3.3	3.0	1.5	2.2	10.1	23.5	30.2	10.4	1.8	0.8	1.1	1.6	2.2	2.5	2.1	1.2	0.6	0.2
39	5010	10	0.0	0.5	0.6	1.2	0.7	2.6	22.7	31.8	27.5	6.0	1.7	1.2	1.1	0.6	0.6	0.3	0.1	0.1	0.2	0.1
39	5010	11	1.4	2.3	9.7	11.6	5.8	5.4	9.6	12.8	11.6	5.7	4.8	3.5	4.4	3.3	2.4	2.5	1.2	1.2	0.5	0.2
39	5010	12	2.0	2.9	6.4	12.0	6.4	5.8	9.2	13.8	9.9	4.2	5.7	5.9	5.5	3.4	1.3	0.7	0.8	1.1	0.1	0.0
39	5010	13	4.7	5.2	7.4	8.1	3.6	8.2	15.4	0.0	3.6	2.7	7.5	9.8	9.8	3.6	3.3	3.9	3.3	0.0	0.0	0.0

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
39	5010	4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	6	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	10	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	11	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	12	0.0	2.5	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 395010 Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
39	5010	4	1.1	0.5	2.0	3.8	4.2	2.8	3.9	9.5	23.6	15.9	11.9	7.8	4.1	3.8	2.0	1.6	0.9	0.2	0.1	0.1
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	6	3.1	9.3	21.6	17.4	8.4	5.0	3.9	3.5	3.4	3.2	4.0	2.8	2.8	3.0	2.3	2.0	1.5	1.8	0.6	0.1
39	5010	7	15.3	2.3	15.9	4.8	3.6	10.9	18.8	12.7	1.0	5.1	2.5	0.0	2.6	0.0	3.2	0.0	0.0	1.3	0.0	0.0
39	5010	8	2.2	2.6	7.9	13.7	17.8	18.4	14.8	10.0	6.1	2.3	1.3	0.8	0.6	0.5	0.5	0.2	0.1	0.0	0.0	0.0
39	5010	9	0.3	1.3	4.7	8.0	11.2	9.4	7.0	5.6	5.2	4.9	5.0	5.4	6.2	7.9	8.8	5.5	2.2	0.9	0.4	0.2
39	5010	10	0.1	0.4	1.2	2.0	8.7	12.1	4.7	3.7	3.7	4.4	5.6	9.2	13.6	12.7	9.3	4.7	2.3	0.9	0.4	0.1
39	5010	11	0.8	7.4	5.5	6.5	22.5	34.9	9.3	2.8	3.2	1.7	0.8	0.7	0.7	1.8	0.8	0.0	0.5	0.2	0.0	0.0
39	5010	12	0.0	0.0	0.0	7.6	11.6	10.2	8.3	15.2	15.5	7.7	5.3	1.8	0.6	0.0	3.7	3.9	7.5	0.6	0.3	0.3
39	5010	13	2.7	0.0	5.1	7.3	2.8	5.0	8.1	3.7	0.0	2.3	0.0	18.3	7.6	0.0	11.9	8.1	9.8	3.7	0.0	1.7

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
39	5010	4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	6	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	10	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	13	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 395010 Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
39	5010	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	6	70.4	0.0	3.7	0.0	0.0	0.0	0.0	0.0	3.7	7.4	0.0	11.1	0.0	3.7	0.0	0.0
39	5010	7	1.0	0.5	0.2	0.4	0.9	1.1	0.5	0.4	4.0	3.9	8.7	9.4	4.5	8.7	9.5	8.2
39	5010	8	16.7	3.0	0.0	0.0	0.0	16.7	6.1	0.0	0.0	0.0	0.0	0.0	0.0	16.7	16.7	9.1
39	5010	9	57.1	16.7	9.5	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	10	3.5	15.1	11.2	4.0	2.8	3.0	3.4	3.6	6.4	11.6	14.1	12.3	6.2	2.0	0.5	0.1
39	5010	11	38.9	16.7	33.3	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
39	5010	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	7	16.8	7.3	6.7	3.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	8	3.0	3.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Section 395010 Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
39	5010	4	0	0	0	0	4	31	16	1	2	0	2	1	0	0	0	0	0	0	0	0
39	5010	5	3	4	5	7	5	7	9	2	2	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	5	1	1	1	1	1	4	13	9	9	1	1	1	0	0	0	0	0	0	0
39	5010	7	1	0	1	3	1	17	34	1	6	7	4	43	7	10	32	1	14	2	1	0
39	5010	8	2	0	0	0	0	1	7	11	0	2	4	5	0	1	2	5	2	1	0	0
39	5010	9	0	0	1	0	0	0	1	9	8	38	3	0	0	0	0	0	0	0	0	0
39	5010	10	0	0	0	1	0	2	83	36	62	17	2	1	2	0	0	0	0	0	0	0
39	5010	11	0	1	28	24	3	0	11	5	43	7	6	1	2	1	0	0	0	0	0	0
39	5010	12	10	0	7	2	34	3	17	3	14	3	5	6	7	2	1	0	1	2	0	0
39	5010	13	77	43	192	230	45	85	149	0	45	26	71	128	128	45	37	54	37	0	0	0

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 395010 Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
39	5010	4	2	0	2	2	4	1	3	33	3	4	6	3	7	2	2	1	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	1	39	0	32	15	2	1	1	0	0	6	0	0	0	1	0	0	1	0	0
39	5010	7	173	7	57	17	25	87	396	35	4	35	25	0	9	0	15	0	0	7	0	0
39	5010	8	0	0	3	3	0	6	15	2	4	1	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	1	2	2	1	0	0	1	1	2	2	0	1	2	0	0	0	0	0
39	5010	10	0	0	2	1	17	36	2	1	2	1	1	3	1	2	9	3	2	1	0	0
39	5010	11	1	31	29	14	59	200	57	6	10	2	1	0	1	9	0	0	0	0	0	0
39	5010	12	0	0	0	9	66	55	59	16	34	33	24	5	1	0	54	51	195	1	0	0
39	5010	13	26	0	90	189	28	31	112	49	0	18	0	311	111	0	340	112	336	49	0	10

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 395010 Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	5110	0	48	0	0	0	0	0	48	192	0	432	0	48	0	0
39	5010	7	4	1	0	0	1	1	1	0	7	8	19	17	3	1	7	33
39	5010	8	972	32	0	0	0	972	129	0	0	0	0	0	0	972	972	289
39	5010	9	4286	972	317	0	0	972	0	0	0	0	0	0	0	0	0	0
39	5010	10	1	31	10	0	2	4	2	1	9	2	3	2	1	0	0	0
39	5010	11	1960	972	3889	0	0	0	0	0	432	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	245	21	16	4	21	0	0	0	0	0	0	0	0	0	0
39	5010	8	32	32	289	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 395010 Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
39	5010	4	31	35	24	38	31	32	21	6	11	2	22	26	23	29	55	41	73	28	90	45
39	5010	5	51	45	32	31	18	18	22	11	17	11	12	16	34	44	33	34	36	55	48	80
39	5010	6	41	66	55	41	49	27	15	16	11	30	28	42	44	67	148	123	179	200	200	162
39	5010	7	93	132	59	60	41	84	81	18	34	51	29	47	28	38	54	17	79	98	118	200
39	5010	8	18	6	15	12	15	8	14	34	5	23	30	36	11	22	52	101	118	95	44	48
39	5010	9	8	5	22	20	6	7	12	13	9	59	96	24	13	21	11	19	23	13	8	20
39	5010	10	200	14	23	65	46	48	40	19	29	67	81	83	110	23	73	105	155	120	73	93
39	5010	11	20	51	54	43	29	7	35	17	56	47	51	28	33	34	19	21	47	56	54	124
39	5010	12	156	15	42	13	90	29	45	12	38	44	40	40	48	41	86	82	136	137	200	0
39	5010	13	187	127	187	187	187	112	79	0	187	187	112	116	116	187	187	187	187	0	0	0

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
39	5010	4	102	125	108	140	128	116	118	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	59	96	115	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	200	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	8	15	80	126	153	98	128	200	0	200	0	0	0	0	0	0	0	0	0	0
39	5010	9	11	6	30	91	104	141	200	76	170	0	200	0	0	0	0	0	0	0	0
39	5010	10	131	81	151	200	200	125	200	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	129	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	180	200	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 395010 Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
39	5010	4	116	27	66	34	45	40	41	60	7	12	21	23	63	40	68	47	77	55	136	98
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	27	67	2	32	47	31	22	28	19	10	64	21	10	10	37	29	17	62	84	115
39	5010	7	86	118	48	86	138	86	106	47	200	116	200	0	116	0	119	0	0	200	0	0
39	5010	8	28	8	21	13	3	13	27	14	32	49	32	37	93	133	134	158	84	68	200	200
39	5010	9	7	12	15	16	12	9	5	4	14	18	26	24	9	9	15	7	28	40	61	72
39	5010	10	100	79	107	42	47	50	28	21	34	25	21	18	7	11	32	39	63	88	110	128
39	5010	11	140	76	98	58	34	41	81	87	102	77	142	70	139	163	77	0	118	200	0	0
39	5010	12	0	0	0	40	70	73	92	26	38	75	92	123	200	0	200	181	185	200	200	200
39	5010	13	187	0	187	187	187	113	130	187	0	187	0	96	139	0	155	130	187	187	0	187

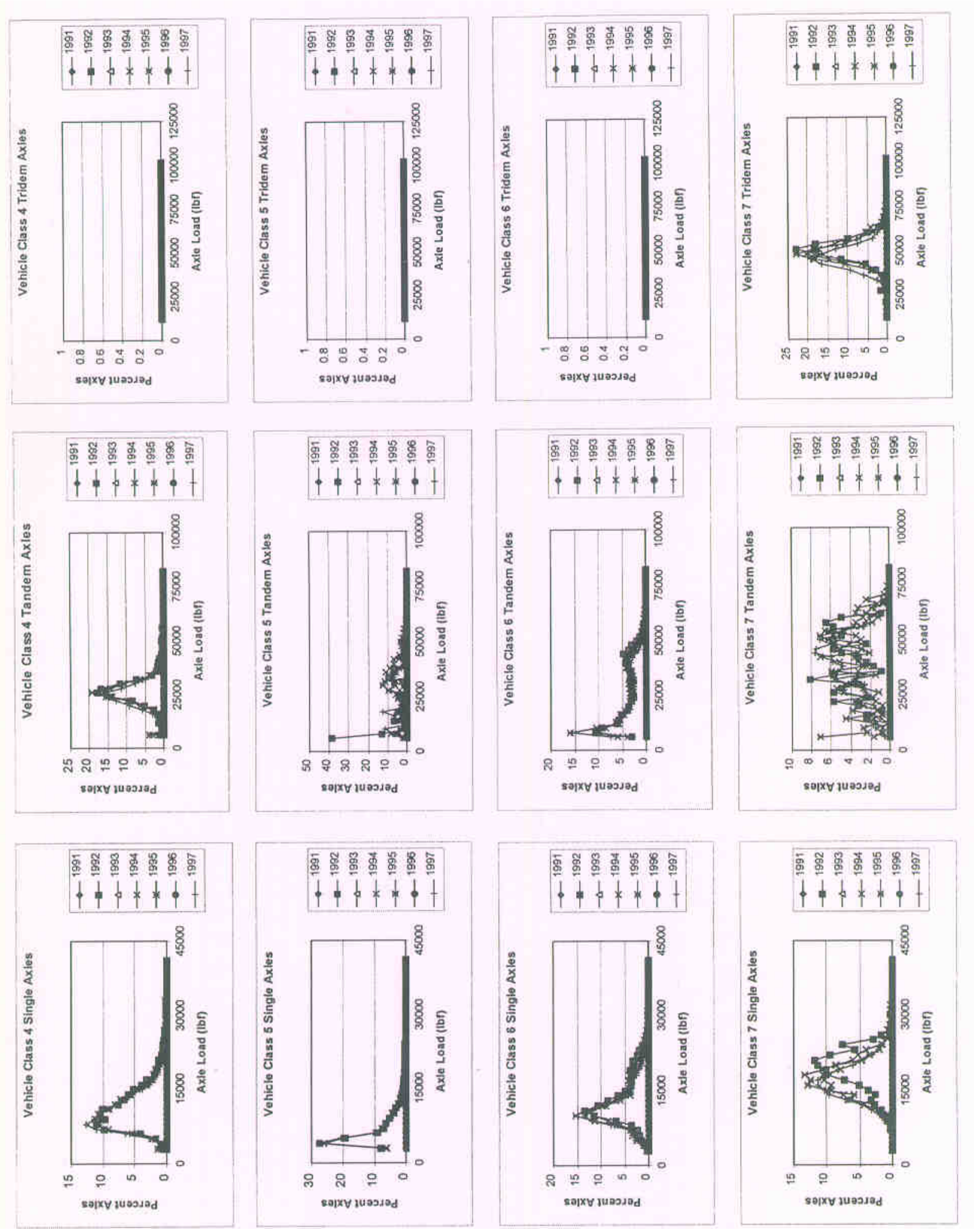
STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
39	5010	4	90	200	0	200	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	127	0	200	0	0	0	163	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	8	0	200	200	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	69	105	92	174	200	0	200	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	10	120	75	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	187	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 395010 Tridem Axles (COV)

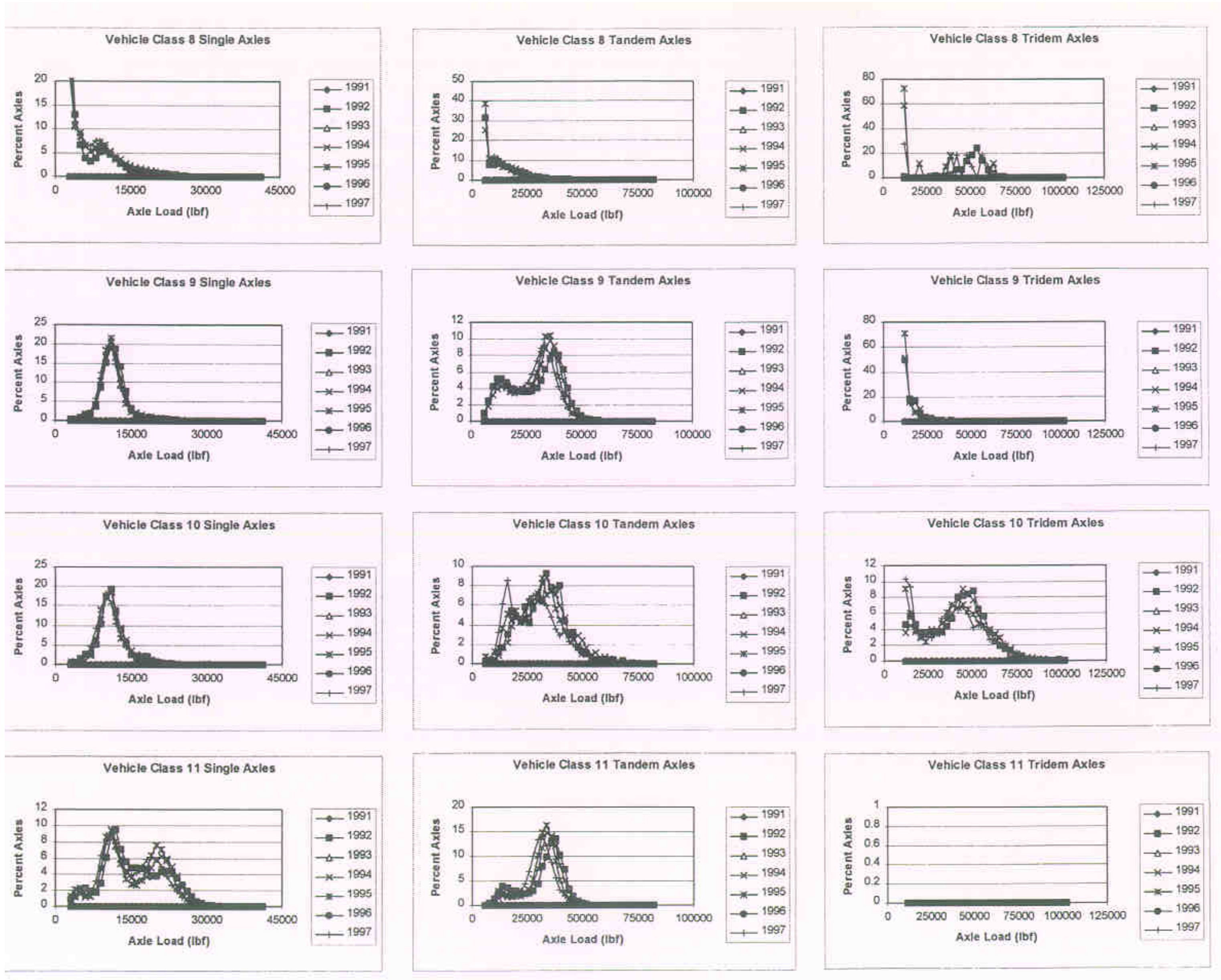
			Load Group (lbf)															
STATE	SHRP	VC	12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	102	0	187	0	0	0	0	0	187	187	0	187	0	187	0	0
39	5010	7	200	200	200	119	91	78	200	119	66	71	50	44	38	13	29	70
39	5010	8	187	187	0	0	0	187	187	0	0	0	0	0	0	187	187	187
39	5010	9	115	187	187	0	0	187	0	0	0	0	0	0	0	0	0	0
39	5010	10	30	37	28	9	45	64	46	33	47	11	13	13	19	15	50	94
39	5010	11	114	187	187	0	0	0	0	0	187	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

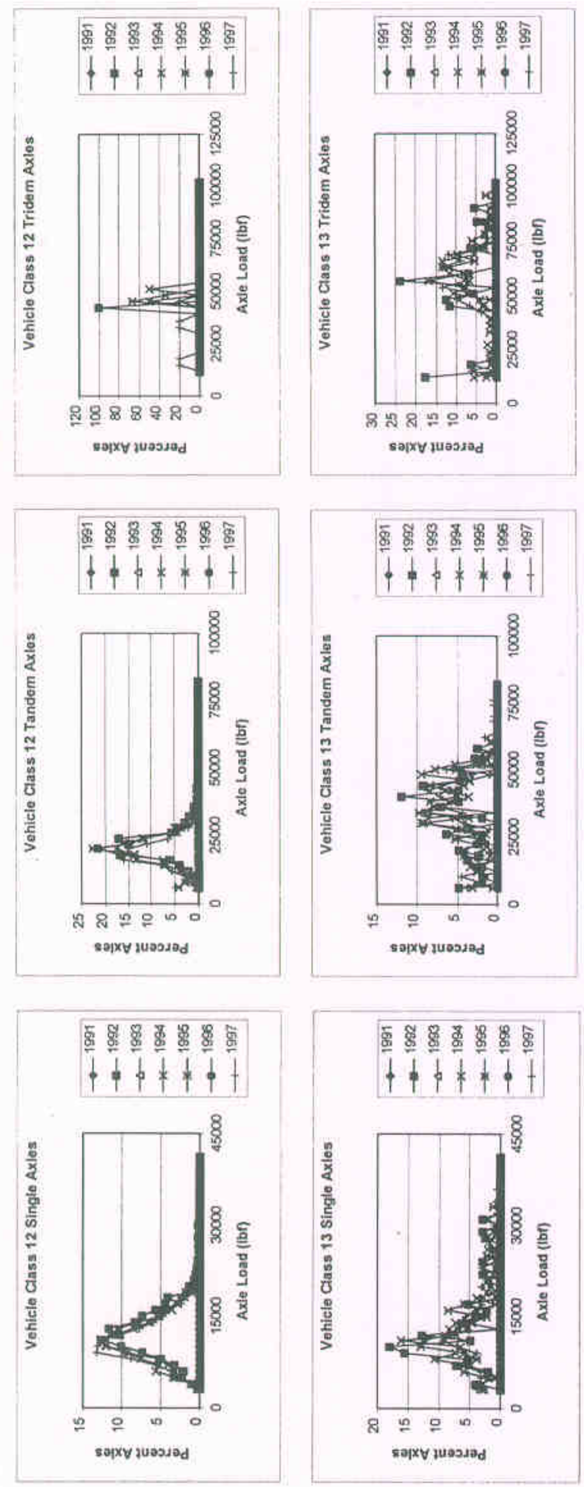
			Load Group (lbf)														
STATE	SHRP	VC	60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
39	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	7	93	63	59	55	123	0	0	0	0	0	0	0	0	0	0
39	5010	8	187	187	187	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	10	115	200	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Section 515010



Vehicle Class 4 Single Axles
Vehicle Class 4 Tandem Axles
Vehicle Class 4 Tridem Axles
Vehicle Class 5 Single Axles
Vehicle Class 5 Tandem Axles
Vehicle Class 5 Tridem Axles
Vehicle Class 6 Single Axles
Vehicle Class 6 Tandem Axles
Vehicle Class 6 Tridem Axles
Vehicle Class 7 Single Axles
Vehicle Class 7 Tandem Axles
Vehicle Class 7 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1993
1994
1995
1996
1997


Vehicle Class 8 Single Axles
Vehicle Class 8 Tandem Axles
Vehicle Class 8 Tridem Axles
Vehicle Class 9 Single Axles
Vehicle Class 9 Tandem Axles
Vehicle Class 9 Tridem Axles
Vehicle Class 10 Single Axles
Vehicle Class 10 Tandem Axles
Vehicle Class 10 Tridem Axles
Vehicle Class 11 Single Axles
Vehicle Class 11 Tandem Axles
Vehicle Class 11 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1993
1994
1995
1996
1997



Vehicle Class 12 Single Axles
Vehicle Class 12 Tandem Axles
Vehicle Class 12 Tridem Axles
Vehicle Class 13 Single Axles
Vehicle Class 13 Tandem Axles
Vehicle Class 13 Tridem Axles
Percent Axles
Axle Load (lbf)
1991
1992
1993
1994
1995
1996
1997

Section 515010 Single Axles (Mean)

			Load Group (lbf)																			
STATE	SHRP	VC	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
51	5010	4	0.9	0.9	2.1	5.2	9.9	11.3	10.7	10.5	9.4	7.9	6.8	5.8	4.5	3.3	2.5	1.9	1.5	1.1	0.9	0.7
51	5010	5	7.2	26.9	19.8	9.4	7.5	6.4	5.3	4.1	3.1	2.4	1.7	1.3	1.0	0.8	0.6	0.5	0.4	0.3	0.3	0.2
51	5010	6	0.3	0.9	2.2	2.8	3.3	6.0	9.6	12.8	12.7	9.6	7.0	5.2	4.5	3.9	3.6	3.3	3.0	2.5	2.0	1.5
51	5010	7	0.1	0.1	0.0	0.1	0.3	0.3	0.8	1.4	2.3	3.6	5.8	6.4	8.2	9.6	10.4	10.9	9.1	8.7	6.7	5.3
51	5010	8	27.3	11.2	8.3	6.0	5.1	5.8	6.5	6.1	4.9	3.9	3.0	2.3	1.9	1.5	1.3	1.1	0.9	0.8	0.6	0.5
51	5010	9	0.4	0.4	0.7	1.0	1.7	4.4	10.3	17.2	20.3	16.9	10.8	5.8	2.9	1.7	1.2	1.0	0.9	0.7	0.6	0.4
51	5010	10	0.3	0.5	1.2	2.1	3.5	6.8	12.5	17.5	18.0	12.4	8.2	5.4	2.9	2.1	2.0	1.5	0.9	0.8	0.5	0.4
51	5010	11	1.1	1.6	2.0	1.6	1.5	2.2	4.7	7.8	9.1	8.0	5.9	4.4	3.8	3.7	4.1	4.6	5.3	5.8	5.6	4.9
51	5010	12	0.3	1.0	2.9	3.6	4.5	6.7	9.9	11.8	12.6	10.7	9.6	7.2	5.6	4.4	3.1	2.5	1.3	0.9	0.5	0.3
51	5010	13	2.4	3.5	1.5	3.3	5.7	6.3	8.1	11.1	10.6	9.1	5.1	6.1	3.7	4.6	3.7	1.9	0.8	1.1	1.6	1.0

			Load Group (lbf)																		
STATE	SHRP	VC	23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
51	5010	4	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	6	1.1	0.8	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	7	3.5	3.1	1.4	0.8	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	8	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	10	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	11	4.0	2.9	2.0	1.3	0.8	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	12	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	13	1.0	0.9	0.9	1.0	0.4	0.9	1.1	0.4	1.2	0.1	0.3	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0

Section 515010 Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
51	5010	4	2.4	0.6	0.6	1.1	1.1	1.7	3.5	6.8	10.0	14.7	17.1	14.6	10.1	6.2	3.2	2.0	1.3	1.0	0.8	0.4
51	5010	5	11.0	8.1	4.1	0.9	4.1	2.9	6.0	2.6	2.0	2.2	3.4	5.4	6.6	6.9	7.7	7.8	5.3	2.4	3.3	2.4
51	5010	6	5.0	13.0	9.4	6.1	5.8	5.1	4.1	3.5	3.3	3.0	2.9	3.1	3.0	3.1	3.2	3.3	3.8	3.9	3.7	3.4
51	5010	7	2.3	1.0	1.2	0.7	2.4	1.4	1.8	2.1	3.5	2.2	3.5	3.9	3.6	5.2	3.3	3.8	2.9	4.2	5.0	4.4
51	5010	8	31.9	9.9	10.3	9.3	7.9	6.7	5.7	4.6	3.8	2.9	1.9	1.4	1.1	0.7	0.6	0.3	0.3	0.2	0.2	0.1
51	5010	9	0.9	2.2	4.0	4.7	4.9	4.4	3.9	3.7	3.7	3.8	4.0	4.5	5.6	7.2	8.7	8.9	7.9	6.3	4.3	2.7
51	5010	10	0.4	0.3	0.8	1.7	3.3	4.7	4.8	5.0	4.3	5.1	5.5	6.2	7.0	7.4	7.8	6.9	6.0	5.4	4.0	2.8
51	5010	11	0.0	0.3	1.2	2.5	2.8	2.4	2.2	2.2	2.4	2.8	3.9	5.7	8.9	12.1	13.2	12.3	10.0	6.6	4.1	2.1
51	5010	12	2.4	1.6	1.8	3.6	5.8	10.7	15.0	19.1	14.2	11.8	5.0	3.9	2.0	1.4	0.7	0.3	0.3	0.1	0.3	0.1
51	5010	13	3.1	1.6	2.4	1.8	2.5	1.7	2.4	3.0	1.9	2.9	3.1	3.3	5.7	4.9	5.7	7.4	5.9	7.0	6.3	7.1

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
51	5010	4	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	1.2	0.9	0.8	1.1	0.3	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	6	2.6	2.0	1.4	0.9	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	7	5.3	4.5	5.5	5.3	5.9	3.7	3.5	2.7	1.9	1.7	0.5	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.0
51	5010	8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	1.5	0.9	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	10	2.7	1.9	1.5	1.2	0.7	0.6	0.4	0.5	0.3	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
51	5010	11	1.1	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	12	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	13	4.1	4.4	4.8	2.7	1.7	0.7	0.7	0.4	0.4	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0

Section 515010 Tridem Axles (Mean)

			Load Group (lbf)															
STATE	SHRP	VC	12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
51	5010	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	7	0.2	0.1	0.0	0.1	0.0	0.7	0.4	1.0	2.3	4.9	9.7	16.0	19.3	17.9	12.4	7.7
51	5010	8	39.9	0.0	0.0	2.9	0.0	0.1	0.3	0.3	2.6	9.5	6.1	1.6	7.7	6.9	6.0	8.0
51	5010	9	60.1	16.9	11.5	6.0	2.0	1.3	0.6	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1
51	5010	10	6.9	6.4	4.1	3.1	3.1	3.4	3.7	4.4	5.3	6.4	7.2	7.8	7.3	6.6	5.4	4.7
51	5010	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	12	0.0	5.0	5.0	0.0	0.0	0.0	0.0	5.0	5.0	0.0	25.0	34.2	8.3	12.5	0.0	0.0
51	5010	13	6.4	1.6	1.8	0.4	0.4	0.5	0.0	0.4	0.4	0.4	0.9	6.1	6.9	7.1	7.3	13.7

			Load Group (lbf)														
STATE	SHRP	VC	60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
51	5010	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	7	4.0	2.1	0.6	0.4	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	8	3.7	3.7	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	10	3.5	3.0	2.5	1.9	1.3	0.8	0.6	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0
51	5010	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	13	8.1	9.6	6.8	6.7	4.3	2.0	1.3	1.3	2.7	0.7	1.7	0.0	0.6	0.0	0.0

Section 515010 Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
51	5010	4	111	102	102	102	100	100	100	100	100	100	100	100	101	101	102	101	101	101	103	101
51	5010	5	101	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	101	102
51	5010	6	113	105	104	103	103	104	103	101	100	100	101	102	101	100	101	102	104	105	110	111
51	5010	7	123	120	224	164	119	157	111	105	104	104	104	110	107	106	102	101	101	103	112	114
51	5010	8	103	101	101	103	103	103	101	100	100	100	101	101	102	101	101	102	102	103	103	107
51	5010	9	110	108	105	107	102	102	101	100	100	101	102	103	101	103	106	106	105	104	103	102
51	5010	10	145	107	105	105	105	104	101	100	100	101	101	101	102	101	101	104	102	100	103	102
51	5010	11	102	105	102	104	102	104	104	101	100	101	101	102	102	103	102	102	103	103	103	102
51	5010	12	111	101	101	108	103	104	103	101	100	100	102	101	102	102	104	107	106	106	108	112
51	5010	13	122	101	135	113	101	111	118	111	110	104	122	102	107	115	117	140	159	162	120	166

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
51	5010	4	104	104	110	108	102	102	105	113	111	155	168	176	138	179	122	224	138	224	0
51	5010	5	102	102	103	106	109	104	103	102	105	119	105	121	113	138	135	153	142	0	0
51	5010	6	115	111	114	113	112	109	122	125	145	168	110	166	165	168	0	224	0	0	0
51	5010	7	112	139	125	128	108	111	125	147	157	176	0	0	0	0	0	0	0	0	0
51	5010	8	111	109	110	108	106	122	106	113	108	111	126	134	128	116	149	153	133	160	162
51	5010	9	102	102	102	102	103	106	105	103	117	121	147	147	120	120	153	0	224	0	0
51	5010	10	109	109	117	142	143	224	160	197	224	224	0	0	0	0	0	0	0	0	0
51	5010	11	103	105	106	109	108	107	111	108	113	111	104	111	113	113	128	133	125	153	0
51	5010	12	108	151	224	165	130	174	0	224	0	224	0	0	0	0	0	0	0	0	0
51	5010	13	181	174	161	131	224	163	146	161	154	224	224	224	0	224	0	0	0	0	0

Section 515010 Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
51	5010	4	114	102	102	102	113	112	108	104	102	100	101	101	102	101	101	101	102	108	106	109
51	5010	5	194	109	156	129	114	134	124	107	103	136	114	130	122	115	101	104	118	159	128	124
51	5010	6	108	103	100	100	100	100	100	100	100	100	101	101	101	101	101	101	100	101	101	105
51	5010	7	172	142	137	153	118	117	128	113	112	101	116	106	102	108	114	117	111	107	107	114
51	5010	8	101	101	101	101	101	100	100	101	102	104	105	110	112	112	120	115	114	118	128	157
51	5010	9	101	101	101	101	100	100	100	100	100	100	101	102	103	103	102	101	101	104	107	108
51	5010	10	114	116	118	118	119	117	101	100	100	101	102	100	100	101	102	102	105	108	101	101
51	5010	11	130	113	109	104	104	106	103	102	102	106	113	113	109	103	102	102	106	110	116	114
51	5010	12	142	122	116	108	106	109	101	102	101	106	101	105	111	102	122	153	141	224	155	224
51	5010	13	116	122	116	120	104	140	115	118	107	114	122	113	127	116	127	100	104	113	103	105

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
51	5010	4	109	125	179	107	224	224	158	0	0	0	224	0	0	0	0	0	0	0	0
51	5010	5	138	175	224	156	224	180	224	154	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	106	109	107	110	110	112	118	130	106	147	133	120	144	224	158	224	0	0	0
51	5010	7	106	106	105	104	101	106	116	116	117	127	139	164	224	224	224	0	0	0	0
51	5010	8	152	135	136	207	191	194	224	195	224	224	177	224	224	0	224	0	0	0	0
51	5010	9	108	107	108	108	108	107	110	112	108	113	120	138	126	153	224	153	0	0	0
51	5010	10	102	105	107	103	105	112	108	109	118	102	103	125	153	122	129	224	0	0	0
51	5010	11	113	113	115	134	111	131	165	224	128	0	0	0	0	224	0	0	0	0	0
51	5010	12	224	224	0	0	0	224	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	13	101	131	122	123	108	161	193	159	224	0	0	224	224	0	224	224	0	0	0

Section 515010 Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	111	156	224	169	224	129	112	154	149	116	112	102	101	103	106	107
51	5010	8	129	0	0	224	0	224	224	224	195	143	172	224	155	163	224	154
51	5010	9	102	101	107	113	115	125	122	125	119	132	140	193	224	224	153	155
51	5010	10	111	105	100	101	101	101	100	102	101	101	101	101	102	104	101	101
51	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	224	224	0	0	0	0	224	224	0	224	133	224	224	0	0
51	5010	13	158	224	189	224	224	224	0	224	224	224	224	118	124	105	126	117

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	106	119	119	127	162	159	224	224	224	0	0	224	0	0	0
51	5010	8	158	182	224	224	224	0	0	0	0	0	0	0	0	0	0
51	5010	9	138	224	169	224	0	0	0	0	0	0	0	0	0	0	0
51	5010	10	101	101	103	101	103	103	100	104	128	119	134	128	224	130	0
51	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	13	104	120	130	127	106	172	153	123	112	154	175	0	224	0	0

Section 515010 Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
51	5010	4	1	1	5	28	100	129	114	111	89	63	47	33	21	11	6	4	2	1	1	0
51	5010	5	53	725	393	89	56	41	28	17	10	6	3	2	1	1	0	0	0	0	0	0
51	5010	6	0	1	5	8	11	39	97	168	162	93	51	28	20	15	13	11	10	7	5	3
51	5010	7	0	0	0	0	0	0	1	2	6	14	37	49	77	103	112	121	85	80	57	37
51	5010	8	786	126	70	38	27	36	43	38	24	15	9	5	4	2	2	1	1	1	0	0
51	5010	9	0	0	0	1	3	21	108	299	413	289	122	35	9	3	2	1	1	1	0	0
51	5010	10	0	0	2	5	13	49	161	307	326	157	69	29	9	5	4	2	1	1	0	0
51	5010	11	1	3	4	3	2	5	24	63	83	66	36	20	15	15	17	22	29	36	33	25
51	5010	12	0	1	9	15	21	48	104	141	158	115	95	53	33	20	10	7	2	1	0	0
51	5010	13	8	12	4	14	33	49	92	153	136	90	39	38	16	28	19	7	2	3	4	3

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	15	19	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	11	17	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	13	3	2	2	2	1	2	3	0	4	0	0	0	0	0	0	0	0	0	0

Section 515010 Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
51	5010	4	7	0	0	1	2	4	14	49	104	217	295	218	106	40	11	4	2	1	1	0
51	5010	5	454	78	42	1	22	15	54	8	4	9	15	49	64	62	61	67	39	14	18	9
51	5010	6	29	181	89	37	34	26	16	12	11	9	9	9	9	10	10	11	15	15	14	13
51	5010	7	16	2	3	1	8	3	5	6	15	5	16	17	13	32	14	20	10	20	28	26
51	5010	8	1046	101	108	88	62	46	33	22	15	9	4	2	1	1	0	0	0	0	0	0
51	5010	9	1	5	16	23	24	20	15	14	14	14	16	21	34	55	78	82	65	42	21	9
51	5010	10	0	0	1	4	15	30	24	25	19	26	32	39	49	57	63	49	39	33	16	8
51	5010	11	0	0	2	7	9	7	5	5	6	9	19	42	93	156	182	158	113	54	23	6
51	5010	12	11	4	4	15	38	136	228	379	206	158	26	17	5	2	1	0	0	0	0	0
51	5010	13	13	4	8	5	7	6	7	12	4	11	14	14	53	32	52	54	37	62	43	56

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	3	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	7	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	32	23	33	30	35	16	17	10	5	4	1	2	0	0	0	0	0	0	0
51	5010	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	10	8	4	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	13	17	33	35	11	3	1	2	0	1	0	0	0	0	0	0	0	0	0	0

Section 515010 Tridem Axles (Variance)

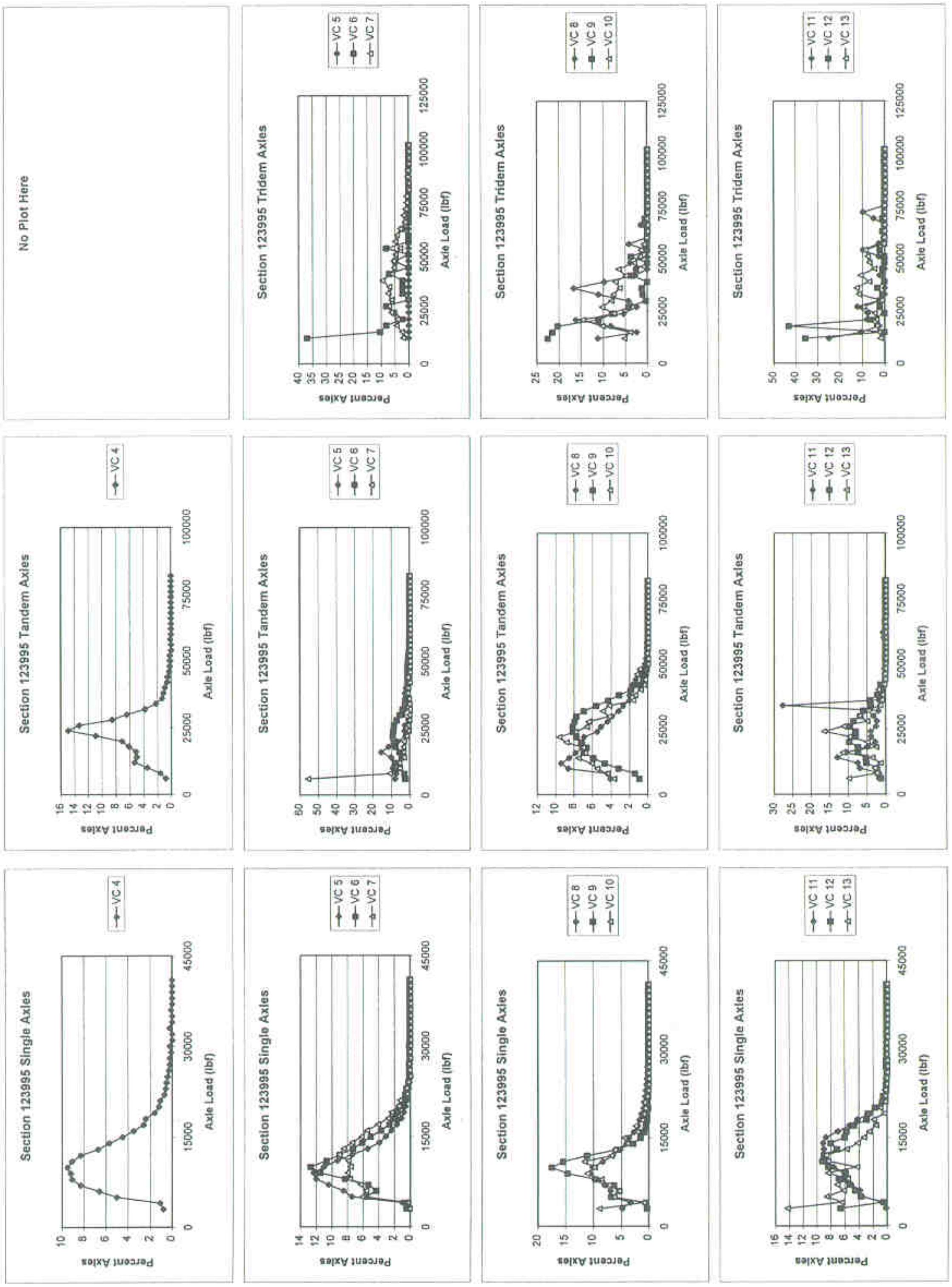
STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	0	0	0	0	0	1	0	2	11	33	119	267	381	337	173	68
51	5010	8	2634	0	0	43	0	0	1	0	26	185	111	13	145	125	181	152
51	5010	9	3738	288	153	45	5	3	1	0	0	0	0	0	0	0	0	0
51	5010	10	59	45	17	10	10	12	13	20	28	41	53	61	55	48	30	22
51	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	125	125	0	0	0	0	125	125	0	3125	2059	347	781	0	0
51	5010	13	102	12	12	1	1	1	0	1	1	1	4	52	72	55	83	255

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
51	5010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	7	18	6	1	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	8	34	44	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	10	12	9	6	4	2	1	0	0	0	0	0	0	0	0	0
51	5010	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	13	71	134	78	72	21	11	4	3	9	1	9	0	2	0	0

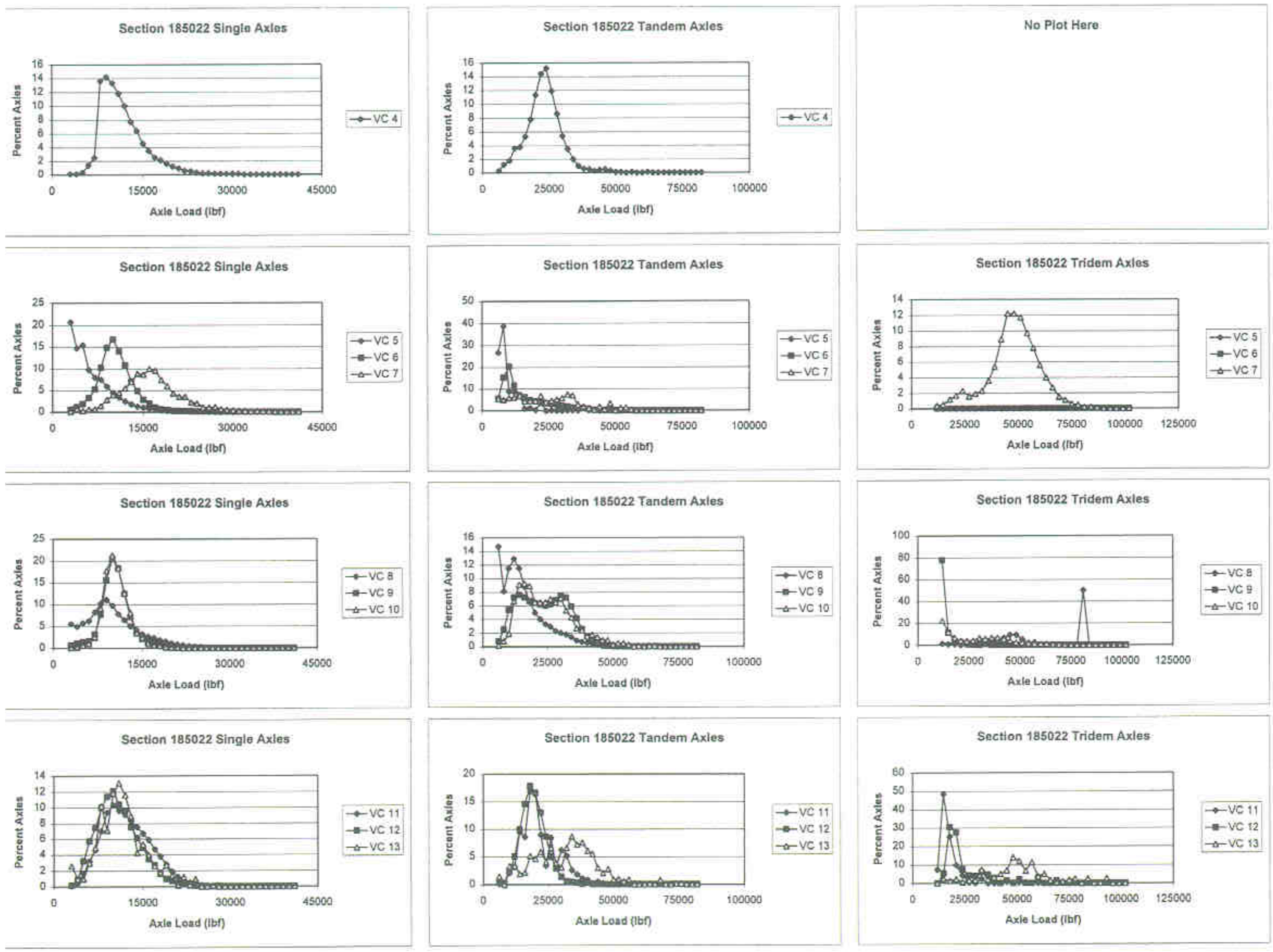
APPENDIX AA.5 – Normalized Axle Weight Statistics for Vehicle Classes 5 and 9 for Selected Sites

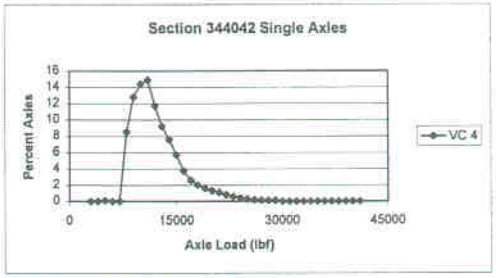
Appendix AA.5 includes a graphical presentation of the average annual normalized axle load spectra for each axle type and vehicle class for the five sites that were included in Appendix AA.4. As shown, there can be relatively large differences among the different vehicle classes for the same axle type. Appendix AA.5 also includes a tabulation of the mean, variance and coefficient of variation of the normalized axle weight spectra for each axle type and axle load group included in the LTPP traffic database for truck or vehicle classes 5 and 9 at selected sites. Vehicle classes 5 and 9 account for the majority of the truck traffic at most of the LTPP sites. As shown, the analysis of the WIM data to determine the default normalized axle load spectra for the different axle types and trucks represents a massive amount of information and data. Only a fraction of the data has been included in this appendix. The following summarizes the information included in this appendix:

Graphical illustration of the average annual normalized axle load spectra for each axle type for each truck class at selected sites (pages AA.5-2 thru AA.5-6)
Means for the annual normalized axle load spectra for each axle type for Truck Class 5 (pages AA.5-7 thru AA.5-12)
Variances for the annual normalized axle load spectra for each axle type for Truck Class 5 (pages AA.5-13 thru AA.5-18)
Coefficient of variations for the annual normalized axle load spectra for each axle type for Truck Class 5 (pages AA.5-19 thru AA.5-24)
Means for the annual normalized axle load spectra for each axle type for Truck Class 9 (pages AA.5-25 thru AA.5-30)
Variances for the annual normalized axle load spectra for each axle type for Truck Class 9 (pages AA.5-31 thru AA.5-36)
Coefficient of variations for the annual normalized axle load spectra for each axle type for Truck Class 9 (pages AA.5-37 thru AA.5-42)



Section 123995 Single Axles
Section 123995 Tandem Axles
Section 123995 Tridem Axles
No Plot Here
Percent Axles
Axle Load (lbf)
VC 4
VC 5
VC 6
VC 7
VC 8
VC 9
VC 10
VC 11
VC 12
VC 13


Section 185022 Single Axles
Percent Axles
Axle Load (lbf)
VC 4
Section 185022 Tandem Axles
Percent Axles
Axle Load (lbf)
VC 4
No Plot Here
Section 185022 Single Axles
VC 5
VC 6
VC 7
Section 185022 Tandem Axles
VC 5
VC 6
VC 7
Section 185022 Tridem Axles
VC 5
VC 6
VC 7
Section 185022 Single Axles
VC 8
VC 9
VC 10
Section 185022 Tandem Axles
VC 8
VC 9
VC 10
Section 185022 Tridem Axles
VC 8
VC 9
VC 10
Section 185022 Single Axles
VC 11
VC 12
VC 13
Section 185022 Tandem Axles
VC 11
VC 12
VC 13
Section 185022 Tridem Axles
VC 11
VC 12
VC 13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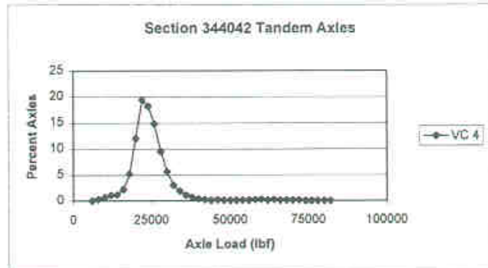
Percent Axles
Axle Load (lbf)
VC 4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Percent Axles
Axle Load (lbf)
VC 4

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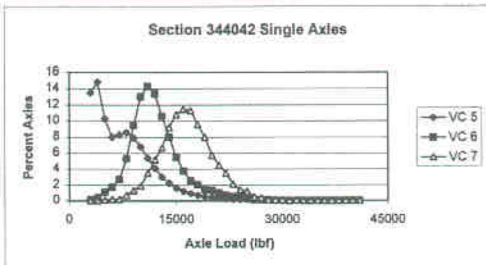
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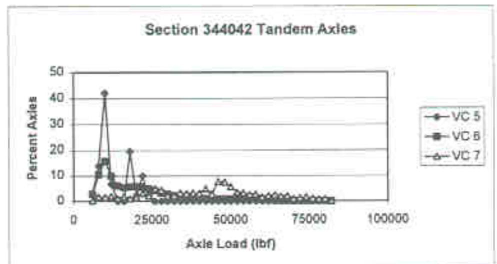
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7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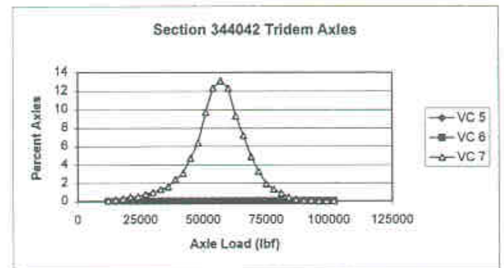
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7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Percent Axles
Axle Load (lbf)
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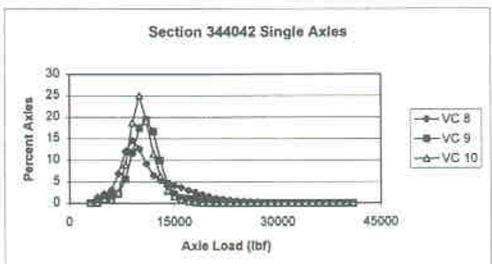
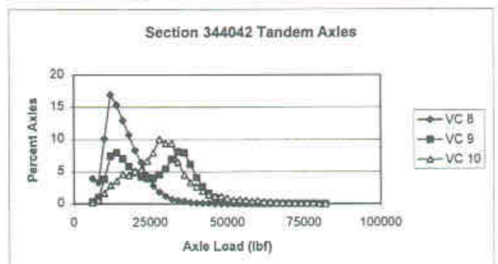
VC 6
VC 7


Section 344042 Single Axles
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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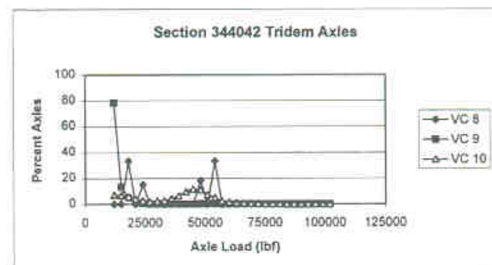
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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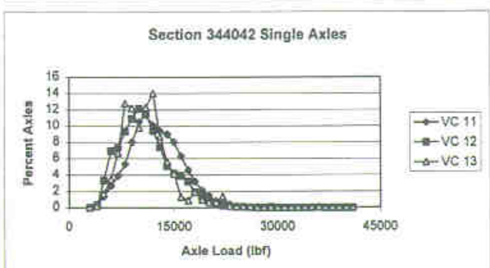
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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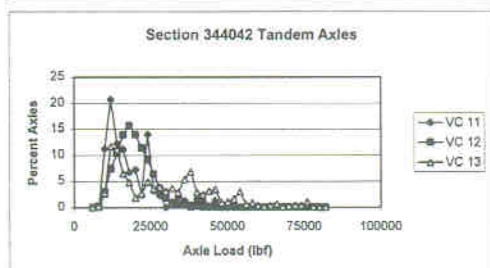
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13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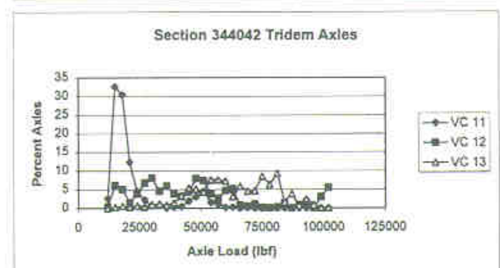
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13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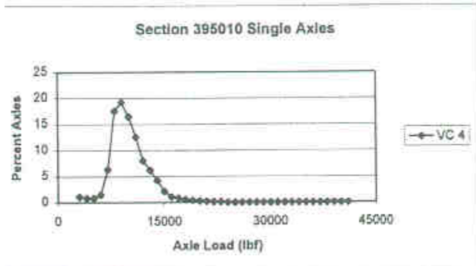
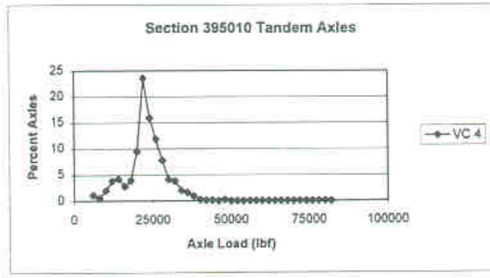
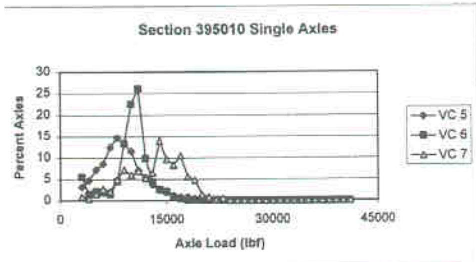
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13


Section 395010 Single Axles
Percent Axles
Axle Load (lbf)
VC 4


Section 395010 Tandem Axles
Percent Axles
Axle Load (lbf)
VC 4

No Plot Here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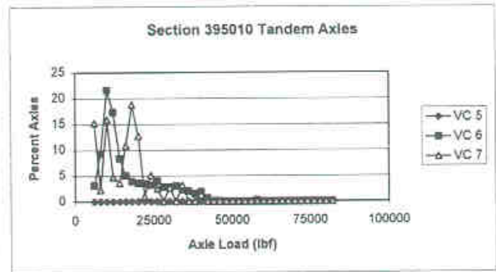
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7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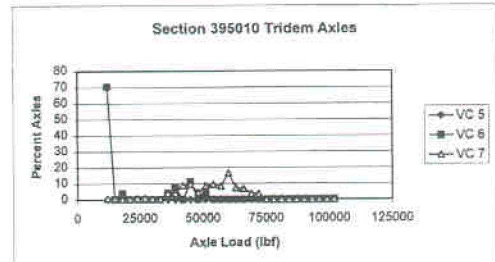
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7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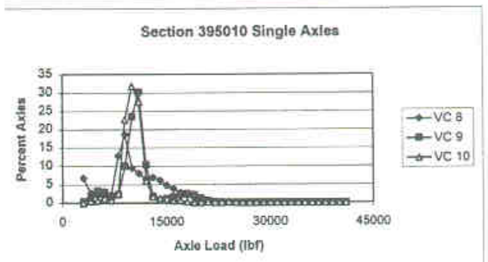
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7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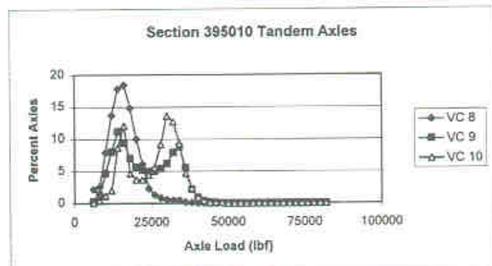
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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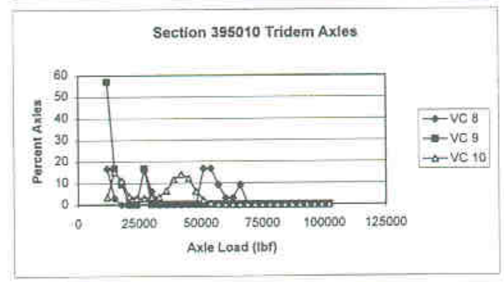
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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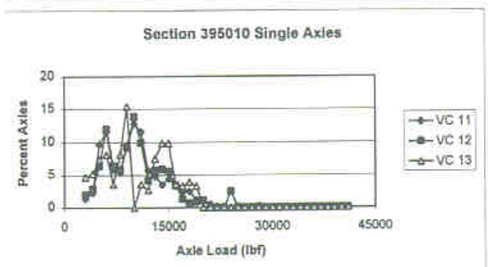
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10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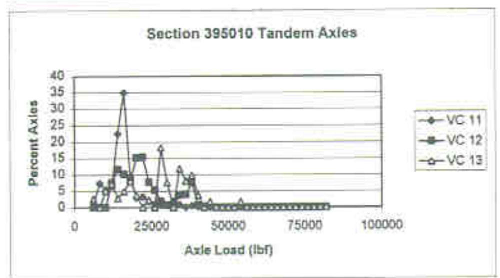
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13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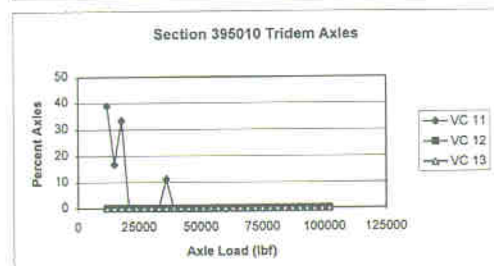
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13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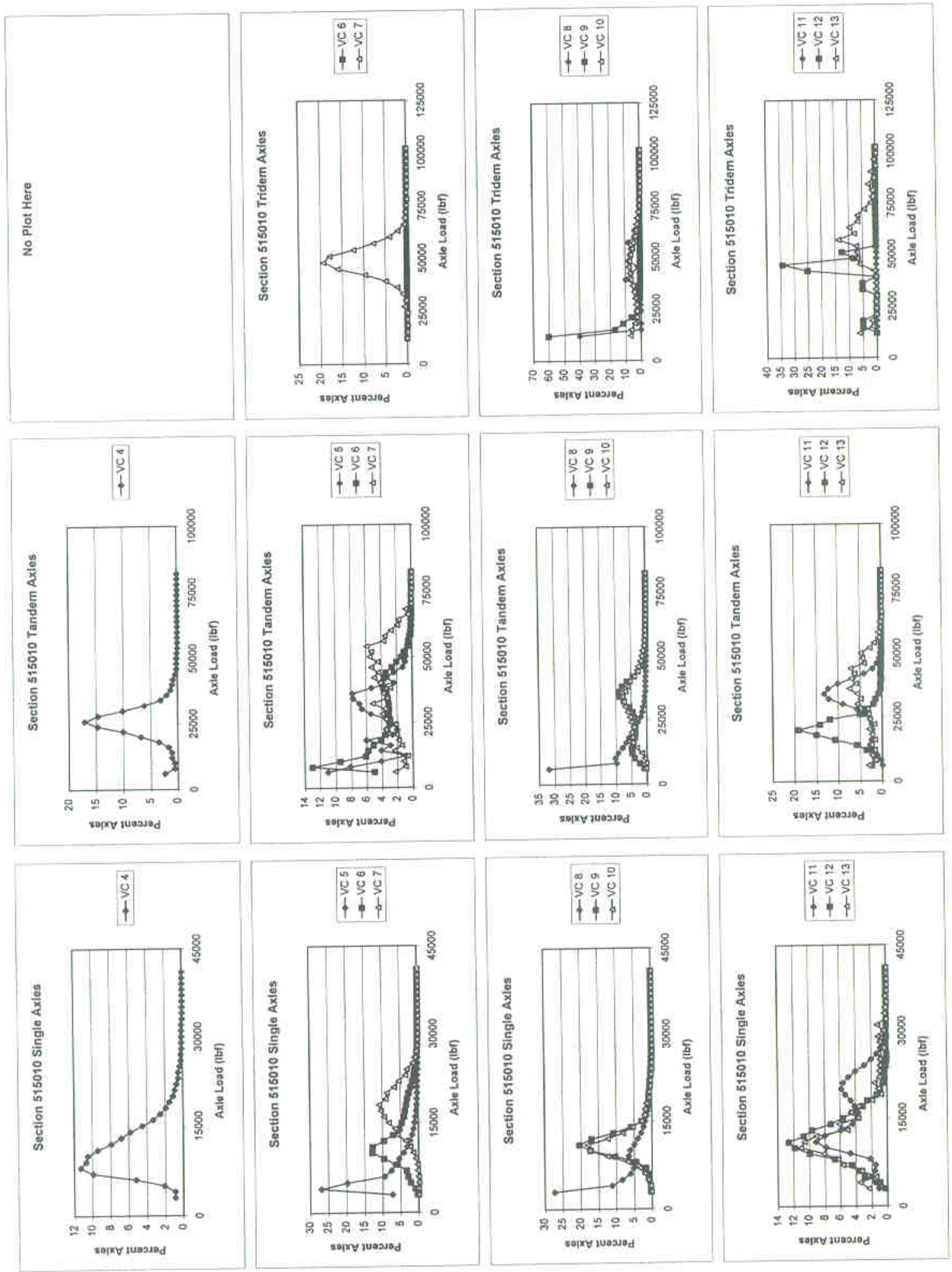
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13


Section 515010 Single Axles
Section 515010 Tandem Axles
No Plot Here
Section 515010 Tridem Axles
Percent Axles
Axle Load (lbf)
VC 4
VC 5
VC 6
VC 7
VC 8
VC 9
VC 10
VC 11
VC 12
VC 13

Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	5	34.4	7.8	5.8	7.6	7.3	6.3	5.7	5.3	4.2	3.2	2.2	1.6	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.4
12	3995	5	0.4	1.0	7.4	8.5	10.4	12.0	12.3	11.0	9.3	7.4	5.4	3.9	3.1	2.4	1.7	1.1	0.8	0.6	0.4	0.3
12	4096	5	0.7	1.1	5.2	9.4	12.6	9.1	13.8	13.1	8.9	8.0	4.1	3.0	3.1	2.5	1.3	1.1	0.4	0.8	0.5	0.8
12	4102	5	0.2	1.0	5.7	7.4	9.9	11.6	11.5	10.4	9.5	8.4	6.8	5.0	4.1	2.9	1.9	1.3	0.9	0.5	0.3	0.2
12	4103	5	0.4	1.1	7.9	9.2	11.0	12.2	11.7	10.6	8.5	6.9	5.4	4.3	3.0	2.2	1.5	1.2	0.8	0.5	0.4	0.3
12	4106	5	0.2	0.8	5.7	8.4	10.3	11.9	11.9	11.8	9.9	7.6	5.7	4.4	3.3	2.1	1.6	1.1	0.8	0.5	0.5	0.4
17	5908	5	5.3	12.1	18.1	15.6	12.1	9.6	7.2	5.4	4.0	2.8	2.0	1.5	1.1	0.9	0.6	0.5	0.4	0.3	0.2	0.1
18	1037	5	6.5	18.7	14.8	8.6	8.1	8.5	7.7	6.2	5.3	3.9	2.6	2.0	1.5	1.3	0.9	0.7	0.7	0.4	0.3	0.3
18	2008	5	19.0	26.1	22.0	9.6	5.3	4.5	3.6	2.8	2.0	1.3	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1
18	3031	5	12.7	23.8	20.3	11.7	7.4	5.7	4.6	3.5	2.3	1.6	1.3	1.1	0.9	0.7	0.6	0.5	0.3	0.3	0.2	0.2
18	4021	5	5.4	16.6	15.7	11.5	10.9	9.3	7.5	5.9	4.7	3.3	2.5	1.8	1.4	1.0	0.7	0.5	0.4	0.3	0.2	0.2
18	5022	5	20.7	14.7	15.4	9.8	8.0	7.5	5.9	4.5	3.4	2.5	1.8	1.3	1.0	0.8	0.6	0.4	0.3	0.3	0.2	0.2
18	5518	5	20.6	23.1	19.0	9.3	6.2	5.4	4.3	3.0	2.3	1.6	1.2	0.9	0.7	0.5	0.4	0.3	0.3	0.2	0.1	0.1
26	1001	5	4.7	15.1	33.7	15.0	9.0	6.1	4.2	3.1	2.2	1.6	1.2	0.9	0.7	0.7	0.4	0.3	0.3	0.2	0.1	0.1
26	1004	5	6.1	8.3	20.8	12.2	9.7	8.7	6.1	5.5	5.3	3.3	2.5	2.0	1.6	1.3	1.0	0.9	0.7	0.6	0.5	0.4
26	1010	5	12.8	13.0	30.2	15.4	11.0	4.8	3.4	1.6	0.9	0.8	0.6	0.5	0.4	0.4	1.1	0.3	0.2	0.2	0.2	1.0
26	9030	5	2.4	6.5	20.0	12.5	11.6	10.9	9.0	6.9	5.1	3.7	2.7	2.0	1.6	1.2	0.9	0.7	0.5	0.4	0.3	0.2
27	4037	5	34.5	21.5	10.6	7.1	6.3	5.5	4.3	3.1	2.1	1.5	1.1	0.7	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.0
28	3099	5	3.4	6.6	26.9	12.9	9.5	8.4	7.0	5.8	4.7	3.6	2.7	2.0	1.5	1.1	0.9	0.6	0.5	0.3	0.2	0.2
28	4024	5	10.1	13.1	40.1	12.1	5.9	4.1	3.0	2.3	1.8	1.4	1.1	1.0	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2
28	5805	5	2.8	4.6	23.4	14.2	12.0	10.0	7.7	5.7	4.3	3.3	2.5	2.0	1.6	1.3	1.0	0.8	0.6	0.5	0.3	0.3
29	4036	5	3.5	14.1	15.7	13.6	11.2	9.0	7.1	5.7	4.3	3.4	2.5	1.9	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.4
29	5503	5	3.2	11.6	14.1	13.1	11.6	10.0	7.7	6.2	4.6	3.2	2.3	1.8	1.9	1.6	1.4	1.2	1.0	0.8	0.6	0.5
34	1011	5	18.3	16.1	10.3	7.9	8.3	9.0	7.7	5.9	4.3	3.2	2.3	1.6	1.2	0.9	0.6	0.5	0.4	0.3	0.2	0.2
34	4042	5	13.5	14.8	10.3	8.0	8.3	8.6	7.9	6.8	5.4	4.1	3.0	2.2	1.6	1.2	0.9	0.7	0.5	0.4	0.4	0.3
39	5010	5	3.2	4.7	7.2	8.6	12.5	14.7	13.2	11.5	7.1	5.4	3.7	2.4	2.0	1.2	0.8	0.8	0.4	0.4	0.2	0.1
42	1627	5	2.8	3.9	15.3	10.2	10.7	11.5	10.3	8.7	6.4	4.7	3.1	2.6	2.1	1.8	1.5	1.2	0.8	0.6	0.5	0.4
48	1123	5	3.0	18.7	22.5	10.1	8.6	8.7	7.1	5.8	4.6	3.0	1.9	1.4	1.2	1.0	0.8	0.6	0.3	0.2	0.1	0.1
51	1417	5	16.1	23.6	20.1	9.8	7.3	5.9	3.7	2.5	2.9	1.8	1.7	0.8	1.2	0.7	0.4	0.3	0.4	0.4	0.1	0.1
51	1423	5	12.1	5.3	11.8	10.0	10.8	8.0	8.7	6.7	5.7	3.2	4.1	2.7	1.2	1.1	1.0	0.9	0.7	0.6	0.4	1.5
51	1464	5	4.6	21.0	16.5	10.9	9.0	8.5	6.9	5.4	4.6	3.4	2.0	1.4	1.4	0.9	0.8	0.6	0.5	0.3	0.4	0.2
51	5010	5	7.2	26.9	19.8	9.4	7.5	6.4	5.3	4.1	3.1	2.4	1.7	1.3	1.0	0.8	0.6	0.5	0.4	0.3	0.3	0.2
53	1002	5	21.2	14.1	11.7	9.9	7.7	6.9	5.6	4.6	3.4	3.0	2.1	1.8	1.6	1.3	1.1	0.9	0.7	0.7	0.4	0.3
53	1007	5	24.9	23.0	14.3	8.4	6.4	5.1	4.4	3.4	2.4	1.6	1.2	1.1	0.8	0.7	0.6	0.5	0.3	0.2	0.2	0.1
53	1801	5	16.4	15.7	13.9	11.0	8.8	7.1	4.9	3.7	3.0	2.6	2.5	2.4	2.0	1.7	1.2	0.9	0.7	0.5	0.3	0.3
53	3812	5	14.3	14.5	12.9	11.3	10.5	9.1	7.0	5.2	3.8	2.8	2.1	1.6	1.2	0.9	0.7	0.5	0.4	0.3	0.2	0.1
85	1801	5	2.0	9.1	18.1	12.8	9.8	7.8	6.2	5.0	3.5	4.4	3.4	2.2	2.4	2.0	1.3	0.8	1.1	0.5	1.0	0.8
90	6410	5	11.4	27.7	20.0	9.2	6.5	5.5	4.2	3.1	2.3	1.7	1.3	1.0	0.9	0.8	0.7	0.5	0.4	0.4	0.3	0.3

Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
12	3995	5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	5	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	5	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	5	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	5	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	5	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	5	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
26	1010	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	5	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
28	4024	5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
29	5503	5	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
34	1011	5	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	1123	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	5	0.2	0.2	1.3	1.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	5	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	5	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	5	0.9	0.5	0.7	0.3	0.7	0.4	0.7	0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.1	0.2	0.0	0.0	0.0
90	6410	5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0

Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	7.9	7.3	9.1	6.8	10.1	15.6	11.5	6.4	2.2	2.9	2.6	0.7	3.8	2.6	2.6	2.4	2.4	2.0	0.0	0.0
12	4096	5	0.0	0.0	6.3	12.5	6.3	6.3	6.3	0.0	0.0	6.3	0.0	6.3	0.0	31.3	18.8	0.0	0.0	0.0	0.0	0.0
12	4102	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	5	1.2	3.7	5.5	6.1	9.8	6.8	6.1	3.7	7.4	8.6	11.1	10.4	3.1	4.3	0.0	0.0	1.2	0.6	1.2	2.4
12	4106	5	1.4	2.9	3.6	6.5	1.4	2.2	2.9	2.2	0.7	0.0	0.0	2.9	2.2	3.6	3.6	31.2	30.5	0.7	0.7	0.0
17	5908	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	5	4.9	64.2	18.6	4.4	1.0	0.4	0.1	0.1	5.7	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
18	2008	5	26.5	65.2	6.1	0.4	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0
18	3031	5	16.6	60.1	15.2	2.7	1.7	0.9	0.5	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.4	0.2	0.3	0.1	0.0	0.0
18	4021	5	13.9	40.4	7.4	8.4	3.2	9.5	4.0	3.0	1.9	1.8	1.4	1.8	0.6	0.6	0.6	0.5	0.3	0.3	0.2	0.0
18	5022	5	26.7	38.8	8.9	8.7	7.2	0.9	1.2	0.3	3.6	0.0	0.2	0.1	0.0	0.2	0.2	0.1	1.8	0.2	0.2	0.0
18	5518	5	14.6	60.2	16.6	3.1	1.1	0.5	0.3	0.4	0.2	0.2	0.2	0.2	0.4	0.8	0.5	0.4	0.1	0.1	0.1	0.1
26	1001	5	0.0	95.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	5	0.0	99.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	5	0.0	93.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	5	0.0	80.7	2.7	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	5	17.7	49.4	10.7	0.2	0.2	20.9	0.1	0.4	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	5	0.0	62.0	37.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	5	0.0	70.6	29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	5	0.0	56.0	43.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	5	0.9	11.6	14.6	13.4	6.9	6.7	5.4	6.2	3.2	4.2	3.4	4.1	3.3	3.5	2.2	2.5	2.4	1.6	0.9	0.5
29	5503	5	1.1	3.0	8.2	5.5	13.8	24.1	5.7	12.2	4.1	2.7	2.9	2.7	2.6	1.2	3.5	2.4	1.8	0.7	1.0	0.4
34	1011	5	22.7	44.6	9.5	5.1	9.9	2.2	3.4	1.7	0.0	0.0	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
34	4042	5	3.1	13.9	42.0	6.8	0.0	0.0	19.5	2.3	10.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	5	11.5	7.9	9.3	6.5	8.6	10.8	10.7	6.3	3.2	3.1	4.7	2.4	2.5	3.2	1.9	1.7	1.8	1.1	1.0	0.3
48	1123	5	1.6	3.6	12.8	7.6	10.5	5.3	3.6	4.3	3.1	7.3	7.2	6.4	6.2	6.7	6.6	4.7	1.4	0.1	0.9	0.0
51	1417	5	8.9	34.2	26.5	13.3	1.3	0.6	9.0	1.2	1.0	1.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
51	1423	5	0.0	0.0	0.0	25.0	0.0	0.0	25.0	25.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	5	19.0	16.4	19.5	6.5	6.1	8.6	9.1	1.7	0.0	0.0	0.0	4.3	0.0	2.2	0.0	0.0	4.3	0.0	0.0	0.0
51	5010	5	11.0	8.1	4.1	0.9	4.1	2.9	6.0	2.6	2.0	2.2	3.4	5.4	6.6	6.9	7.7	7.8	5.3	2.4	3.3	2.4
53	1002	5	0.0	0.0	0.0	24.2	6.0	14.7	16.7	13.1	14.3	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	5	7.4	32.2	3.5	0.0	5.4	5.0	5.0	11.6	6.6	15.8	1.6	5.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	5	1.5	18.4	30.1	14.0	4.8	5.1	6.9	0.0	0.2	0.0	5.7	0.0	1.2	1.2	4.4	3.2	0.0	0.9	0.0	0.0
53	3812	5	5.4	10.4	12.2	9.3	12.5	9.7	5.4	7.9	5.4	3.8	3.5	2.5	1.3	3.0	2.4	1.0	0.8	1.2	1.1	0.0
85	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	5	7.5	15.9	11.5	8.7	10.7	7.6	2.0	23.6	1.1	1.3	0.7	0.6	3.1	0.5	0.5	0.4	0.5	0.4	0.4	0.3

Tandem Axles (Mean)

			Load Group (lbf)																		
STATE	SHRP	VC	46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	5	0.6	2.5	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	5	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.1	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	5	0.3	0.4	0.6	0.4	0.2	0.1	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
29	5503	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	5	0.5	0.1	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	1123	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	5	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	1.2	0.9	0.8	1.1	0.3	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	5	0.0	0.0	0.0	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	5	0.2	0.2	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0

Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	5503	5	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	5	18.3	4.3	1.7	0.6	2.9	0.0	2.8	2.8	0.0	2.8	13.9	11.7	13.3	7.1	17.9	0.0
48	1123	5	0.0	0.0	0.0	0.0	0.0	12.5	12.5	0.0	62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	5503	5	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	1123	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	5	1321	66	15	32	38	32	28	28	20	13	6	3	1	1	1	0	0	0	0	0
12	3995	5	0	0	19	5	1	0	1	2	2	2	2	2	1	0	0	0	0	0	0	0
12	4096	5	2	3	11	24	13	14	10	25	4	6	5	4	3	2	1	1	0	1	1	2
12	4102	5	0	1	33	19	37	54	51	37	31	25	18	9	6	3	2	1	1	0	0	0
12	4103	5	0	2	48	6	2	3	3	5	2	2	2	1	1	0	0	0	0	0	0	0
12	4106	5	0	0	15	7	2	0	2	3	2	4	2	1	1	0	0	0	0	0	0	0
17	5908	5	10	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	37	182	112	39	33	37	31	20	15	8	4	2	1	1	0	0	0	0	0	0
18	2008	5	74	145	107	20	7	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	59	135	97	30	14	11	8	5	2	1	1	0	0	0	0	0	0	0	0	0
18	4021	5	15	4	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	1043	77	68	17	19	20	13	7	4	2	1	1	0	0	0	0	0	0	0	0
18	5518	5	184	18	38	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	5	11	115	3	7	8	4	3	2	1	1	0	0	0	0	0	0	0	0	0
26	1004	5	4	4	69	11	1	4	1	1	8	1	1	0	0	0	0	0	0	0	0	0
26	1010	5	31	22	248	7	140	15	11	0	0	0	0	0	0	0	4	0	0	0	0	4
26	9030	5	4	21	26	2	0	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
27	4037	5	8	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	10	7	29	0	3	5	2	2	1	1	0	0	0	0	0	0	0	0	0	0
28	4024	5	29	20	37	1	6	6	4	3	1	1	1	0	0	0	0	0	0	0	0	0
28	5805	5	2	3	8	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	6	87	80	40	28	18	12	8	5	3	2	1	0	0	0	0	0	0	0	0
29	5503	5	6	27	29	3	3	5	7	3	1	1	1	1	0	1	0	0	0	0	0	0
34	1011	5	59	1	1	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0
34	4042	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	3	4	5	7	5	7	9	2	2	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	27	30	1	1	4	1	3	2	3	1	1	0	0	0	0	0	0	0	0	0
48	1123	5	4	130	25	1	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0
51	1417	5	540	220	166	57	26	14	9	5	4	1	1	1	1	0	0	0	0	0	0	0
51	1423	5	860	140	561	433	474	277	302	180	128	43	67	30	8	7	6	5	3	2	1	10
51	1464	5	33	668	408	178	126	108	73	44	33	18	6	3	3	1	1	1	0	0	0	0
51	5010	5	53	725	393	89	56	41	28	17	10	6	3	2	1	1	0	0	0	0	0	0
53	1002	5	431	158	10	31	17	14	8	6	4	4	2	2	2	1	1	1	0	0	0	0
53	1007	5	226	263	80	27	17	10	8	4	2	1	1	1	0	0	0	0	0	0	0	0
53	1801	5	316	219	4	30	30	24	8	4	4	3	4	4	3	2	1	0	0	0	0	0
53	3812	5	130	62	5	15	16	10	4	2	1	1	0	0	0	0	0	0	0	0	0	0
85	1801	5	1	56	99	53	27	22	11	13	6	7	4	2	2	3	1	0	1	0	1	1
90	6410	5	39	210	106	25	11	9	6	3	2	1	0	0	0	0	0	0	0	0	0	0

Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	258	216	349	185	409	968	619	181	21	39	29	3	68	29	29	36	36	16	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	54	2505	315	49	3	0	0	0	155	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	195	896	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	200	858	113	22	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	174	442	53	61	5	223	17	9	6	7	4	6	0	1	2	2	1	1	0	0
18	5022	5	326	1024	109	102	124	3	3	0	56	0	0	0	0	0	0	0	14	0	0	0
18	5518	5	111	70	41	7	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
26	1001	5	0	4602	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	4910	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	2263	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	1569	9	0	0	0	0	417	0	0	0	417	0	0	0	0	0	0	0	0
27	4037	5	209	1223	375	0	0	1510	0	1	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	4690	2139	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	172	172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	296	255	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	2	129	189	108	20	32	9	23	5	14	11	11	8	11	6	6	7	4	1	0
29	5503	5	3	12	65	45	280	1175	38	317	10	9	7	9	16	3	32	14	10	3	7	1
34	1011	5	395	811	153	26	198	6	12	6	0	0	1	0	0	0	1	0	0	0	0	0
34	4042	5	42	385	2509	201	0	0	928	22	433	22	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	532	84	8	3	16	35	38	18	4	6	23	2	2	9	4	1	1	1	0	0
48	1123	5	7	15	187	64	112	31	13	24	10	54	59	50	41	46	55	40	5	0	1	0
51	1417	5	183	1312	705	236	7	2	296	4	4	4	4	0	0	0	4	0	0	0	4	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	1456	1197	1530	255	161	446	374	18	0	0	0	113	0	28	0	0	113	0	0	0
51	5010	5	454	78	42	1	22	15	54	8	4	9	15	49	64	62	61	67	39	14	18	9
53	1002	5	0	0	0	677	142	505	499	380	370	494	0	0	0	0	0	0	0	0	0	0
53	1007	5	271	5175	61	0	130	125	125	543	153	1151	12	130	1	1	0	0	0	0	0	0
53	1801	5	10	377	878	142	49	57	93	0	0	0	96	0	6	6	91	49	0	4	0	0
53	3812	5	37	97	112	81	143	122	21	55	30	17	14	5	3	12	9	3	1	3	6	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	106	175	176	58	199	87	5	1976	2	3	1	1	23	1	1	1	1	1	1	1

Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	3	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	1452	81	13	1	33	0	33	33	0	33	836	590	770	221	1382	0
48	1123	5	0	0	0	0	0	469	469	0	6719	0	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	5	0	0	0	0	0	0	0	0	469	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	5	106	104	66	74	84	90	94	100	107	114	112	105	97	97	98	96	91	94	89	94
12	3995	5	38	22	59	26	11	5	8	12	17	19	29	39	33	25	23	28	37	50	68	67
12	4096	5	218	165	64	52	29	41	23	38	23	30	52	62	57	50	57	95	165	104	135	166
12	4102	5	109	88	101	59	61	63	62	59	58	59	62	60	60	59	69	74	87	101	141	134
12	4103	5	88	123	88	27	13	14	15	20	16	19	25	19	25	28	28	34	43	46	78	87
12	4106	5	71	48	68	32	13	5	11	16	14	25	27	27	21	23	22	25	57	55	80	93
17	5908	5	60	7	4	2	5	10	9	9	16	13	10	8	10	16	6	15	27	18	18	23
18	1037	5	93	72	72	73	71	71	72	73	72	73	77	76	76	73	76	73	73	78	95	88
18	2008	5	46	46	47	46	49	51	50	49	51	49	54	56	56	54	55	56	54	53	62	72
18	3031	5	61	49	49	47	51	57	62	62	59	56	60	58	54	55	55	52	58	58	56	49
18	4021	5	71	12	8	16	11	7	6	5	9	15	15	17	24	17	25	22	29	20	35	29
18	5022	5	156	60	53	42	54	60	61	59	60	58	61	59	58	65	64	63	62	64	68	64
18	5518	5	66	18	32	20	6	15	18	18	17	20	21	21	23	29	21	23	24	24	32	24
26	1001	5	50	22	32	12	30	45	48	57	61	64	68	65	71	84	71	85	80	103	74	88
26	1004	5	33	23	40	27	11	23	12	18	55	22	35	30	29	36	35	55	61	71	92	103
26	1010	5	43	36	52	17	107	79	97	35	66	76	91	96	101	101	166	118	114	131	118	199
26	9030	5	86	71	26	11	5	14	16	19	22	22	22	25	25	26	27	25	29	34	35	39
27	4037	5	8	9	11	7	13	13	12	17	21	15	17	19	16	10	15	17	28	26	29	29
28	3099	5	90	40	20	3	18	25	22	24	25	22	21	20	22	21	22	23	24	24	33	43
28	4024	5	53	34	15	9	43	62	68	69	67	67	70	70	75	80	73	81	72	61	51	30
28	5805	5	46	36	12	9	13	14	13	11	9	10	10	11	14	18	24	26	32	36	43	58
29	4036	5	71	66	57	47	47	48	48	49	50	52	56	52	52	55	55	55	53	56	59	65
29	5503	5	79	45	38	13	16	22	33	27	23	34	53	43	27	47	35	39	39	43	24	58
34	1011	5	42	6	9	14	13	16	16	17	23	26	24	27	24	18	29	27	29	30	33	22
34	4042	5	11	6	5	5	2	4	3	4	7	9	10	12	15	15	13	12	13	12	10	14
39	5010	5	51	45	32	31	18	18	22	11	17	11	12	16	34	44	33	34	36	55	48	80
42	1627	5	188	141	8	9	18	10	17	18	26	24	28	19	30	26	25	28	15	20	12	17
48	1123	5	66	61	22	11	4	5	8	24	27	41	29	34	19	39	48	67	84	105	125	140
51	1417	5	144	63	64	77	70	63	83	90	66	59	69	90	92	62	91	91	91	99	91	90
51	1423	5	242	221	200	208	202	208	200	201	200	203	202	200	245	245	245	245	245	245	245	218
51	1464	5	125	123	123	123	125	123	123	123	125	126	123	123	125	123	125	127	127	126	130	123
51	5010	5	101	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	101	102
53	1002	5	98	89	27	56	53	55	51	54	56	65	68	77	77	81	77	79	72	93	72	84
53	1007	5	60	71	62	62	65	61	64	61	64	62	72	84	72	66	63	62	61	71	61	61
53	1801	5	109	94	15	50	63	69	59	58	67	68	76	82	84	90	77	79	76	82	74	60
53	3812	5	80	54	16	34	38	35	30	29	26	27	28	34	37	40	39	42	40	37	42	41
85	1801	5	60	82	55	57	53	60	53	71	70	61	56	62	53	91	60	87	81	91	77	113
90	6410	5	55	52	52	54	52	56	58	55	54	54	52	57	61	61	64	70	80	81	91	106

Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	5	93	92	91	95	104	107	97	109	109	110	102	115	102	107	119	130	131	117	165
12	3995	5	71	101	100	116	117	127	130	100	155	176	245	245	157	157	0	245	245	245	0
12	4096	5	245	0	245	245	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	142	165	143	154	208	208	208	166	0	137	0	208	135	0	0	0	0	0	0
12	4103	5	113	81	120	115	126	163	115	144	144	189	124	0	245	245	164	0	245	0	0
12	4106	5	94	102	105	141	143	134	120	198	245	155	188	245	167	245	245	245	167	0	0
17	5908	5	33	42	82	76	81	125	102	192	109	120	159	245	155	167	0	245	0	0	0
18	1037	5	78	96	97	83	111	124	124	103	134	144	144	156	147	145	207	235	235	216	0
18	2008	5	59	76	54	87	92	93	70	114	70	77	90	101	126	249	249	0	249	0	0
18	3031	5	49	54	64	72	96	89	107	66	97	184	174	237	229	139	249	161	249	231	0
18	4021	5	25	55	32	42	75	73	61	60	72	232	247	132	127	147	171	209	265	171	0
18	5022	5	62	56	66	59	68	56	79	66	67	110	105	113	144	151	164	180	194	245	245
18	5518	5	27	36	30	39	40	47	65	45	59	82	82	159	84	126	155	137	245	173	0
26	1001	5	87	117	118	110	131	135	122	123	101	111	88	150	146	168	94	207	198	155	265
26	1004	5	122	127	148	160	167	227	199	220	199	196	242	231	208	253	244	248	256	243	255
26	1010	5	128	133	121	128	125	129	123	114	123	125	102	130	99	140	107	114	97	81	140
26	9030	5	55	56	62	79	72	98	113	102	119	141	146	144	145	159	152	168	170	171	217
27	4037	5	28	43	66	65	265	160	153	265	265	265	0	0	0	0	0	0	0	0	0
28	3099	5	50	83	92	118	138	128	139	139	141	150	146	160	152	162	170	179	183	185	224
28	4024	5	30	36	34	23	11	16	29	25	36	104	89	94	167	51	137	105	0	224	0
28	5805	5	69	82	99	119	125	148	162	169	181	188	197	196	201	206	213	207	207	224	224
29	4036	5	63	67	70	66	71	80	79	69	98	98	111	109	143	100	107	82	112	114	249
29	5503	5	19	85	65	118	137	56	75	96	156	183	222	200	197	231	236	253	0	257	0
34	1011	5	35	27	42	23	29	39	35	53	34	77	33	84	61	85	58	70	72	105	0
34	4042	5	9	11	14	14	19	26	35	37	47	50	50	52	53	88	80	85	107	149	0
39	5010	5	59	96	115	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	17	40	41	40	48	57	47	34	50	88	115	96	180	224	198	185	224	224	0
48	1123	5	127	78	173	173	104	173	0	173	0	0	0	0	0	0	0	0	0	0	0
51	1417	5	90	100	95	103	99	101	147	159	118	142	110	121	147	153	208	208	208	0	0
51	1423	5	245	245	230	232	245	245	245	245	245	245	245	245	245	245	245	245	245	245	0
51	1464	5	150	139	145	132	150	151	151	153	150	192	156	168	158	151	152	212	168	153	0
51	5010	5	102	102	103	106	109	104	103	102	105	119	105	121	113	138	135	153	142	0	0
53	1002	5	71	85	79	61	65	67	65	63	79	122	140	151	154	163	0	0	224	224	0
53	1007	5	69	62	73	67	102	75	76	107	208	110	142	94	208	0	208	208	0	208	0
53	1801	5	98	90	93	38	88	137	96	154	245	128	131	0	0	178	0	0	245	0	0
53	3812	5	54	48	54	43	40	53	48	61	72	55	123	55	69	115	75	120	177	96	167
85	1801	5	69	107	89	110	105	174	117	157	155	117	115	150	160	104	229	146	229	229	229
90	6410	5	109	115	132	132	155	161	165	176	192	179	167	176	188	192	193	172	177	162	229

Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf)																			
			6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	203	201	205	201	200	200	216	209	210	216	209	245	218	209	209	245	245	203	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	149	78	95	160	155	130	154	190	220	166	155	235	235	200	0	0	235	235	0	0
18	2008	5	53	46	65	154	147	136	233	225	249	165	175	249	235	249	249	249	249	249	249	249
18	3031	5	85	49	70	173	188	157	150	131	223	172	249	249	231	249	187	249	216	246	249	249
18	4021	5	95	52	99	93	68	157	105	98	128	145	145	132	104	144	218	265	265	265	215	265
18	5022	5	67	83	117	116	155	197	156	142	210	229	229	197	229	167	204	211	204	204	229	0
18	5518	5	72	14	38	86	74	87	123	133	119	116	133	125	168	162	164	158	118	166	190	186
26	1001	5	0	71	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	71	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	51	152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	49	112	0	0	0	0	245	0	0	0	245	0	0	0	0	0	0	0	0
27	4037	5	82	71	180	265	186	186	265	226	186	0	265	265	0	0	0	0	0	0	0	0
28	3099	5	0	111	125	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	19	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	31	37	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	161	98	94	78	65	84	55	78	69	90	100	81	84	93	106	96	116	124	134	107
29	5503	5	161	113	98	120	121	142	108	146	79	110	91	114	151	155	165	154	172	265	265	206
34	1011	5	88	64	130	100	141	113	104	146	0	0	208	0	0	0	208	0	0	0	0	0
34	4042	5	208	141	119	208	0	0	156	208	208	208	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	201	116	31	27	46	55	57	68	65	75	102	63	60	97	101	66	56	81	60	115
48	1123	5	173	108	107	106	101	104	100	115	103	100	107	110	103	101	112	134	151	173	114	0
51	1417	5	152	106	100	116	200	200	190	161	181	191	188	200	200	0	197	200	0	0	200	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	200	211	201	245	209	245	213	245	0	0	0	245	0	245	0	0	245	0	0	0
51	5010	5	194	109	156	129	114	134	124	107	103	136	114	130	122	115	101	104	118	159	128	124
53	1002	5	0	0	0	107	200	153	134	149	135	200	0	0	0	0	0	0	0	0	0	0
53	1007	5	224	224	224	0	211	224	224	202	189	215	224	211	224	224	0	0	0	0	0	0
53	1801	5	216	106	98	85	147	147	140	0	216	0	171	0	216	216	216	216	0	216	0	0
53	3812	5	112	94	87	97	96	113	85	94	101	109	104	93	127	116	128	165	146	146	216	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	137	83	115	88	132	123	107	188	130	140	164	192	157	229	189	208	176	205	171	229

Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	249	177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	249	249	249	249	249	249	249	0	249	249	249	249	0	249	0	0	0	249	0
18	4021	5	265	0	0	0	0	0	0	0	0	0	0	265	0	0	0	0	0	0	0
18	5022	5	229	0	0	229	229	229	0	0	0	0	0	0	229	0	0	0	0	0	0
18	5518	5	245	169	0	245	0	245	0	0	0	0	245	0	0	0	0	245	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	169	134	124	130	165	188	249	249	195	230	0	0	0	249	249	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	265	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	85	153	95	142	224	224	224	0	0	0	0	224	0	0	0	0	0	0	0
48	1123	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	138	175	224	156	224	180	224	154	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	216	0	216	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	216	216	0	0	216	0	216	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	0	0

Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	208	208	208	208	201	0	208	208	0	208	208	208	208	208	208	0
48	1123	5	0	0	0	0	0	173	173	0	131	0	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	5	0	0	0	0	0	0	0	0	173	0	0	0	0	0	0
51	1417	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Single Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	9	1.3	1.7	2.9	4.0	9.4	16.6	18.3	17.0	11.0	6.7	3.8	2.5	1.7	1.1	0.5	0.4	0.3	0.2	0.2	0.1
12	3995	9	0.3	0.5	6.8	5.3	6.3	9.6	14.6	17.5	15.4	11.1	5.8	2.8	1.5	0.8	0.5	0.3	0.3	0.1	0.2	0.1
12	4096	9	0.6	1.2	2.7	3.4	5.2	10.4	17.9	22.5	16.2	8.6	4.6	2.6	1.4	0.9	0.9	0.2	0.3	0.1	0.1	0.0
12	4102	9	0.6	0.8	2.8	5.8	8.1	10.6	13.3	16.2	14.1	11.6	7.9	4.6	1.9	0.6	0.3	0.3	0.1	0.1	0.1	0.1
12	4103	9	0.4	0.1	1.7	4.2	6.6	9.9	15.0	19.8	18.2	10.8	5.8	2.6	1.7	1.0	0.9	0.3	0.3	0.2	0.1	0.0
12	4106	9	0.4	0.4	5.2	4.6	5.7	9.8	14.9	19.1	15.6	12.2	5.8	2.9	1.3	0.7	0.4	0.2	0.2	0.2	0.1	0.1
17	5908	9	0.8	1.3	1.7	1.5	2.1	5.1	10.9	17.1	18.0	15.8	10.4	6.1	3.4	2.1	1.4	1.0	0.5	0.3	0.1	0.1
18	1037	9	0.6	1.9	3.1	2.1	1.0	1.8	8.0	17.8	21.2	16.3	9.1	4.3	2.3	1.7	1.8	1.8	1.7	1.3	0.9	0.6
18	2008	9	0.3	0.5	1.2	2.8	2.6	5.7	15.9	24.8	22.7	11.6	4.1	2.0	1.0	0.8	0.9	0.9	0.8	0.6	0.4	0.2
18	3031	9	0.4	1.3	2.8	2.7	4.5	15.3	21.1	21.2	15.7	8.3	3.1	1.1	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.1
18	4021	9	1.2	2.3	4.1	5.3	7.3	12.9	19.5	19.2	12.7	6.2	3.0	1.3	0.9	0.8	0.8	0.8	0.7	0.4	0.3	0.2
18	5022	9	0.7	1.1	1.4	1.6	3.1	7.7	15.5	20.5	18.3	12.4	7.1	3.8	2.1	1.4	1.0	0.8	0.5	0.3	0.2	0.1
18	5518	9	1.2	1.4	2.8	3.4	3.9	5.4	10.5	17.3	21.3	15.0	6.7	3.5	2.0	1.2	1.0	0.9	0.8	0.5	0.4	0.3
26	1001	9	1.3	2.4	4.1	6.2	8.7	12.8	15.9	15.3	11.5	7.4	3.6	2.6	2.1	1.6	1.3	0.8	0.7	0.4	0.3	0.2
26	1004	9	2.5	2.7	5.2	6.3	7.5	9.2	10.4	10.2	8.6	6.1	4.8	4.0	3.6	3.7	3.0	2.8	2.2	1.6	1.3	0.9
26	1010	9	1.5	1.1	4.6	5.7	7.2	11.0	16.2	13.1	8.6	6.3	5.1	3.4	2.7	2.1	2.1	1.5	1.4	1.5	0.9	0.7
26	9030	9	0.7	1.6	2.6	2.6	5.1	12.8	20.3	20.3	13.4	6.4	3.1	2.2	2.0	1.9	1.6	1.2	0.8	0.5	0.3	0.2
27	4037	9	1.7	1.5	1.2	1.1	2.1	7.1	15.6	25.9	23.6	10.8	3.0	1.0	0.8	1.0	1.2	1.1	0.7	0.4	0.2	0.1
28	3099	9	0.2	0.1	0.8	1.6	2.6	6.1	13.8	21.9	20.5	12.6	6.6	3.4	1.9	1.4	1.3	1.3	1.2	1.0	0.7	0.5
28	4024	9	0.7	0.9	1.2	3.2	7.1	12.7	16.9	17.5	15.2	10.9	6.7	3.6	1.7	0.7	0.4	0.2	0.1	0.1	0.0	0.1
28	5805	9	0.7	0.9	1.2	2.1	7.7	15.9	21.3	19.2	13.3	7.7	4.0	2.0	1.2	0.8	0.7	0.5	0.3	0.2	0.1	0.1
29	4036	9	1.0	1.0	1.4	2.7	6.0	9.2	11.4	13.8	15.1	13.5	9.2	5.4	3.1	1.9	1.3	1.0	0.8	0.6	0.5	0.3
29	5503	9	1.4	1.1	1.1	2.0	5.8	8.2	12.4	18.6	20.8	15.0	6.7	2.4	1.1	0.8	0.7	0.6	0.5	0.2	0.1	0.1
34	1011	9	0.3	0.7	1.5	2.2	4.0	8.2	14.4	18.9	18.0	13.2	7.4	3.5	1.8	1.1	0.9	0.8	0.7	0.6	0.5	0.4
34	4042	9	0.1	0.5	1.3	1.5	2.1	5.6	11.8	17.4	19.3	16.6	10.0	4.5	2.1	1.2	1.1	1.0	1.0	0.9	0.7	0.5
39	5010	9	0.3	1.1	3.3	3.0	1.5	2.2	10.1	23.5	30.2	10.4	1.8	0.8	1.1	1.6	2.2	2.5	2.1	1.2	0.6	0.2
42	1627	9	0.5	0.9	1.6	1.7	1.5	3.4	9.2	20.0	26.7	18.0	4.1	1.1	0.7	1.1	1.5	1.9	1.9	1.4	0.9	0.5
48	1123	9	1.0	0.5	2.5	2.7	1.5	3.6	11.6	24.1	28.6	15.0	4.4	0.8	0.6	0.8	0.8	0.6	0.4	0.2	0.1	0.0
51	1417	9	2.5	4.9	7.9	5.8	6.9	9.6	11.9	11.6	11.1	9.4	6.7	4.6	2.9	1.3	1.2	0.4	0.4	0.2	0.3	0.2
51	1423	9	0.1	0.2	0.5	9.3	11.7	3.2	7.2	10.2	9.7	18.2	4.5	13.3	1.1	9.3	0.3	0.2	0.2	0.2	0.1	0.1
51	1464	9	0.3	0.5	0.6	0.7	2.3	6.5	13.4	19.0	18.8	15.2	10.8	5.4	2.9	1.7	1.1	0.5	0.2	0.2	0.1	0.0
51	5010	9	0.4	0.4	0.7	1.0	1.7	4.4	10.3	17.2	20.3	16.9	10.8	5.8	2.9	1.7	1.2	1.0	0.9	0.7	0.6	0.4
53	1002	9	2.1	2.2	3.4	5.0	6.3	9.4	12.0	14.1	13.5	10.5	6.8	4.0	2.5	1.6	1.2	1.0	0.9	0.7	0.6	0.5
53	1007	9	0.4	0.8	1.6	3.0	4.7	7.3	10.4	13.2	14.0	12.3	9.0	6.2	4.1	2.7	2.0	1.7	1.4	1.2	1.0	0.8
53	1801	9	1.6	1.4	2.0	2.9	4.5	10.2	15.9	16.8	14.7	10.6	6.4	3.9	2.5	1.7	1.2	0.9	0.8	0.6	0.5	0.3
53	3812	9	1.2	1.7	2.7	2.8	4.1	9.3	16.4	20.0	16.7	11.1	6.3	3.1	1.5	0.9	0.6	0.5	0.4	0.3	0.2	0.2
85	1801	9	32.7	6.0	12.6	8.9	4.7	5.1	5.0	4.9	4.4	3.9	3.6	2.1	1.5	1.5	1.4	0.6	0.4	0.3	0.1	0.0
90	6410	9	2.2	2.5	3.2	3.6	4.3	6.4	10.0	14.4	17.1	14.7	8.7	4.7	2.4	1.5	0.9	0.7	0.5	0.3	0.3	0.2

Single Axles (Mean)

			Load Group (lbf)																		
STATE	SHRP	VC	23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	9	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	9	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	9	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	9	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	9	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	9	0.8	0.6	0.4	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	9	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
26	9030	9	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	9	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	5503	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	9	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	9	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	1123	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	9	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	9	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	9	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	9	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	9	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
90	6410	9	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	9	3.6	7.5	9.4	8.9	8.1	5.9	4.9	4.3	4.1	3.5	4.4	3.7	4.1	4.2	3.6	3.3	3.2	2.5	1.8	1.7
12	3995	9	0.9	1.4	3.2	4.7	5.9	6.9	6.6	7.2	7.7	8.1	8.1	7.9	7.7	6.9	5.6	4.3	3.1	1.8	1.0	0.5
12	4096	9	0.6	1.1	2.4	4.0	3.6	6.1	6.7	8.1	8.5	10.3	9.3	10.8	9.3	7.9	5.5	2.5	1.4	0.9	0.5	0.3
12	4102	9	0.1	0.5	1.6	2.8	4.5	6.2	7.3	8.4	8.9	9.2	9.7	9.4	9.1	7.5	5.6	3.8	2.5	1.3	0.9	0.4
12	4103	9	0.3	1.1	2.7	3.7	5.5	7.0	7.9	9.0	9.7	9.3	8.4	7.6	7.1	5.4	5.0	3.5	2.8	1.9	1.0	0.5
12	4106	9	0.8	1.4	3.2	4.8	5.9	7.3	7.3	7.7	8.5	8.6	8.3	7.6	6.8	6.1	5.0	4.1	3.0	1.7	1.0	0.5
17	5908	9	1.7	4.8	8.1	9.1	9.0	6.9	5.1	4.3	4.2	4.5	5.3	6.3	7.8	8.1	6.3	3.8	2.1	1.0	0.6	0.4
18	1037	9	1.8	4.5	7.0	7.5	9.1	6.4	3.8	2.8	2.7	3.0	3.5	4.0	4.3	4.6	5.9	6.6	7.0	6.1	4.3	2.4
18	2008	9	1.0	3.1	5.3	6.8	7.3	6.4	6.0	5.7	5.2	5.1	5.6	6.4	6.7	7.4	7.1	5.7	4.0	2.4	1.4	0.8
18	3031	9	2.1	10.4	11.6	11.4	11.8	7.2	4.0	3.1	2.7	2.3	2.1	2.4	3.3	4.7	6.0	5.4	4.0	2.5	1.4	0.7
18	4021	9	1.5	3.2	6.0	8.9	8.7	7.5	6.7	6.4	6.0	5.4	5.1	5.2	5.8	6.3	5.8	4.5	3.1	1.9	1.0	0.5
18	5022	9	0.8	2.5	5.4	7.2	7.6	7.2	6.7	6.4	6.2	6.0	6.2	6.8	7.5	7.2	5.9	4.2	2.6	1.5	0.9	0.5
18	5518	9	2.6	3.9	6.4	7.4	8.1	7.3	6.6	6.2	5.7	5.3	5.0	5.1	5.4	6.0	6.2	5.1	3.3	1.8	1.0	0.6
26	1001	9	1.4	4.0	8.5	11.7	13.4	13.0	10.5	7.8	6.5	5.1	4.6	3.4	3.0	2.3	1.5	0.9	0.6	0.4	0.3	0.2
26	1004	9	2.9	4.1	6.2	7.7	8.1	8.2	7.6	7.0	6.3	5.8	5.5	5.2	4.9	4.6	3.8	2.8	2.1	1.8	1.3	1.1
26	1010	9	3.4	5.4	7.5	8.7	9.3	9.1	8.9	7.1	6.1	5.2	4.3	4.1	3.9	3.3	3.2	2.1	1.8	1.3	1.0	0.8
26	9030	9	0.7	2.6	7.0	9.9	9.4	8.6	7.7	6.9	6.3	6.1	6.3	6.7	6.6	5.7	4.1	2.5	1.3	0.7	0.4	0.2
27	4037	9	0.9	3.0	9.4	12.8	9.3	6.5	5.6	5.2	5.0	5.0	5.2	6.0	6.8	7.2	5.8	3.5	1.7	0.8	0.3	0.1
28	3099	9	0.2	0.8	2.2	3.8	4.8	4.9	5.1	5.3	5.6	5.9	6.4	7.7	9.1	9.7	8.6	6.7	4.6	3.1	2.1	1.4
28	4024	9	1.5	4.9	8.6	10.4	9.4	7.0	5.1	3.7	2.9	2.5	2.8	3.2	3.5	4.0	4.0	4.0	3.9	3.7	3.5	2.9
28	5805	9	0.8	4.5	7.6	8.5	7.9	6.5	5.5	5.0	5.2	6.0	7.2	7.8	7.2	6.3	4.8	3.3	2.2	1.4	0.9	0.5
29	4036	9	4.7	5.8	6.3	6.2	5.8	5.2	5.1	5.3	5.6	5.7	5.8	5.8	5.9	5.8	5.3	4.6	3.6	2.5	1.6	1.0
29	5503	9	2.6	6.4	7.8	7.5	5.8	4.4	3.7	3.5	3.4	3.5	4.4	6.0	8.3	9.5	8.6	6.2	3.7	2.1	1.3	0.6
34	1011	9	1.1	4.6	7.6	8.4	8.1	6.8	5.6	5.0	4.4	4.2	4.6	5.4	6.4	6.8	6.3	4.9	3.6	2.3	1.5	0.9
34	4042	9	0.3	1.0	3.8	7.4	7.9	7.0	5.8	4.8	4.2	3.9	4.0	4.5	5.4	6.9	8.1	7.9	6.1	4.1	2.7	1.7
39	5010	9	0.3	1.3	4.7	8.0	11.2	9.4	7.0	5.6	5.2	4.9	5.0	5.4	6.2	7.9	8.8	5.5	2.2	0.9	0.4	0.2
42	1627	9	0.6	2.2	4.6	4.9	6.0	5.5	5.2	5.4	5.3	5.1	4.9	5.3	6.7	9.5	11.7	9.1	4.5	1.9	0.8	0.4
48	1123	9	0.7	1.2	3.0	3.7	4.6	4.8	4.5	4.6	4.8	5.1	6.0	8.4	13.3	15.1	10.6	6.6	2.3	0.5	0.1	0.0
51	1417	9	6.9	7.7	7.7	7.7	7.6	6.0	4.9	4.8	4.7	4.2	4.6	5.4	5.3	5.1	4.3	4.1	3.1	2.3	1.5	0.9
51	1423	9	0.2	2.2	9.3	10.1	10.4	14.2	2.1	10.2	1.3	1.3	5.7	1.6	7.3	6.7	2.8	3.1	2.7	2.4	1.9	1.5
51	1464	9	1.3	5.0	11.3	12.9	10.9	8.1	6.0	4.4	3.3	3.1	2.8	2.8	3.4	3.7	4.5	4.3	3.6	2.6	1.9	1.3
51	5010	9	0.9	2.2	4.0	4.7	4.9	4.4	3.9	3.7	3.7	3.8	4.0	4.5	5.6	7.2	8.7	8.9	7.9	6.3	4.3	2.7
53	1002	9	4.7	6.4	8.2	8.2	6.6	5.4	4.6	4.5	4.4	4.5	4.6	4.8	5.1	5.6	5.3	4.4	3.5	2.5	1.9	1.3
53	1007	9	1.5	3.6	4.7	4.7	4.7	4.6	4.3	4.0	4.0	3.9	4.4	5.2	6.1	7.2	7.6	7.1	6.0	4.8	3.7	2.7
53	1801	9	2.9	4.5	10.7	11.1	12.3	9.9	6.9	4.9	3.7	2.9	3.2	4.5	5.2	5.0	4.2	3.0	2.0	1.2	0.8	0.5
53	3812	9	2.0	5.4	9.5	9.3	8.3	7.2	6.4	6.0	5.9	6.1	6.5	6.9	6.8	5.4	3.7	2.2	1.1	0.6	0.3	0.2
85	1801	9	42.3	10.6	9.2	7.2	5.8	4.2	3.3	2.3	2.3	1.8	1.4	1.2	1.0	1.0	0.6	0.8	0.7	0.9	0.5	0.3
90	6410	9	3.1	4.1	5.7	6.6	6.7	6.7	6.3	5.9	5.7	5.7	5.4	5.2	5.1	4.9	4.9	4.2	3.3	2.6	1.8	1.4

Tandem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	9	1.1	0.9	0.8	0.7	0.6	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0
12	3995	9	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	9	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	9	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	9	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	1037	9	1.3	0.7	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	9	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	9	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	9	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	9	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	9	0.9	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	9	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	9	0.9	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	9	2.3	1.9	1.4	1.0	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	9	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	9	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	5503	9	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	9	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	1.0	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	9	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	1123	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	9	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	9	1.0	0.7	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	9	0.9	0.6	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	1.5	0.9	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	9	1.0	0.8	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	9	1.9	1.3	0.8	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	9	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	1801	9	0.3	0.4	0.3	0.3	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	9	1.1	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0

Tridem Axles (Mean)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	9	91.1	8.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	22.5	21.5	20.2	11.1	8.0	4.2	0.3	1.0	1.2	0.0	3.5	2.5	0.0	3.7	0.0	0.0
12	4096	9	48.9	27.4	18.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	9	50.4	21.9	12.5	5.8	4.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	9	14.7	20.6	31.0	22.4	6.3	1.4	0.7	1.4	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	9	24.1	35.0	12.0	10.4	8.7	1.7	4.7	2.7	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
17	5908	9	70.4	19.6	5.7	1.4	1.3	0.9	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
18	1037	9	93.9	4.1	1.1	0.0	0.1	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	9	81.5	11.4	3.2	2.1	0.4	0.4	0.8	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0
18	3031	9	83.6	5.6	7.7	1.3	0.7	0.5	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
18	4021	9	84.7	8.7	4.0	1.3	0.7	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
18	5022	9	77.7	11.3	4.1	2.8	1.1	0.5	0.3	1.2	0.2	0.1	0.3	0.2	0.0	0.1	0.0	0.1
18	5518	9	71.6	10.0	6.1	3.1	2.6	1.9	1.8	0.6	0.3	0.4	0.1	0.1	0.0	0.2	0.2	0.4
26	1001	9	75.6	4.8	11.0	0.9	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
26	1004	9	60.9	13.4	9.6	5.2	1.4	3.5	0.9	2.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
26	1010	9	65.0	6.3	20.5	2.0	2.4	2.0	0.7	0.5	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.0
26	9030	9	65.1	15.7	8.1	4.0	2.5	1.6	1.0	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.0
27	4037	9	73.8	12.9	5.9	1.9	1.2	1.1	1.0	0.8	0.0	0.4	0.6	0.3	0.0	0.0	0.0	0.0
28	3099	9	33.3	1.0	1.0	2.9	2.9	2.0	3.9	4.9	10.8	9.8	8.8	2.0	2.9	3.9	2.0	1.0
28	4024	9	0.0	33.3	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	9	0.0	0.0	10.0	16.7	36.7	10.0	0.0	10.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0
29	4036	9	30.1	6.6	4.3	3.4	3.8	3.2	2.2	2.9	2.5	3.1	2.2	5.0	6.4	4.7	4.2	3.4
29	5503	9	49.3	18.4	12.5	7.7	5.4	0.9	0.1	0.4	0.4	0.2	0.3	0.2	0.0	0.0	0.1	0.1
34	1011	9	85.8	11.4	1.5	0.4	0.1	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0
34	4042	9	78.4	13.3	5.0	1.5	0.6	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.4	0.0	0.0
39	5010	9	57.1	16.7	9.5	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	9	34.2	12.0	6.6	6.3	3.5	2.9	2.5	3.3	2.7	2.7	2.2	1.1	1.3	1.6	1.6	2.0
48	1123	9	57.2	20.1	7.8	3.1	3.1	1.1	0.6	1.5	1.0	0.3	0.4	0.9	0.6	1.3	0.7	0.1
51	1417	9	83.1	8.5	3.4	1.9	0.6	0.5	0.2	0.6	0.1	0.2	0.2	0.1	0.1	0.0	0.3	0.2
51	1423	9	41.4	31.0	17.4	5.3	1.3	0.5	0.5	0.3	0.3	0.0	0.3	0.3	1.1	0.0	0.0	0.0
51	1464	9	85.6	6.5	2.4	1.0	0.4	0.1	0.3	0.3	0.6	0.6	0.5	0.7	0.4	0.4	0.1	0.1
51	5010	9	60.1	16.9	11.5	6.0	2.0	1.3	0.6	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1
53	1002	9	81.9	9.8	4.5	1.5	0.0	0.0	0.4	0.2	0.7	0.0	0.7	0.3	0.0	0.0	0.0	0.0
53	1007	9	89.7	5.3	1.8	0.7	0.1	0.6	0.7	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	9	88.7	4.7	3.0	0.8	0.9	1.1	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
53	3812	9	73.9	10.1	4.9	0.7	1.2	0.6	1.3	1.5	1.1	1.1	0.8	0.9	0.2	0.1	0.2	0.3
85	1801	9	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	9	64.0	11.5	11.2	6.0	1.5	1.8	0.5	0.4	0.8	0.2	0.3	0.1	0.2	0.3	0.2	0.3

Tridem Axles (Mean)

			Load Group (lbf)														
STATE	SHRP	VC	60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	3995	9	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4096	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4102	9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4103	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4106	9	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5908	9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
18	1037	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2008	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3031	9	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	4021	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5022	9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5518	9	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1001	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1004	9	1.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1010	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9030	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4037	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3099	9	2.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	4024	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	5805	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	4036	9	2.8	2.6	1.4	2.1	1.4	0.6	0.3	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.0
29	5503	9	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	1011	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	4042	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	5010	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1627	9	0.7	0.8	0.7	1.4	1.7	1.7	1.7	1.5	0.7	1.1	0.4	0.5	0.3	0.1	0.1
48	1123	9	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1417	9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1423	9	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	1464	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	5010	9	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1002	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1007	9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	1801	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	3812	9	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.2	0.2	0.0	0.2	0.0	0.0
85	1801	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	6410	9	0.1	0.0	0.2	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	9	2	3	6	11	51	112	121	118	65	22	7	3	1	1	0	0	0	0	0	0
12	3995	9	0	0	24	2	12	8	3	7	8	4	3	2	1	0	0	0	0	0	0	0
12	4096	9	0	2	4	2	6	12	71	26	3	21	16	6	2	0	0	0	0	0	0	0
12	4102	9	0	1	7	13	31	56	87	101	83	60	36	14	3	0	0	0	0	0	0	0
12	4103	9	0	0	1	8	15	17	2	38	44	2	2	2	1	1	1	0	0	0	0	0
12	4106	9	0	0	26	6	10	11	6	10	6	4	2	2	1	0	0	0	0	0	0	0
17	5908	9	0	0	0	0	1	3	2	7	4	4	2	1	1	1	0	0	0	0	0	0
18	1037	9	0	2	5	2	1	2	41	195	242	138	50	22	7	3	2	2	2	1	1	0
18	2008	9	0	0	1	26	14	21	94	147	141	49	8	7	1	1	1	1	1	0	0	0
18	3031	9	0	1	4	3	8	92	112	94	53	26	7	1	0	0	0	0	0	0	0	0
18	4021	9	0	1	7	16	18	30	80	83	37	9	5	1	0	0	0	0	0	0	0	0
18	5022	9	1	1	1	2	3	8	24	26	20	12	9	4	1	1	0	0	0	0	0	0
18	5518	9	2	2	5	8	22	26	12	27	90	44	15	17	4	1	0	0	0	0	0	0
26	1001	9	0	0	0	2	5	6	2	1	4	3	1	0	1	1	1	0	0	0	0	0
26	1004	9	5	2	1	2	3	9	14	8	3	5	3	2	2	2	0	0	0	0	0	0
26	1010	9	1	0	6	8	8	2	128	24	2	4	2	2	2	1	0	0	0	0	0	0
26	9030	9	0	0	0	0	4	18	13	9	19	3	1	0	0	0	0	0	0	0	0	0
27	4037	9	0	0	1	1	0	4	15	15	7	14	4	0	0	0	0	0	0	0	0	0
28	3099	9	0	0	0	0	1	6	28	37	6	21	32	13	2	0	0	0	0	0	0	0
28	4024	9	0	1	1	7	38	76	38	4	47	51	30	10	2	0	0	0	0	0	0	0
28	5805	9	0	0	0	0	6	15	11	1	7	8	4	1	0	0	0	0	0	0	0	0
29	4036	9	0	1	1	2	14	23	31	48	53	43	22	8	3	1	1	0	0	0	0	0
29	5503	9	0	0	1	9	116	69	5	36	62	39	11	2	0	0	0	0	0	0	0	0
34	1011	9	0	0	0	0	2	5	4	2	4	5	1	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	1	2	1	1	7	7	0	2	1	0	0	0	0	0	0	0
39	5010	9	0	0	1	0	0	0	1	9	8	38	3	0	0	0	0	0	0	0	0	0
42	1627	9	0	0	0	0	0	5	6	7	41	45	6	0	0	0	0	0	0	0	0	0
48	1123	9	0	0	4	5	0	4	31	59	7	134	35	0	0	0	0	0	0	0	0	0
51	1417	9	7	46	124	28	29	35	49	68	69	50	31	12	4	2	1	0	0	0	0	0
51	1423	9	0	0	2	476	750	62	307	626	566	1344	119	849	7	476	1	0	0	0	0	0
51	1464	9	0	0	1	1	11	80	288	548	531	353	207	55	17	6	3	1	0	0	0	0
51	5010	9	0	0	0	1	3	21	108	299	413	289	122	35	9	3	2	1	1	1	0	0
53	1002	9	2	2	1	10	17	26	16	1	10	16	11	3	1	0	0	0	0	0	0	0
53	1007	9	0	0	1	6	21	37	47	59	68	56	32	15	7	3	2	1	1	1	1	0
53	1801	9	10	5	2	2	1	28	68	27	7	13	11	6	2	1	0	0	0	0	0	0
53	3812	9	0	0	1	0	11	70	104	59	42	74	43	15	3	1	0	0	0	0	0	0
85	1801	9	1385	48	107	31	16	43	43	26	17	12	16	6	3	4	5	1	0	0	0	0
90	6410	9	3	4	8	12	13	15	26	74	128	90	23	8	3	2	1	1	0	0	0	0

Single Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	9	15	30	40	33	25	13	9	8	8	6	9	6	6	7	6	5	6	4	3	2
12	3995	9	1	2	10	16	16	11	1	7	13	16	17	13	7	2	1	1	1	0	0	0
12	4096	9	1	2	6	12	3	7	2	8	22	28	14	6	2	7	5	1	1	1	0	0
12	4102	9	0	0	2	4	8	14	19	26	30	35	40	34	29	20	12	6	4	1	1	0
12	4103	9	0	1	6	6	5	1	4	4	5	9	6	3	2	1	1	1	3	2	0	0
12	4106	9	1	2	10	17	15	12	1	7	19	22	22	17	9	2	2	4	3	1	0	0
17	5908	9	1	3	1	2	3	2	1	0	0	0	1	1	2	2	0	0	0	0	0	0
18	1037	9	2	11	25	29	43	21	8	4	4	5	6	8	9	11	17	22	27	21	11	4
18	2008	9	1	4	7	10	12	10	10	8	6	5	9	10	12	20	18	12	6	2	1	0
18	3031	9	2	27	28	27	29	13	5	2	1	1	1	1	2	5	9	6	3	2	1	0
18	4021	9	1	3	2	1	0	0	0	0	0	0	0	0	2	5	4	2	1	0	0	0
18	5022	9	1	6	8	3	0	0	0	0	0	0	1	2	2	3	4	4	2	1	1	0
18	5518	9	11	7	4	2	1	0	1	1	0	0	0	0	1	5	8	7	3	2	2	1
26	1001	9	0	1	2	2	2	2	3	2	0	1	1	1	0	0	0	0	0	0	0	0
26	1004	9	8	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
26	1010	9	3	8	14	7	1	1	14	3	4	1	0	0	3	2	3	0	0	1	0	0
26	9030	9	0	2	3	1	1	0	0	0	0	0	0	1	3	4	2	1	0	0	0	0
27	4037	9	0	1	2	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
28	3099	9	0	0	0	0	1	0	0	1	1	1	2	3	5	4	1	2	6	8	7	4
28	4024	9	2	19	25	7	0	3	6	3	1	0	0	1	2	2	1	0	0	1	3	3
28	5805	9	0	1	1	0	0	0	0	0	0	1	2	3	0	1	2	2	1	1	0	0
29	4036	9	7	9	9	9	7	6	5	6	7	7	8	8	8	7	6	4	3	2	1	0
29	5503	9	2	5	2	1	3	1	0	0	0	0	1	3	6	4	1	5	4	3	2	1
34	1011	9	0	2	1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	4	1	1	2	1
39	5010	9	0	0	1	2	2	1	0	0	1	1	2	2	0	1	2	0	0	0	0	0
42	1627	9	0	1	0	0	0	0	0	0	0	0	0	0	1	4	6	6	3	2	1	0
48	1123	9	0	1	1	1	1	1	0	0	1	1	1	8	39	12	43	78	12	1	0	0
51	1417	9	55	36	24	24	32	15	8	8	8	10	12	12	14	15	14	8	5	3	1	1
51	1423	9	0	28	348	409	430	922	27	521	11	10	149	15	239	189	48	58	45	33	22	13
51	1464	9	3	38	191	250	179	98	54	30	16	14	12	12	18	21	31	28	19	10	6	3
51	5010	9	1	5	16	23	24	20	15	14	14	14	16	21	34	55	78	82	65	42	21	9
53	1002	9	6	5	4	2	0	0	0	1	0	1	1	1	0	0	2	3	2	1	1	1
53	1007	9	2	6	7	7	8	7	6	6	7	7	9	11	13	17	20	18	13	9	6	3
53	1801	9	41	27	45	16	14	7	13	9	3	1	1	3	2	0	2	3	2	1	0	0
53	3812	9	1	6	4	0	0	0	0	0	1	2	3	2	4	6	6	5	2	1	0	0
85	1801	9	1222	21	28	23	21	14	9	5	4	2	1	1	1	1	0	1	1	1	0	0
90	6410	9	8	9	11	12	11	11	10	9	9	9	8	8	8	8	9	6	3	2	1	1

Tandem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	9	2	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4096	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5908	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	4024	9	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	5503	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1011	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1123	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	9	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	9	2838	75	2	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	432	281	184	41	51	31	0	5	7	0	64	28	0	71	0	0
12	4096	9	2048	734	437	149	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	1980	794	122	147	28	0	11	0	0	0	0	0	0	0	0	0
12	4103	9	177	296	690	386	117	4	2	4	2	3	0	0	0	0	0	0
12	4106	9	244	1212	118	52	158	4	76	21	0	0	1	0	0	0	0	0
17	5908	9	45	40	3	5	6	1	0	0	0	0	0	0	0	0	0	0
18	1037	9	4469	36	3	0	0	1	0	0	0	0	0	0	0	0	0	0
18	2008	9	1416	70	8	7	0	0	2	0	0	0	0	0	0	0	0	0
18	3031	9	1528	29	64	2	1	1	0	0	0	0	0	0	0	0	0	0
18	4021	9	140	51	13	1	1	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	77	24	1	2	2	0	0	6	0	0	0	0	0	0	0	0
18	5518	9	141	5	6	9	4	2	2	1	0	0	0	0	0	0	0	0
26	1001	9	1316	69	322	2	0	355	0	0	0	0	0	0	0	0	0	1
26	1004	9	359	106	39	86	11	14	2	25	0	0	0	0	0	0	0	0
26	1010	9	1223	30	1534	6	18	5	3	1	0	0	0	0	0	0	0	0
26	9030	9	26	2	3	1	1	0	1	0	0	0	0	0	0	0	0	0
27	4037	9	111	159	126	15	3	5	2	2	0	0	2	0	0	0	0	0
28	3099	9	4444	4	4	17	17	7	36	62	258	168	190	15	17	62	15	4
28	4024	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	500	1389	4056	500	0	500	0	0	0	1389	0	0	0	0
29	4036	9	917	50	22	11	18	6	7	18	6	11	7	38	49	32	28	11
29	5503	9	2040	183	110	85	83	3	0	0	0	0	0	0	0	0	0	0
34	1011	9	2	4	2	0	0	0	0	0	1	0	0	0	0	0	0	0
34	4042	9	4	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	4286	972	317	0	0	972	0	0	0	0	0	0	0	0	0	0
42	1627	9	617	41	9	9	3	5	8	31	16	5	10	2	2	2	2	7
48	1123	9	3277	435	64	10	10	2	1	2	1	0	0	2	1	5	2	0
51	1417	9	7053	99	19	6	0	1	0	1	0	0	0	0	0	0	0	0
51	1423	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	11140	97	13	2	0	0	0	0	1	1	1	1	0	0	0	0
51	5010	9	3738	288	153	45	5	3	1	0	0	0	0	0	0	0	0	0
53	1002	9	83	15	15	4	0	0	1	0	1	0	1	0	0	0	0	0
53	1007	9	2683	15	2	0	0	1	1	0	0	0	0	0	0	0	0	0
53	1801	9	105	15	33	2	1	5	0	1	0	0	1	0	0	0	0	0
53	3812	9	112	17	6	0	2	0	2	6	4	1	2	1	0	0	0	0
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	1143	51	72	20	1	5	1	0	1	0	0	0	0	0	0	0

Tridem Axles (Variance)

STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12	4096	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17	5908	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4021	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5518	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1001	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	9	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	4037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	9	15	4	4	4	4	4	0	0	0	0	0	0	0	0	0
28	4024	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	9	9	6	3	6	4	1	0	1	0	0	0	0	0	0	0
29	5503	9	0	0	0	87	0	0	0	0	0	0	0	0	0	0	0
34	1011	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	9	1	1	2	9	15	14	14	11	3	6	1	1	1	0	0
48	1123	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1417	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1002	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
09	1803	9	118	99	81	81	76	64	60	64	73	70	67	72	68	83	59	69	77	68	83	144
12	3995	9	98	88	72	29	56	29	12	16	18	18	28	56	64	70	46	47	61	85	102	141
12	4096	9	105	101	72	38	47	33	47	23	11	53	85	94	90	64	57	146	110	245	245	0
12	4102	9	120	108	93	63	69	71	70	62	65	67	76	83	91	92	58	73	97	123	145	188
12	4103	9	57	124	71	67	59	41	10	31	36	12	23	60	52	74	90	70	64	96	116	178
12	4106	9	89	97	99	53	57	34	17	17	16	17	23	43	70	58	43	20	67	96	112	106
17	5908	9	56	28	19	18	38	33	14	16	11	12	12	19	31	40	26	46	43	23	45	58
18	1037	9	81	74	74	73	77	79	80	78	73	72	78	110	120	93	84	84	83	81	87	102
18	2008	9	92	72	91	185	146	80	61	49	52	60	71	133	113	94	100	104	100	87	80	74
18	3031	9	73	63	70	67	60	63	50	46	46	62	86	96	91	99	92	85	85	93	111	111
18	4021	9	43	47	66	75	58	42	46	47	48	48	73	82	71	61	55	59	66	73	71	79
18	5022	9	118	87	57	79	60	36	31	25	24	28	42	50	55	57	55	61	77	91	93	91
18	5518	9	118	102	80	82	119	94	33	30	45	44	57	118	102	67	60	58	54	52	64	86
26	1001	9	42	29	11	21	26	20	9	8	18	21	26	26	35	57	56	66	60	87	103	104
26	1004	9	92	51	19	20	22	32	36	27	19	37	37	37	38	39	23	22	30	31	32	57
26	1010	9	55	51	53	50	40	13	70	37	18	31	29	47	55	40	20	25	15	40	17	52
26	9030	9	30	21	22	12	37	33	18	15	33	29	25	27	16	4	5	8	16	24	30	31
27	4037	9	16	25	63	95	28	30	25	15	11	35	69	44	20	16	13	22	25	48	71	91
28	3099	9	16	24	26	23	30	40	38	28	12	36	86	107	83	38	26	31	32	27	26	29
28	4024	9	93	91	73	85	87	68	37	12	45	66	81	89	89	90	76	73	90	82	74	101
28	5805	9	32	29	16	32	33	24	15	5	19	36	51	54	41	31	35	48	59	66	70	72
29	4036	9	57	74	70	56	62	52	49	50	48	49	51	51	50	58	64	68	73	74	79	83
29	5503	9	52	45	94	147	187	101	18	32	38	42	50	54	58	62	57	57	68	60	63	85
34	1011	9	17	22	17	16	31	28	13	7	11	17	13	11	30	40	39	34	32	21	14	17
34	4042	9	32	23	12	7	36	27	9	6	14	15	5	28	47	37	14	4	12	16	24	36
39	5010	9	8	5	22	20	6	7	12	13	9	59	96	24	13	21	11	19	23	13	8	20
42	1627	9	89	55	20	10	43	68	28	14	24	37	58	56	32	39	27	20	15	19	55	76
48	1123	9	25	75	79	78	45	52	48	32	9	77	134	49	15	31	18	33	91	121	134	118
51	1417	9	102	139	142	91	77	62	59	71	75	75	82	75	70	102	79	105	77	97	120	143
51	1423	9	245	245	245	235	234	245	245	245	245	202	245	219	245	235	245	245	245	245	245	245
51	1464	9	150	153	137	159	146	139	127	123	123	124	133	137	144	152	156	144	130	127	125	151
51	5010	9	110	108	105	107	102	102	101	100	100	101	102	103	101	103	106	106	105	104	103	102
53	1002	9	60	68	24	63	65	54	33	7	24	38	48	41	36	41	43	54	69	71	73	84
53	1007	9	60	61	60	84	96	84	66	58	59	61	63	63	64	66	69	72	71	72	74	74
53	1801	9	205	155	66	46	19	52	52	31	18	33	52	63	60	51	50	65	76	84	89	108
53	3812	9	46	40	33	25	82	90	62	38	39	78	104	126	124	88	64	69	91	109	120	133
85	1801	9	114	116	82	62	85	129	131	104	94	91	111	114	108	136	160	194	156	164	168	245
90	6410	9	72	76	87	94	84	60	51	60	66	64	55	59	79	97	113	123	123	140	139	163

Single Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
09	1803	9	106	129	100	177	91	0	104	152	208	0	208	208	208	0	0	208	0	0	0
12	3995	9	129	117	130	156	245	156	156	136	0	136	0	245	0	245	245	245	245	0	0
12	4096	9	245	245	245	0	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	183	208	152	208	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	9	217	234	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	131	139	152	245	162	245	203	245	245	0	245	0	0	114	206	0	0	245	0
17	5908	9	77	185	106	119	156	122	155	155	245	245	245	0	0	0	0	0	0	0	0
18	1037	9	109	139	140	124	134	116	115	118	123	99	146	134	164	119	178	235	154	235	0
18	2008	9	87	81	86	84	95	103	124	118	174	156	166	173	0	249	0	0	249	0	0
18	3031	9	137	172	144	146	156	155	123	221	197	197	0	201	0	249	249	0	249	0	0
18	4021	9	81	89	93	77	104	107	79	95	116	90	265	178	0	161	0	198	0	0	0
18	5022	9	94	92	104	118	118	93	139	128	92	132	167	167	0	167	0	0	245	0	0
18	5518	9	114	128	125	121	117	100	111	128	126	107	142	110	77	110	245	155	0	0	0
26	1001	9	138	144	148	138	133	137	171	171	223	182	191	171	265	265	265	0	0	0	0
26	1004	9	57	76	47	55	107	56	85	63	87	96	132	116	174	148	158	202	203	226	0
26	1010	9	56	55	68	58	54	67	57	84	56	83	81	80	90	100	60	99	117	100	245
26	9030	9	32	41	51	51	58	64	64	68	74	57	82	80	56	112	100	122	118	167	0
27	4037	9	102	87	90	126	265	0	265	0	265	0	0	0	0	0	0	0	0	0	0
28	3099	9	44	60	81	97	102	105	100	91	83	83	87	99	105	100	122	137	163	163	0
28	4024	9	76	98	84	130	132	110	176	157	107	0	224	93	224	224	224	224	0	0	0
28	5805	9	77	80	68	65	82	87	110	139	132	154	173	186	191	137	186	224	181	224	0
29	4036	9	85	99	91	90	104	94	82	80	69	52	80	106	100	89	249	122	130	249	0
29	5503	9	91	118	170	99	111	116	242	192	228	156	125	0	171	265	171	0	265	0	0
34	1011	9	16	31	26	43	33	28	35	31	24	78	77	107	106	90	56	140	109	137	0
34	4042	9	49	59	62	61	63	62	74	55	64	59	65	52	78	71	114	82	224	56	224
39	5010	9	11	6	30	91	104	141	200	76	170	0	200	0	0	0	0	0	0	0	0
42	1627	9	129	138	182	193	203	205	213	216	206	214	218	218	216	218	224	224	224	224	0
48	1123	9	120	130	89	0	49	0	0	0	0	0	0	173	173	173	0	0	0	0	0
51	1417	9	104	103	130	147	165	156	178	208	140	162	208	0	0	0	0	0	0	0	0
51	1423	9	245	245	245	245	245	245	245	245	245	245	245	245	0	245	245	245	245	0	0
51	1464	9	154	153	151	152	150	158	153	158	168	0	212	212	212	0	0	0	0	0	0
51	5010	9	102	102	102	102	103	106	105	103	117	121	147	147	120	120	153	0	224	0	0
53	1002	9	78	90	108	123	114	120	136	126	139	150	157	188	174	179	137	181	224	224	224
53	1007	9	74	75	78	81	84	86	82	89	80	91	93	92	108	97	147	162	0	208	208
53	1801	9	115	99	119	109	130	155	94	127	155	155	158	245	245	245	245	0	0	0	0
53	3812	9	134	149	95	59	70	29	58	64	61	75	84	84	88	45	89	87	95	91	192
85	1801	9	203	183	245	245	245	159	245	245	245	0	0	245	245	245	245	0	0	245	0
90	6410	9	168	156	170	146	180	209	212	193	200	222	229	218	229	229	229	222	211	229	229

Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
09	1803	9	107	72	67	64	62	62	62	65	67	70	69	64	60	62	70	65	78	77	87	92
12	3995	9	120	108	97	85	69	49	15	36	46	50	50	46	35	20	18	24	32	38	37	41
12	4096	9	121	112	107	88	51	45	23	35	55	51	40	22	13	35	41	38	67	99	118	100
12	4102	9	142	95	81	73	63	61	59	60	61	64	65	63	59	60	63	67	76	88	93	88
12	4103	9	180	100	92	64	42	16	26	23	22	32	29	24	17	15	17	25	62	72	67	57
12	4106	9	113	105	97	86	66	48	16	34	51	54	57	55	44	26	25	48	60	60	65	58
17	5908	9	61	35	12	13	20	21	17	14	7	11	14	12	16	18	5	14	34	51	67	103
18	1037	9	80	72	72	72	72	71	73	72	72	74	72	71	72	73	71	71	74	76	76	82
18	2008	9	106	67	48	48	47	50	54	48	46	45	54	50	51	61	60	62	61	61	64	68
18	3031	9	62	50	46	45	46	51	53	47	45	45	46	46	47	49	49	47	46	55	70	79
18	4021	9	63	55	26	14	3	6	6	9	9	12	8	8	24	34	34	34	36	34	44	54
18	5022	9	142	94	53	22	9	9	8	7	8	8	15	20	20	22	34	46	59	73	86	105
18	5518	9	125	69	29	17	10	7	11	16	9	7	6	5	22	38	46	50	53	76	122	142
26	1001	9	32	22	19	13	10	10	16	18	8	15	19	27	20	22	20	50	68	65	94	72
26	1004	9	99	22	16	12	15	15	20	17	13	13	19	17	25	17	20	36	45	51	77	88
26	1010	9	50	51	50	31	13	10	42	23	34	18	5	16	41	37	54	16	27	59	63	61
26	9030	9	72	55	26	11	9	8	9	10	11	10	7	14	27	35	38	38	43	48	50	47
27	4037	9	53	28	13	5	10	7	8	7	7	8	9	9	11	17	17	19	36	64	77	101
28	3099	9	28	25	22	18	17	12	12	15	17	17	20	24	25	21	13	21	52	92	125	146
28	4024	9	102	88	58	26	6	25	48	49	39	14	13	31	36	35	28	12	18	32	46	58
28	5805	9	41	19	10	4	2	2	1	3	8	14	21	21	6	13	29	40	49	57	59	57
29	4036	9	56	52	47	47	46	46	45	47	49	48	48	48	48	47	45	45	47	51	54	58
29	5503	9	52	36	19	10	28	19	6	2	4	17	21	29	29	22	13	35	57	84	115	116
34	1011	9	32	30	14	8	4	6	9	9	13	15	14	13	8	7	13	17	21	23	24	25
34	4042	9	16	33	15	6	4	6	6	5	5	9	13	14	10	20	28	24	18	29	46	59
39	5010	9	7	12	15	16	12	9	5	4	14	18	26	24	9	9	15	7	28	40	61	72
42	1627	9	72	46	8	13	6	5	5	4	4	6	7	11	17	20	22	27	38	72	112	139
48	1123	9	77	71	31	23	24	18	15	12	15	15	18	34	47	23	62	133	151	150	157	140
51	1417	9	108	78	64	64	74	65	59	59	60	74	74	63	70	75	86	70	76	71	81	96
51	1423	9	245	245	202	200	200	214	245	223	245	245	213	245	212	204	245	245	245	245	245	245
51	1464	9	144	125	123	123	122	123	123	124	123	123	123	124	123	124	122	123	123	124	125	129
51	5010	9	101	101	101	101	100	100	100	100	100	100	101	102	103	103	102	101	101	104	107	108
53	1002	9	54	36	25	16	7	7	12	19	14	18	22	23	11	11	30	41	43	45	49	53
53	1007	9	83	67	58	58	58	59	58	62	67	66	67	64	60	58	59	60	61	63	67	69
53	1801	9	224	115	63	36	31	26	52	60	47	26	25	36	29	12	34	59	62	71	68	77
53	3812	9	40	45	20	5	2	4	3	7	15	25	26	21	31	45	69	99	124	135	145	128
85	1801	9	83	43	57	67	78	87	91	95	86	81	86	80	90	108	95	105	107	95	111	115
90	6410	9	93	72	57	52	50	50	50	51	51	52	52	53	55	58	61	58	53	51	52	55

Tandem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
09	1803	9	110	108	113	135	131	141	191	190	195	196	200	203	208	208	198	208	208	208	0
12	3995	9	40	46	51	85	104	95	136	0	131	146	175	245	206	135	245	206	245	0	0
12	4096	9	157	245	245	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	81	84	123	115	147	145	208	208	208	0	0	0	0	0	0	0	0	0	0
12	4103	9	148	145	211	132	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	62	64	90	101	131	150	235	161	237	228	215	198	245	245	245	245	245	245	0
17	5908	9	121	147	155	137	116	156	154	158	155	0	245	0	0	0	0	245	0	0	0
18	1037	9	100	121	135	137	122	106	90	100	115	76	79	133	137	157	162	165	0	235	0
18	2008	9	74	74	76	71	80	65	94	63	101	112	249	197	173	0	0	0	0	0	0
18	3031	9	88	88	92	104	139	179	210	218	191	237	241	225	211	207	215	249	0	0	0
18	4021	9	63	72	72	53	58	115	114	171	157	116	265	0	171	0	0	265	0	0	0
18	5022	9	111	110	111	107	110	112	111	84	103	147	90	155	155	245	0	0	0	0	0
18	5518	9	131	112	123	150	164	164	162	136	126	164	155	192	0	0	0	0	0	0	0
26	1001	9	99	111	118	110	139	169	111	228	194	201	176	196	210	265	164	265	265	265	0
26	1004	9	101	95	84	71	85	50	64	74	98	134	124	133	153	265	213	265	265	265	0
26	1010	9	65	62	66	67	63	58	64	52	73	71	84	61	110	78	89	91	97	0	0
26	9030	9	46	50	55	61	64	71	87	91	110	126	159	167	167	110	0	0	0	0	0
27	4037	9	106	95	126	184	198	265	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	9	157	159	159	160	153	143	137	131	134	144	142	140	145	153	149	173	224	224	0
28	4024	9	68	77	84	87	92	91	96	94	93	74	108	98	104	194	128	224	144	0	0
28	5805	9	49	46	44	60	70	85	101	113	130	139	144	169	171	191	191	204	224	224	0
29	4036	9	63	67	69	58	52	50	48	53	54	53	54	56	57	62	58	72	79	130	0
29	5503	9	132	119	124	73	166	61	122	182	128	112	180	118	138	265	265	265	0	0	0
34	1011	9	29	32	39	43	80	64	91	82	99	63	99	109	74	68	127	186	191	224	0
34	4042	9	67	73	75	76	71	75	70	72	58	58	62	48	99	87	71	137	224	0	0
39	5010	9	69	105	92	174	200	0	200	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	9	161	164	177	186	181	170	178	191	91	224	149	105	224	224	0	224	0	0	0
48	1123	9	129	145	43	173	173	0	0	0	0	87	0	0	0	0	0	0	0	0	0
51	1417	9	101	108	121	125	139	138	158	164	155	172	153	153	153	208	208	0	0	0	0
51	1423	9	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	0	0	0	0
51	1464	9	131	136	154	155	151	139	131	140	164	165	176	188	175	212	212	212	212	212	0
51	5010	9	108	107	108	108	108	107	110	112	108	113	120	138	126	153	224	153	0	0	0
53	1002	9	53	57	64	67	84	87	91	74	101	84	102	114	152	195	140	138	0	0	0
53	1007	9	71	76	75	82	85	78	73	77	78	89	123	108	114	122	208	208	0	0	0
53	1801	9	85	85	85	118	144	185	137	159	245	194	245	245	0	245	245	245	0	0	0
53	3812	9	100	67	60	39	55	59	49	45	80	47	58	82	55	136	90	110	99	210	0
85	1801	9	119	129	134	135	125	152	164	156	245	132	175	173	245	245	245	245	245	245	0
90	6410	9	66	73	78	80	89	101	98	112	122	132	130	134	170	142	194	168	169	150	0

Tridem Axles (COV)

STATE	SHRP	VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
09	1803	9	58	108	153	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	92	78	67	58	90	133	229	229	229	0	229	213	0	229	0	0
12	4096	9	93	99	116	216	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	88	129	88	208	134	0	208	0	0	0	0	0	0	0	0	0
12	4103	9	91	84	85	88	172	141	216	141	216	216	0	0	0	0	0	0
12	4106	9	65	100	91	69	144	127	186	171	0	0	245	0	0	0	0	0
17	5908	9	10	32	29	149	189	117	181	0	0	155	0	0	0	245	0	0
18	1037	9	71	148	156	0	235	181	235	235	0	0	0	0	0	0	0	0
18	2008	9	46	74	91	126	150	158	160	249	249	161	249	0	0	249	0	0
18	3031	9	47	96	104	123	167	249	249	0	249	249	0	0	0	249	249	0
18	4021	9	14	82	93	85	113	211	265	265	0	0	0	265	0	185	0	265
18	5022	9	11	43	29	47	140	72	155	204	124	115	170	177	245	245	0	194
18	5518	9	17	22	40	95	80	72	87	131	164	113	120	118	178	159	151	158
26	1001	9	48	171	163	171	0	258	0	0	0	0	0	0	0	0	0	265
26	1004	9	31	77	65	179	224	106	173	172	265	0	0	0	0	0	0	265
26	1010	9	54	86	191	116	176	107	245	180	0	245	0	169	0	0	245	0
26	9030	9	8	8	20	26	46	36	79	93	109	63	60	92	139	125	155	245
27	4037	9	14	97	188	204	143	196	134	156	0	184	210	172	0	0	0	0
28	3099	9	200	200	200	141	141	132	152	160	149	132	156	200	141	200	200	200
28	4024	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	224	224	174	224	0	224	0	0	0	224	0	0	0	0
29	4036	9	101	106	109	97	111	74	125	144	99	105	124	124	109	121	125	97
29	5503	9	92	74	84	119	167	179	157	139	124	235	160	156	0	0	235	235
34	1011	9	2	18	83	74	164	150	224	0	224	0	224	0	0	0	224	224
34	4042	9	3	22	29	70	88	106	177	0	157	0	224	174	158	131	0	224
39	5010	9	115	187	187	0	0	187	0	0	0	0	0	0	0	0	0	0
42	1627	9	73	53	46	47	53	80	115	172	147	86	143	122	109	80	79	128
48	1123	9	100	103	103	101	104	123	173	104	106	173	173	173	173	173	173	173
51	1417	9	101	117	130	128	101	164	120	149	133	181	160	148	200	200	200	200
51	1423	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	123	152	150	150	151	151	158	182	158	151	152	150	153	150	154	212
51	5010	9	102	101	107	113	115	125	122	125	119	132	140	193	224	224	153	155
53	1002	9	11	39	85	134	0	0	224	224	140	0	140	224	0	0	0	0
53	1007	9	58	72	70	96	208	129	159	208	0	208	0	0	0	0	0	0
53	1801	9	12	82	190	179	117	194	0	245	0	0	245	0	0	0	0	0
53	3812	9	14	41	51	68	112	109	104	167	183	69	174	90	114	168	222	165
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	53	62	76	75	73	130	151	124	132	147	107	229	229	229	165	153

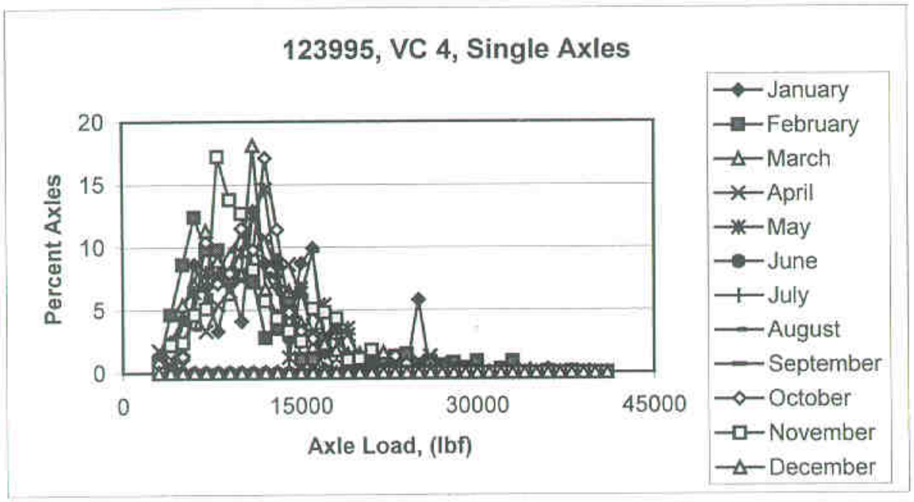
Tridem Axles (COV)

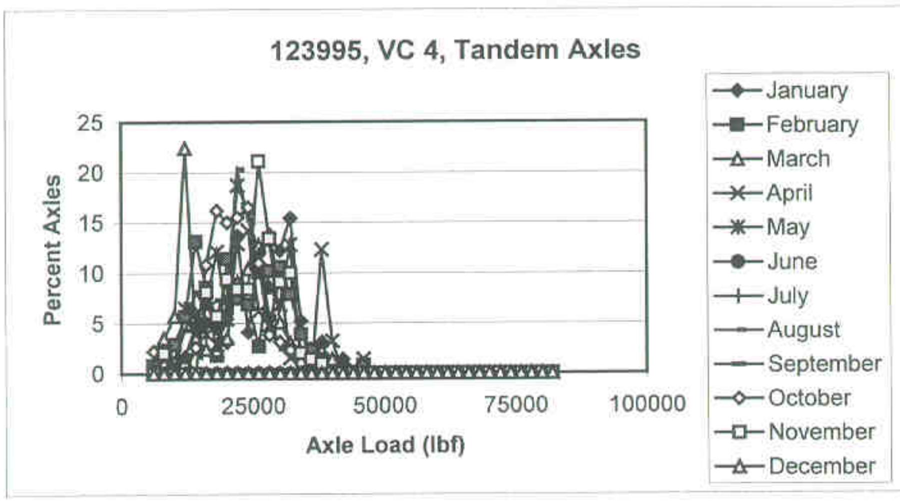
STATE	SHRP	VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
09	1803	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3995	9	0	0	0	229	0	0	0	0	0	0	0	0	0	0	0
12	4096	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4102	9	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4103	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	4106	9	0	0	0	0	245	0	0	0	0	0	0	0	0	0	0
17	5908	9	0	0	0	0	0	0	245	0	0	0	0	245	0	0	0
18	1037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2008	9	0	0	249	0	0	0	0	0	0	0	0	0	0	0	0
18	3031	9	249	0	0	0	249	0	0	249	0	0	0	0	0	0	0
18	4021	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	5022	9	0	245	245	245	0	0	0	0	0	0	0	0	0	0	0
18	5518	9	245	245	245	245	0	0	0	0	0	0	0	0	0	0	0
26	1001	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1004	9	265	0	265	0	0	0	0	0	0	0	0	0	0	0	0
26	1010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	9030	9	0	0	245	0	0	245	0	0	0	0	0	0	0	0	0
27	4037	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3099	9	200	200	200	200	200	200	0	0	0	0	0	0	0	0	0
28	4024	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	5805	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	4036	9	107	95	119	113	141	185	195	202	161	249	177	0	249	0	0
29	5503	9	0	0	0	235	0	0	0	0	0	0	0	0	0	0	0
34	1011	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	4042	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	5010	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1627	9	140	142	200	205	224	215	224	224	224	224	224	224	224	224	224
48	1123	9	0	173	0	0	0	0	173	0	0	0	0	0	0	0	0
51	1417	9	200	200	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1423	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1464	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	5010	9	138	224	169	224	0	0	0	0	0	0	0	0	0	0	0
53	1002	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1007	9	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3812	9	163	0	0	0	245	245	175	0	0	245	222	0	245	0	0
85	1801	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	6410	9	229	0	229	229	0	0	153	0	0	0	0	0	0	0	0

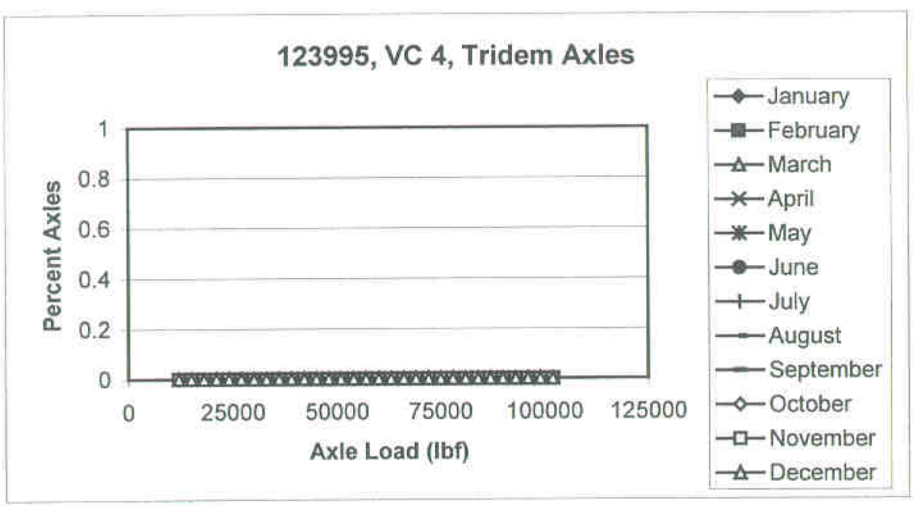
APPENDIX AA.6 – Normalized Monthly Axle Load Spectra for Five Sites

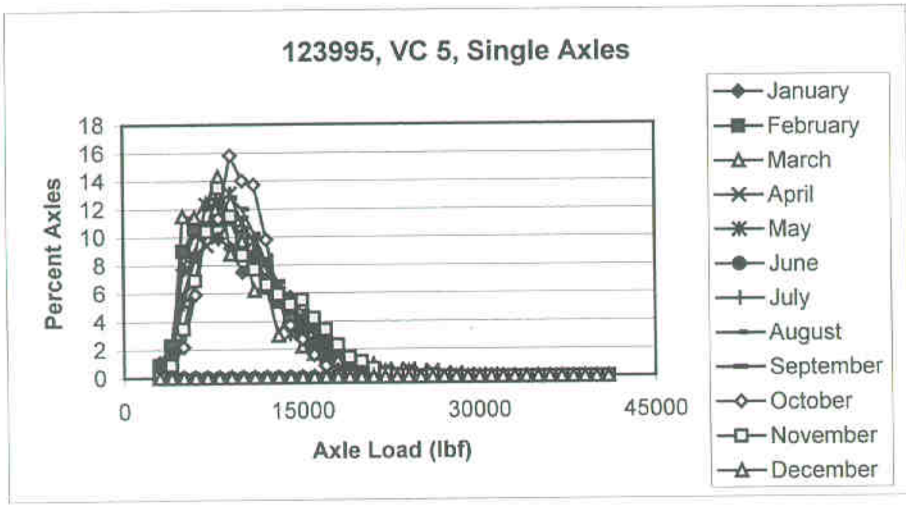
Appendix AA.6 includes graphical summaries and illustrations of the monthly normalized axle load spectra for five of the LTPP core sites. These are the same sites that were included in Appendix AA.4 showing the annual normalized axle load spectra. As shown, the monthly axle load spectra are highly variable, but no consistent difference was found among the different months. Therefore, all months were combined in developing the default normalized axle load spectra for each axle and each truck type. The following summarizes those five LTPP sites included in this appendix:

- LTPP Site 123995 (pages AA.6-2 thru AA.6-11)
- LTPP Site 185022 (pages AA.6-12 thru AA.6-21)
- LTPP Site 344042 (pages AA.6-22 thru AA.6-31)
- LTPP Site 395010 (pages AA.6-32 thru AA.6-41)
- LTPP Site 515010 (pages AA.6-42 thru AA.6-51)

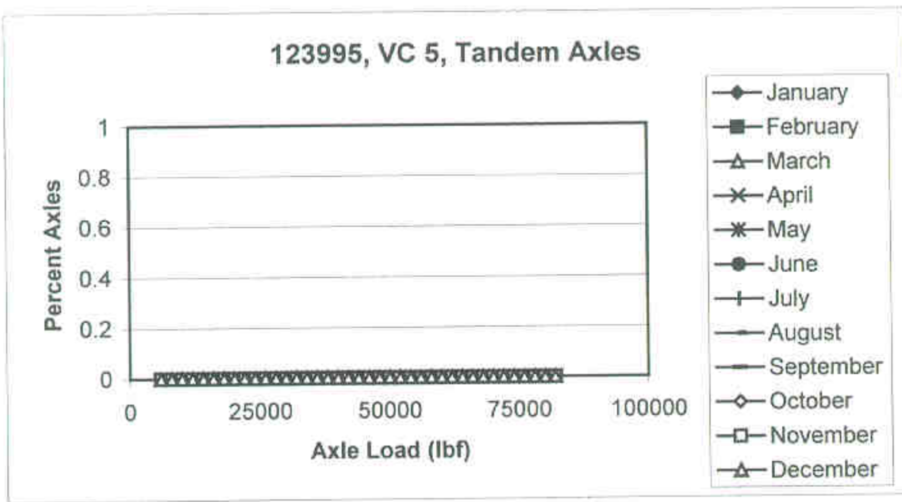

123995, VC 4, Single Axles
Percent Axles
20
15
10
5
0
0
15000
30000
45000
Axle Load, (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 4, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

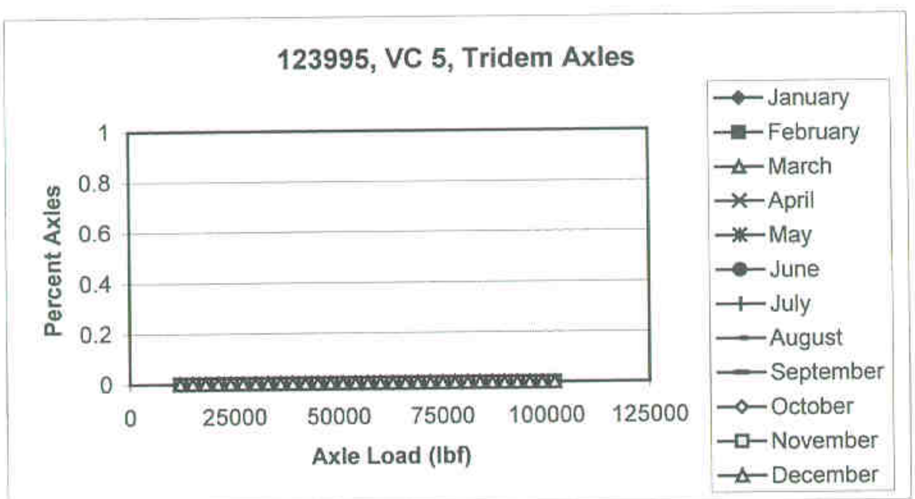

123995, VC 4, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



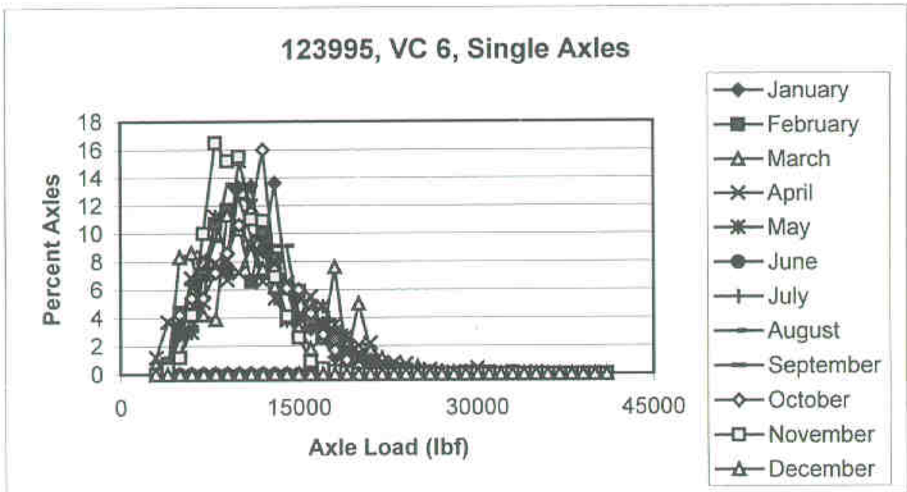
123995, VC 5, Single Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



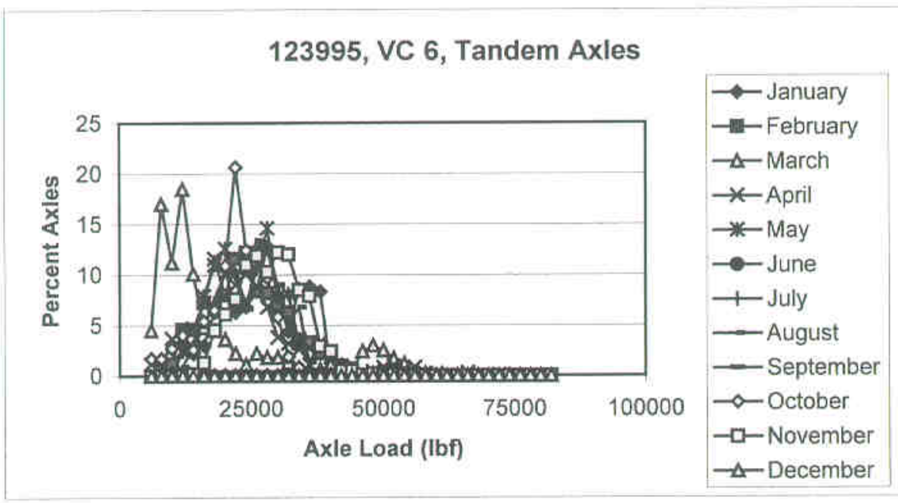
123995, VC 5, Tandem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



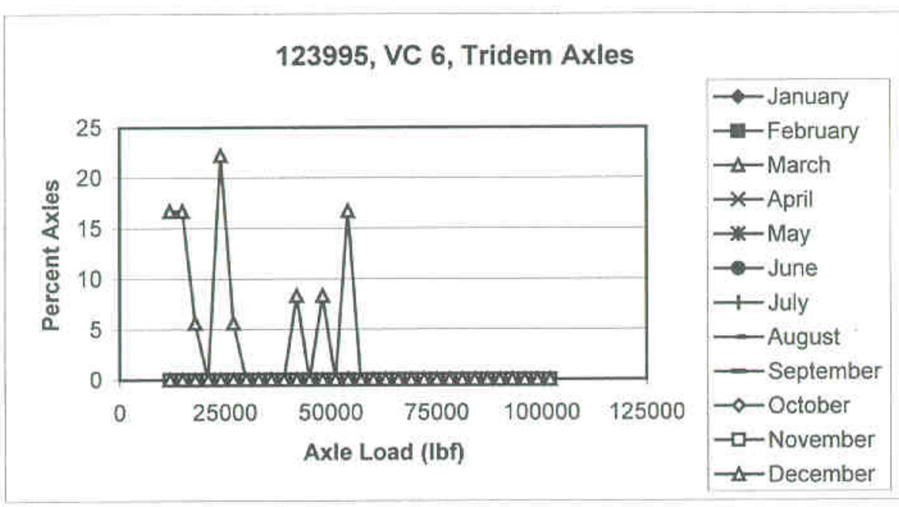
123995, VC 5, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



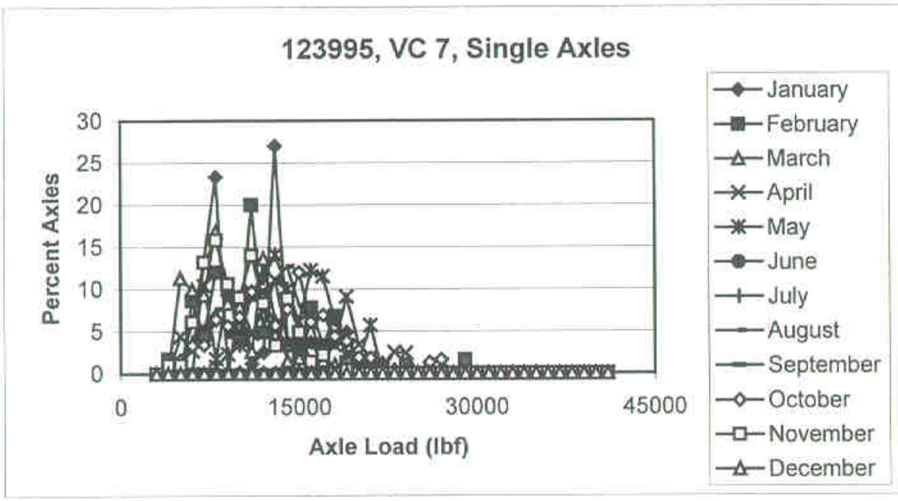
123995, VC 6, Single Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



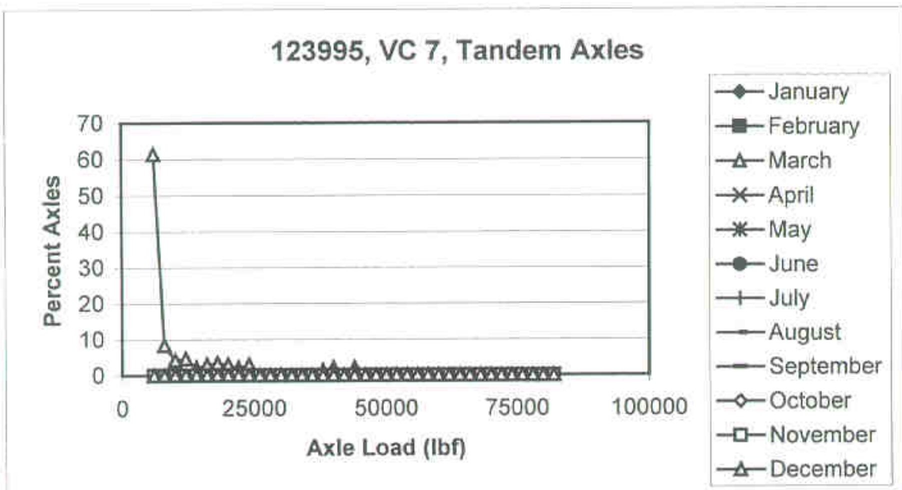
123995, VC 6, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



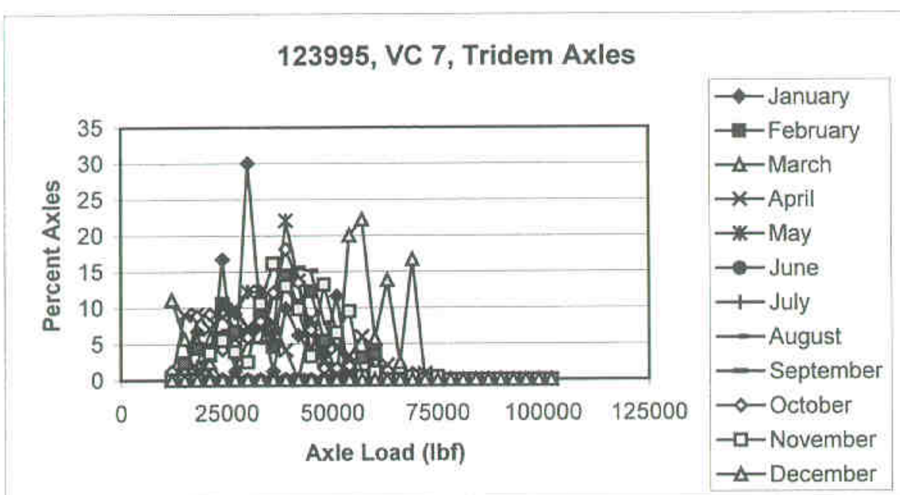
123995, VC 6, Tridem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



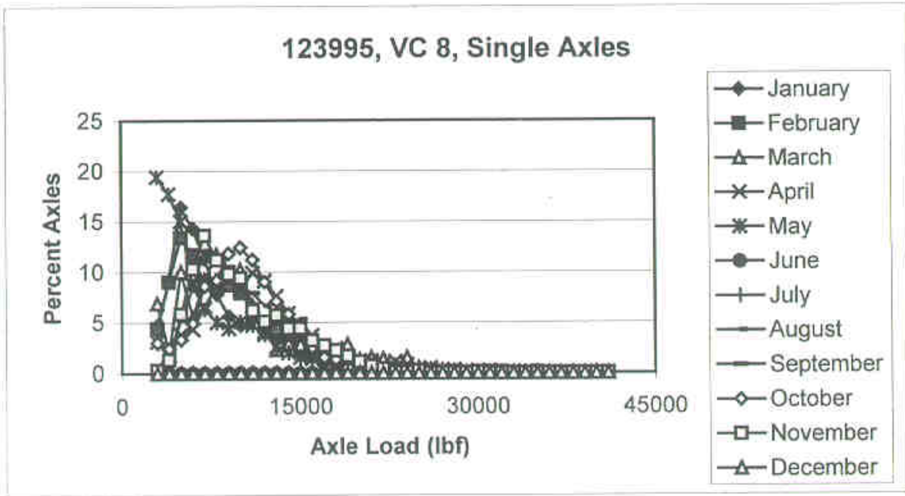
123995, VC 7, Single Axles
Percent Axles
30
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



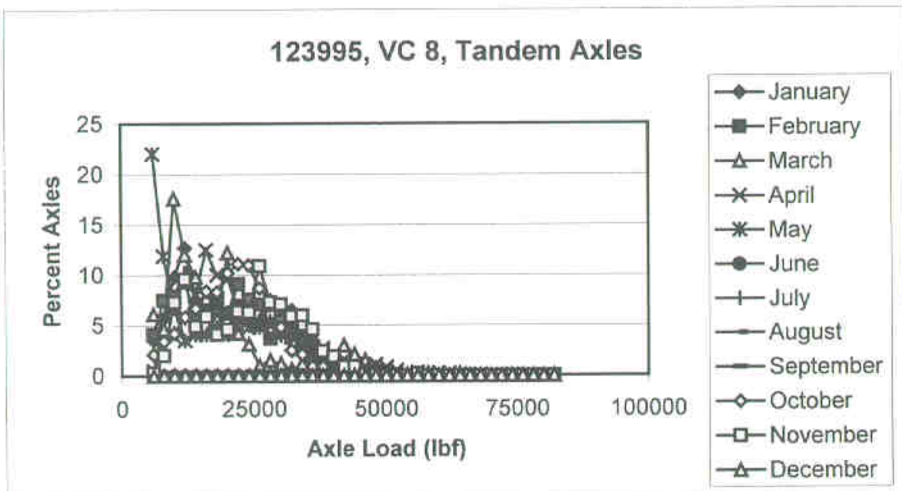
123995, VC 7, Tandem Axles
Percent Axles
70
60
50
40
30
20
10
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



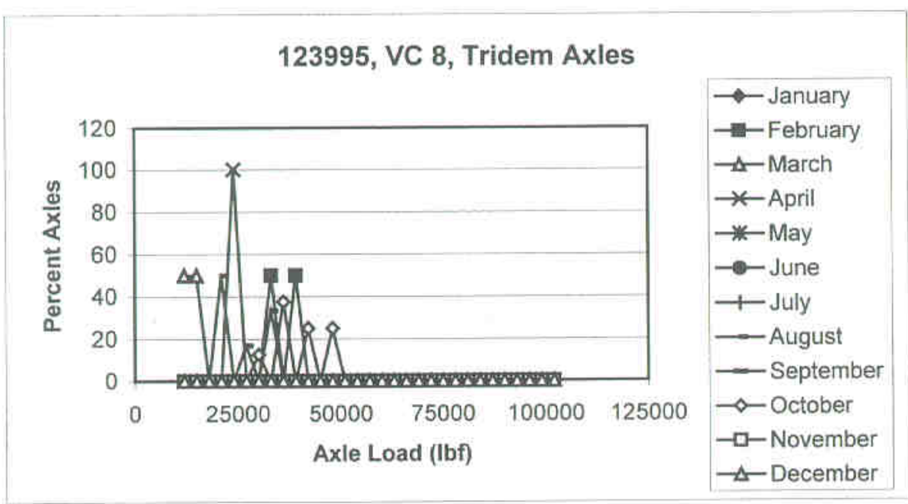
123995, VC 7, Tridem Axles
Percent Axles
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



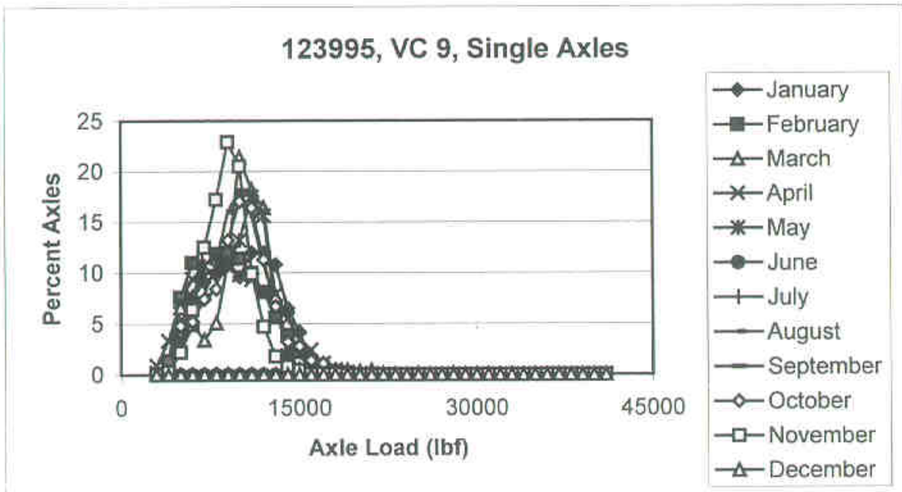
123995, VC 8, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

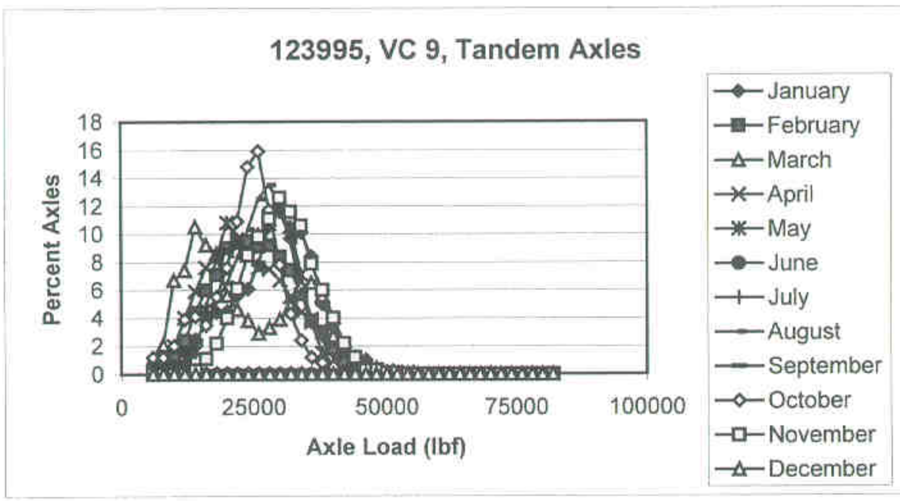


123995, VC 8, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



123995, VC 8, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 9, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 9, Tandem Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
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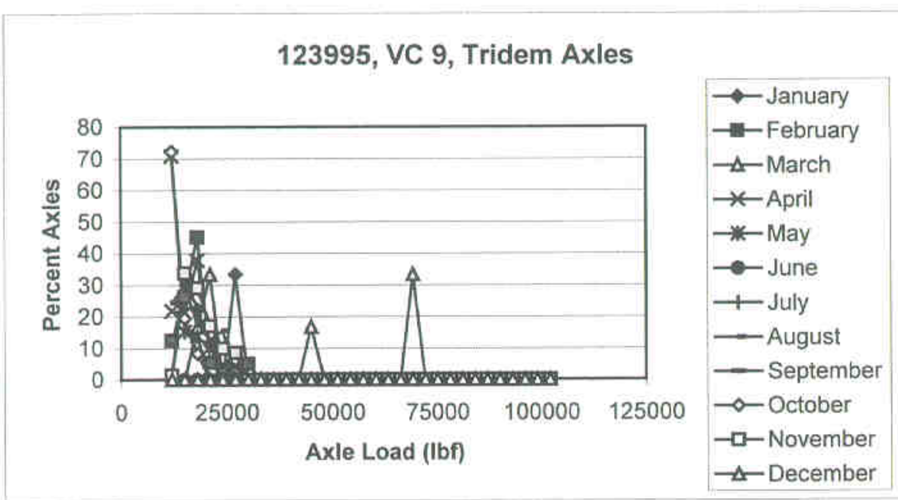
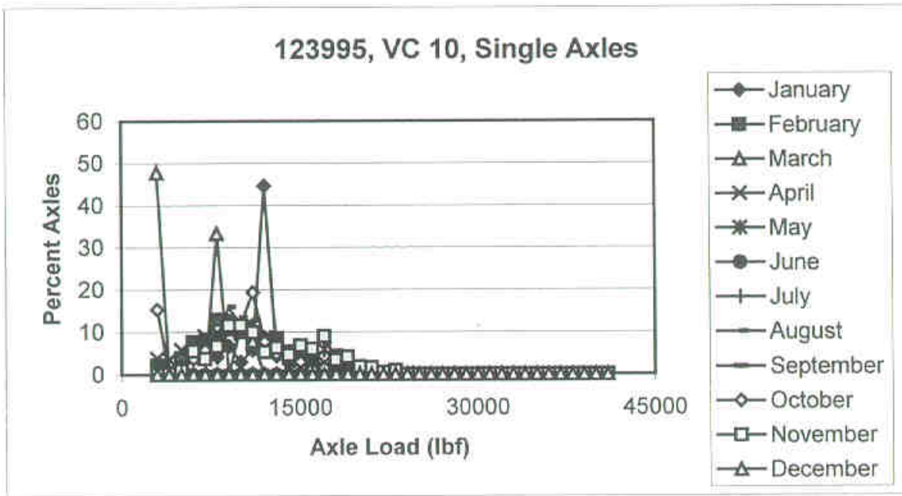
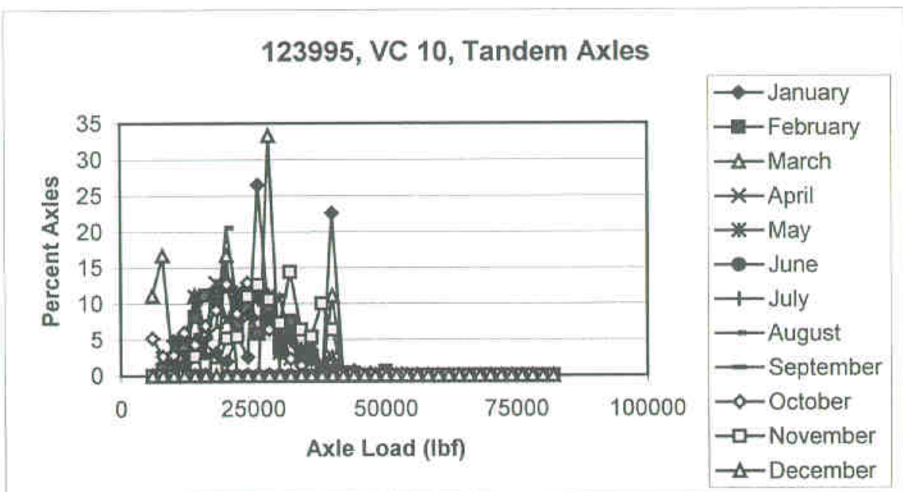
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 9, Tridem Axles
Percent Axles
80
70
60
50
40
30
20
10
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 10, Single Axles
Percent Axles
60
50
40
30
20
10
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


123995, VC 10, Tandem Axles
Percent Axles
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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May
June
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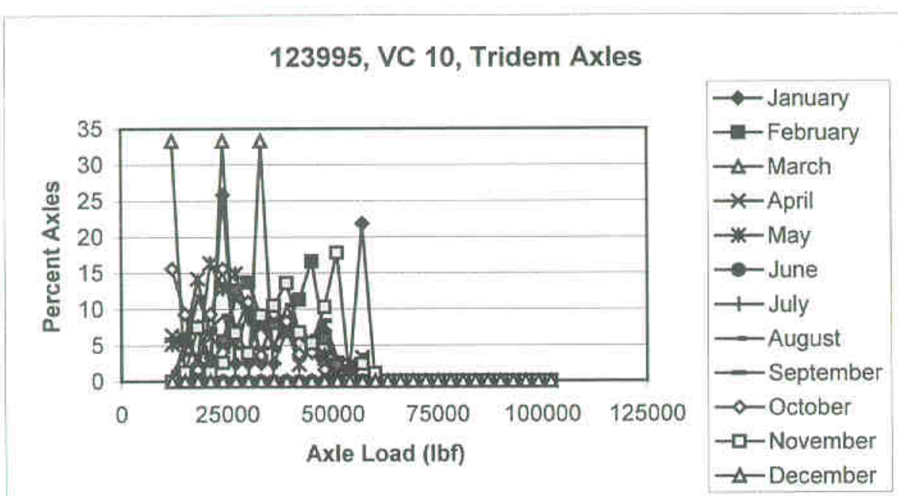
September
October
November
December


123995, VC 10, Tridem Axles
Percent Axles
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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May
June
July
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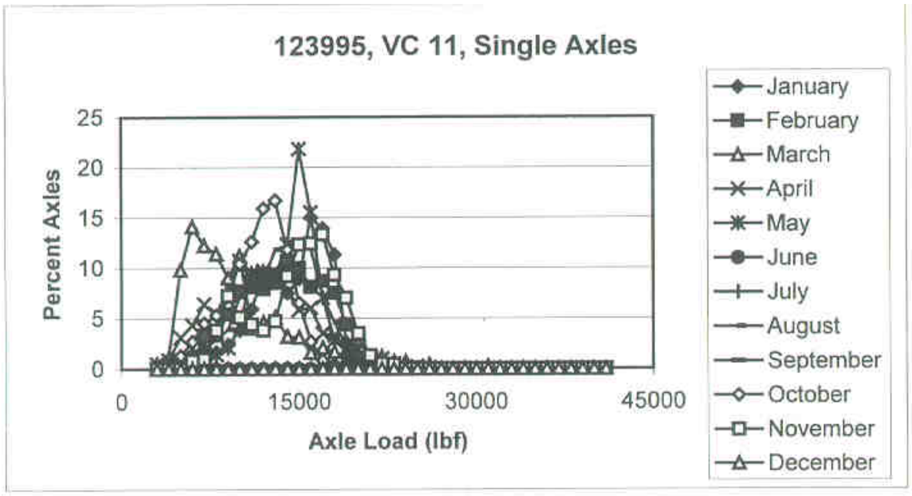
September
October
November
December



123995, VC 11, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
0
15000
30000
45000
January
February
March
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May
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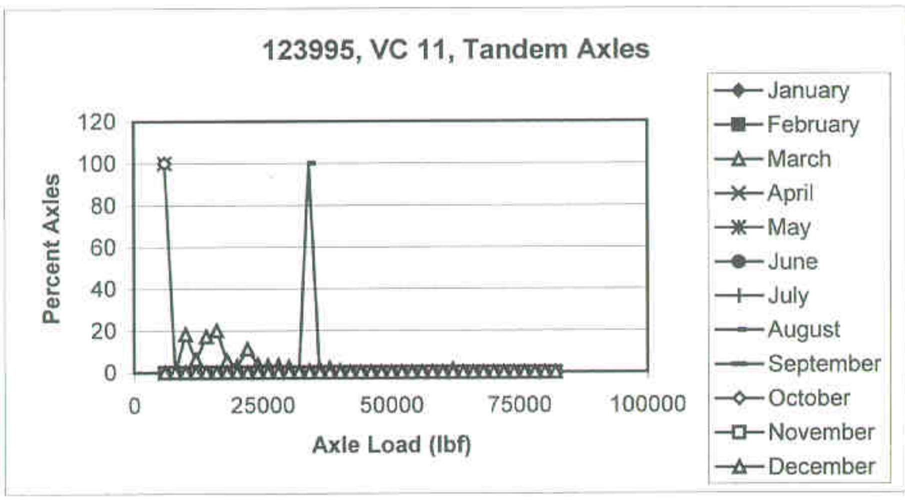
August
September
October
November
December



123995, VC 11, Tandem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
0
25000
50000
75000
100000
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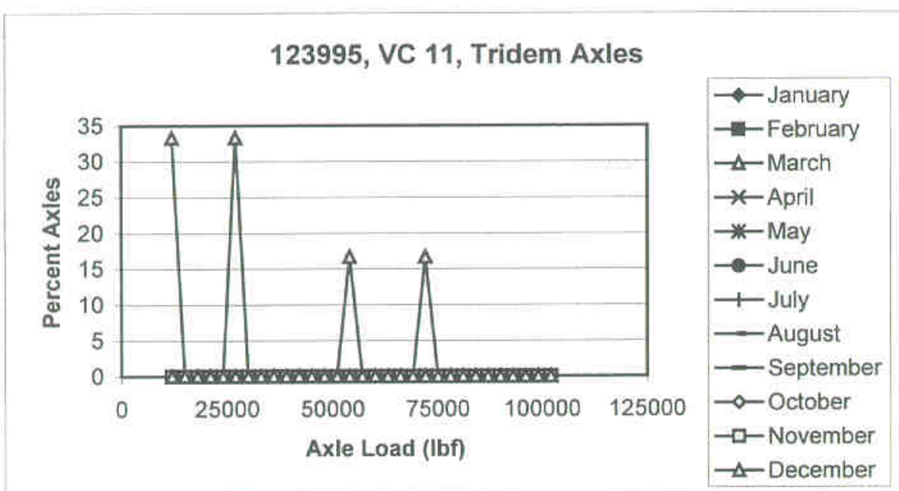
September
October
November
December



123995, VC 11, Tridem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
0
25000
50000
75000
100000
125000
January
February
March
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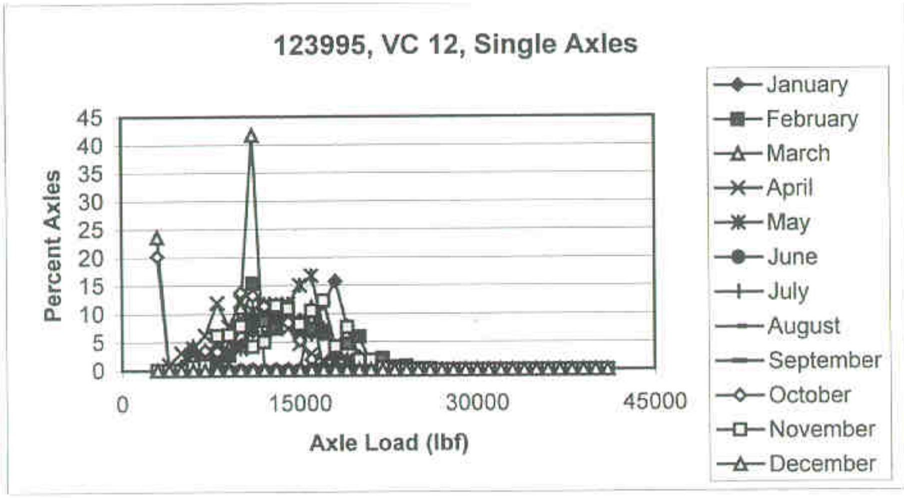

123995, VC 12, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
40
45
0
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30000
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January
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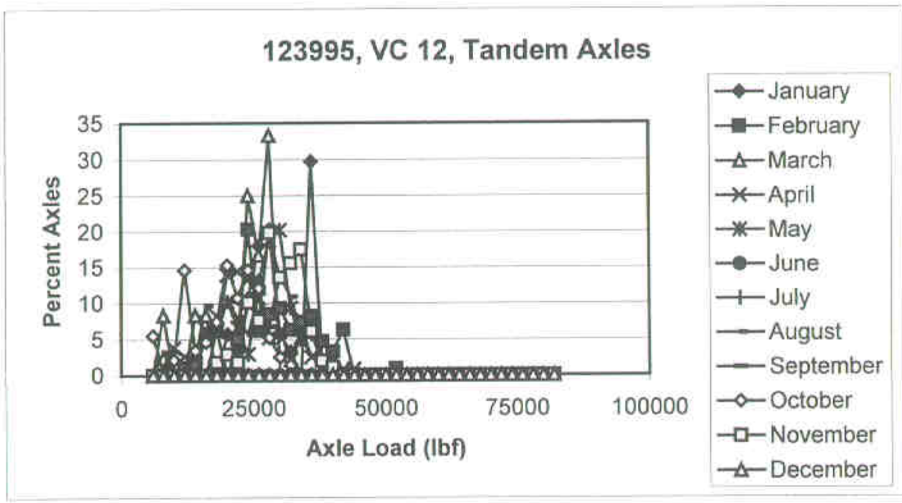
September
October
November
December



123995, VC 12, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
0
25000
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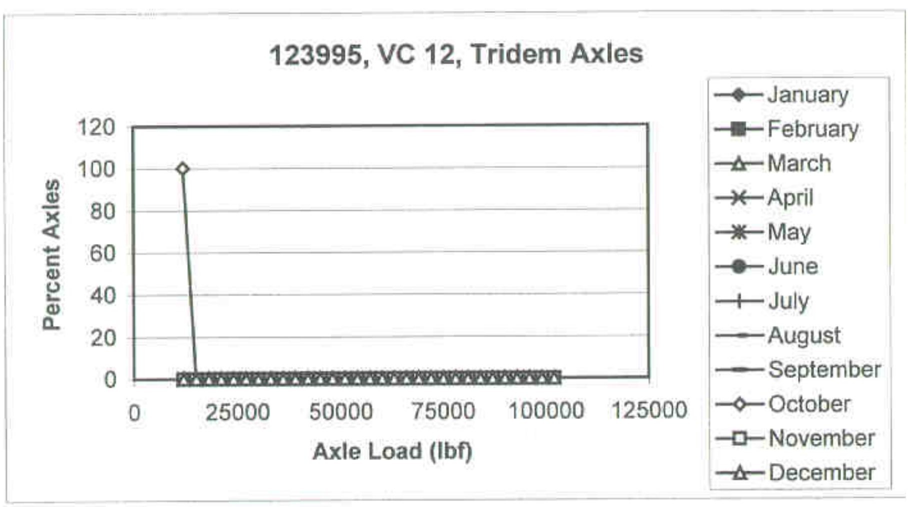
August
September
October
November
December



123995, VC 12, Tridem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
0
25000
50000
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100000
125000
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February
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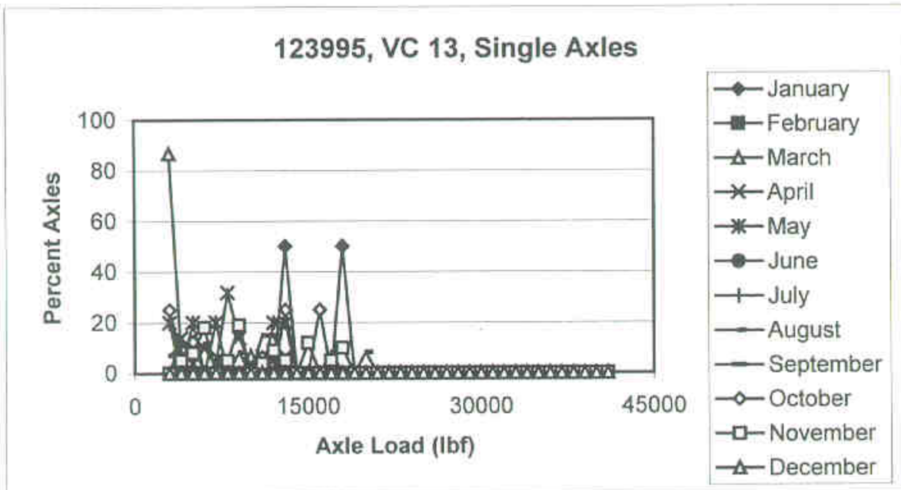
September
October
November
December


123995, VC 13, Single Axles
Percent Axles
100
80
60
40
20
0
0
15000
30000
45000
Axle Load (lbf)
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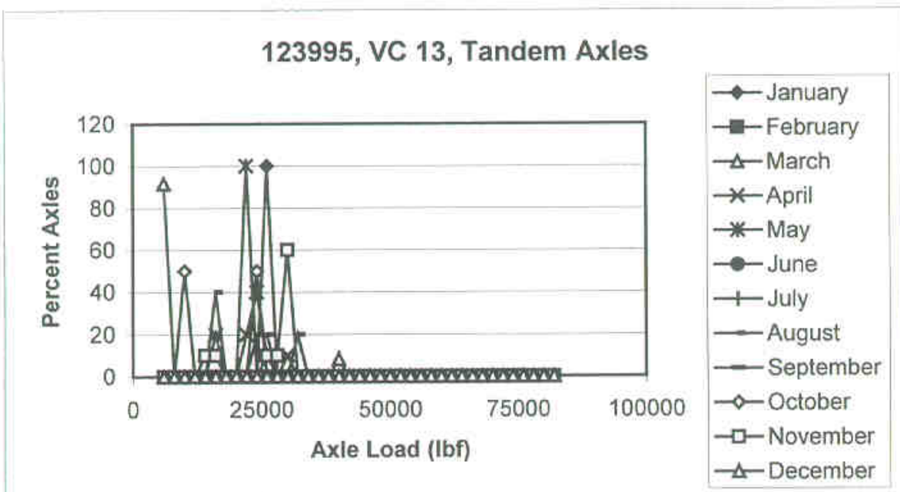
September
October
November
December


123995, VC 13, Tandem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
Axle Load (lbf)
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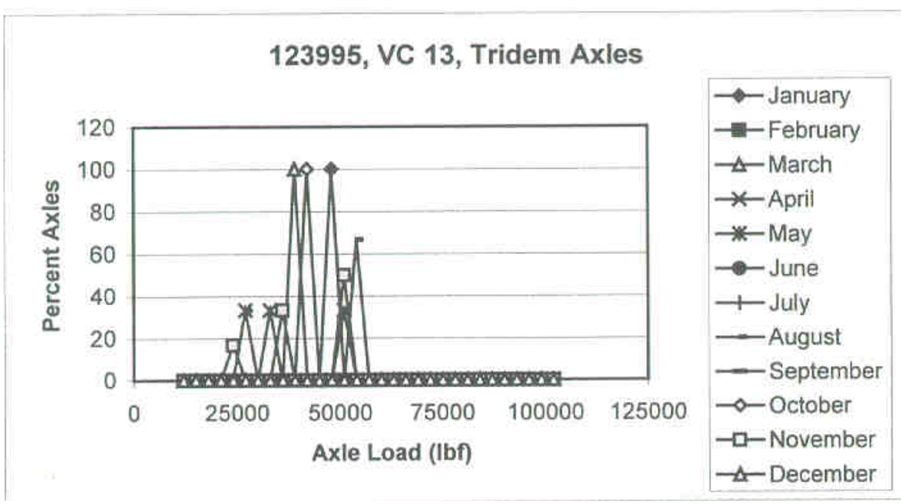
September
October
November
December


123995, VC 13, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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May
June
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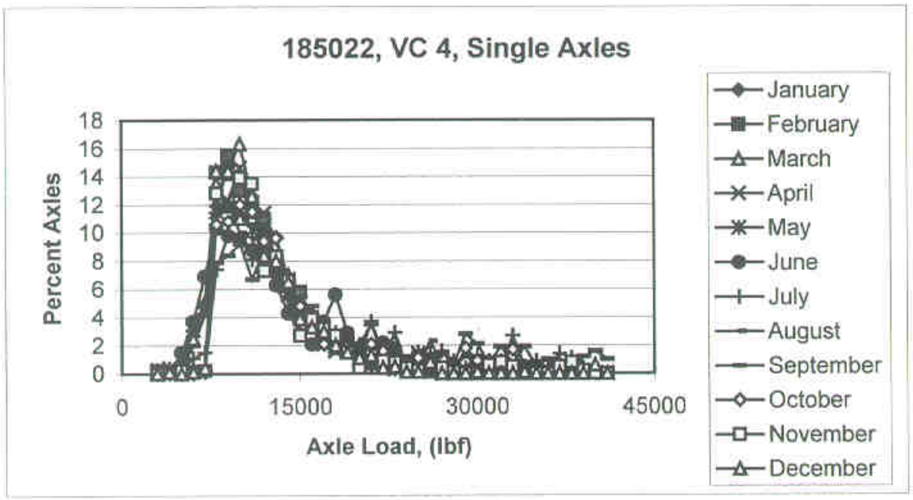
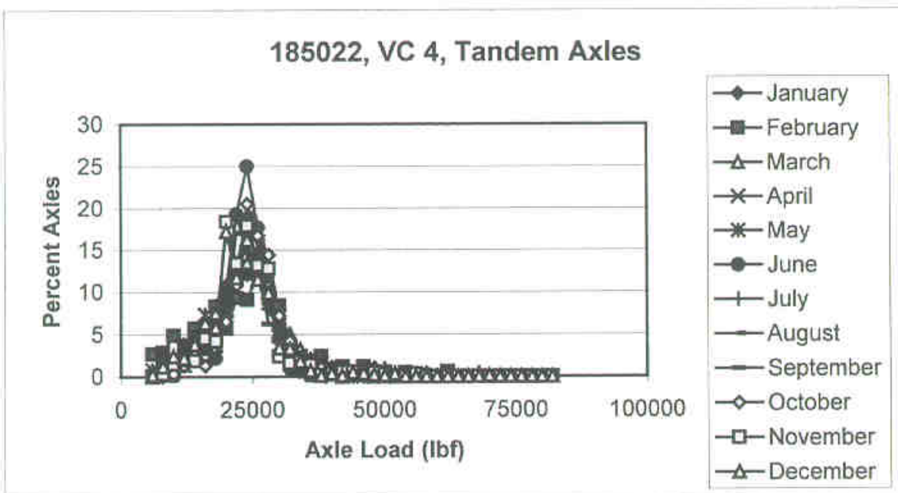
August
September
October
November
December


185022, VC 4, Single Axles
Percent Axles
Axle Load, (lbf)
18
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


185022, VC 4, Tandem Axles
Percent Axles
Axle Load (lbf)
30
25
20
15
10
5
0
0
25000
50000
75000
100000
January
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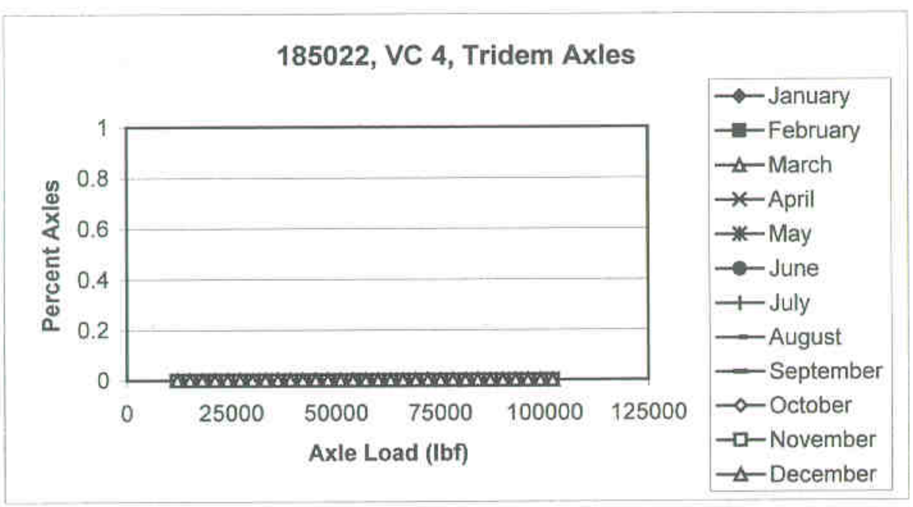
August
September
October
November
December


185022, VC 4, Tridem Axles
Percent Axles
Axle Load (lbf)
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
January
February
March
April
May
June
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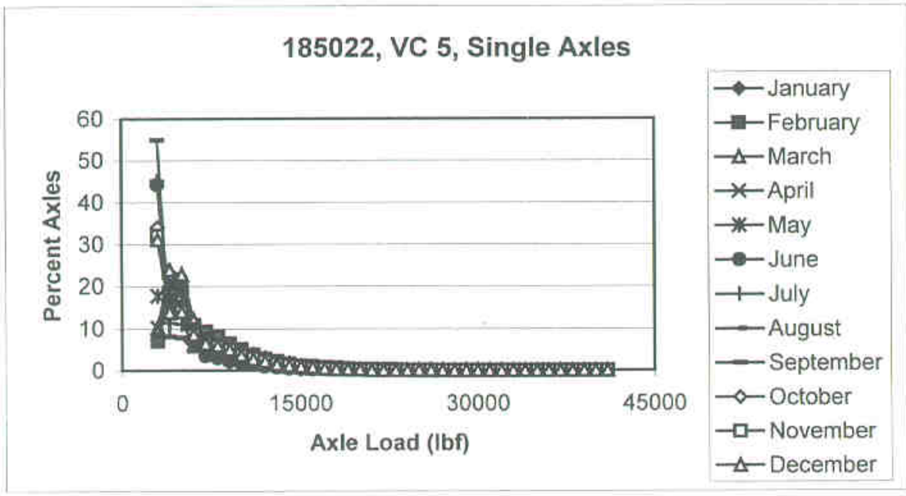
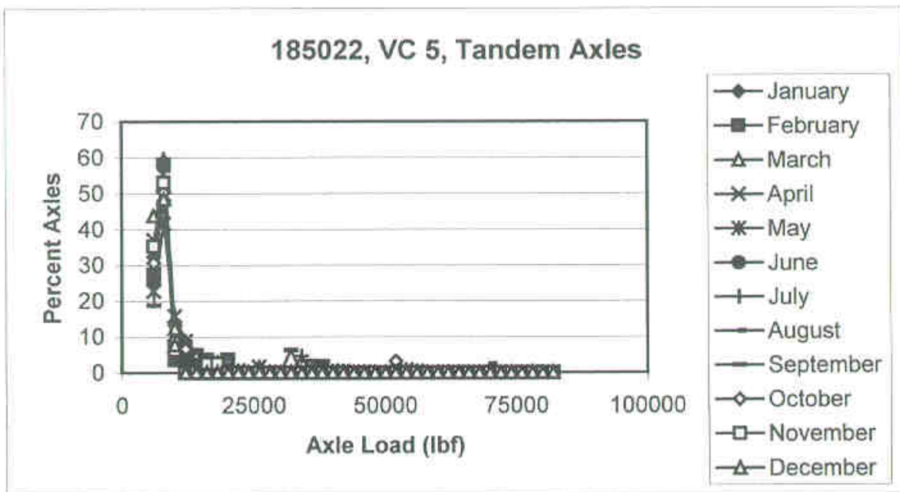
September
October
November
December


185022, VC 5, Single Axles
Percent Axles
60
50
40
30
20
10
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


185022, VC 5, Tandem Axles
Percent Axles
70
60
50
40
30
20
10
0
0
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50000
75000
100000
Axle Load (lbf)
January
February
March
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September
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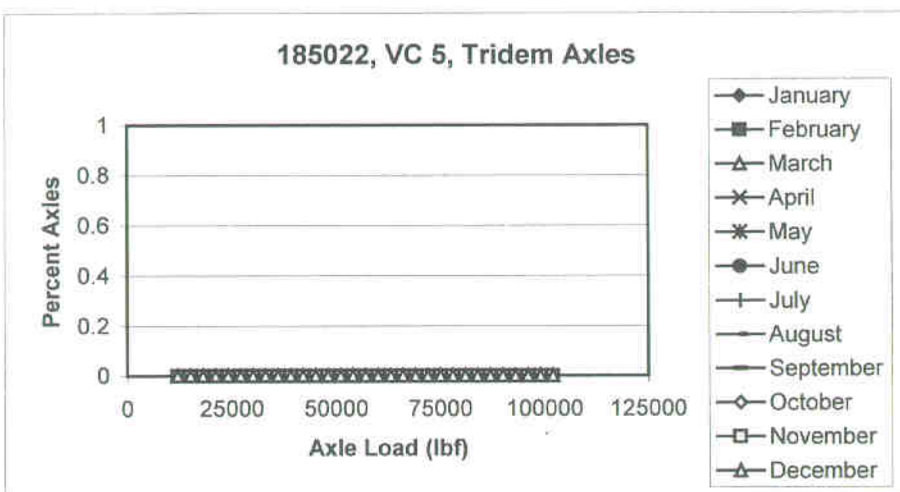
November
December


185022, VC 5, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
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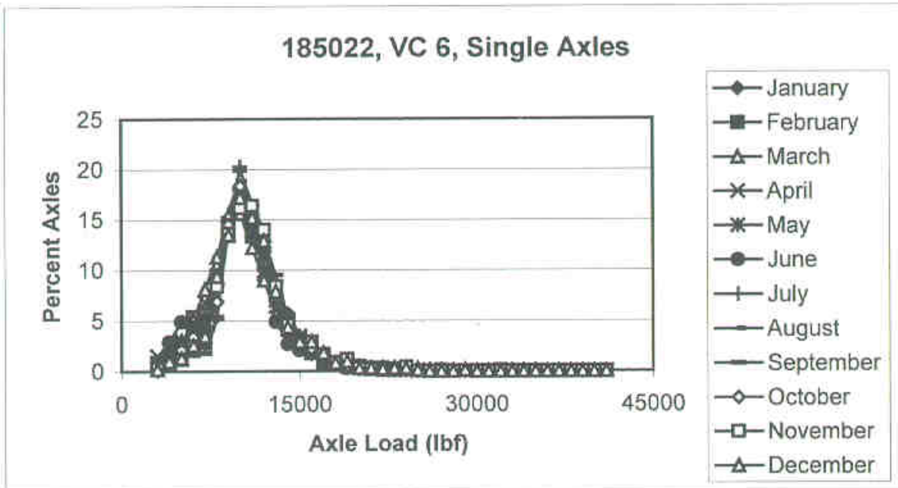
September
October
November
December


185022, VC 6, Single Axles
Percent Axles
25
20
15
10
5
0
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15000
30000
45000
Axle Load (lbf)
January
February
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October
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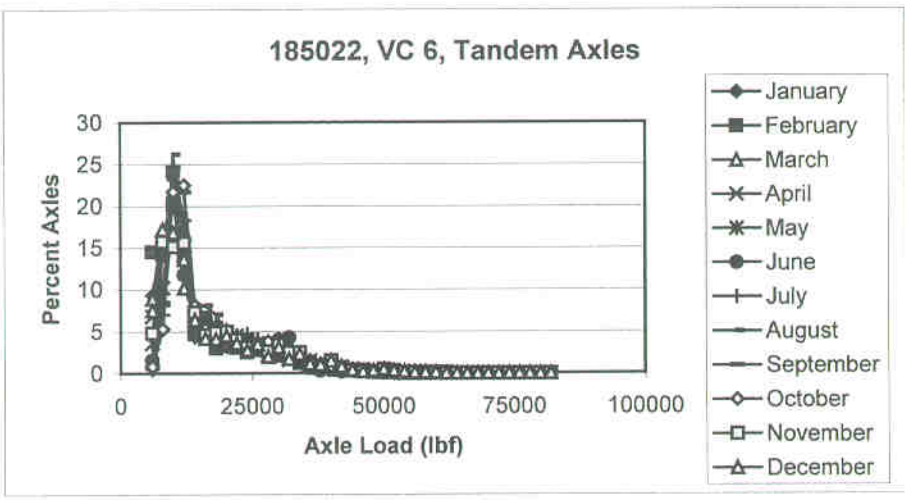
December


185022, VC 6, Tandem Axles
Percent Axles
30
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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May
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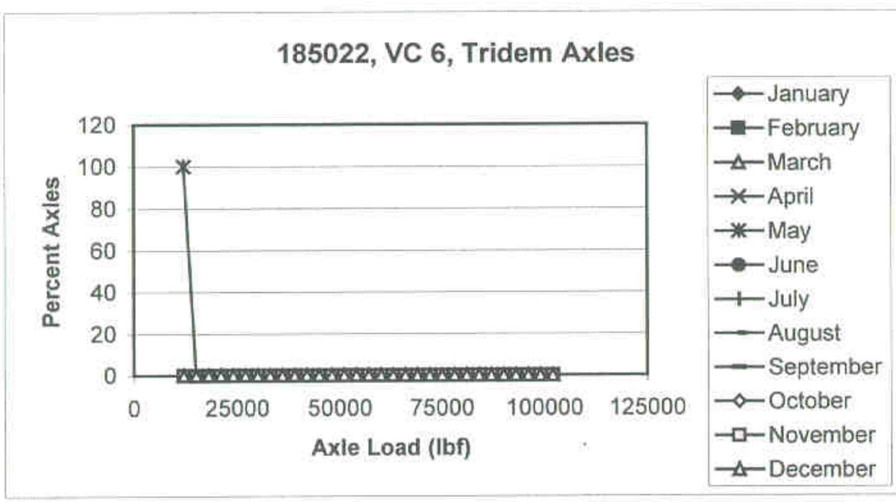
December


185022, VC 6, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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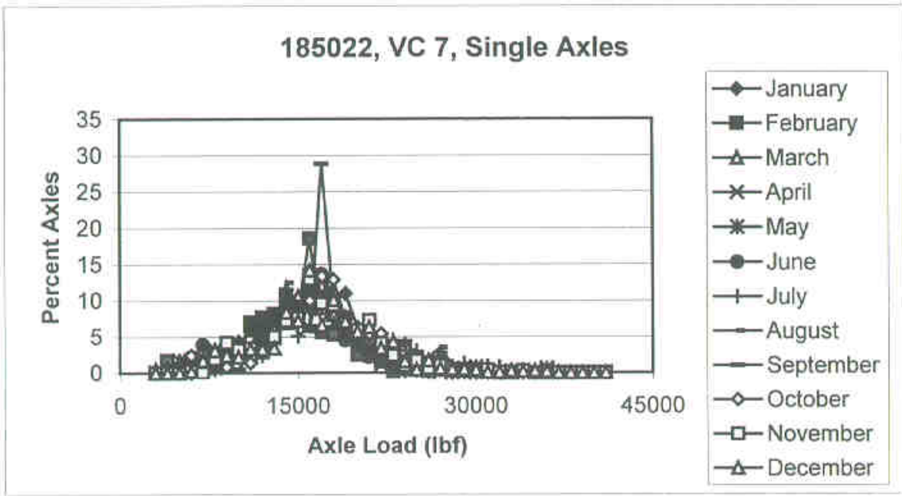
November
December


185022, VC 7, Single Axles
Percent Axles
Axle Load (lbf)
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5
10
15
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30000
45000
January
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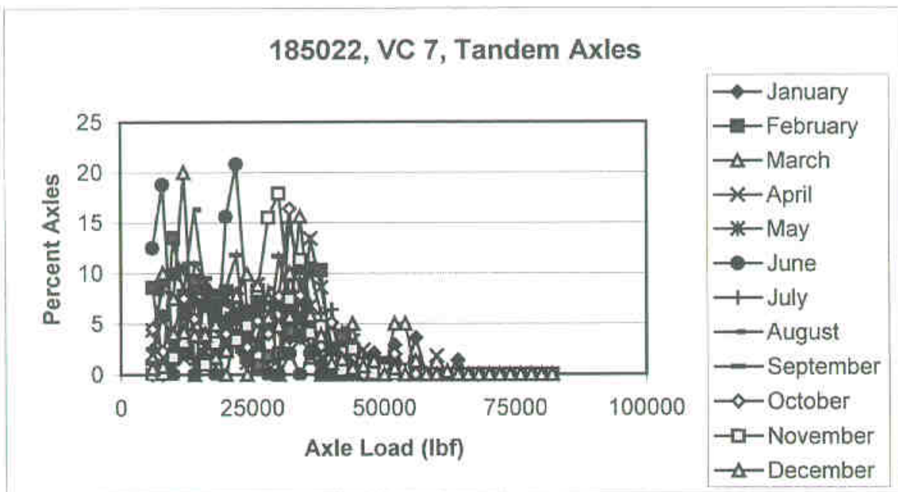
185022, VC 7, Tandem Axles
Percent Axles
Axle Load (lbf)
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10
15
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50000
75000
100000
January
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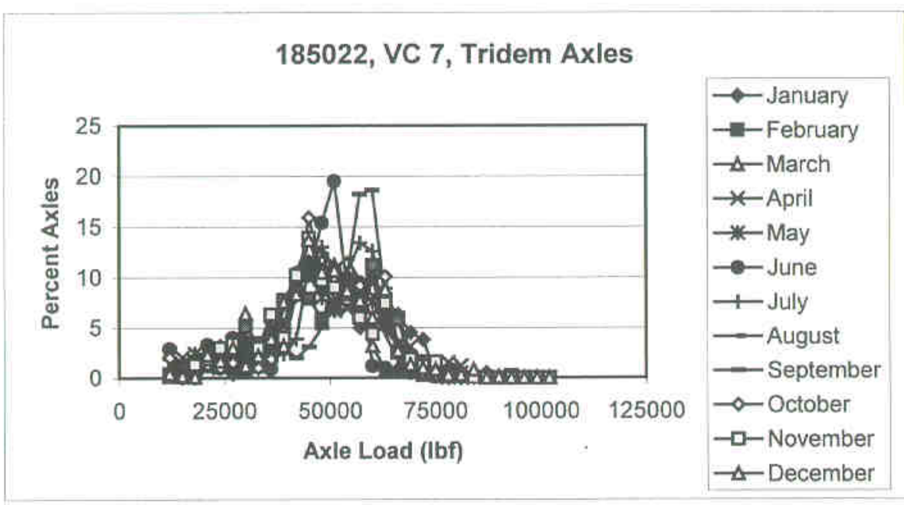
185022, VC 7, Tridem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
0
25000
50000
75000
100000
125000
January
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March
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May
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November
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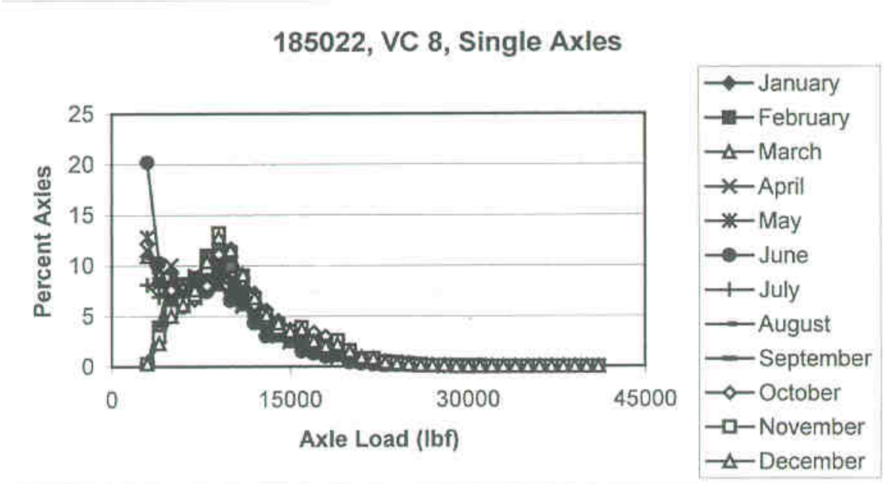
185022, VC 8, Single Axles
Percent Axles
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20
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5
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15000
30000
45000
Axle Load (lbf)
January
February
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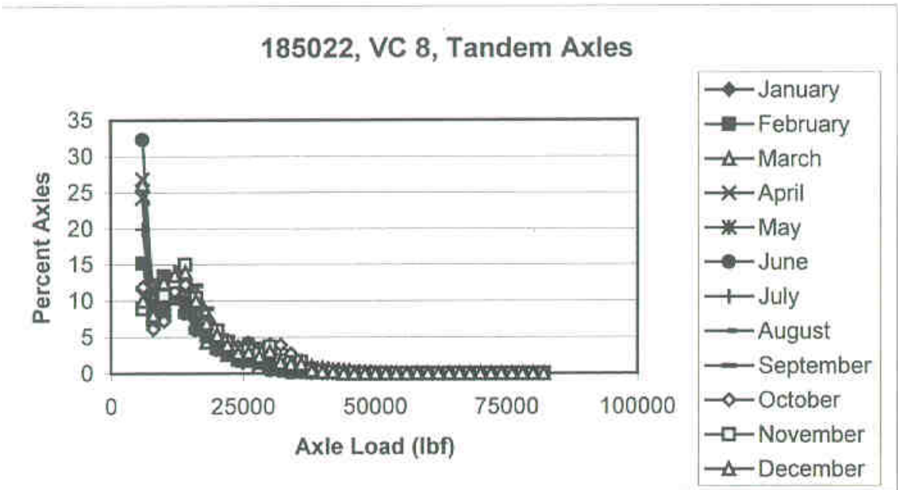
September
October
November
December


185022, VC 8, Tandem Axles
Percent Axles
35
30
25
20
15
10
5
0
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25000
50000
75000
100000
Axle Load (lbf)
January
February
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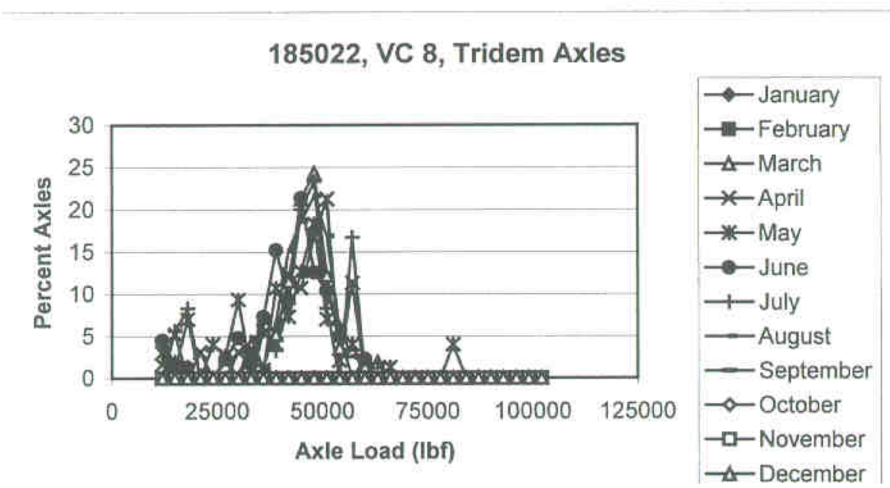
November
December


185022, VC 8, Tridem Axles
Percent Axles
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25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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May
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September
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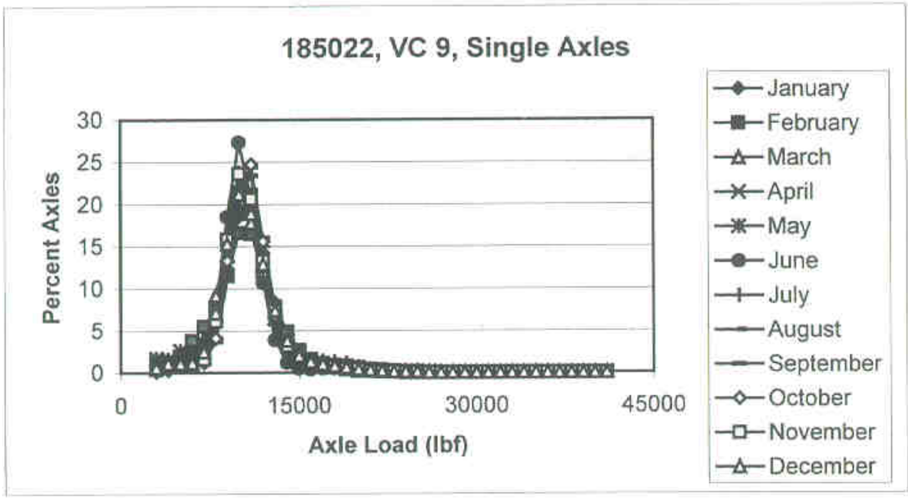
November
December


185022, VC 9, Single Axles
Percent Axles
Axle Load (lbf)
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5
10
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25
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15000
30000
45000
January
February
March
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May
June
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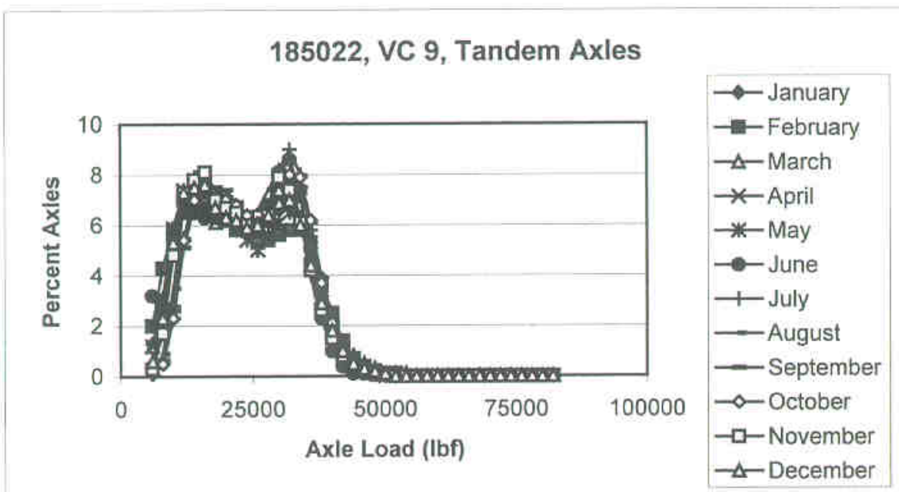
September
October
November
December


185022, VC 9, Tandem Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
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25000
50000
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September
October
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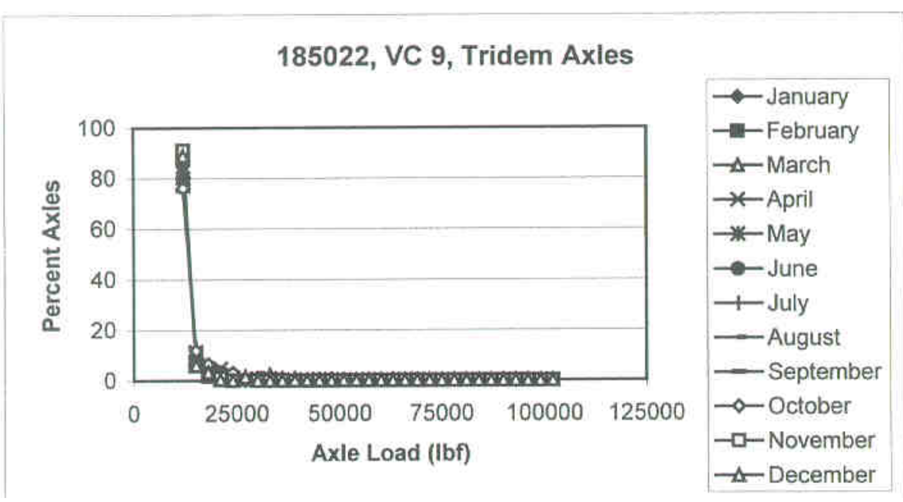
December


185022, VC 9, Tridem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
0
25000
50000
75000
100000
125000
January
February
March
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May
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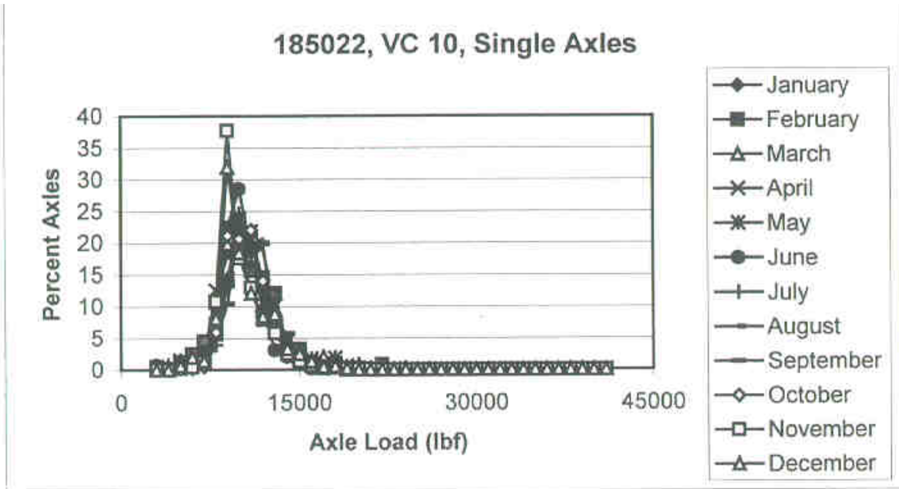
December


185022, VC 10, Single Axles
Percent Axles
Axle Load (lbf)
January
February
March
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May
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September
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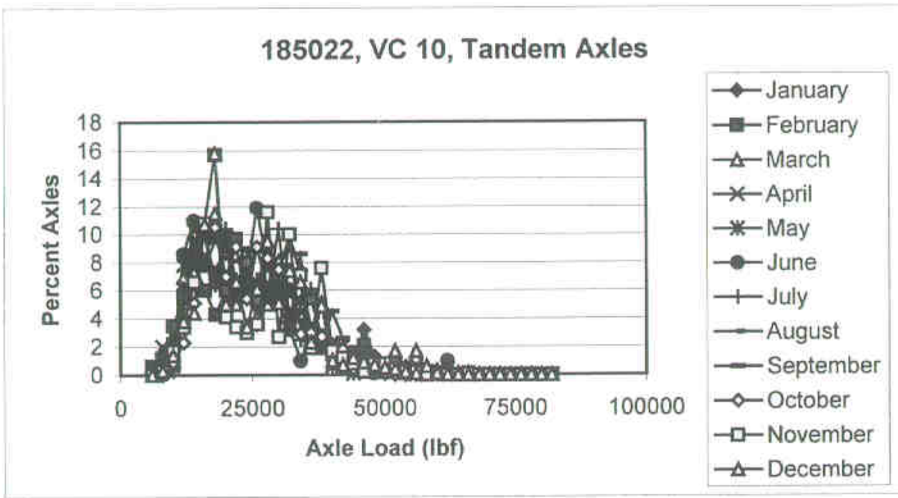
November
December


185022, VC 10, Tandem Axles
Percent Axles
Axle Load (lbf)
January
February
March
April
May
June
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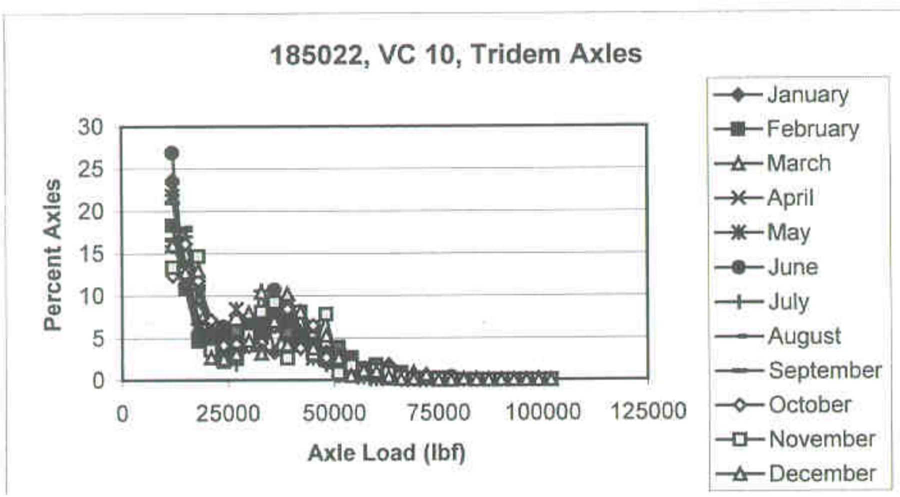
September
October
November
December


185022, VC 10, Tridem Axles
Percent Axles
Axle Load (lbf)
January
February
March
April
May
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September
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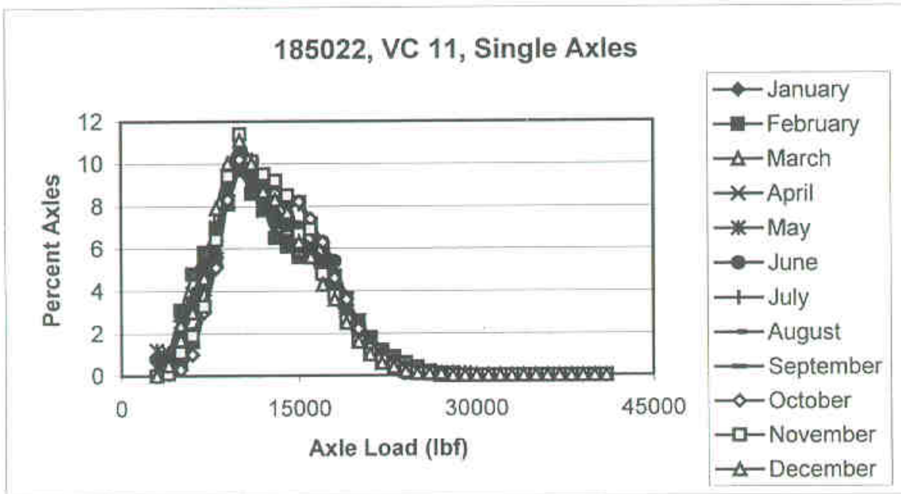
November
December



185022, VC 11, Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
0
15000
30000
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January
February
March
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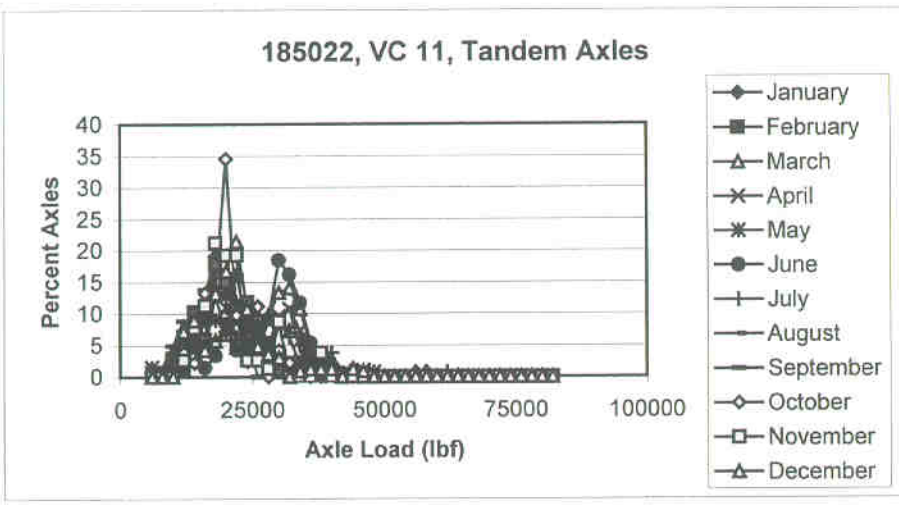
August
September
October
November
December



185022, VC 11, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
40
0
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50000
75000
100000
January
February
March
April
May
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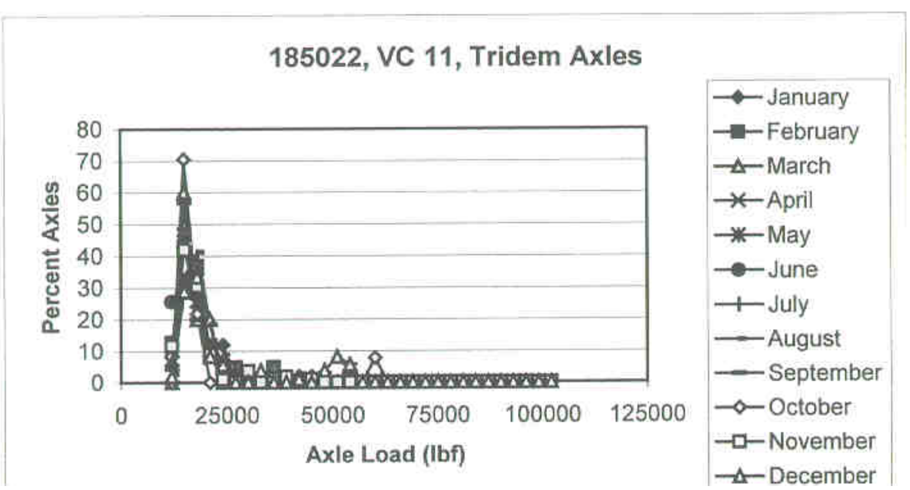
August
September
October
November
December



185022, VC 11, Tridem Axles
Percent Axles
Axle Load (lbf)
0
10
20
30
40
50
60
70
80
0
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50000
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100000
125000
January
February
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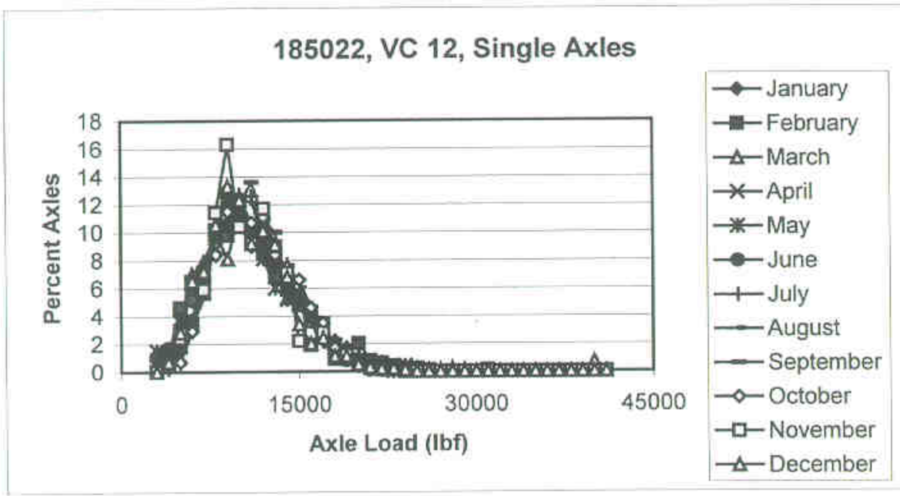
August
September
October
November
December



185022, VC 12, Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
16
18
0
15000
30000
45000
January
February
March
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May
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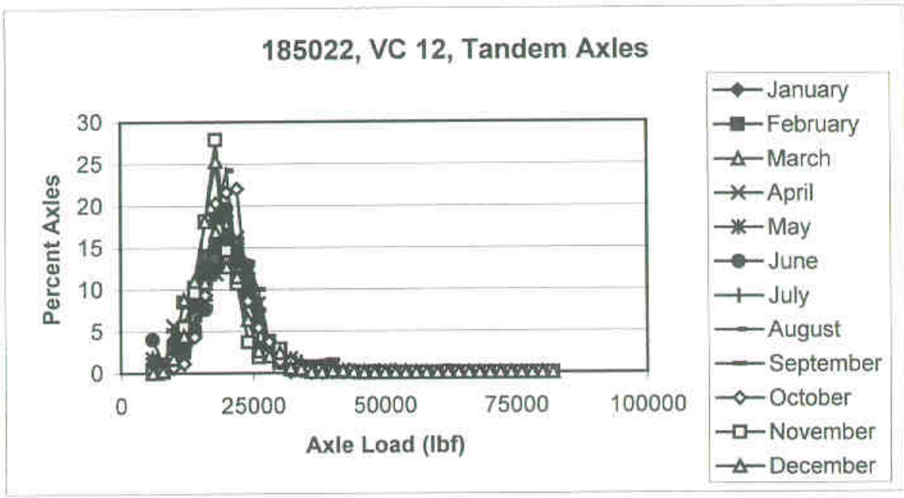
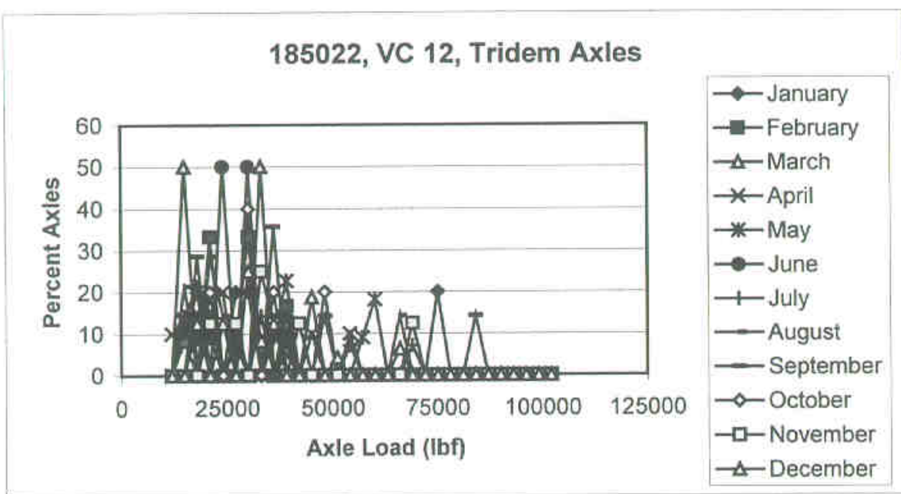
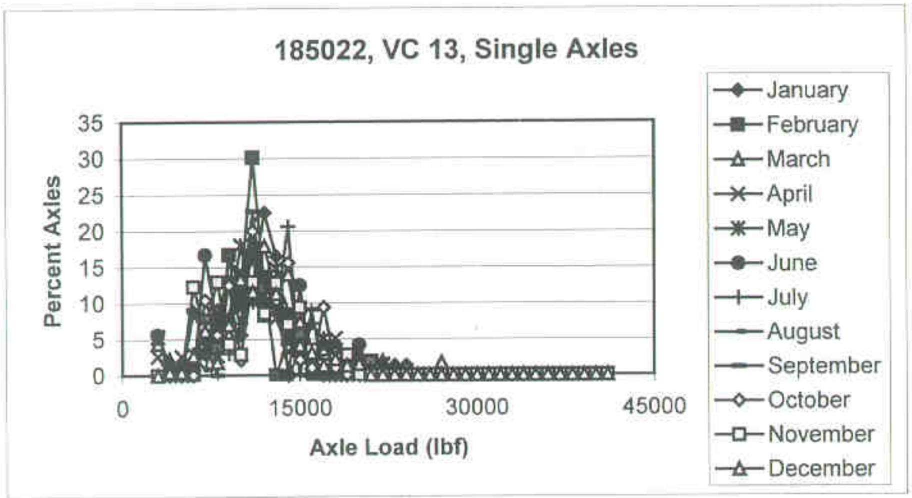
September
October
November
December

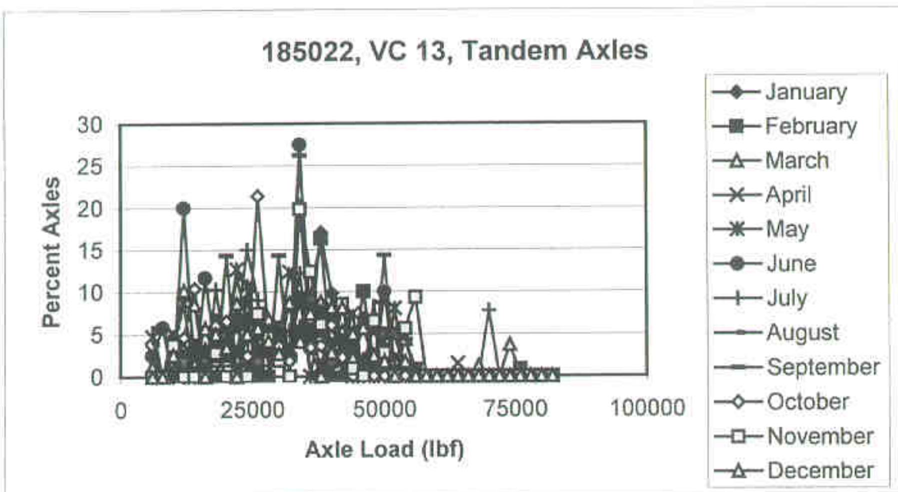


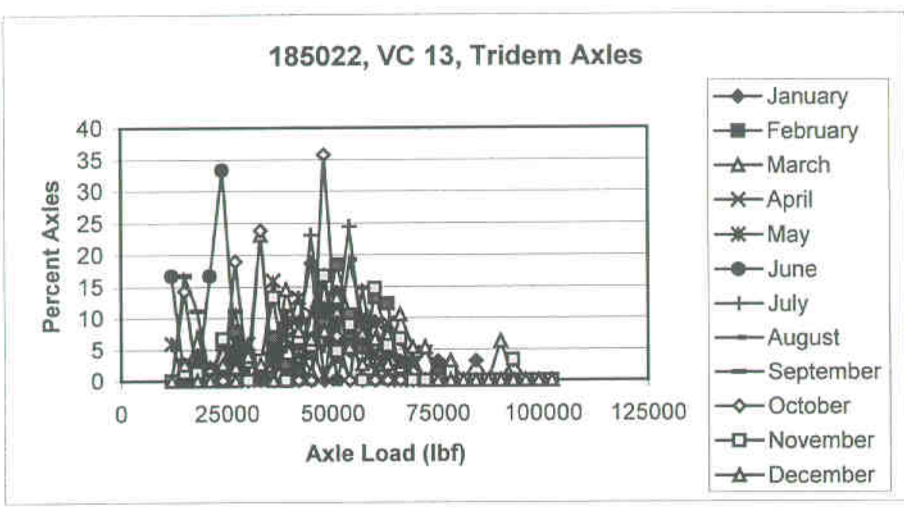
185022, VC 12, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
0
25000
50000
75000
100000
January
February
March
April
May
June
July
August
September
October
November
December

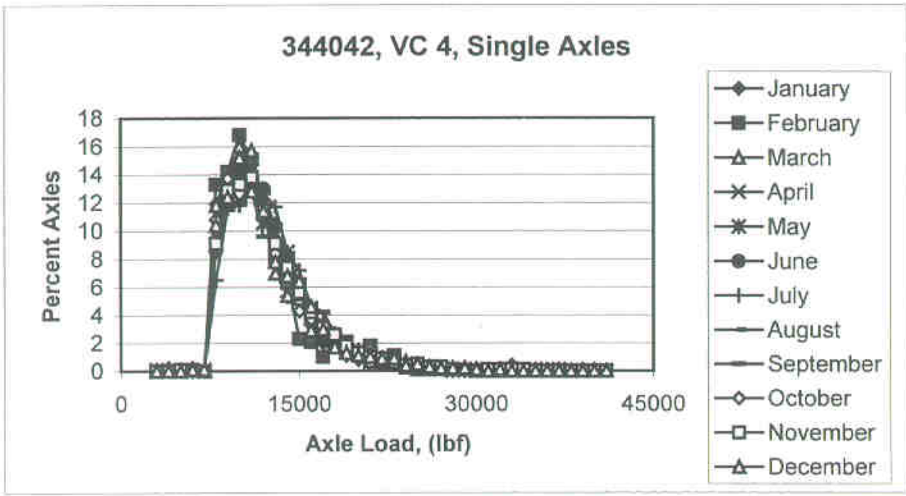


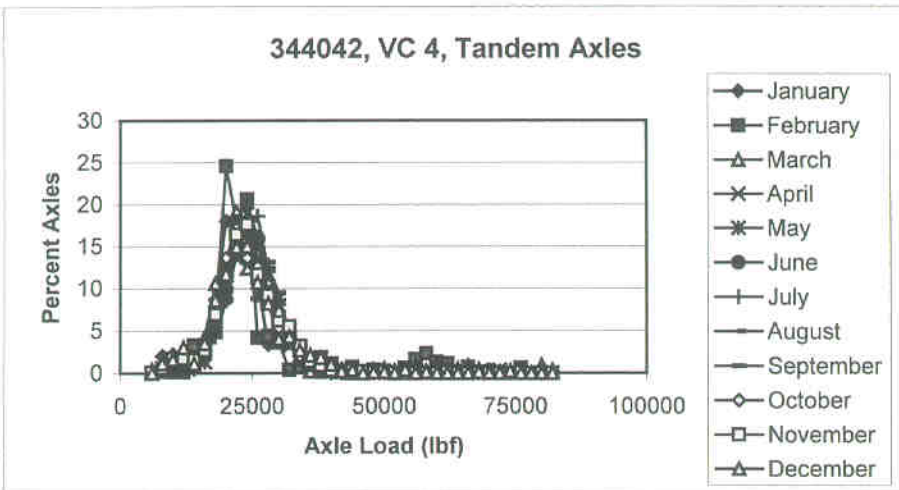
185022, VC 12, Tridem Axles
Percent Axles
Axle Load (lbf)
0
10
20
30
40
50
60
0
25000
50000
75000
100000
125000
January
February
March
April
May
June
July
August
September
October
November
December


185022, VC 13, Single Axles
Percent Axles
35
30
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


185022, VC 13, Tandem Axles
Percent Axles
30
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


185022, VC 13, Tridem Axles
Percent Axles
40
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


344042, VC 4, Single Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load, (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


344042, VC 4, Tandem Axles
Percent Axles
30
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
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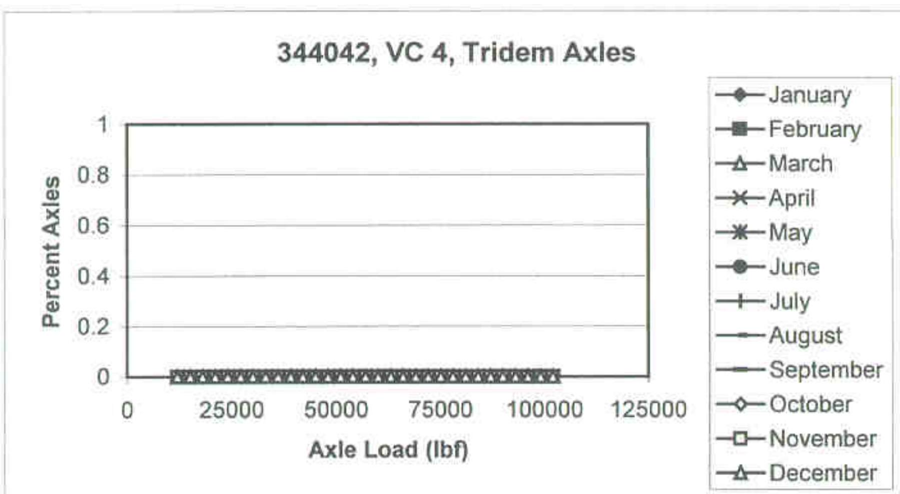
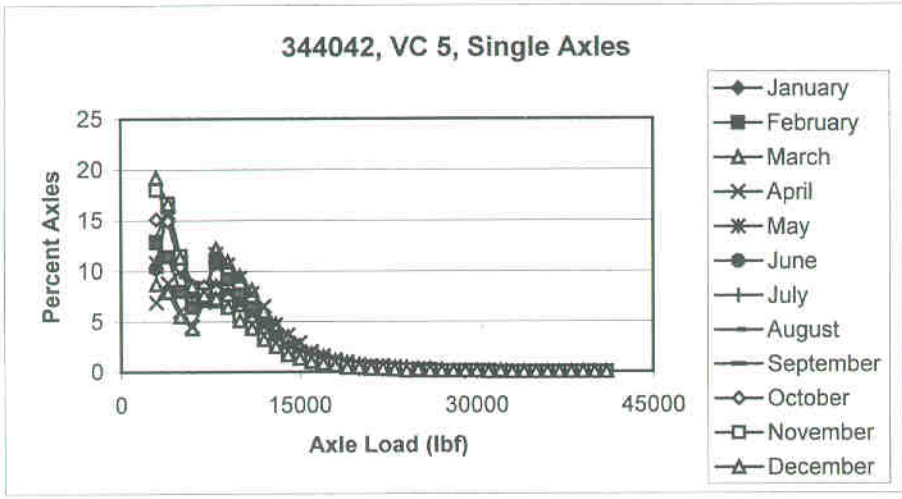
August
September
October
November
December


344042, VC 4, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


344042, VC 5, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
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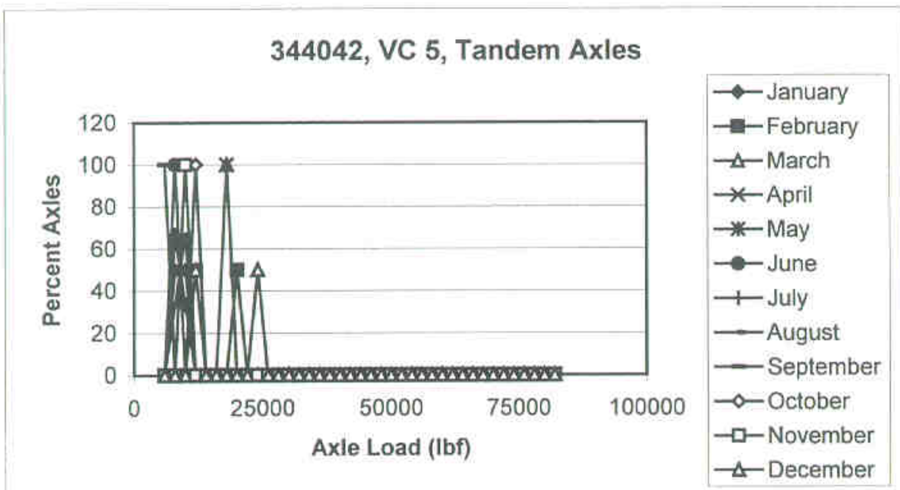
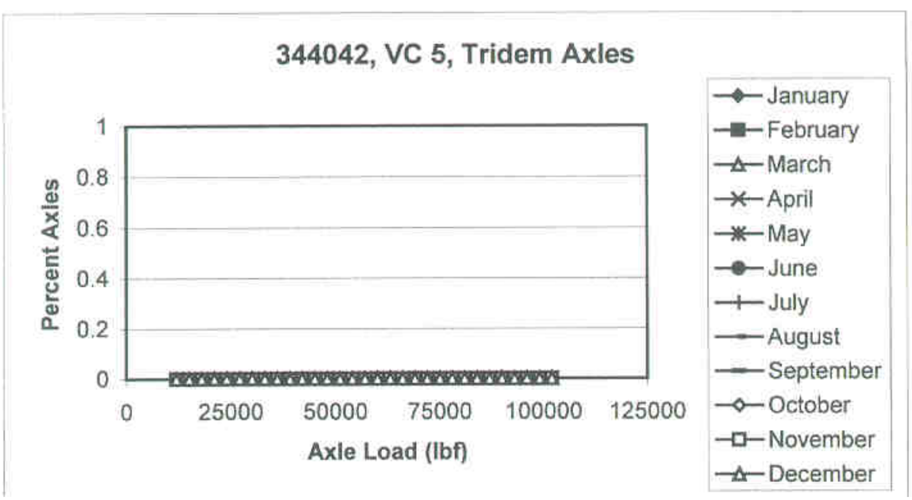
July
August
September
October
November
December


344042, VC 5, Tandem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


344042, VC 5, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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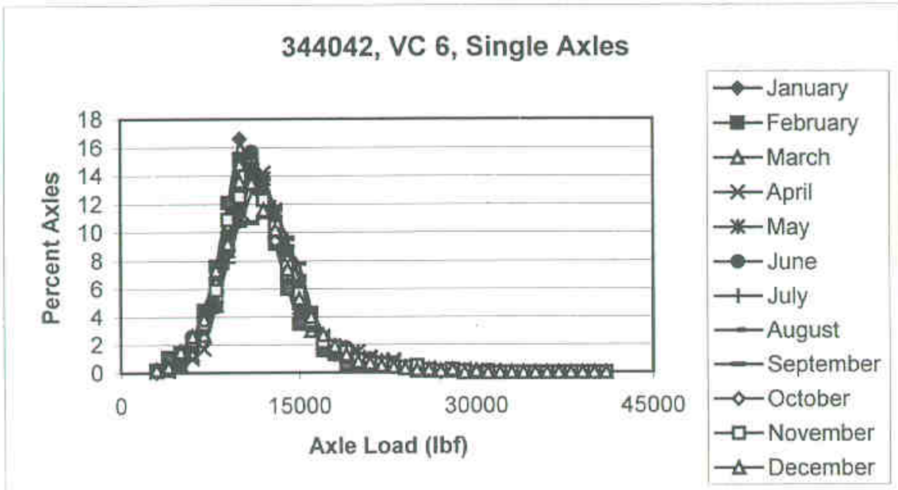
September
October
November
December


344042, VC 6, Single Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
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June
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September
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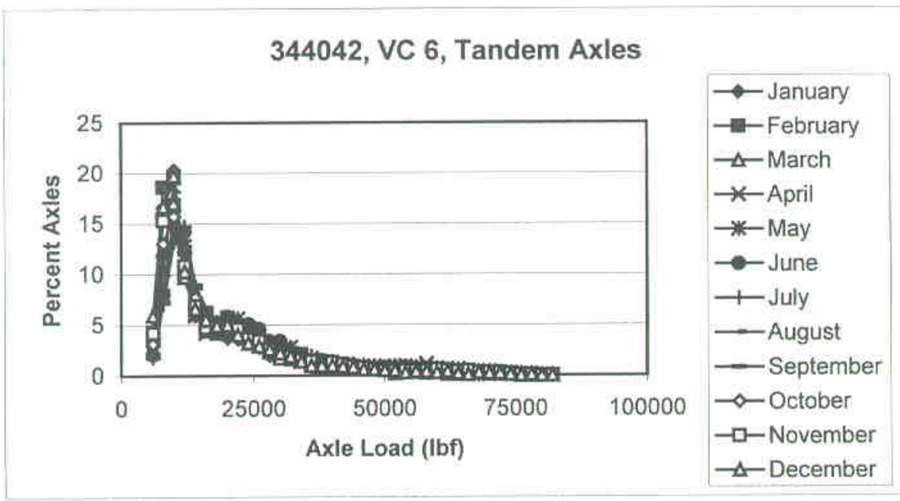
November
December


344042, VC 6, Tandem Axles
Percent Axles
25
20
15
10
5
0
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25000
50000
75000
100000
Axle Load (lbf)
January
February
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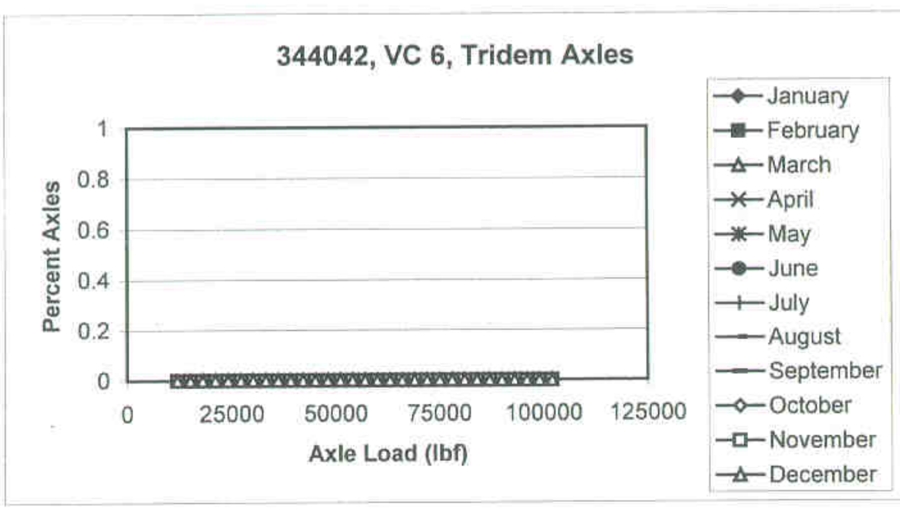
September
October
November
December


344042, VC 6, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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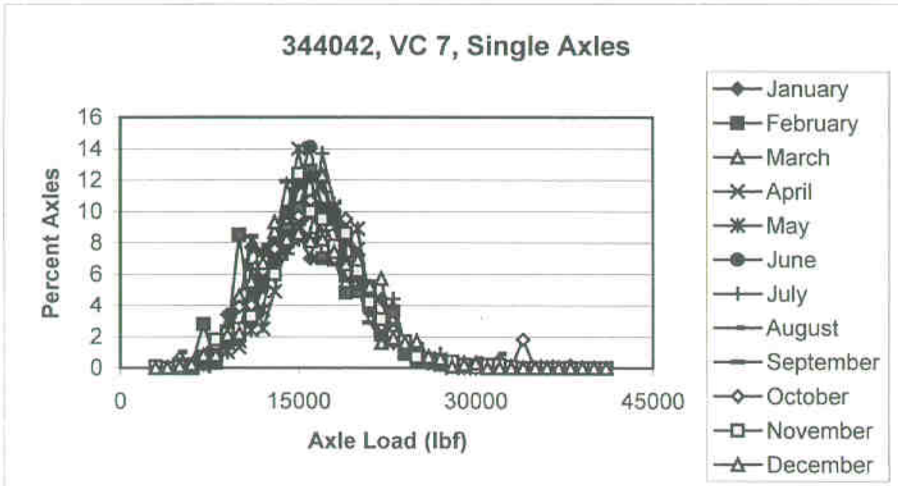
September
October
November
December


344042, VC 7, Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
16
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30000
45000
January
February
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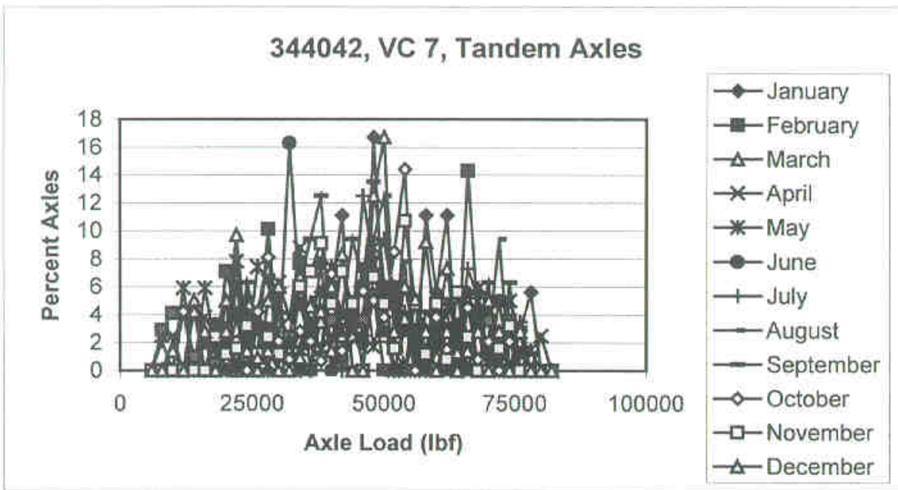
August
September
October
November
December


344042, VC 7, Tandem Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
16
18
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50000
75000
100000
January
February
March
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June
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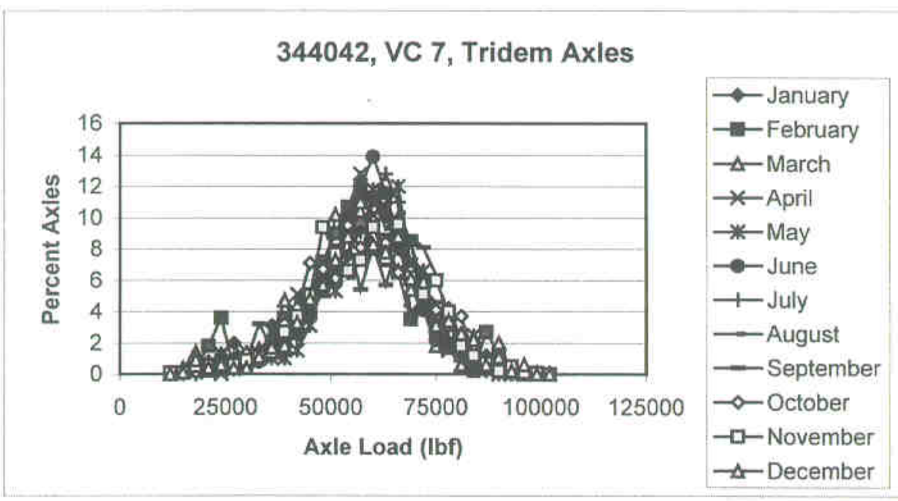
September
October
November
December


344042, VC 7, Tridem Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
16
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75000
100000
125000
January
February
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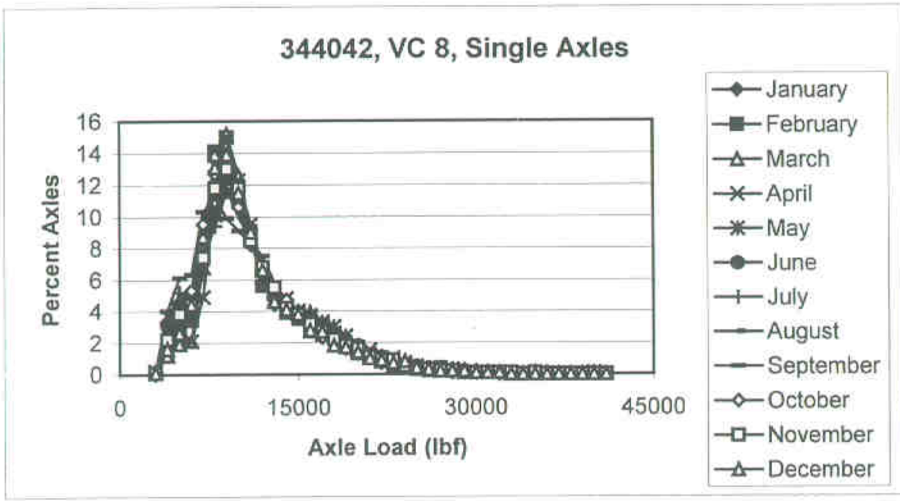
September
October
November
December



344042, VC 8, Single Axles
Percent Axles
Axle Load (lbf)
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
January
February
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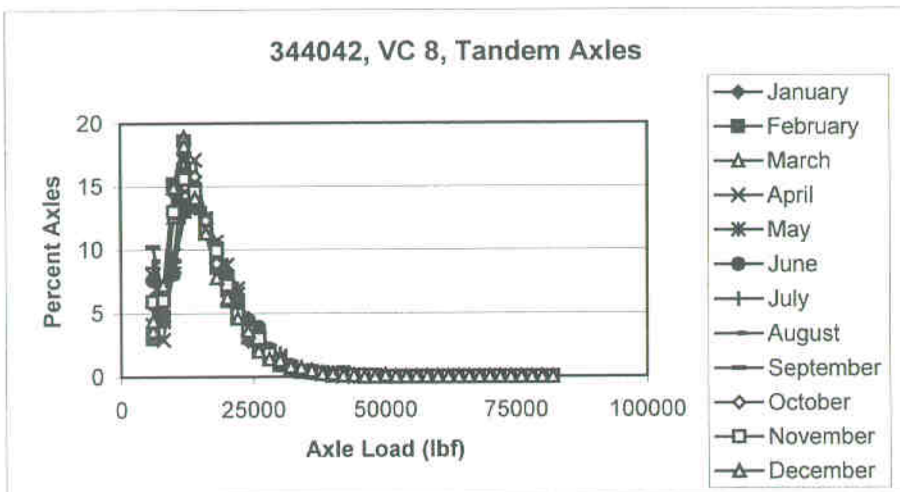
August
September
October
November
December



344042, VC 8, Tandem Axles
Percent Axles
Axle Load (lbf)
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15
10
5
0
0
25000
50000
75000
100000
January
February
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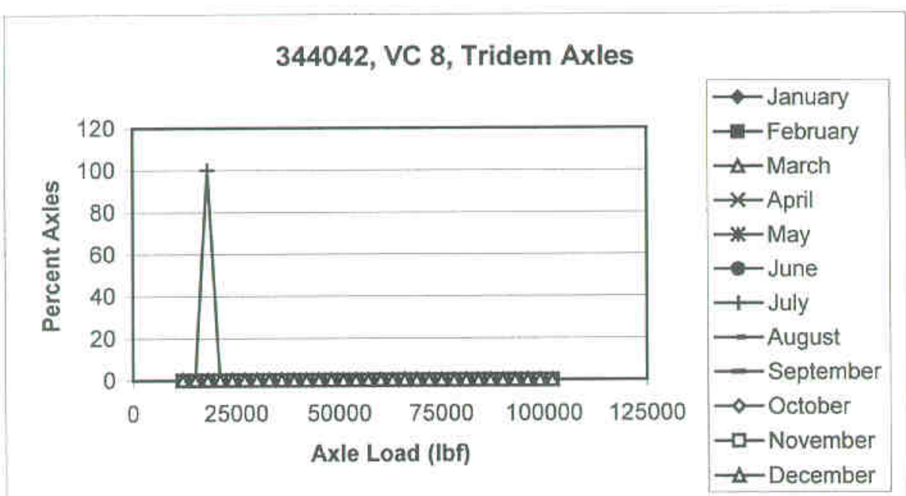
August
September
October
November
December



344042, VC 8, Tridem Axles
Percent Axles
Axle Load (lbf)
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
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February
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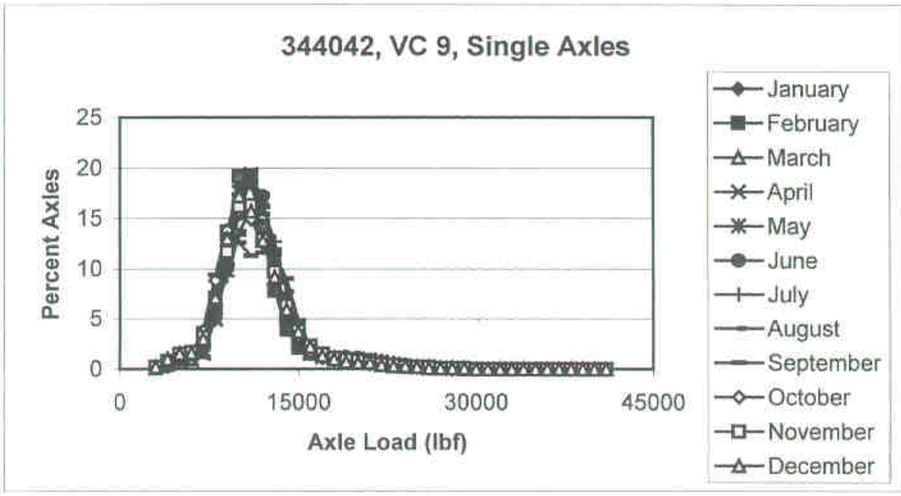
October
November
December


344042, VC 9, Single Axles
Percent Axles
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20
15
10
5
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15000
30000
45000
Axle Load (lbf)
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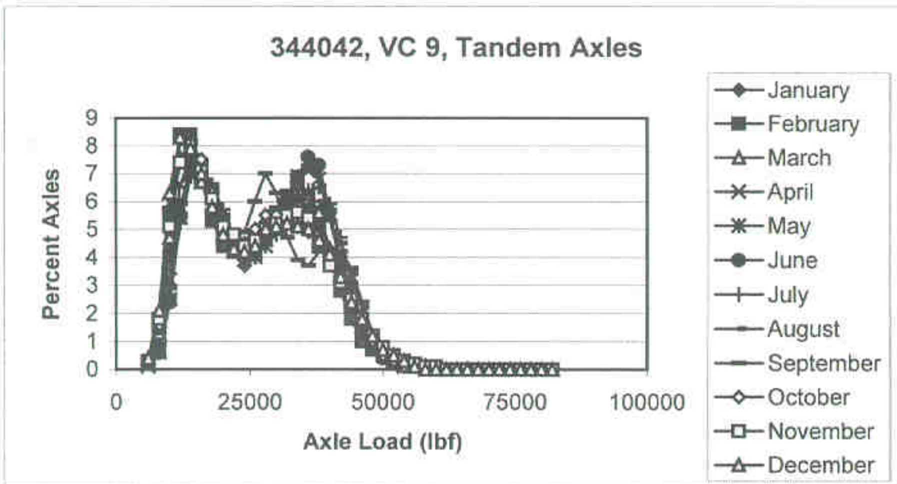
November
December


344042, VC 9, Tandem Axles
Percent Axles
9
8
7
6
5
4
3
2
1
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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September
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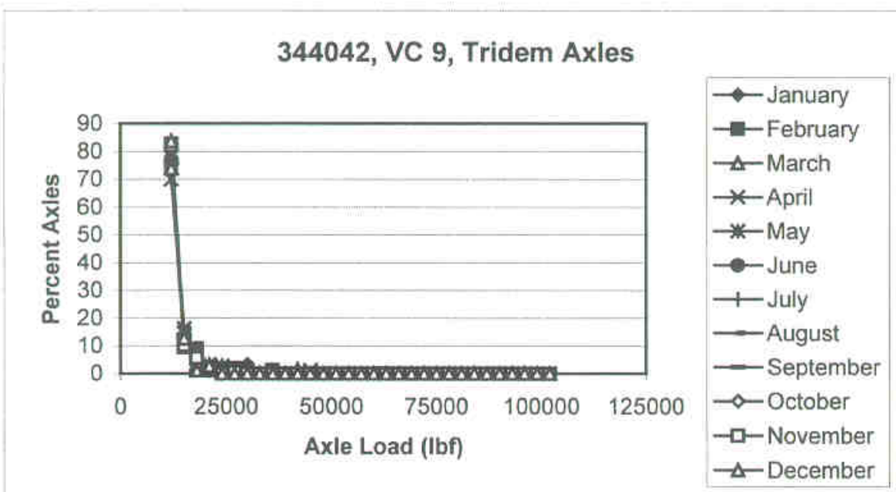
December


344042, VC 9, Tridem Axles
Percent Axles
90
80
70
60
50
40
30
20
10
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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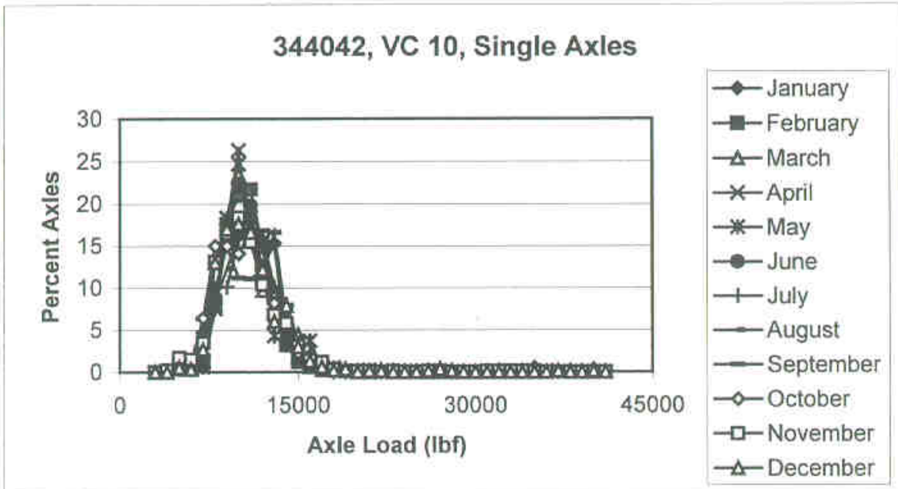
August
September
October
November
December


344042, VC 10, Single Axles
Percent Axles
Axle Load (lbf)
30
25
20
15
10
5
0
0
15000
30000
45000
January
February
March
April
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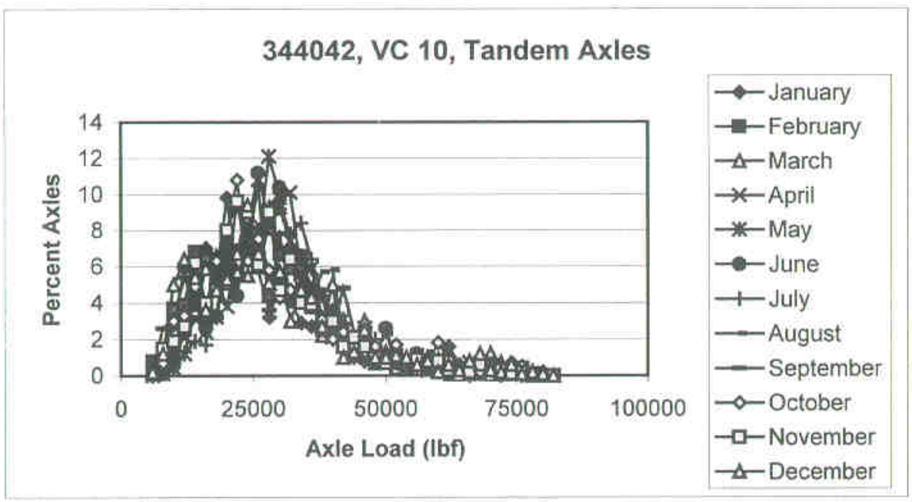
September
October
November
December


344042, VC 10, Tandem Axles
Percent Axles
Axle Load (lbf)
14
12
10
8
6
4
2
0
0
25000
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75000
100000
January
February
March
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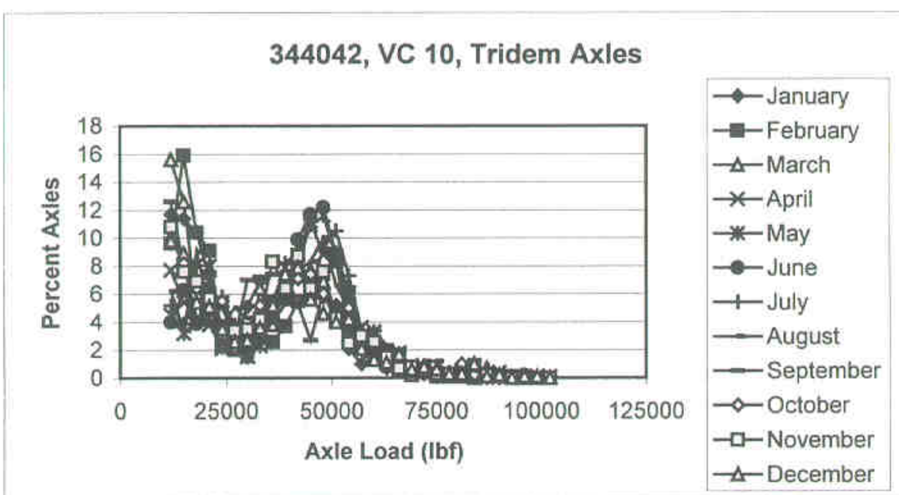
November
December


344042, VC 10, Tridem Axles
Percent Axles
Axle Load (lbf)
18
16
14
12
10
8
6
4
2
0
0
25000
50000
75000
100000
125000
January
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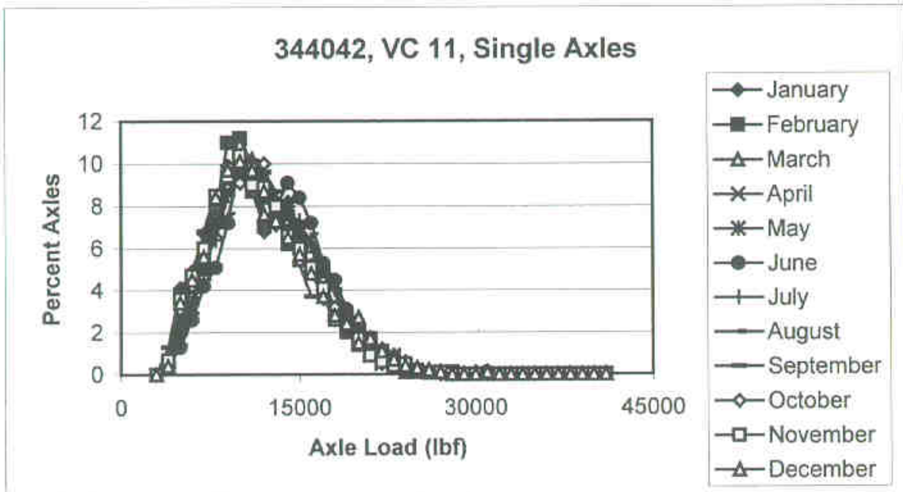
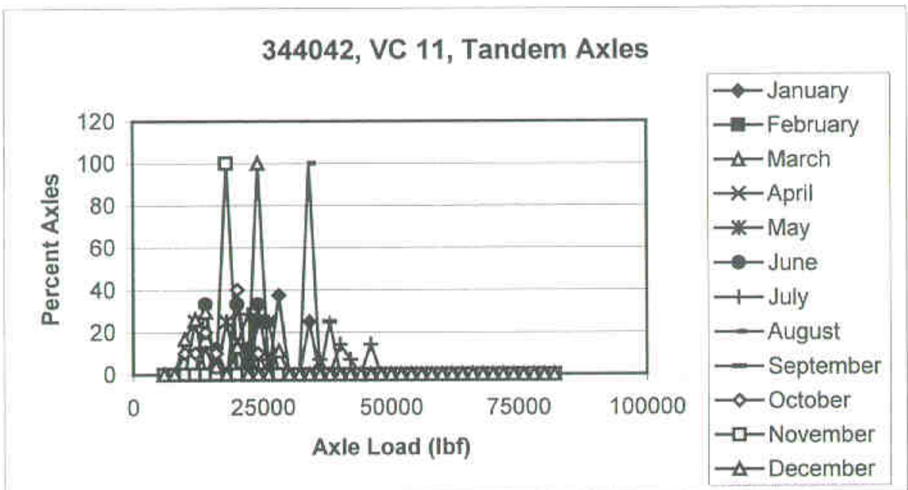
October
November
December


344042, VC 11, Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
0
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


344042, VC 11, Tandem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
0
25000
50000
75000
100000
January
February
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May
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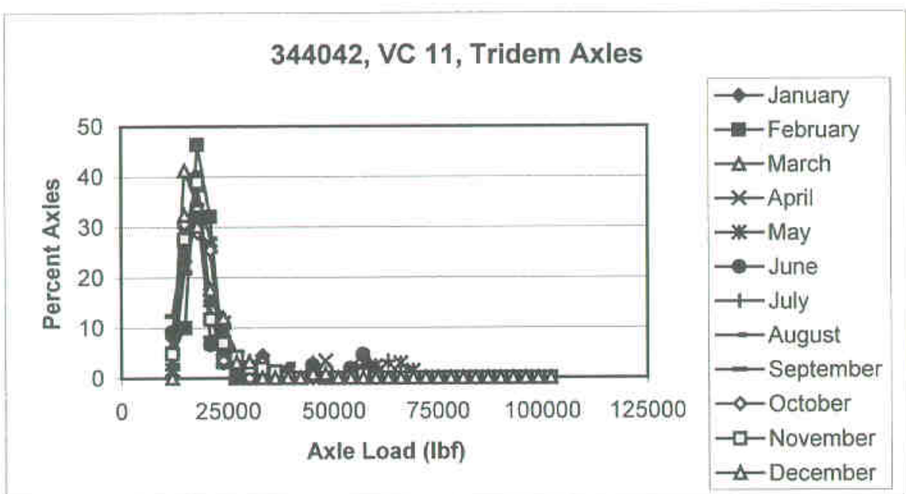
September
October
November
December


344042, VC 11, Tridem Axles
Percent Axles
Axle Load (lbf)
0
10
20
30
40
50
0
25000
50000
75000
100000
125000
January
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March
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September
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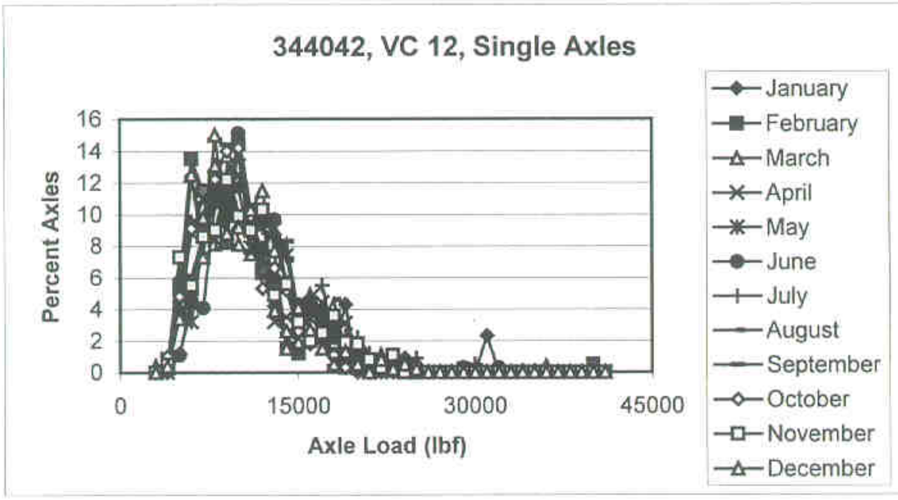
November
December


344042, VC 12, Single Axles
Percent Axles
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
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July
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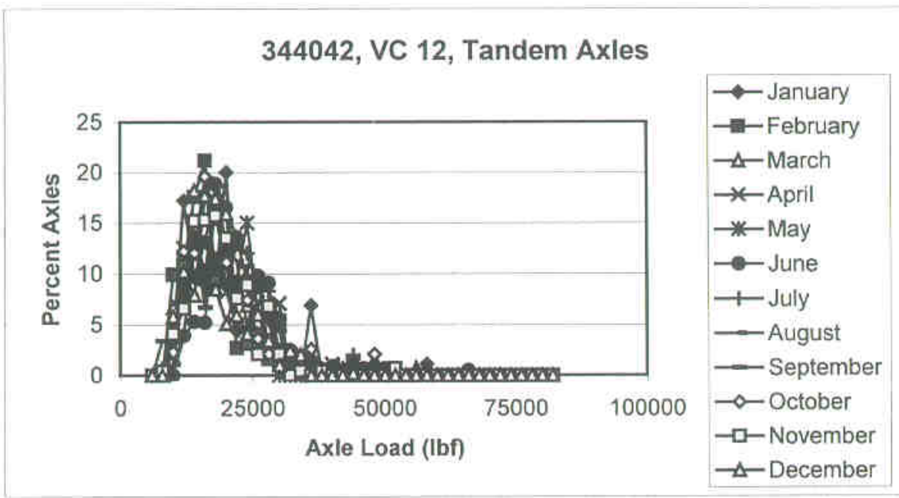
September
October
November
December


344042, VC 12, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
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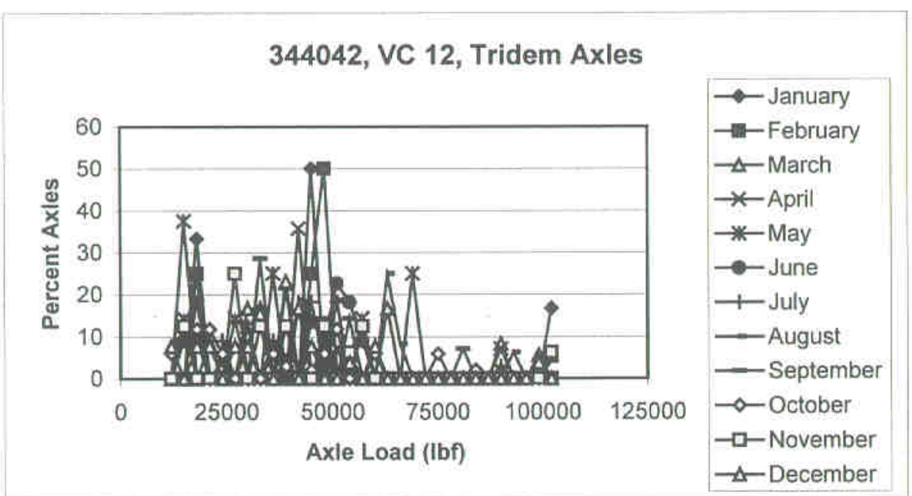
December


344042, VC 12, Tridem Axles
Percent Axles
60
50
40
30
20
10
0
0
25000
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75000
100000
125000
Axle Load (lbf)
January
February
March
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November
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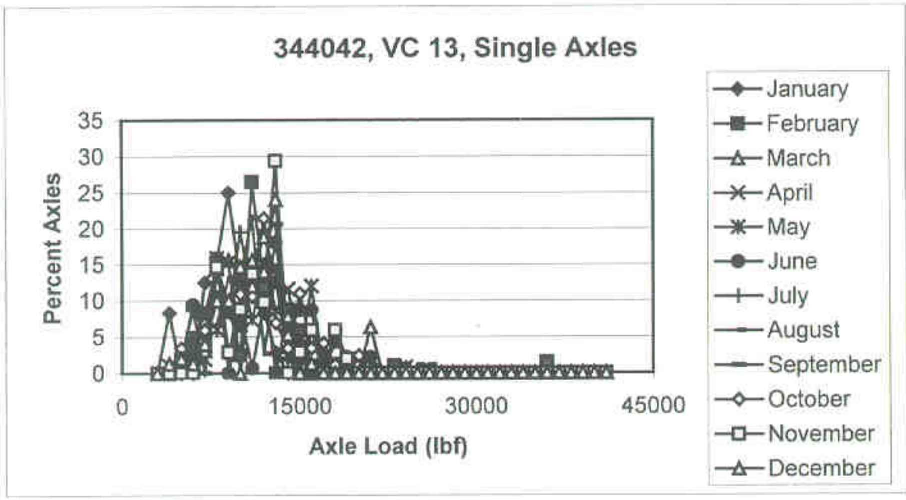
344042, VC 13, Single Axles
Percent Axles
35
30
25
20
15
10
5
0
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15000
30000
45000
Axle Load (lbf)
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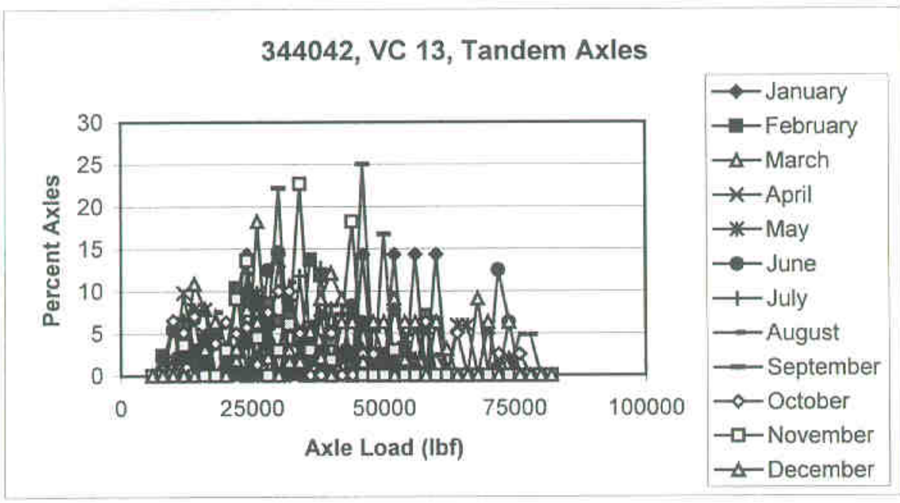
November
December


344042, VC 13, Tandem Axles
Percent Axles
30
25
20
15
10
5
0
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50000
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100000
Axle Load (lbf)
January
February
March
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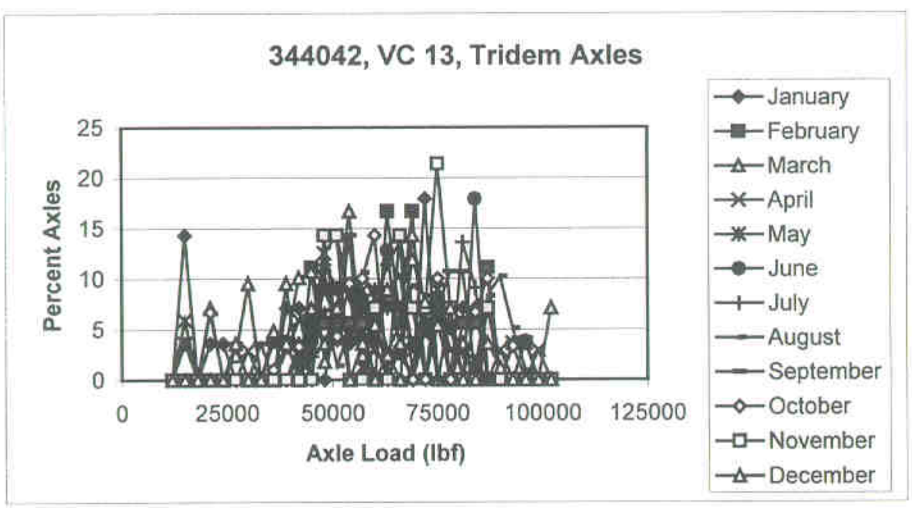
November
December


344042, VC 13, Tridem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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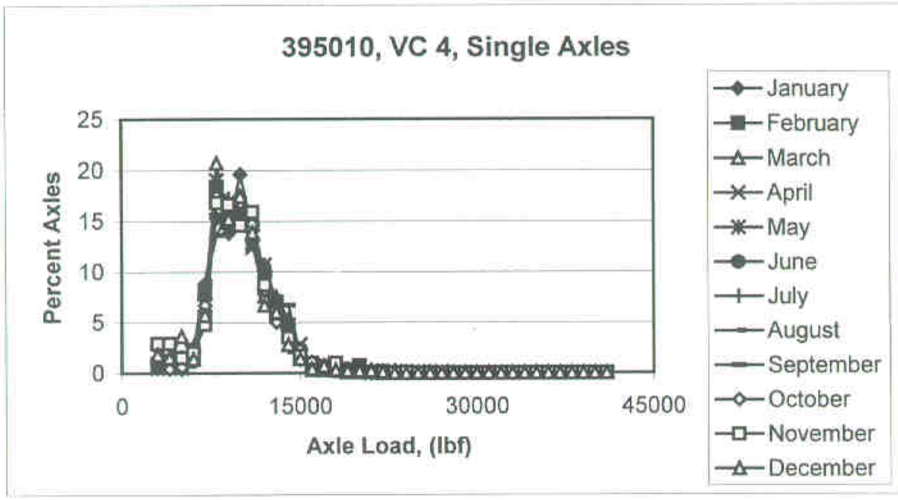
November
December


395010, VC 4, Single Axles
Percent Axles
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20
15
10
5
0
0
15000
30000
45000
Axle Load, (lbf)
January
February
March
April
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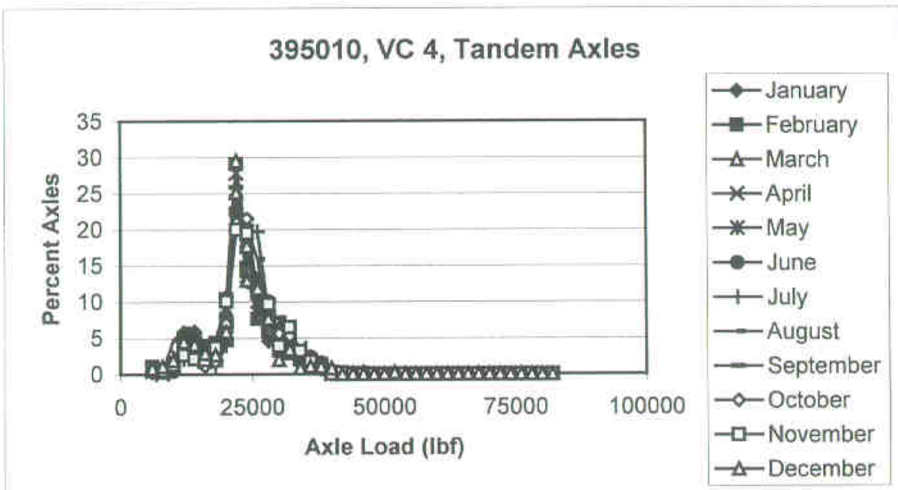
August
September
October
November
December


395010, VC 4, Tandem Axles
Percent Axles
35
30
25
20
15
10
5
0
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25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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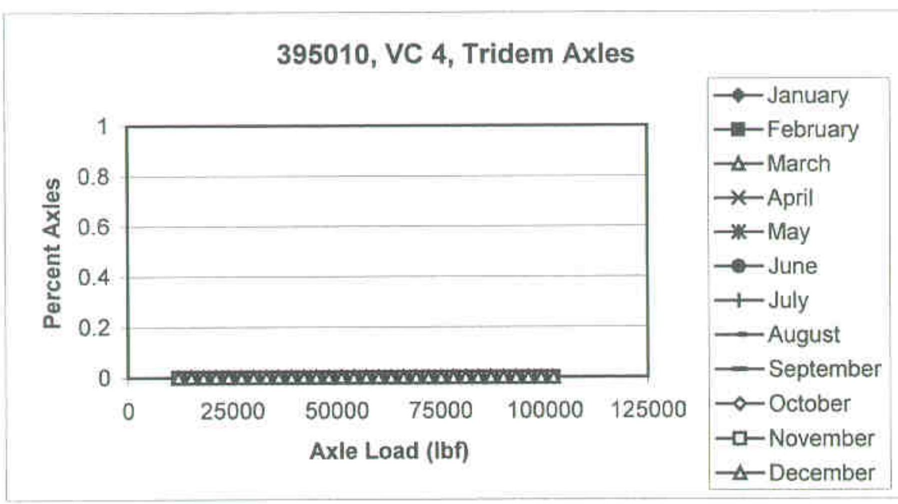
September
October
November
December


395010, VC 4, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
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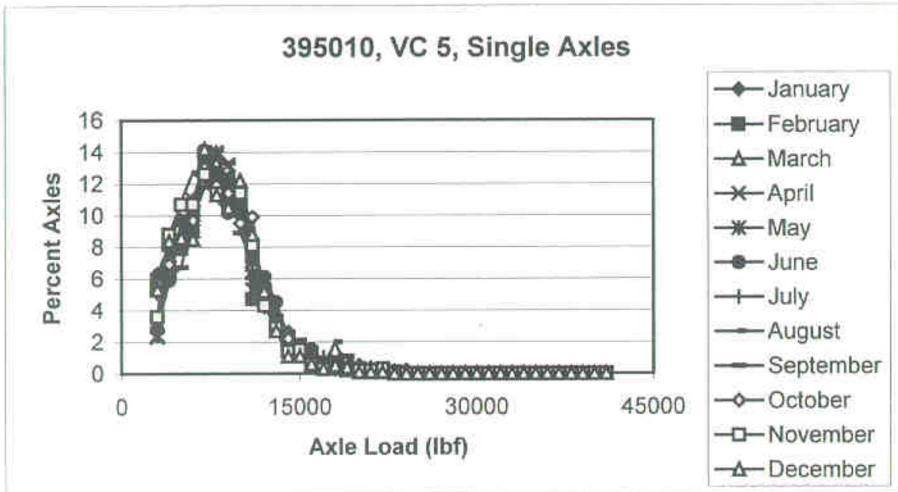
September
October
November
December



395010, VC 5, Single Axles
Percent Axles
16
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
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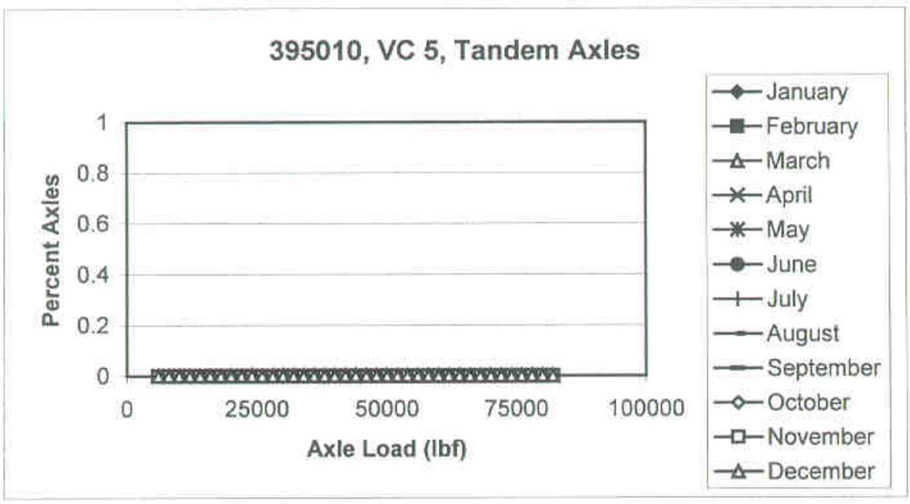
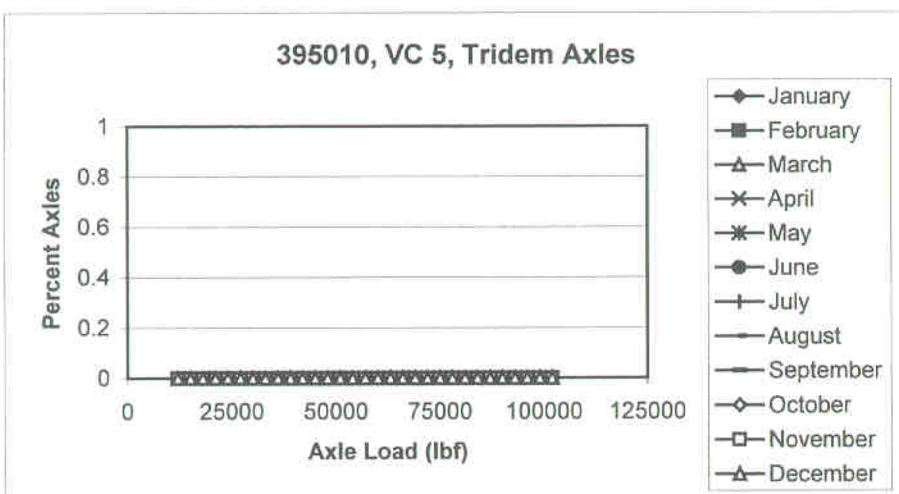
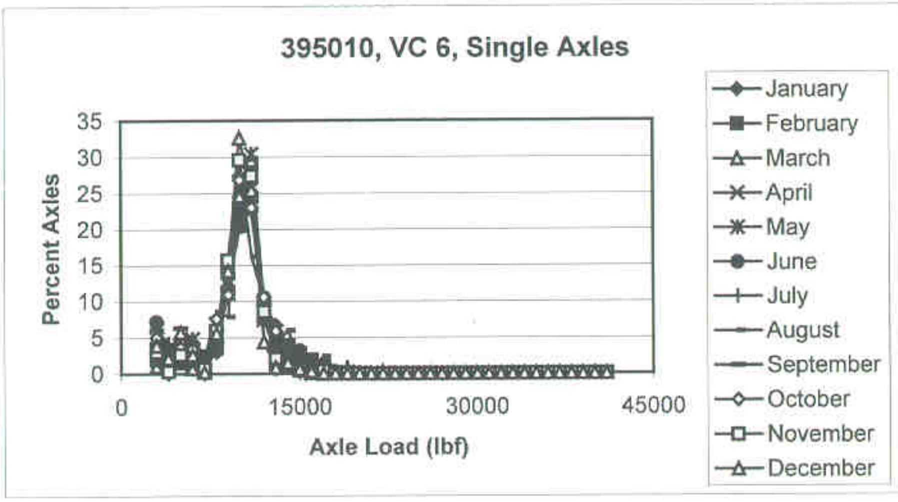
September
October
November
December

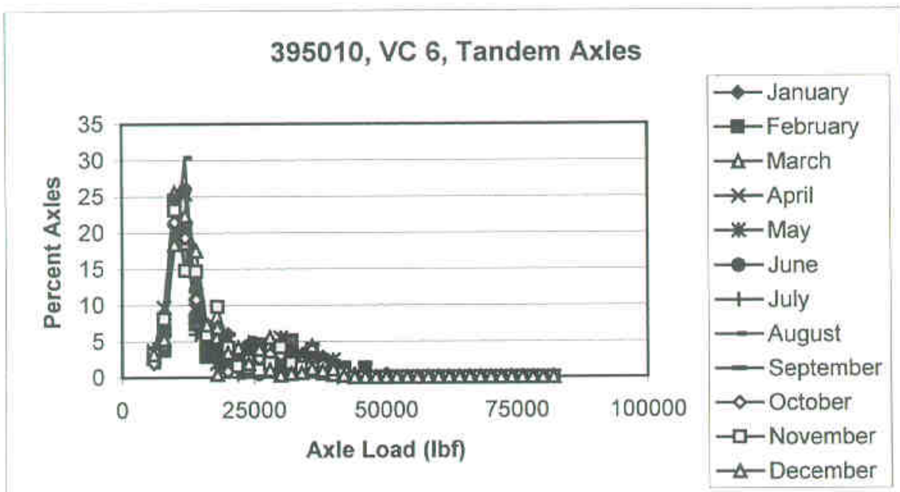


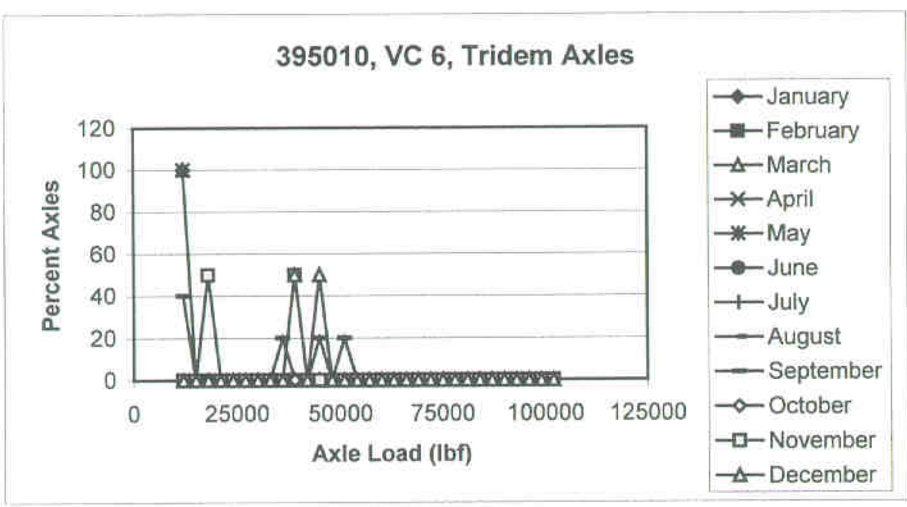
395010, VC 5, Tandem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



395010, VC 5, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 6, Single Axles
Percent Axles
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 6, Tandem Axles
Percent Axles
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 6, Tridem Axles
Percent Axles
Axle Load (lbf)
January
February
March
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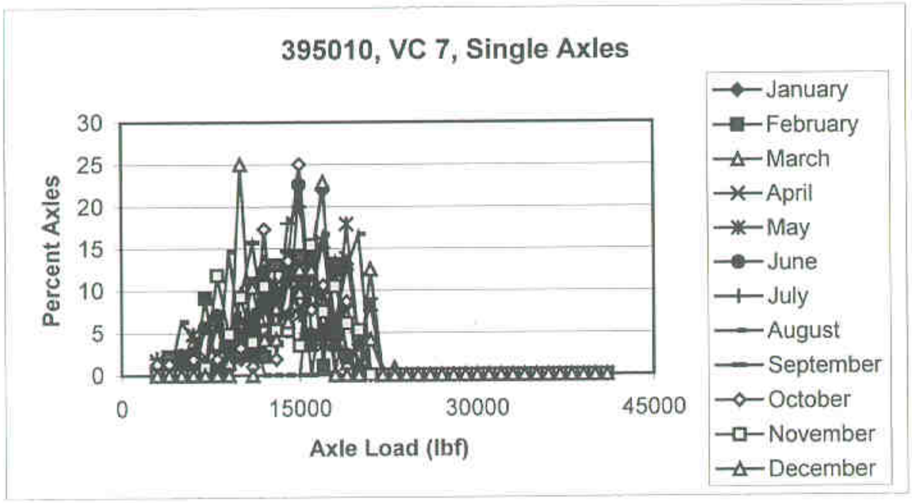
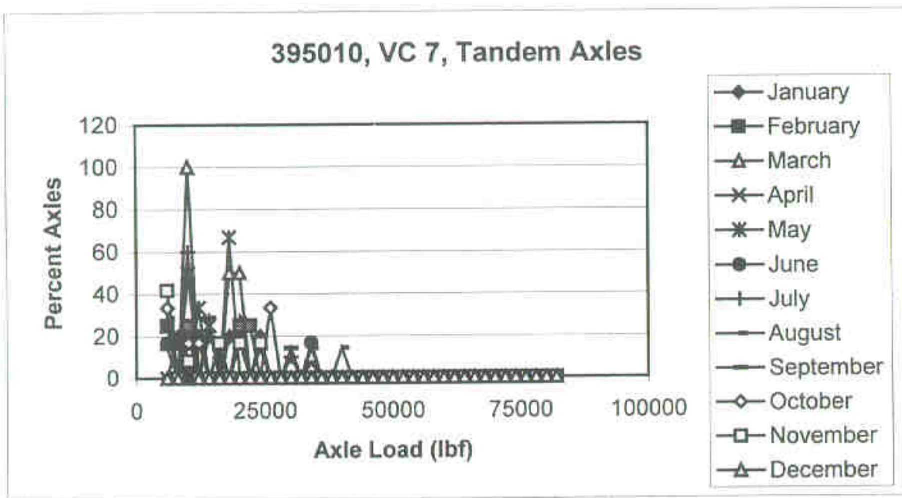
May
June
July
August
September
October
November
December


395010, VC 7, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
0
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 7, Tandem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
0
25000
50000
75000
100000
January
February
March
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May
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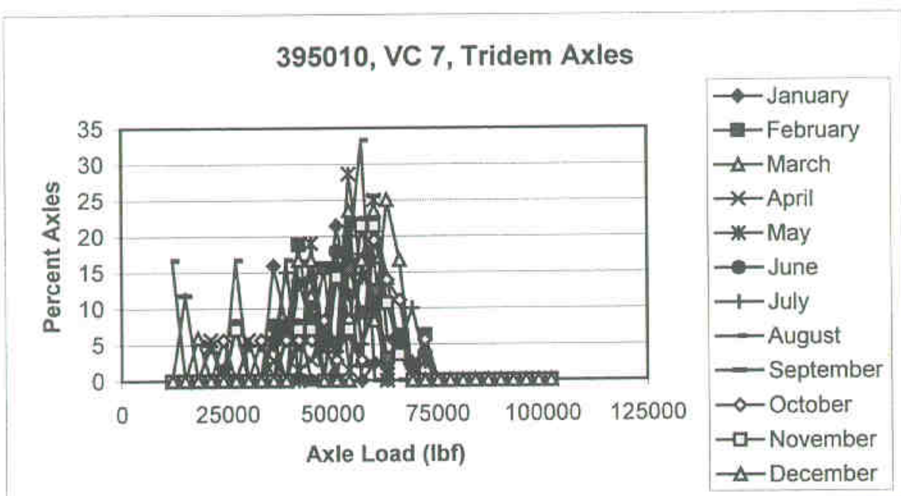
August
September
October
November
December


395010, VC 7, Tridem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
0
25000
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75000
100000
125000
January
February
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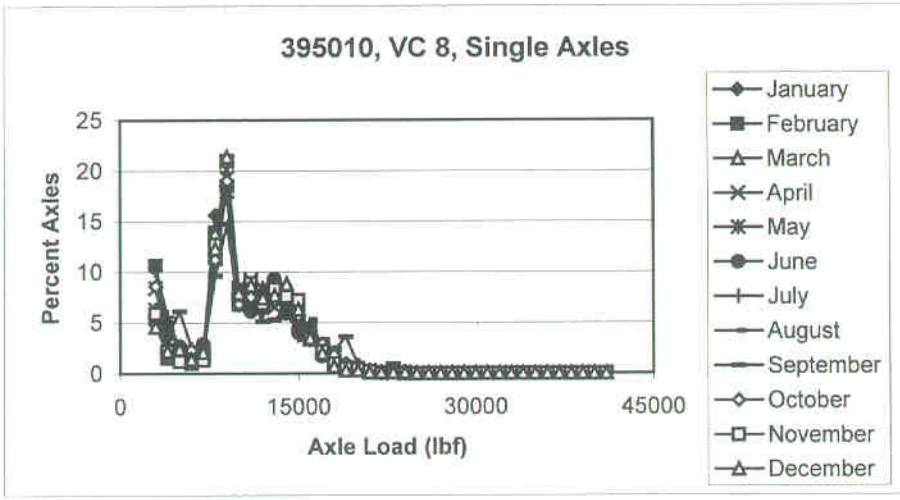
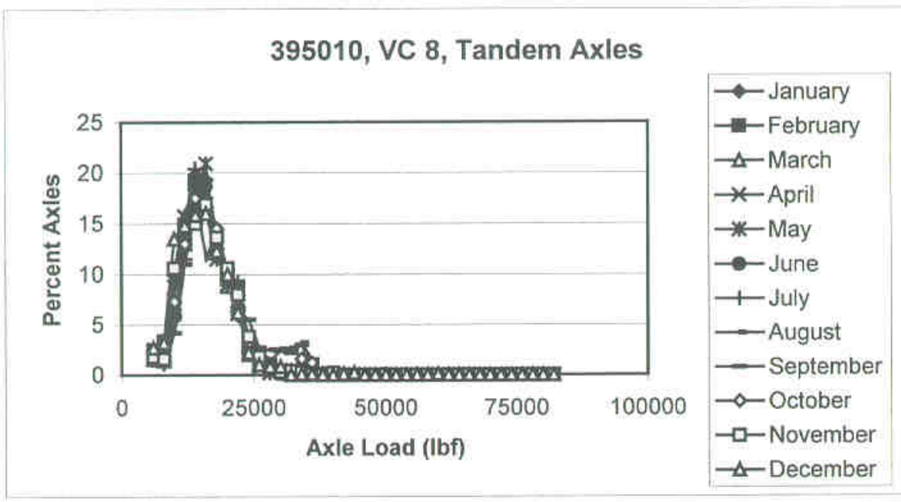
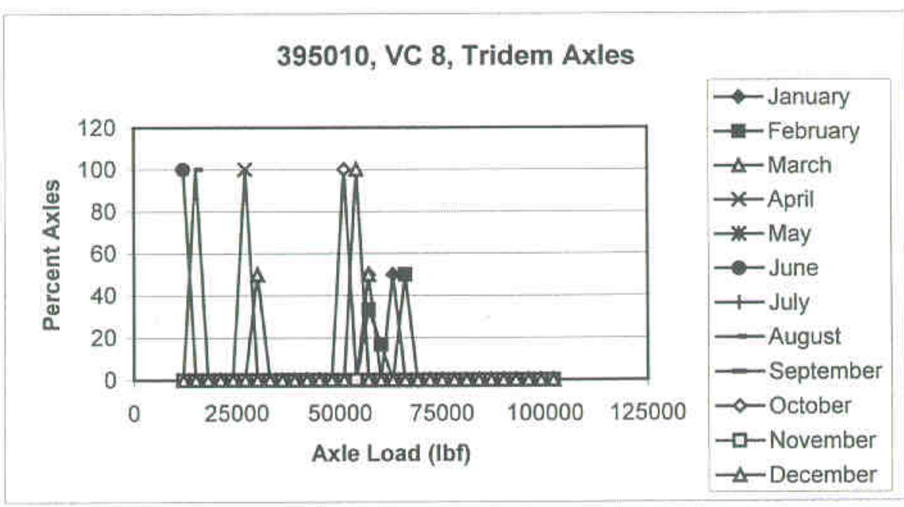
August
September
October
November
December


395010, VC 8, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 8, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 8, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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May
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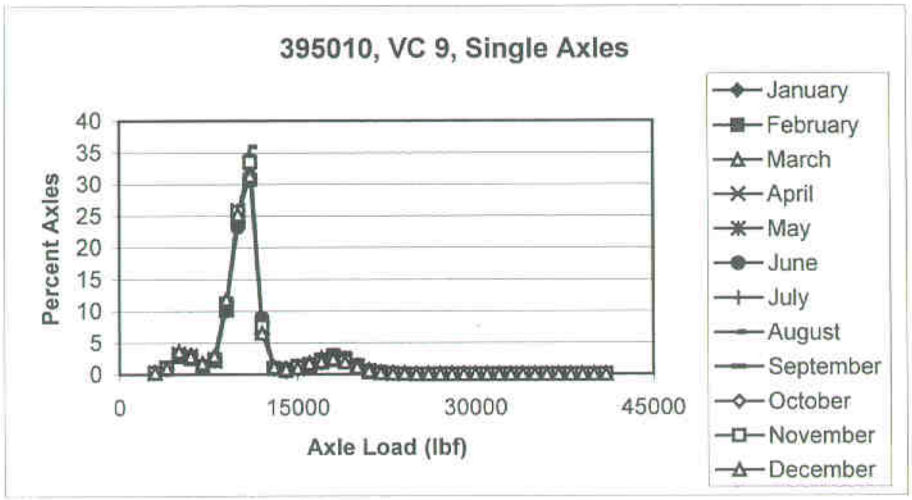
September
October
November
December


395010, VC 9, Single Axles
Percent Axles
Axle Load (lbf)
40
35
30
25
20
15
10
5
0
0
15000
30000
45000
January
February
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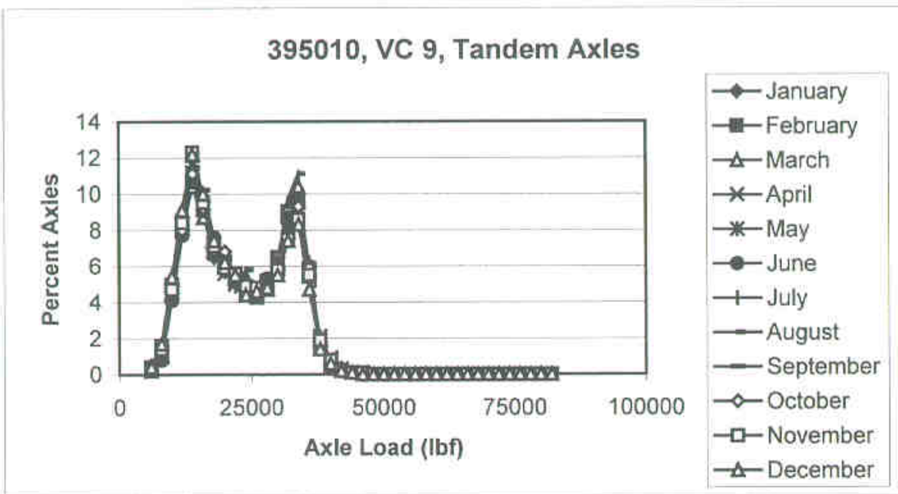
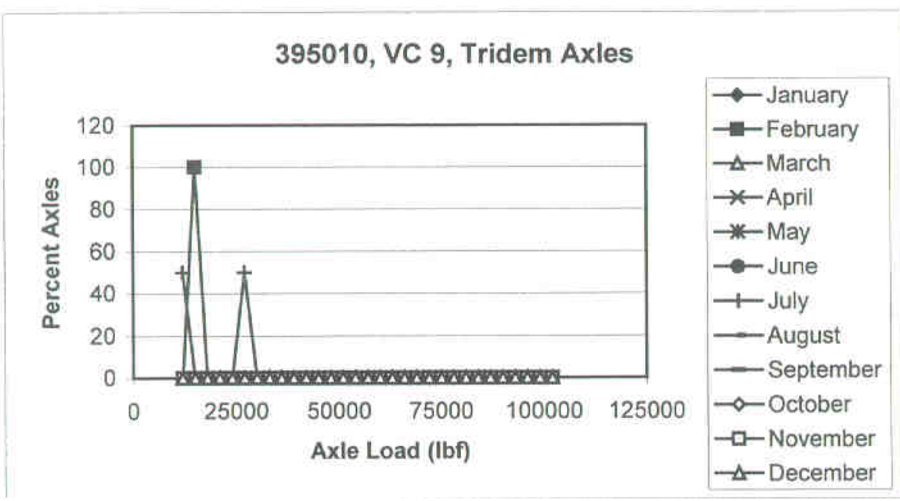
August
September
October
November
December


395010, VC 9, Tandem Axles
Percent Axles
Axle Load (lbf)
14
12
10
8
6
4
2
0
0
25000
50000
75000
100000
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 9, Tridem Axles
Percent Axles
Axle Load (lbf)
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
January
February
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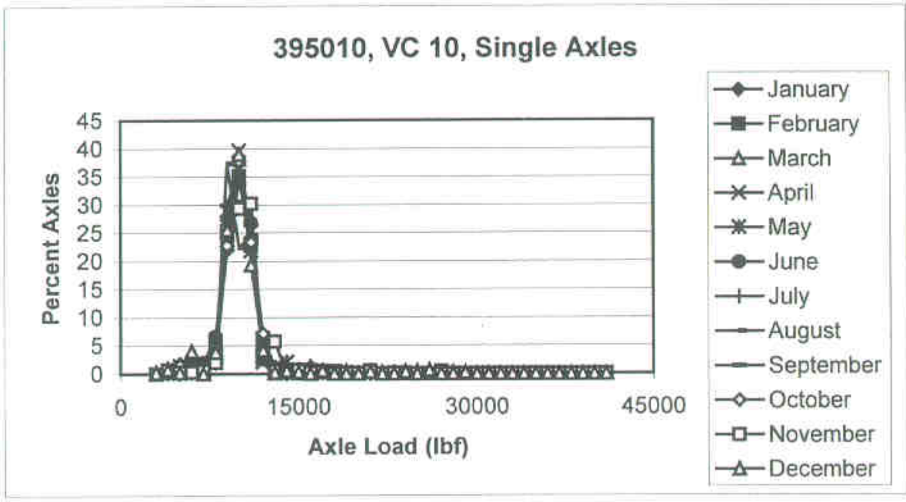
August
September
October
November
December


395010, VC 10, Single Axles
Percent Axles
45
40
35
30
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
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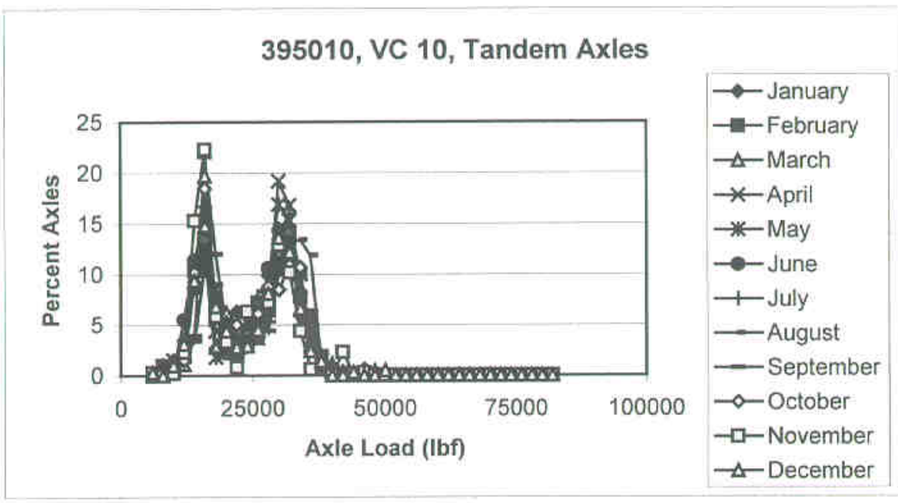
September
October
November
December


395010, VC 10, Tandem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
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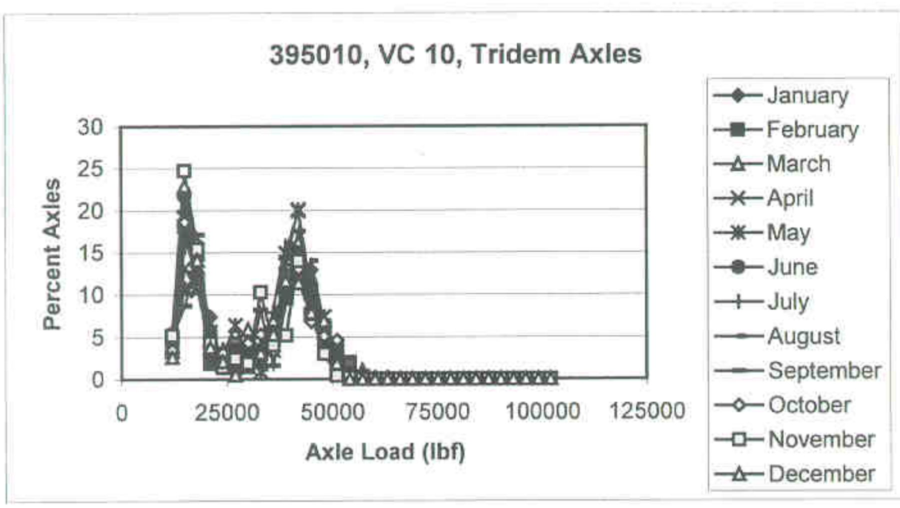
September
October
November
December


395010, VC 10, Tridem Axles
Percent Axles
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
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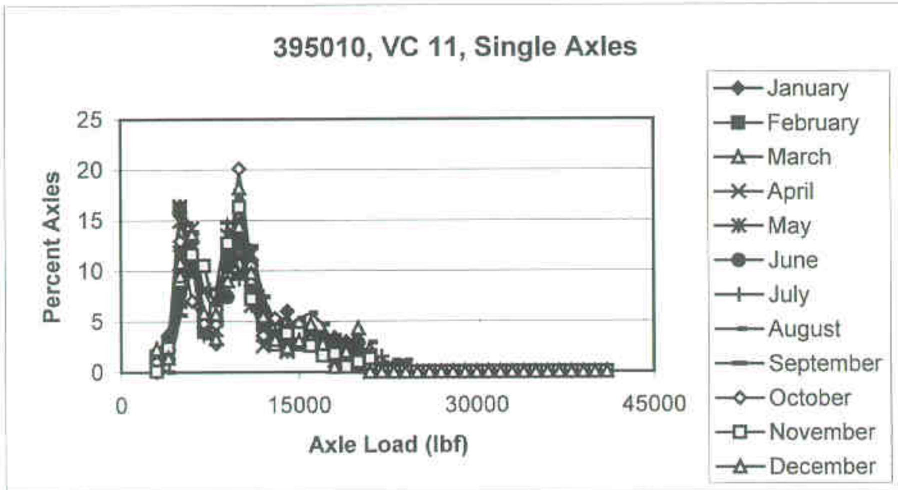
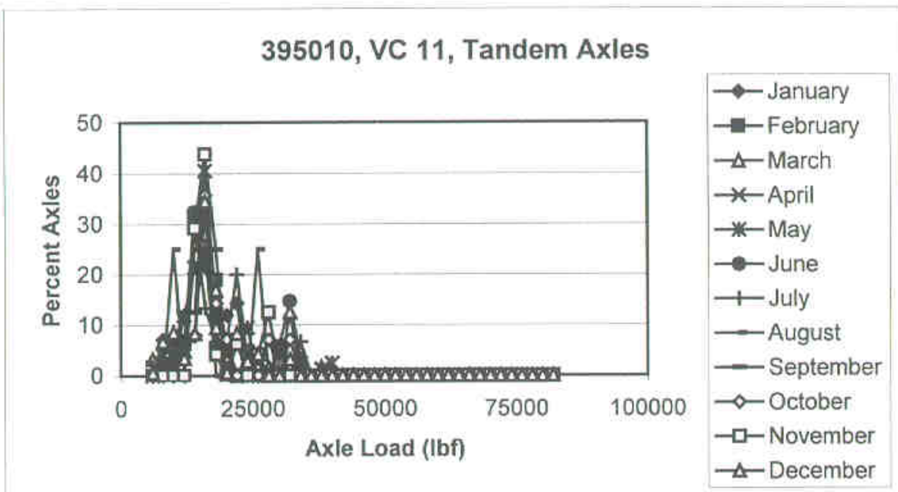
September
October
November
December



395010, VC 11, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December



395010, VC 11, Tandem Axles
Percent Axles
50
40
30
20
10
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
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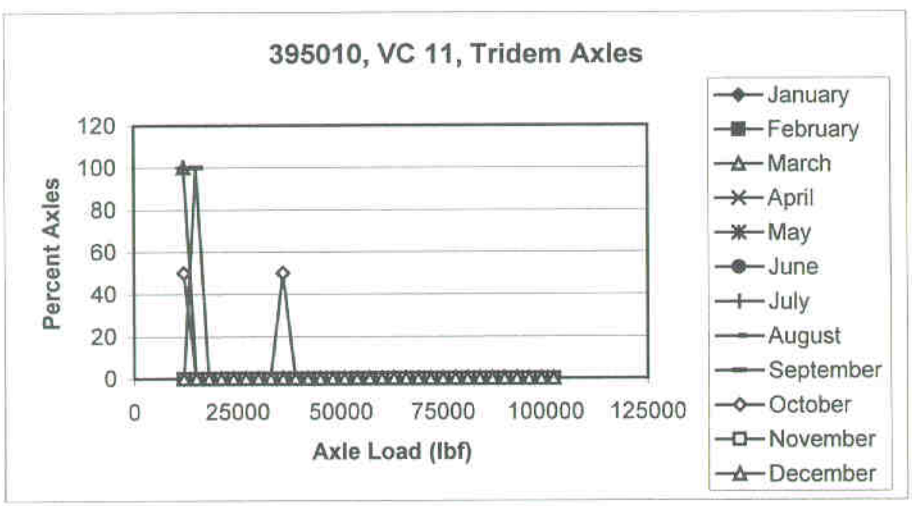
August
September
October
November
December



395010, VC 11, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
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September
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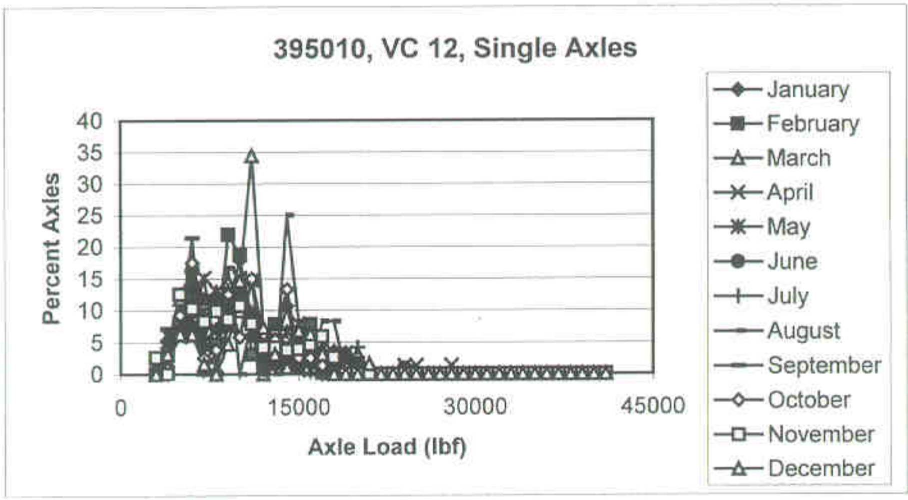
November
December


395010, VC 12, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
40
0
15000
30000
45000
January
February
March
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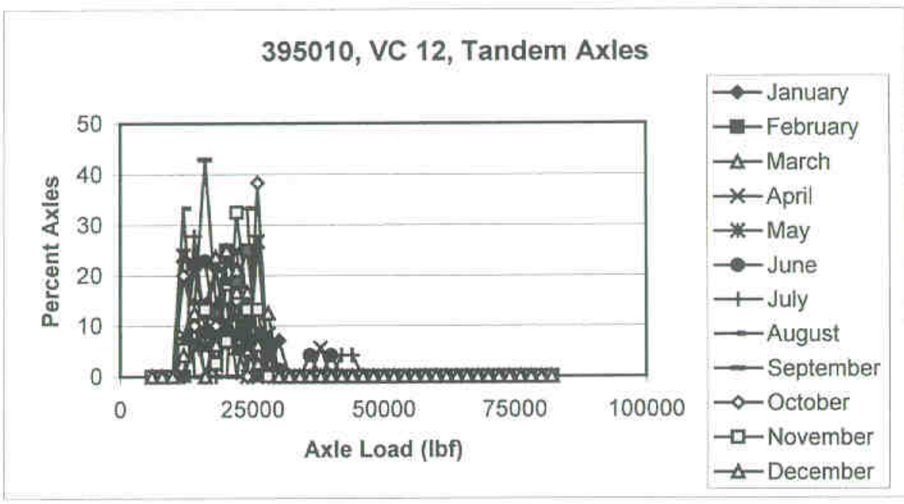
August
September
October
November
December


395010, VC 12, Tandem Axles
Percent Axles
Axle Load (lbf)
0
10
20
30
40
50
0
25000
50000
75000
100000
January
February
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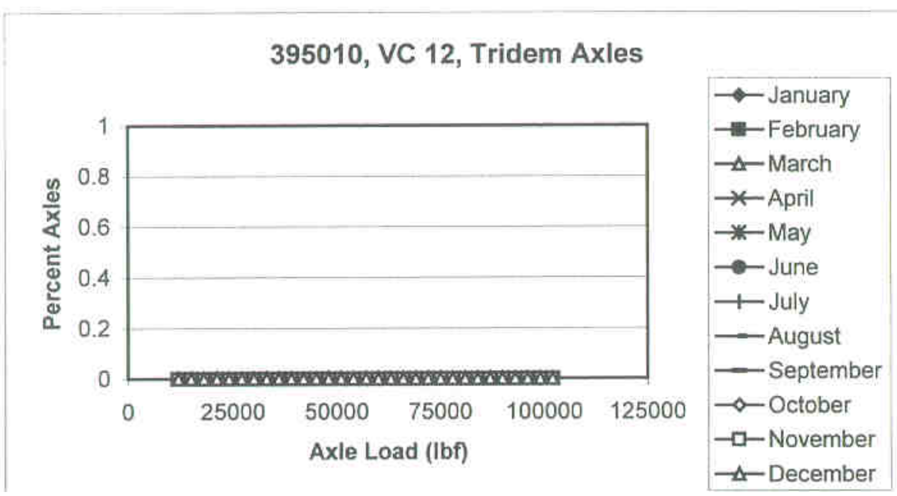
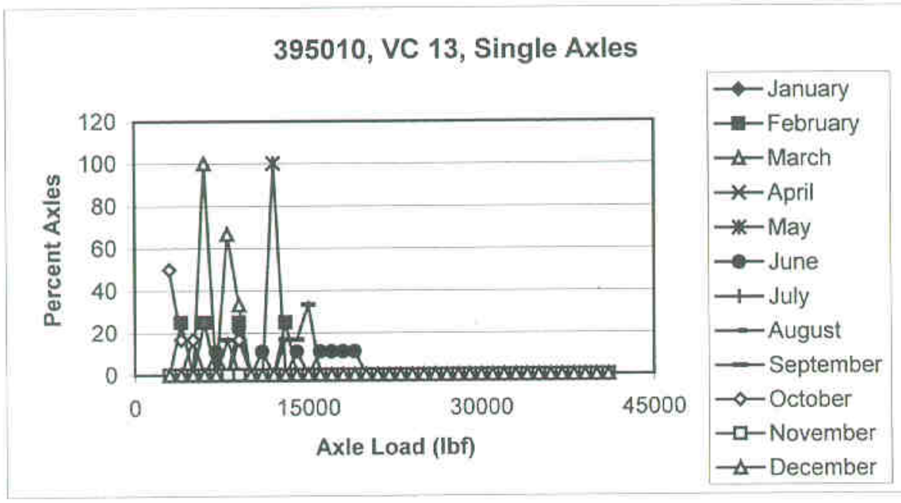
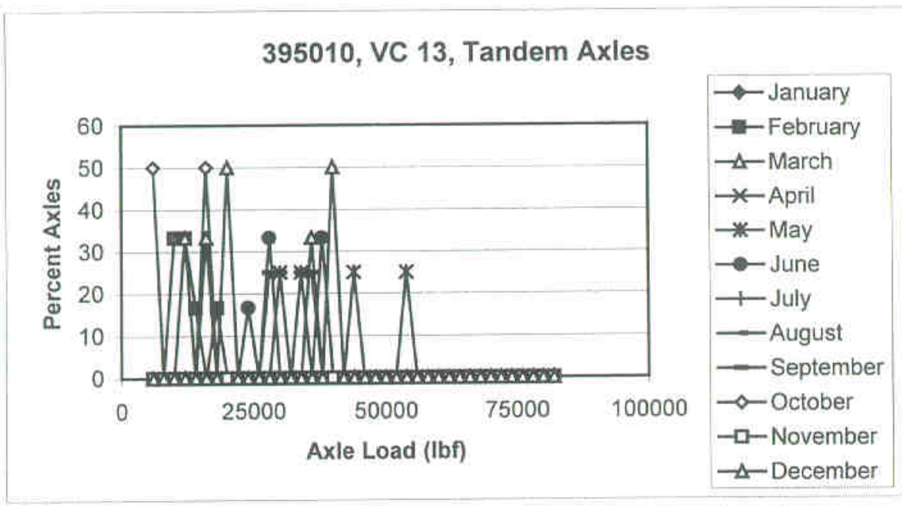
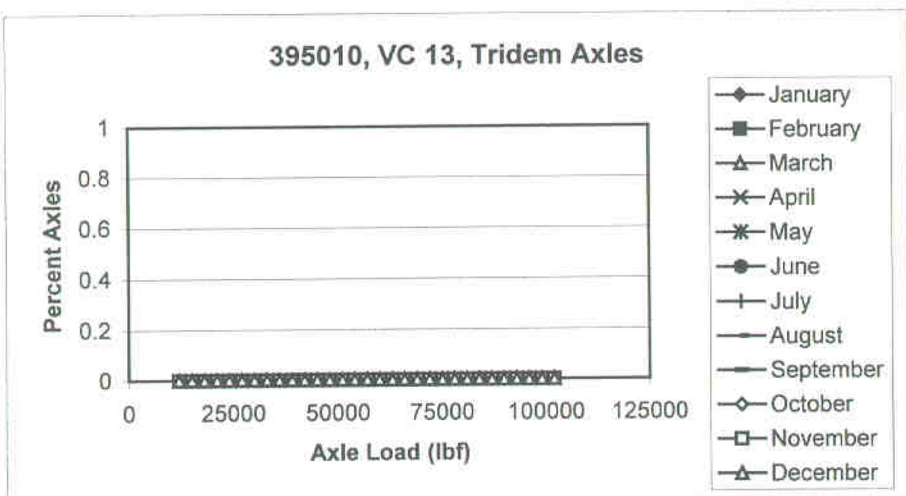
August
September
October
November
December


395010, VC 12, Tridem Axles
Percent Axles
Axle Load (lbf)
0
0.2
0.4
0.6
0.8
1
0
25000
50000
75000
100000
125000
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 13, Single Axles
Percent Axles
120
100
80
60
40
20
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 13, Tandem Axles
Percent Axles
60
50
40
30
20
10
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


395010, VC 13, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
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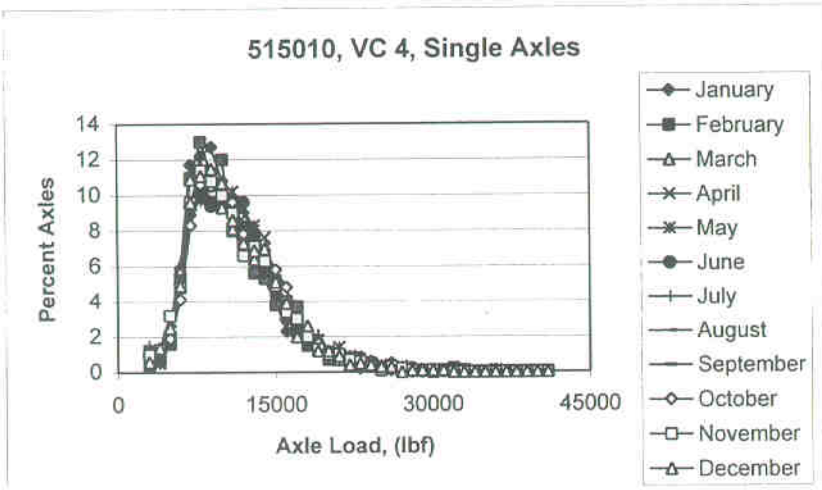
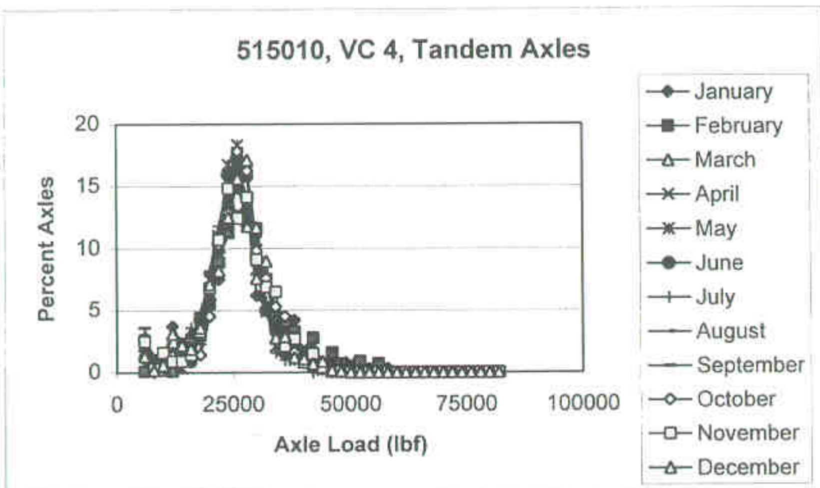
September
October
November
December


515010, VC 4, Single Axles
Percent Axles
14
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load, (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 4, Tandem Axles
Percent Axles
20
15
10
5
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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May
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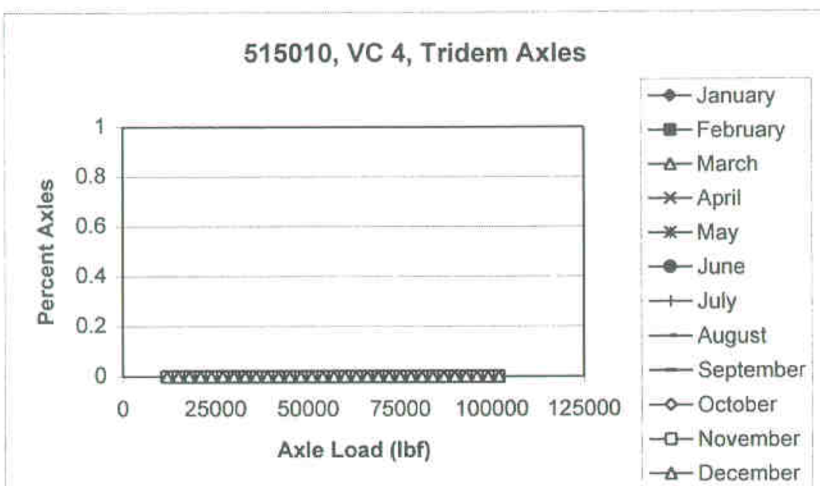
August
September
October
November
December


515010, VC 4, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
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May
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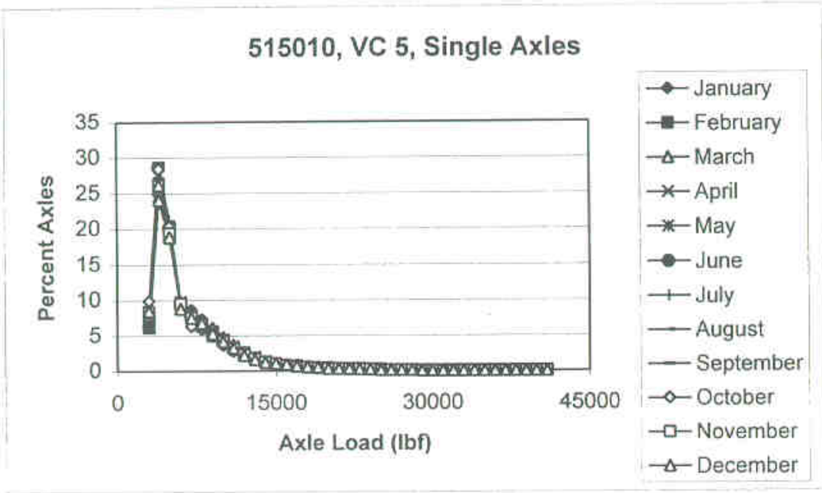
July
August
September
October
November
December



515010, VC 5, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
0
15000
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January
February
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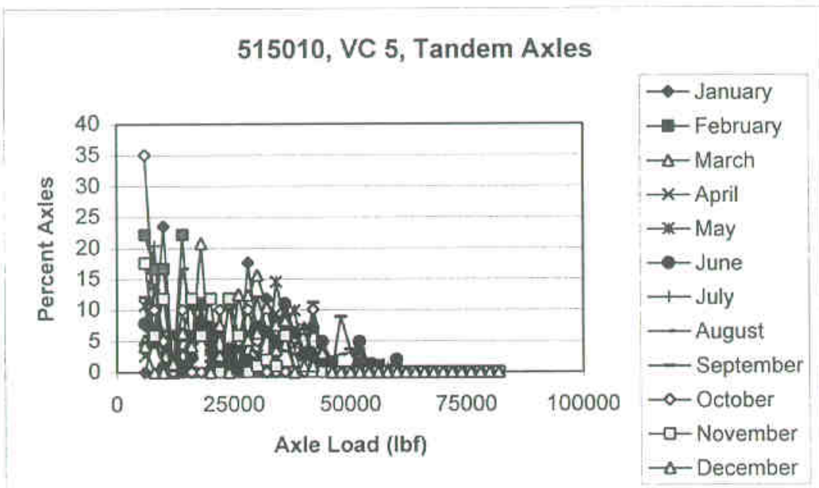
August
September
October
November
December



515010, VC 5, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
40
0
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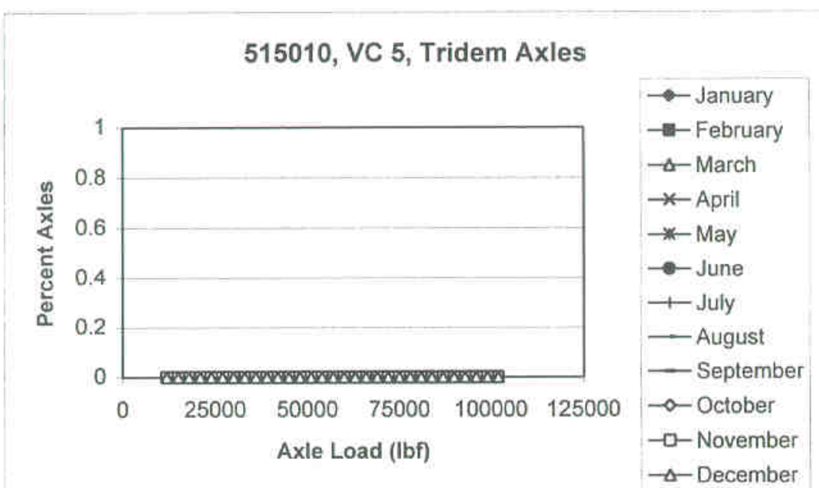
September
October
November
December



515010, VC 5, Tridem Axles
Percent Axles
Axle Load (lbf)
0
0.2
0.4
0.6
0.8
1
0
25000
50000
75000
100000
125000
January
February
March
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May
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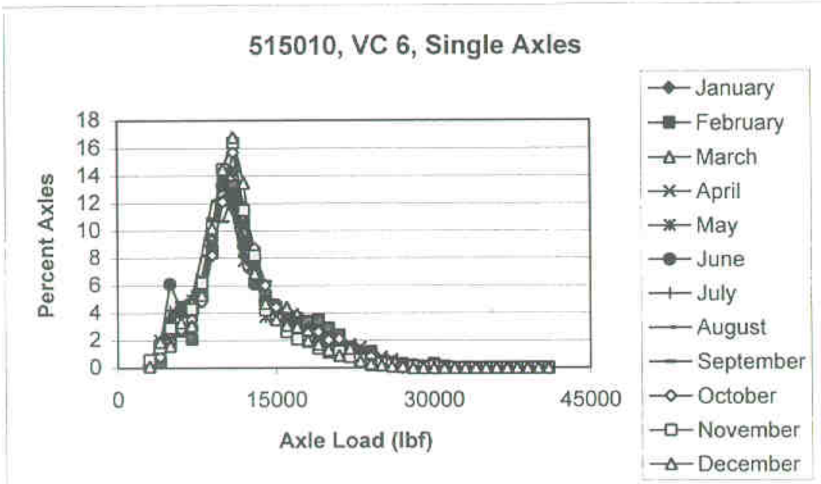
November
December


515010, VC 6, Single Axles
Percent Axles
18
16
14
12
10
8
6
4
2
0
0
15000
30000
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Axle Load (lbf)
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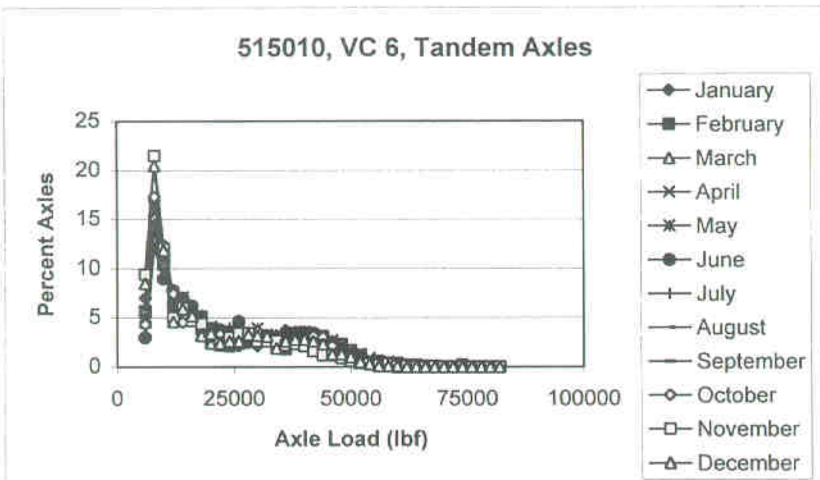
September
October
November
December


515010, VC 6, Tandem Axles
Percent Axles
25
20
15
10
5
0
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25000
50000
75000
100000
Axle Load (lbf)
January
February
March
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September
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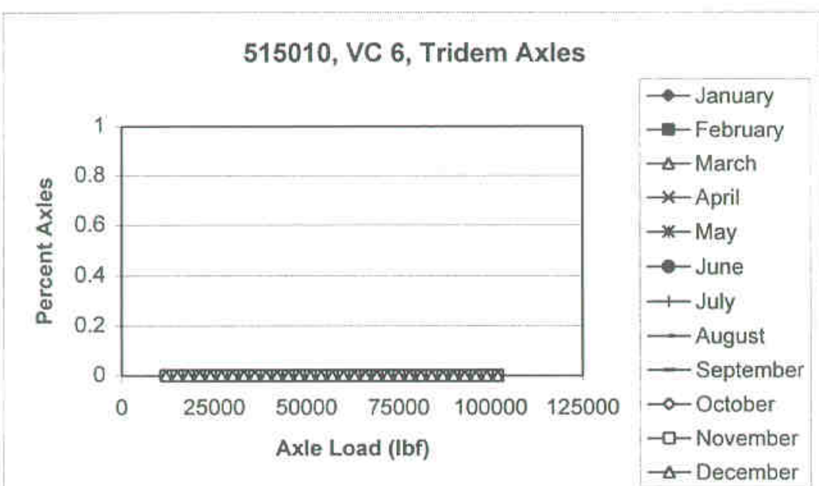
November
December


515010, VC 6, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
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100000
125000
Axle Load (lbf)
January
February
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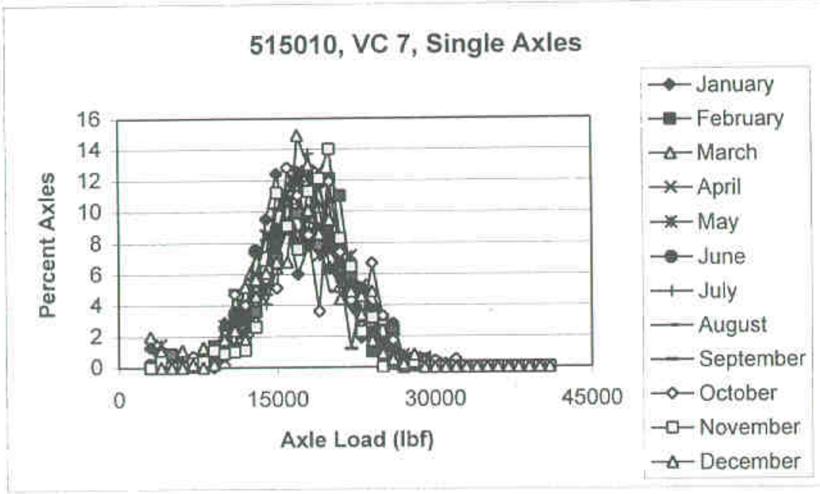
November
December


515010, VC 7, Single Axles
Percent Axles
16
14
12
10
8
6
4
2
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15000
30000
45000
Axle Load (lbf)
January
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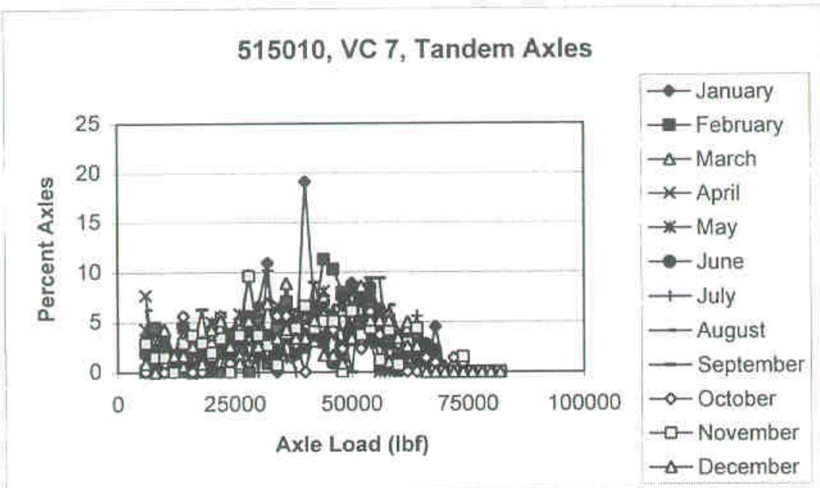
November
December


515010, VC 7, Tandem Axles
Percent Axles
25
20
15
10
5
0
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100000
Axle Load (lbf)
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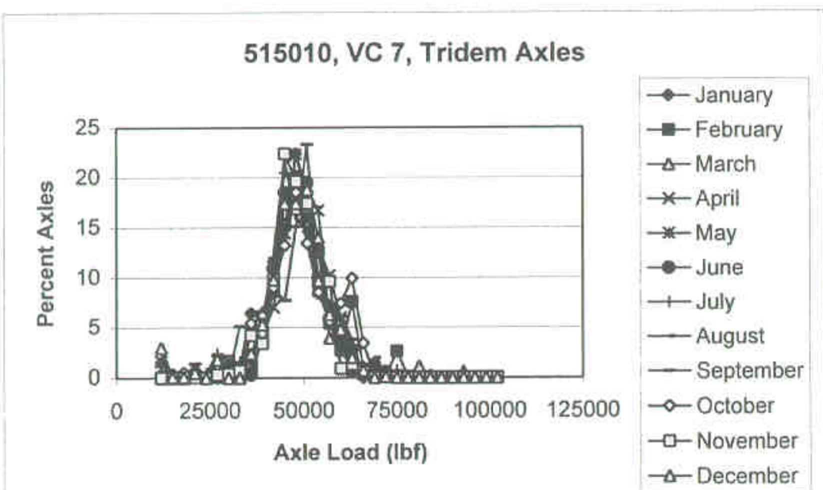
November
December


515010, VC 7, Tridem Axles
Percent Axles
25
20
15
10
5
0
0
25000
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75000
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125000
Axle Load (lbf)
January
February
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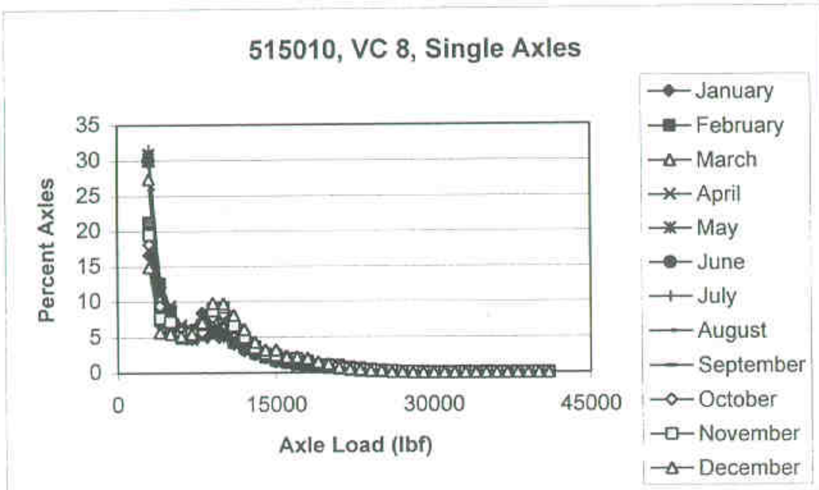
December



515010, VC 8, Single Axles
Percent Axles
35
30
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
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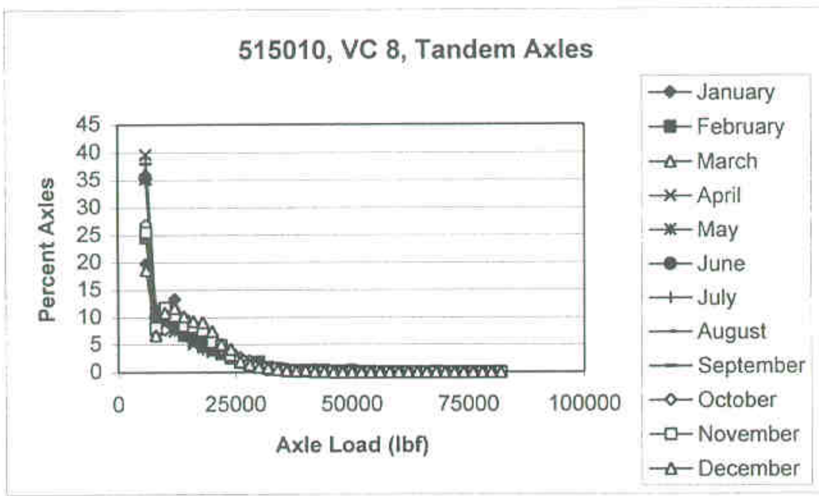
November
December



515010, VC 8, Tandem Axles
Percent Axles
45
40
35
30
25
20
15
10
5
0
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25000
50000
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100000
Axle Load (lbf)
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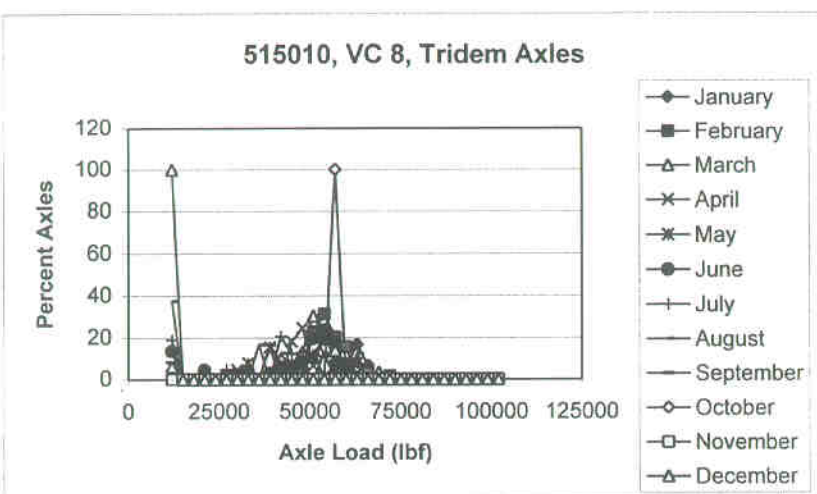
December



515010, VC 8, Tridem Axles
Percent Axles
120
100
80
60
40
20
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
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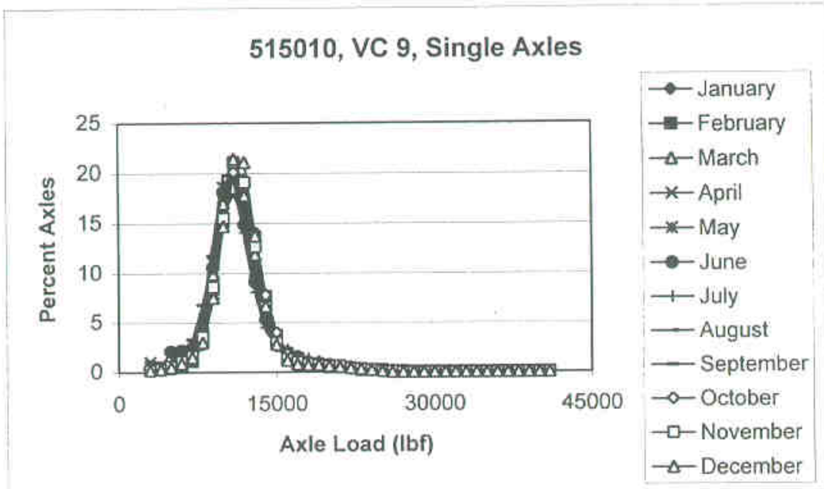
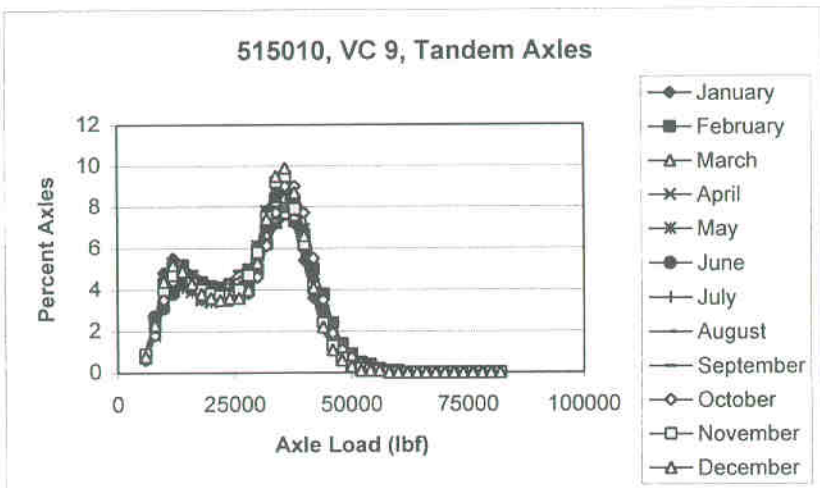
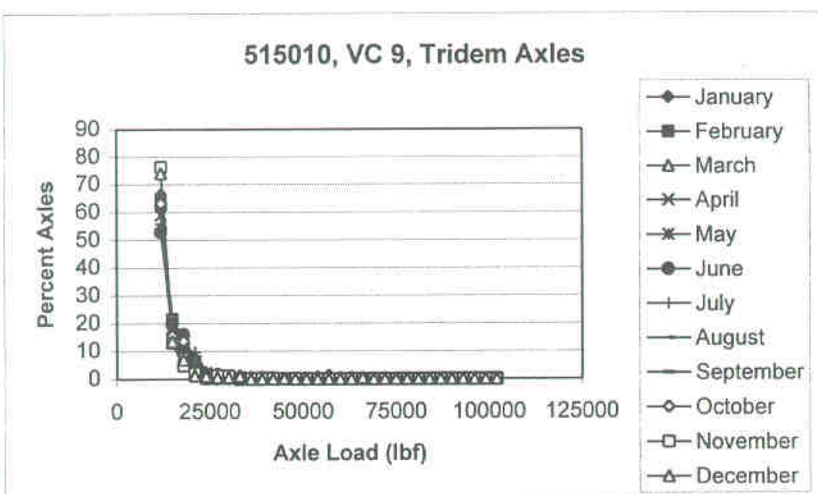
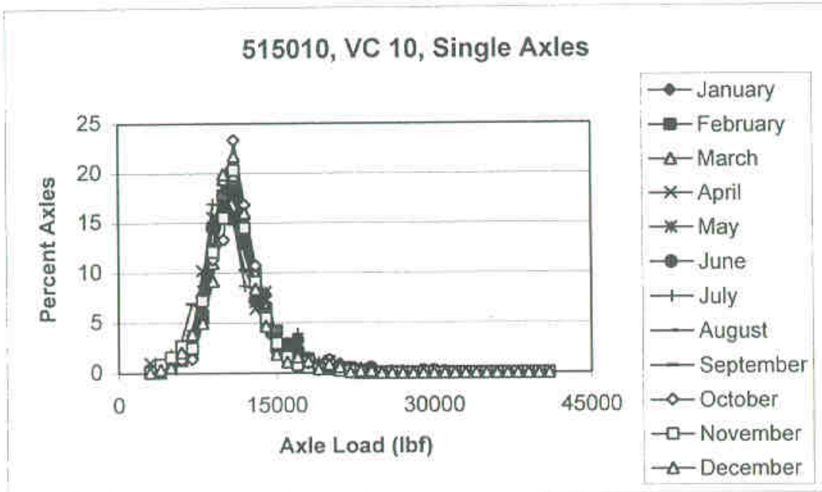
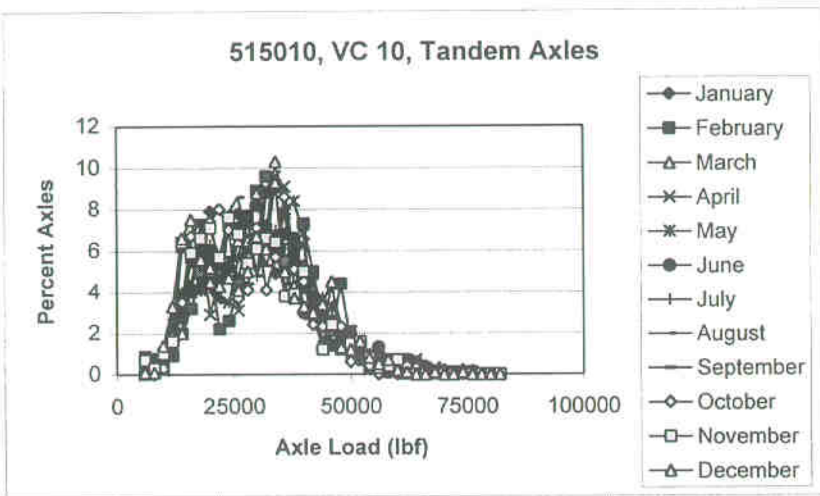
November
December

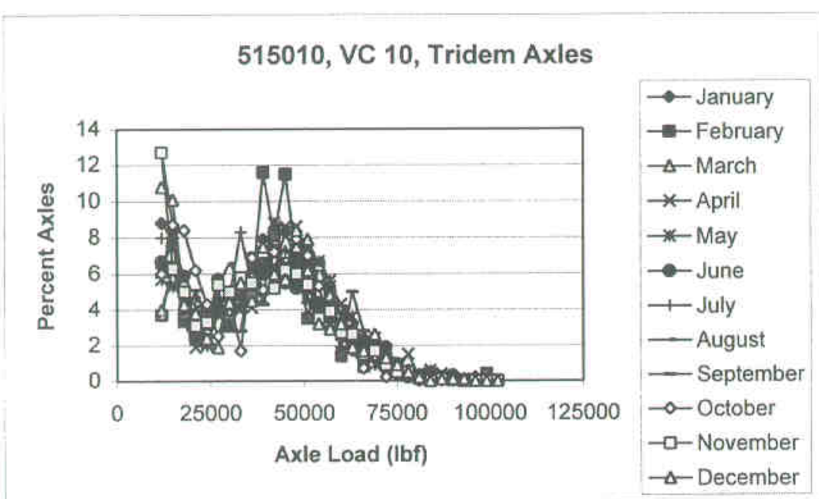

515010, VC 9, Single Axles
Percent Axles
25
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

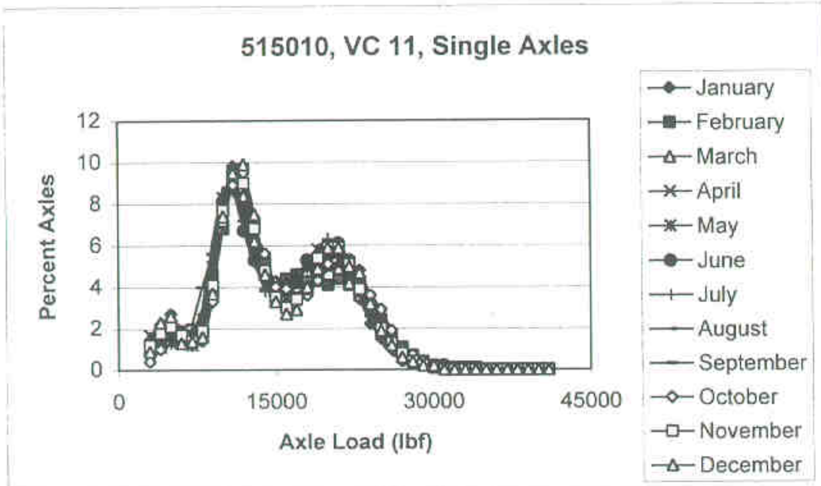

515010, VC 9, Tandem Axles
Percent Axles
12
10
8
6
4
2
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 9, Tridem Axles
Percent Axles
90
80
70
60
50
40
30
20
10
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

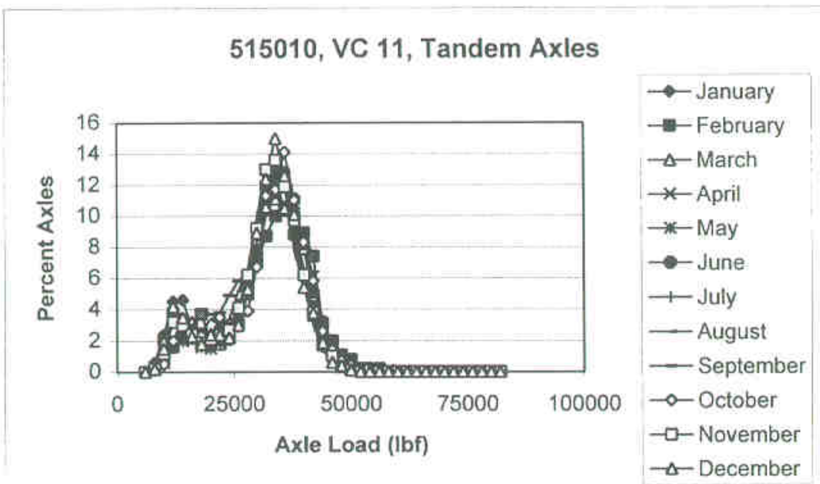

515010, VC 10, Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
0
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 10, Tandem Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
0
25000
50000
75000
100000
January
February
March
April
May
June
July
August
September
October
November
December

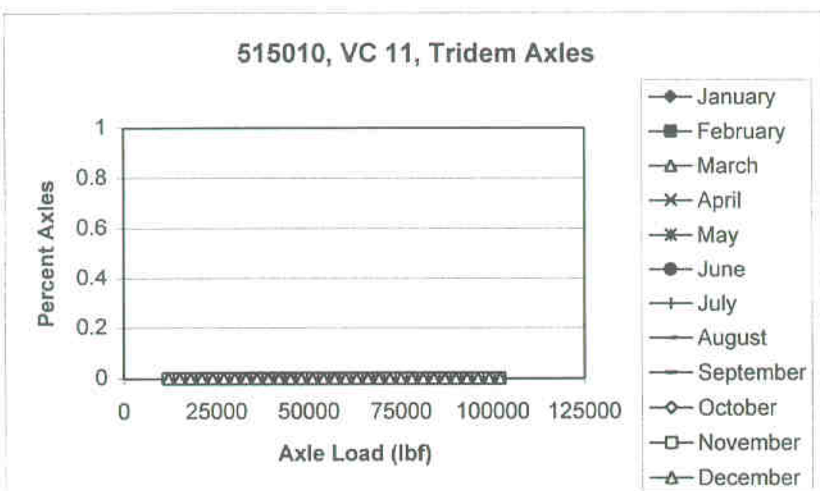

515010, VC 10, Tridem Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
0
25000
50000
75000
100000
125000
January
February
March
April
May
June
July
August
September
October
November
December



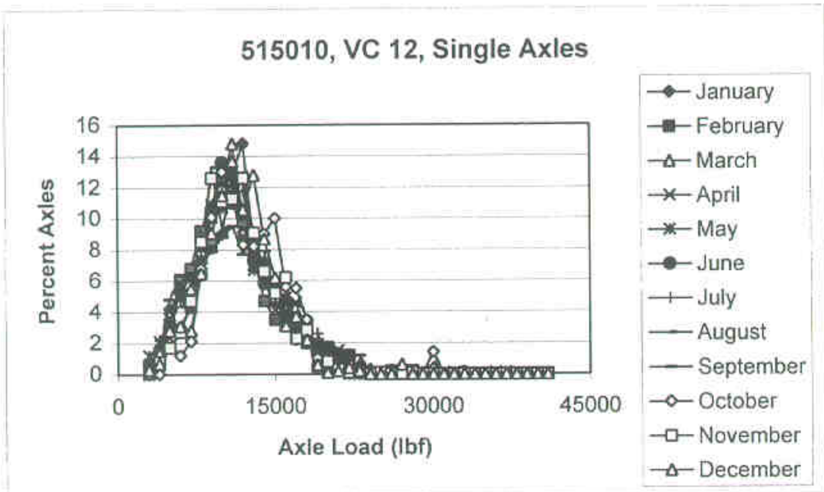
515010, VC 11, Single Axles
Percent Axles
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

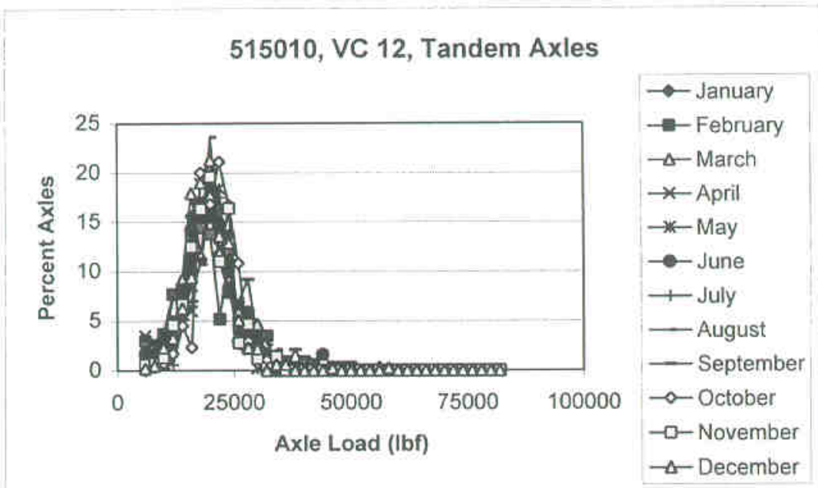


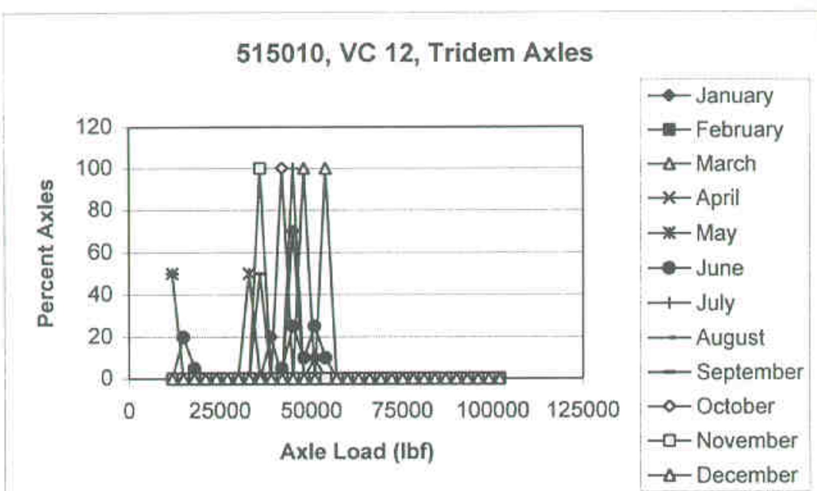
515010, VC 11, Tandem Axles
Percent Axles
16
14
12
10
8
6
4
2
0
0
25000
50000
75000
100000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

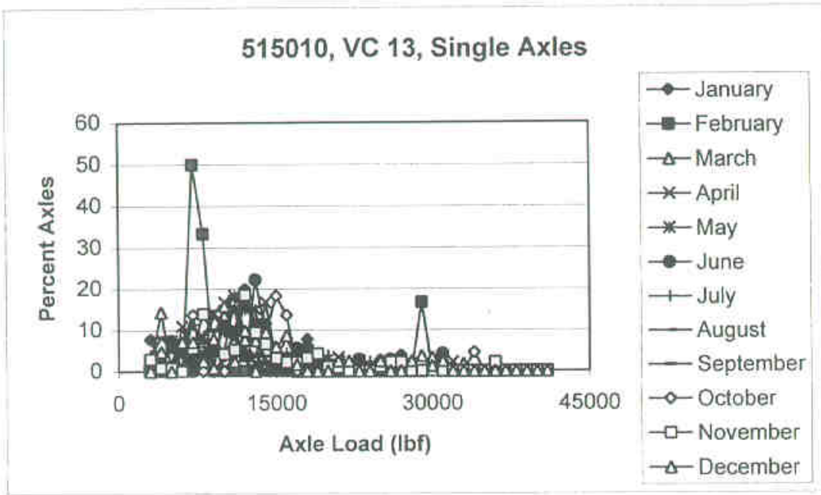


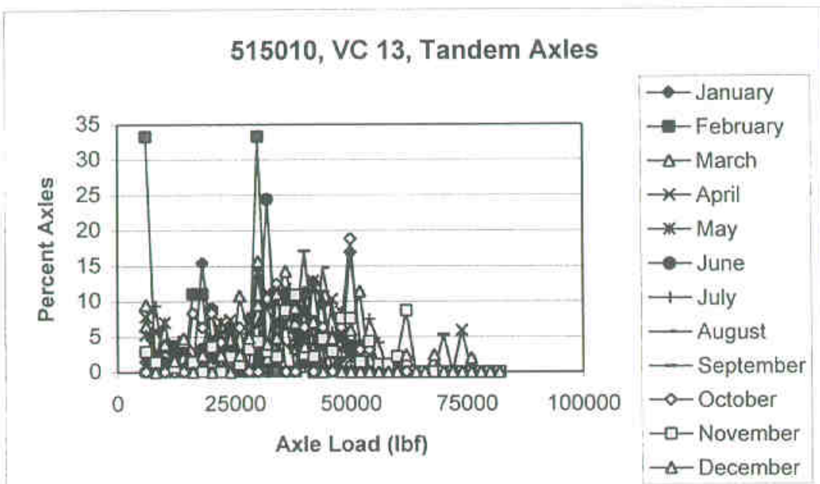
515010, VC 11, Tridem Axles
Percent Axles
1
0.8
0.6
0.4
0.2
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
January
February
March
April
May
June
July
August
September
October
November
December

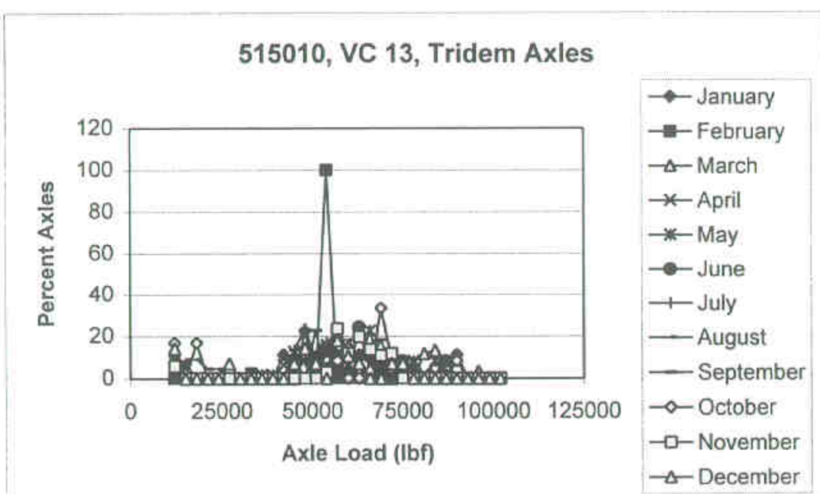

515010, VC 12, Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
16
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 12, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
25000
50000
75000
100000
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 12, Tridem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
25000
50000
75000
100000
125000
January
February
March
April
May
June
July
August
September
October
November
December

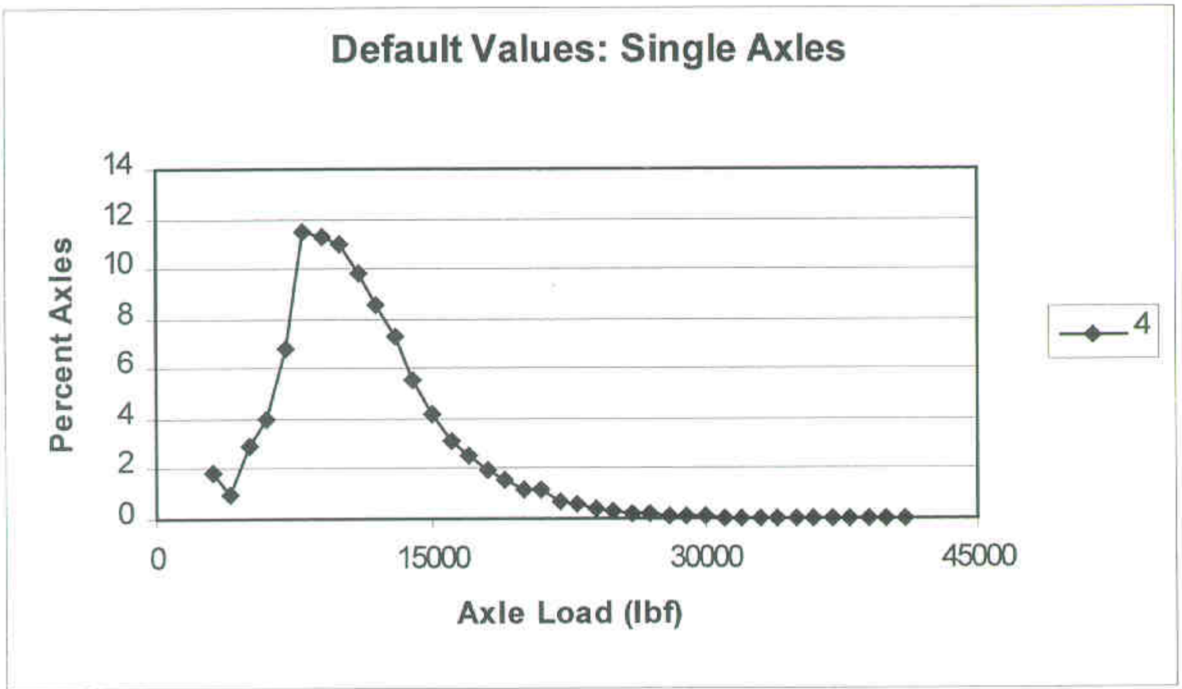

515010, VC 13, Single Axles
Percent Axles
Axle Load (lbf)
0
10
20
30
40
50
60
0
15000
30000
45000
January
February
March
April
May
June
July
August
September
October
November
December


515010, VC 13, Tandem Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
25
30
35
0
25000
50000
75000
100000
January
February
March
April
May
June
July
August
September
October
November
December

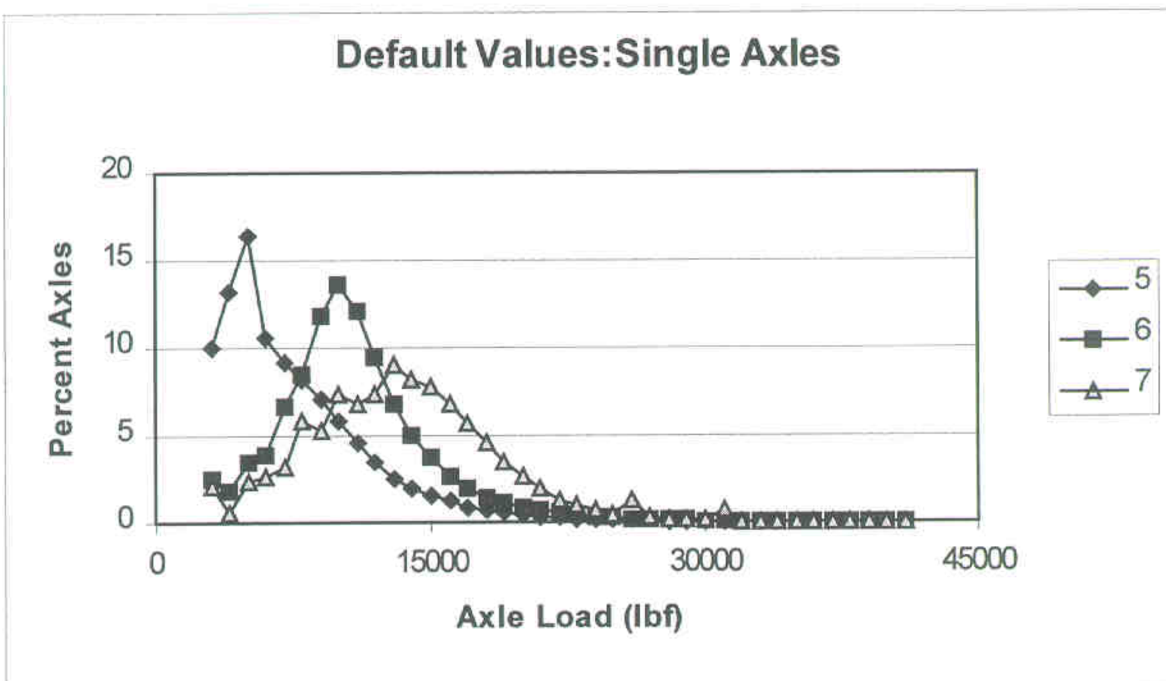

515010, VC 13, Tridem Axles
Percent Axles
Axle Load (lbf)
0
20
40
60
80
100
120
0
25000
50000
75000
100000
125000
January
February
March
April
May
June
July
August
September
October
November
December

APPENDIX AA.7 – Default Normalized Axle Load Spectra

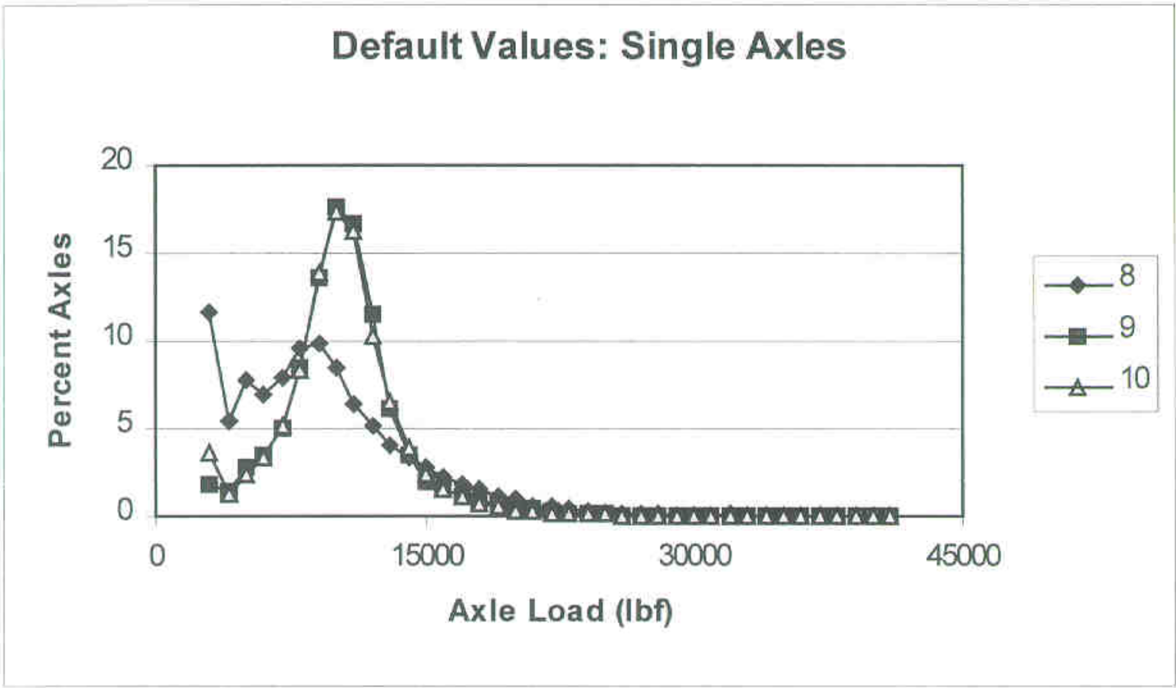
Appendix AA.7 provides a graphical summary/presentation and tabulation of the default values suggested for the normalized axle load spectra for each axle type and vehicle class. The graphical illustrations (or histograms) of the default values for the normalized single axle load spectra for each vehicle or truck class are provided first and followed by the histograms for the tandem and then tridem axle load spectra. The normalized mean values for each axle type and truck class are tabulated and included in this appendix after the histograms. The tabularized summary of the mean values are followed by the variance and coefficient of variation summaries.

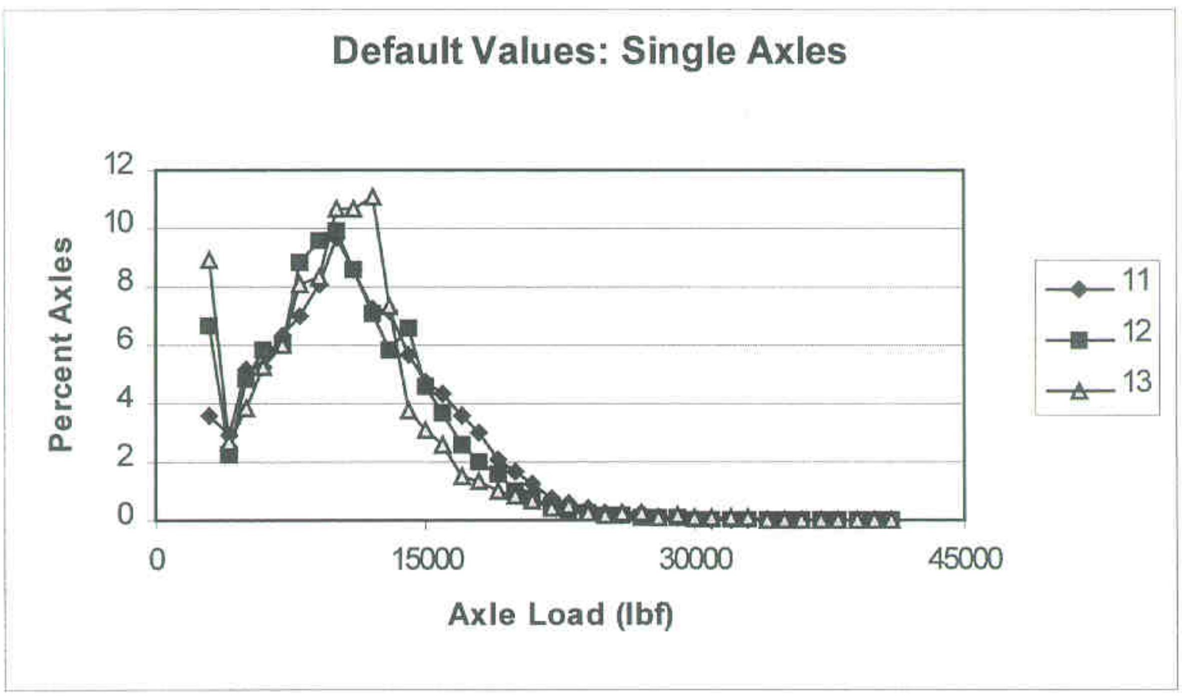


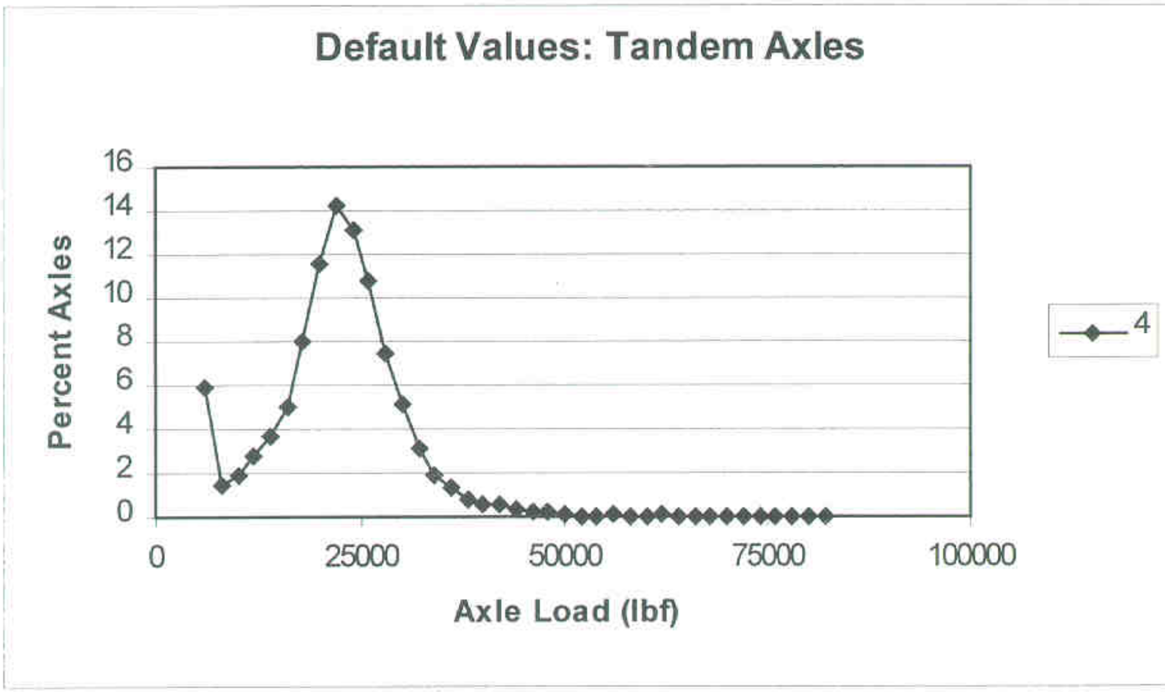
Default Values: Single Axles
Percent Axles
Axle Load (lbf)
0
2
4
6
8
10
12
14
15000
30000
45000
4

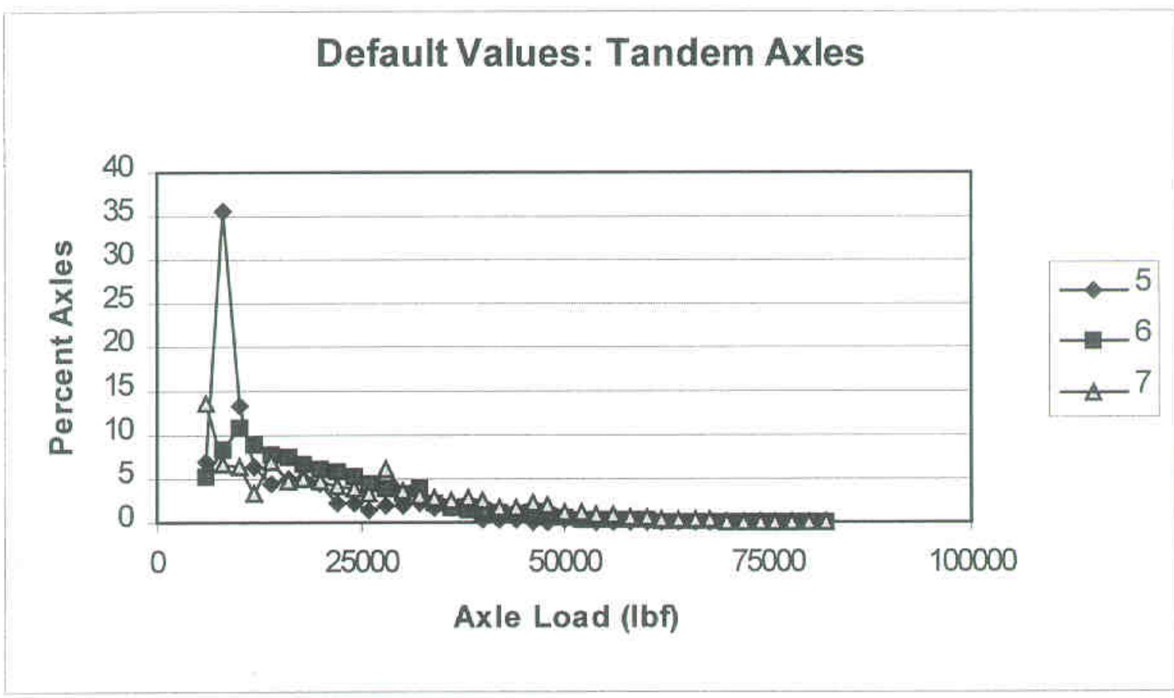


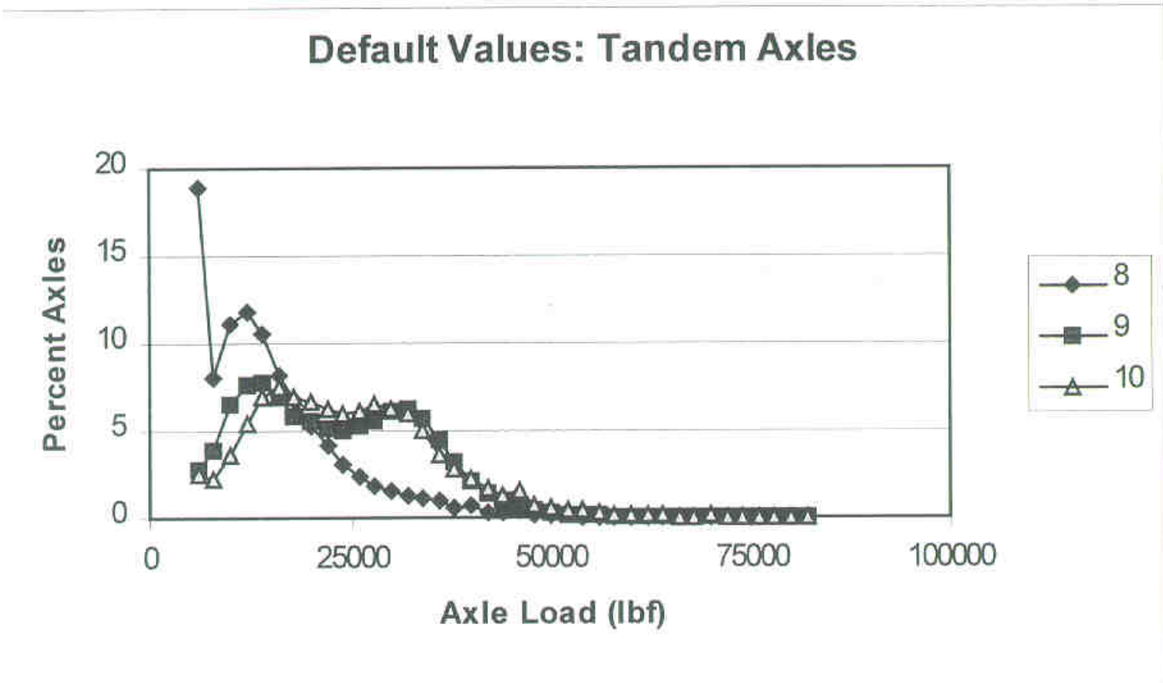
Default Values:Single Axles
Percent Axles
Axle Load (lbf)
0
5
10
15
20
15000
30000
45000
5
6
7


Default Values: Single Axles
Percent Axles
20
15
10
5
0
0
15000
30000
45000
Axle Load (lbf)
8
9
10

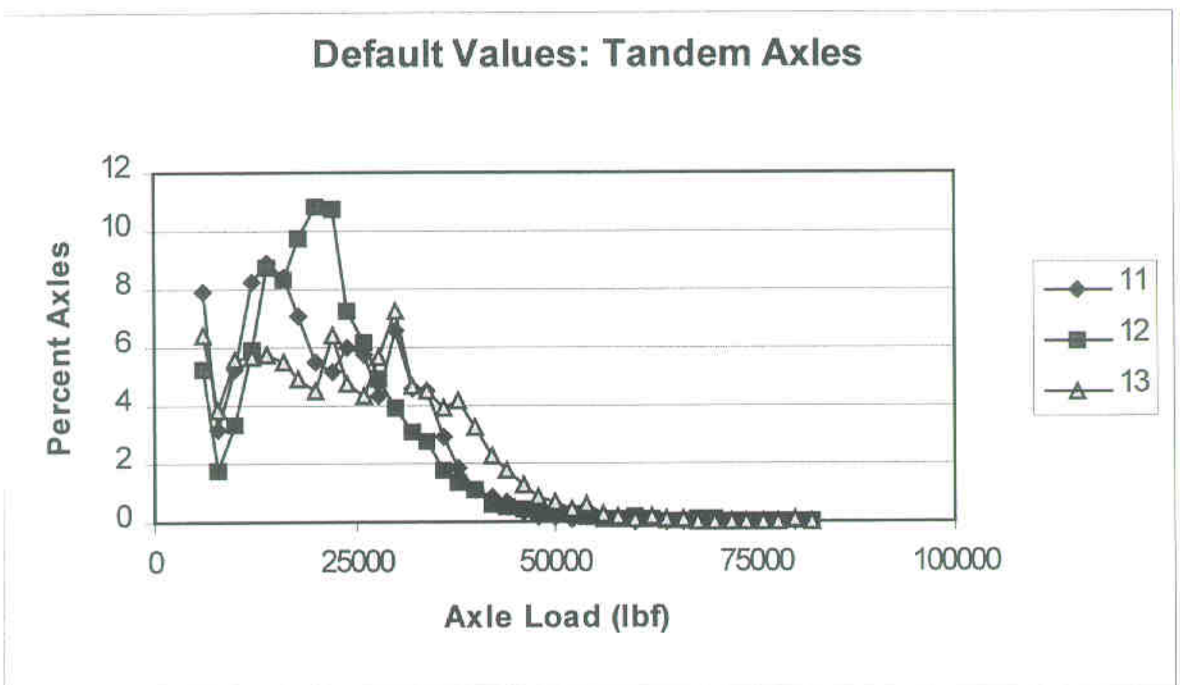

Default Values: Single Axles
Percent Axles
12
10
8
6
4
2
0
0
15000
30000
45000
Axle Load (lbf)
11
12
13


Default Values: Tandem Axles
Percent Axles
Axle Load (lbf)
16
14
12
10
8
6
4
2
0
0
25000
50000
75000
100000
4

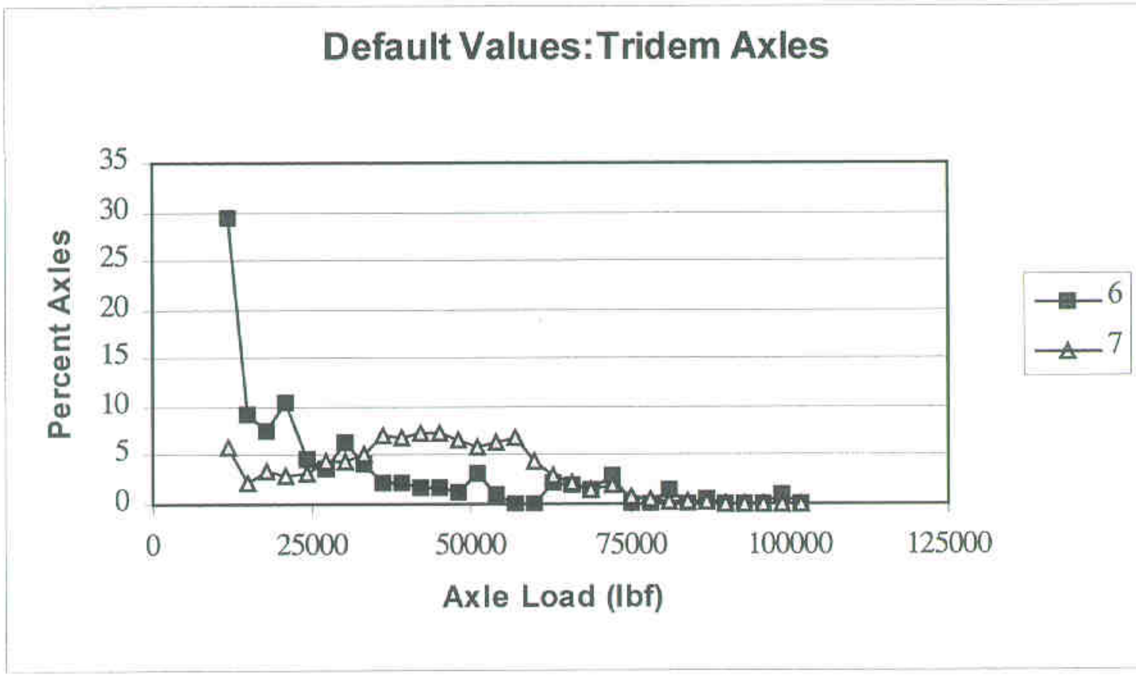

Default Values: Tandem Axles
Percent Axles
Axle Load (lbf)
40
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
5
6
7



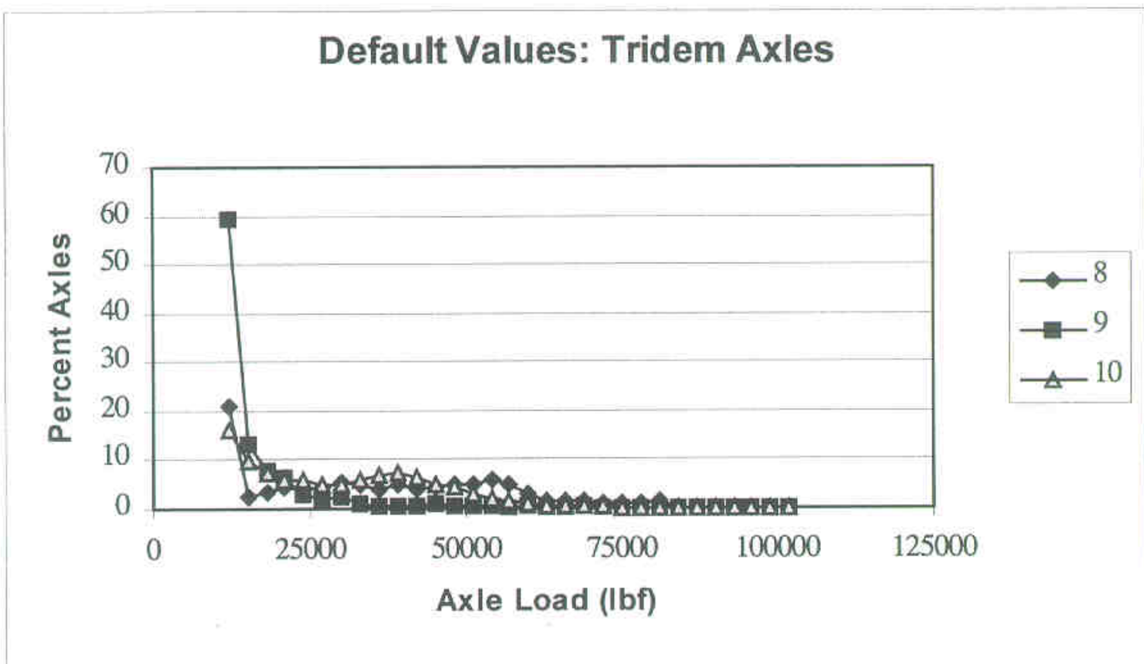
Default Values: Tandem Axles
Percent Axles
Axle Load (lbf)
20
15
10
5
0
0
25000
50000
75000
100000
8
9
10



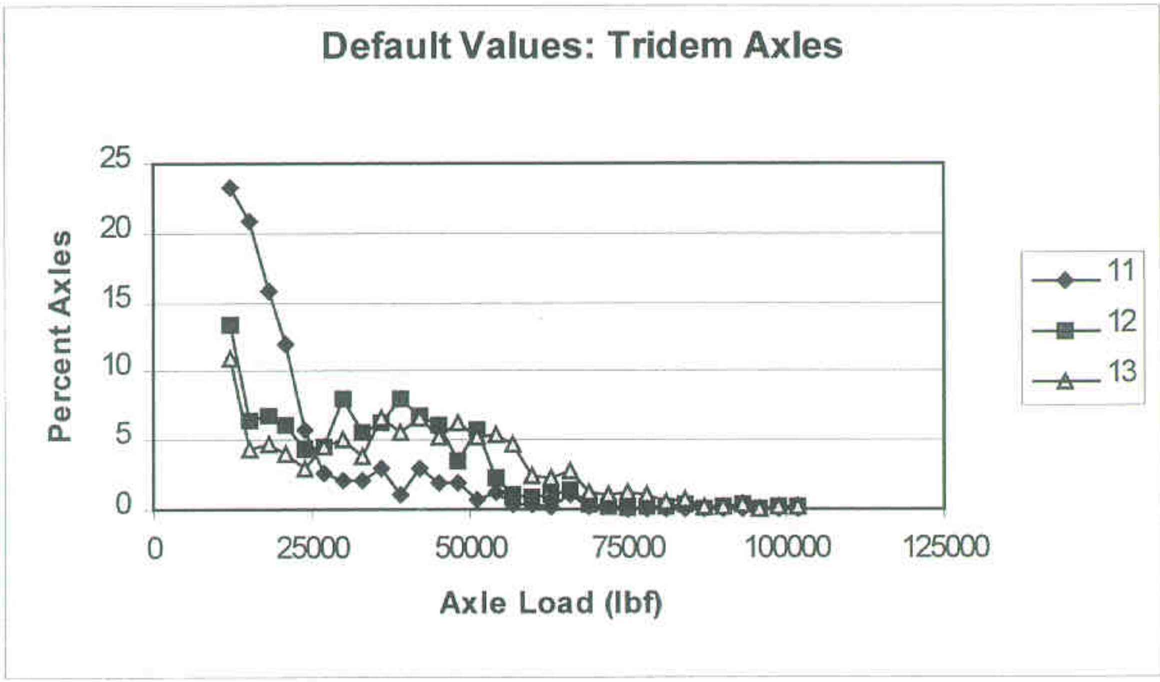
Default Values: Tandem Axles
Percent Axles
Axle Load (lbf)
12
10
8
6
4
2
0
0
25000
50000
75000
100000
11
12
13



Default Values:Tridem Axles
Percent Axles
Axle Load (lbf)
35
30
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
6
7



Default Values: Tridem Axles
Percent Axles
Axle Load (lbf)
70
60
50
40
30
20
10
0
0
25000
50000
75000
100000
125000
8
9
10


Default Values: Tridem Axles
Percent Axles
25
20
15
10
5
0
0
25000
50000
75000
100000
125000
Axle Load (lbf)
11
12
13

Single Axles (Mean)

VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
4	1.8	1.0	2.9	4.0	6.8	11.5	11.3	11.0	9.9	8.5	7.3	5.5	4.2	3.1	2.5	2.0	1.5	1.2	1.2	0.7
5	10.0	13.2	16.4	10.6	9.2	8.3	7.1	5.8	4.5	3.5	2.6	1.9	1.5	1.2	0.9	0.7	0.5	0.4	0.3	0.3
6	2.5	1.8	3.5	3.9	6.7	8.4	11.9	13.6	12.1	9.5	6.8	5.0	3.7	2.7	1.9	1.4	1.1	0.8	0.6	0.5
7	2.1	0.6	2.4	2.7	3.2	5.8	5.3	7.4	6.9	7.4	9.0	8.2	7.8	6.8	5.7	4.6	3.5	2.6	1.9	1.3
8	11.6	5.4	7.8	7.0	8.0	9.6	9.9	8.5	6.5	5.2	4.0	3.4	2.7	2.2	1.8	1.5	1.2	1.0	0.6	0.6
9	1.7	1.4	2.8	3.5	4.9	8.4	13.7	17.7	16.7	11.6	6.1	3.5	1.9	1.6	1.1	0.9	0.7	0.5	0.4	0.3
10	3.6	1.2	2.4	3.4	5.2	8.3	13.8	17.3	16.2	10.3	6.5	3.9	2.3	1.6	1.1	0.7	0.5	0.3	0.3	0.2
11	3.5	2.9	5.2	5.3	6.3	7.0	8.1	9.7	8.5	7.3	7.2	5.6	4.8	4.4	3.6	3.0	2.1	1.6	1.3	0.8
12	6.7	2.3	4.9	5.9	6.0	8.9	9.6	9.9	8.6	7.1	5.9	6.6	4.6	3.6	2.6	2.0	1.5	1.0	0.7	0.5
13	8.9	2.7	3.8	5.2	6.0	8.1	8.3	10.7	10.7	11.1	7.3	3.8	3.1	2.6	1.5	1.3	1.0	0.8	0.6	0.4

VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
4	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	1.0	0.7	0.4	1.2	0.3	0.2	0.2	0.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.6	0.4	0.3	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.5	0.2	0.1	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tandem Axles (Mean)

VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
4	5.9	1.4	1.9	2.7	3.6	5.0	8.0	11.6	14.2	13.1	10.7	7.5	5.1	3.1	1.9	1.3	0.8	0.5	0.5	0.3
5	6.1	30.8	11.5	5.5	3.8	4.4	4.4	3.8	2.0	2.0	1.3	1.7	1.6	1.9	1.5	1.5	1.4	0.3	0.3	0.2
6	5.3	8.4	10.8	9.0	7.7	7.5	6.8	6.1	5.7	5.2	4.5	3.9	3.2	3.9	2.1	1.7	1.4	1.3	1.0	0.8
7	13.7	6.7	6.5	3.5	7.1	4.8	5.0	4.6	4.3	3.8	3.4	6.0	3.7	3.0	2.9	2.5	2.7	2.5	1.6	1.5
8	19.0	8.1	11.2	11.8	10.5	8.3	6.8	5.3	4.1	3.1	2.3	1.8	1.6	1.2	1.1	0.9	0.6	0.6	0.3	0.3
9	2.8	3.9	6.5	7.6	7.7	7.0	5.8	5.6	5.2	5.1	5.3	5.5	6.1	6.3	5.7	4.5	3.2	2.1	1.4	0.9
10	2.5	2.2	3.7	5.4	6.9	7.5	7.0	6.6	6.3	6.0	6.2	6.5	6.2	5.9	5.0	3.6	2.8	2.2	1.7	1.3
11	7.9	3.2	5.2	8.2	8.9	8.5	7.1	5.5	5.1	6.0	5.7	4.4	6.6	4.6	4.5	2.9	1.8	1.1	0.8	0.7
12	5.2	1.8	3.3	5.9	8.7	8.4	9.8	10.8	10.8	7.2	6.1	4.9	3.9	3.1	2.7	1.7	1.3	1.1	0.6	0.5
13	6.4	3.8	5.6	5.7	5.7	5.5	4.9	4.5	6.4	4.8	4.3	5.6	7.2	4.7	4.5	3.9	4.2	3.2	2.3	1.8

VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
4	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	2.1	1.9	1.2	1.1	0.9	0.8	0.5	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
8	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1.5	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
11	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
13	1.2	0.8	0.6	0.4	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Tridem Axles (Mean)

VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
4	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.5	0.0	0.0	0.0	0.0
5	5.1	0.1	0.0	0.0	0.1	0.3	0.4	0.1	1.6	0.1	0.4	0.3	0.4	0.2	0.5	0.0
6	13.2	4.1	3.4	4.6	2.1	1.6	2.8	1.9	0.9	1.0	0.8	0.8	0.5	1.4	0.4	0.0
7	5.9	2.2	3.3	3.0	3.3	4.3	4.5	5.1	7.0	6.8	7.2	7.2	6.6	5.8	6.2	6.9
8	19.8	2.2	3.2	4.0	3.5	4.1	5.0	4.6	3.7	4.7	3.8	4.3	4.7	4.7	5.7	4.7
9	59.2	13.0	7.9	6.5	2.8	1.9	2.5	1.0	0.7	0.6	0.6	0.8	0.4	0.5	0.3	0.2
10	16.2	9.5	7.3	5.8	5.8	5.0	5.0	5.8	6.7	7.4	6.4	4.9	4.5	2.8	1.8	1.3
11	16.6	14.8	11.3	8.5	4.1	1.9	1.5	1.5	2.1	0.8	2.1	1.4	1.3	0.5	0.9	0.3
12	11.2	5.4	5.7	5.1	3.7	3.8	6.7	4.7	5.3	6.8	5.6	5.1	2.9	4.9	1.9	0.8
13	10.6	4.3	4.6	3.9	2.9	4.3	4.9	3.7	6.3	5.3	6.3	5.1	6.2	5.1	5.3	4.6

VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.9	0.9	0.7	1.3	0.0	0.0	0.7	0.0	0.2	0.0	0.0	0.0	0.4	0.0
7	4.3	2.9	2.1	1.4	2.0	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
8	2.9	1.4	1.3	1.5	1.1	0.9	1.1	1.3	0.1	0.0	0.1	0.0	0.0	0.1	0.1
9	0.3	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1.0	0.6	0.5	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
11	0.3	0.1	0.7	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.7	0.8	1.2	0.3	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.3	0.0	0.1	0.2
13	2.3	2.3	2.6	1.2	1.1	1.1	1.1	0.5	0.7	0.2	0.2	0.3	0.1	0.1	0.1

Single Axles (Variance)

VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
4	20	3	20	10	28	24	13	10	9	10	7	5	2	2	1	1	1	1	3	0
5	84	65	61	5	4	6	8	8	5	4	2	1	1	0	0	0	0	0	0	0
6	27	5	7	4	62	8	13	17	13	6	5	5	4	2	1	1	1	0	0	0
7	35	1	34	10	15	33	16	27	13	12	26	14	18	17	13	10	7	5	3	2
8	125	14	13	6	4	5	10	6	3	2	2	1	1	1	0	0	0	1	0	0
9	27	1	5	4	7	14	15	19	30	14	6	5	1	2	0	0	0	0	0	0
10	43	2	4	5	10	17	24	36	36	12	10	5	2	1	1	0	0	0	0	0
11	57	12	22	15	12	7	7	15	9	7	21	9	7	5	4	3	2	1	2	1
12	245	7	22	23	8	58	16	19	13	7	7	60	9	11	3	2	2	1	1	1
13	142	8	10	14	19	49	18	33	43	51	20	5	7	16	2	1	1	1	1	0

VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	1	0	29	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tandem Axles (Variance)

VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
4	258	4	5	5	6	8	22	34	25	23	19	13	13	3	2	1	1	0	1	0
5	66	999	139	40	19	38	35	38	10	13	6	7	18	27	12	27	25	0	0	0
6	70	23	24	8	6	8	8	6	6	5	5	4	2	61	1	1	0	1	0	0
7	342	98	122	13	99	46	29	84	15	21	12	153	29	8	6	13	9	8	4	3
8	170	12	19	19	15	8	6	4	3	3	3	3	2	2	1	3	0	2	0	0
9	46	6	7	7	6	4	3	3	3	4	3	4	5	6	5	4	3	2	1	1
10	28	5	6	8	12	8	5	7	5	5	5	8	7	9	6	3	3	2	1	1
11	233	20	35	62	86	95	40	16	12	34	33	10	56	18	30	11	6	3	1	2
12	265	8	11	20	79	23	53	83	245	19	18	24	24	10	12	5	3	2	1	1
13	64	30	22	16	12	18	10	11	63	14	15	20	88	7	10	9	33	7	6	3

VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	8	10	3	3	2	4	1	1	1	0	0	0	0	0	0	0	0	0	0
8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tridem Axles (Variance)

VC	Load Group (lbf) 12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
4	512	0	0	0	0	0	0	0	0	0	168	11	0	0	0	0
5	405	0	0	0	0	4	4	0	103	0	5	4	5	1	8	0
6	743	105	101	302	40	67	96	72	12	13	12	11	7	47	3	0
7	123	8	21	10	12	19	18	14	37	21	18	23	17	22	23	79
8	840	12	41	51	79	85	119	72	29	34	41	51	75	56	102	59
9	753	77	45	265	37	10	115	4	3	3	2	8	1	1	1	0
10	140	22	14	8	14	5	4	5	8	15	12	9	23	3	2	1
11	493	219	182	109	60	11	7	29	41	7	30	10	15	2	10	1
12	430	139	84	55	60	31	321	77	52	271	77	74	20	270	11	3
13	183	32	50	14	9	22	43	18	78	25	96	19	25	19	60	29

VC	Load Group (lbf) 60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	16	0	0	0	0	4	0	0	0	0	0	0
6	0	29	29	16	66	0	0	9	0	2	0	0	0	7	0
7	25	12	7	4	30	1	1	0	0	0	0	0	0	0	0
8	37	8	13	21	18	10	29	66	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	2	0	8	1	2	0	0	0	0	0	0	0	0	0	0
12	2	3	16	1	0	0	1	0	2	0	0	2	0	0	1
13	7	8	32	3	3	6	7	2	6	0	0	1	0	0	0

Single Axles (COV)

VC	Load Group (lbf) 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000
4	246	174	153	78	78	43	32	29	30	36	37	41	34	41	45	53	55	63	147	104
5	91	61	48	22	22	30	41	49	51	56	55	55	55	51	44	45	45	43	58	92
6	211	128	76	52	118	34	31	30	30	25	34	44	50	55	57	67	75	83	91	91
7	276	179	241	118	119	99	75	70	52	46	57	46	55	60	64	69	74	87	96	106
8	96	69	46	34	26	24	31	28	29	28	34	36	37	39	38	45	41	108	47	109
9	298	87	82	58	52	44	28	24	33	32	40	63	46	93	53	70	75	82	84	92
10	181	126	84	64	60	49	36	35	37	34	47	54	58	70	77	77	84	93	98	116
11	213	118	91	72	55	39	33	40	35	37	65	54	56	52	53	55	66	73	110	121
12	234	119	97	82	48	86	42	44	43	38	44	118	67	93	70	78	102	103	131	140
13	134	106	84	73	72	87	50	54	62	64	61	61	86	157	85	92	91	101	126	120

VC	Load Group (lbf) 23000	24000	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000	39000	40000	41000
4	127	108	134	139	197	173	219	170	185	213	194	228	330	277	315	361	260	369	N/A
5	84	74	148	185	162	164	258	207	248	249	248	234	277	305	295	454	616	616	N/A
6	114	127	146	172	204	204	243	292	300	349	327	421	402	402	454	361	616	616	N/A
7	105	124	134	457	137	160	178	189	559	216	238	260	249	317	369	369	454	369	N/A
8	68	72	75	112	94	102	127	162	147	408	315	277	401	430	295	616	369	616	N/A
9	108	116	142	169	211	245	251	260	260	346	346	430	616	430	616	N/A	N/A	N/A	N/A
10	183	270	172	186	275	268	310	277	289	369	396	295	430	616	430	616	430	573	N/A
11	150	169	145	171	270	163	322	190	183	351	430	616	616	N/A	616	396	616	616	N/A
12	155	203	238	274	198	209	234	268	310	402	402	430	N/A	616	439	483	N/A	616	N/A
13	187	166	190	346	338	255	265	224	416	389	284	277	346	315	346	505	430	N/A	N/A

Tandem Axles (COV)

VC	Load Group (lbf) 6000	8000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000
4	273	138	114	83	66	57	59	50	35	37	41	48	71	58	68	73	95	106	139	144
5	132	103	103	116	116	140	135	162	161	179	184	159	259	275	227	337	345	183	202	324
6	158	57	45	32	31	38	41	42	44	44	49	50	45	200	36	41	49	60	69	78
7	134	148	170	102	141	140	109	200	92	120	99	205	146	94	85	141	110	110	120	119
8	69	43	40	37	37	33	35	38	44	55	78	94	92	105	113	170	102	224	147	152
9	243	63	41	34	30	30	28	32	36	40	35	37	35	38	40	43	51	65	75	84
10	215	100	66	52	51	37	32	40	37	38	35	44	42	51	50	49	57	61	65	87
11	193	142	113	95	105	115	89	72	68	97	101	71	113	92	122	116	129	154	133	205
12	311	158	101	75	102	58	75	84	145	61	69	99	125	103	126	124	130	147	173	216
13	125	144	84	70	60	76	66	75	123	78	89	80	130	58	71	74	136	85	104	104

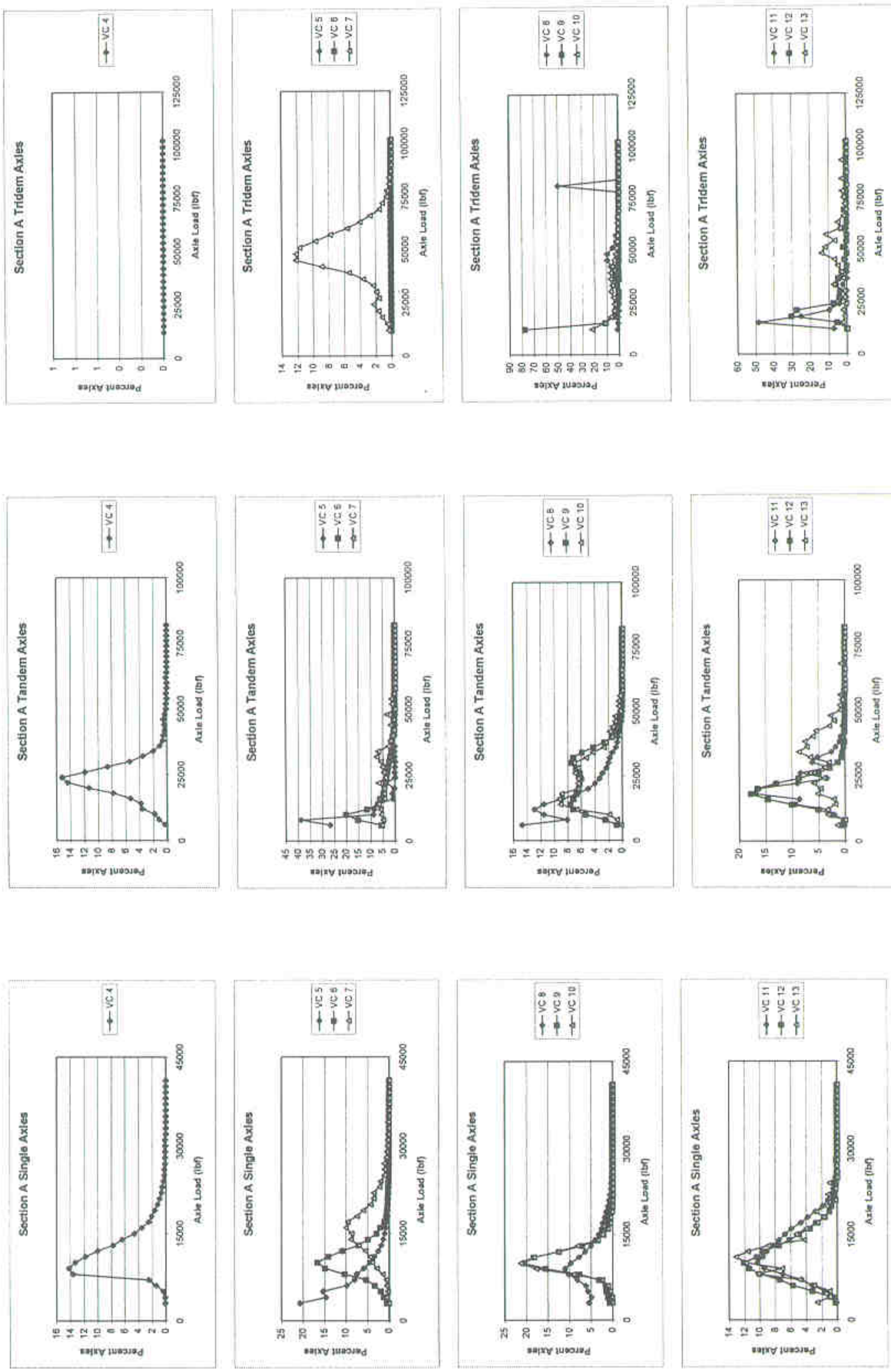
VC	Load Group (lbf) 46000	48000	50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000	76000	78000	80000	82000
4	140	160	161	156	283	347	369	330	567	616	550	483	430	616	616	N/A	N/A	N/A	N/A
5	254	372	347	265	266	373	361	361	454	454	616	616	376	430	N/A	N/A	N/A	N/A	N/A
6	80	83	95	114	120	136	155	147	184	187	194	238	182	232	305	295	616	N/A	N/A
7	132	169	147	158	163	251	190	166	199	244	236	277	295	246	428	320	616	616	N/A
8	338	198	189	196	202	201	182	373	472	277	346	N/A	616	616	616	N/A	N/A	N/A	N/A
9	90	102	114	134	151	151	190	207	274	248	274	346	315	454	616	616	616	N/A	N/A
10	263	89	116	112	109	119	135	136	145	174	177	164	358	225	260	295	346	N/A	N/A
11	160	194	282	255	411	385	472	289	392	454	361	454	616	616	616	N/A	N/A	N/A	N/A
12	228	201	297	339	471	405	415	392	418	423	485	412	504	616	N/A	616	616	N/A	N/A
13	113	168	151	145	160	156	166	220	289	342	326	386	369	305	352	458	550	616	N/A

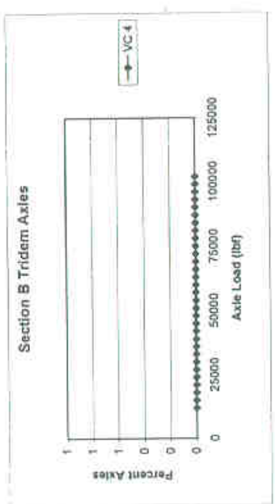
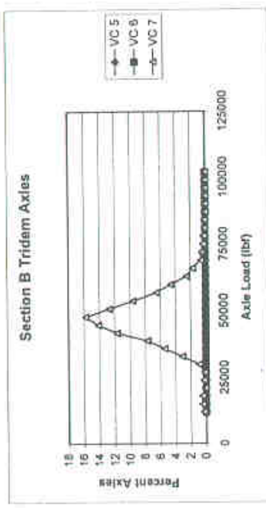
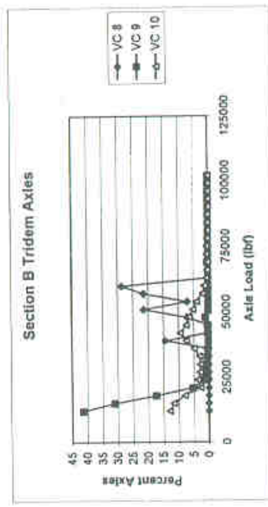
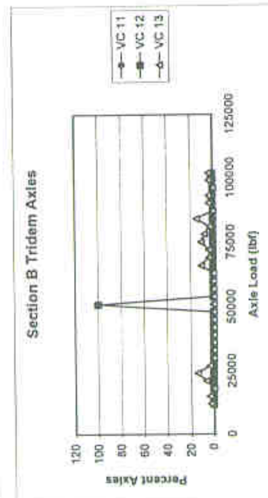
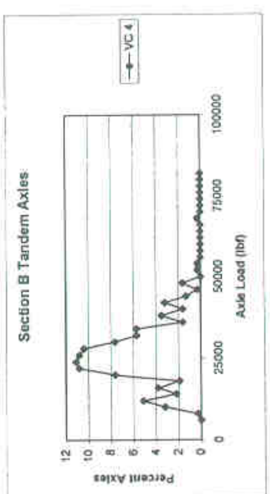
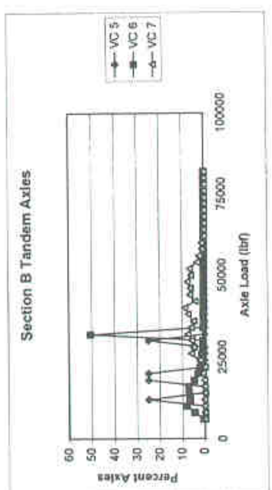
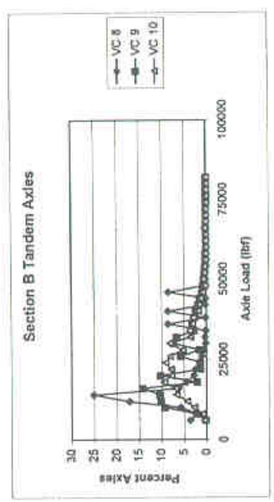
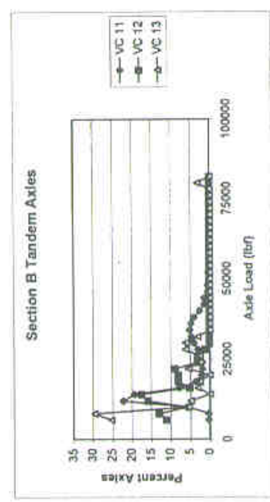
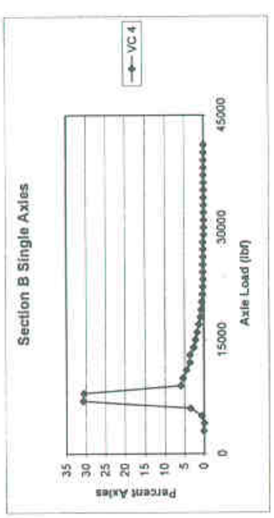
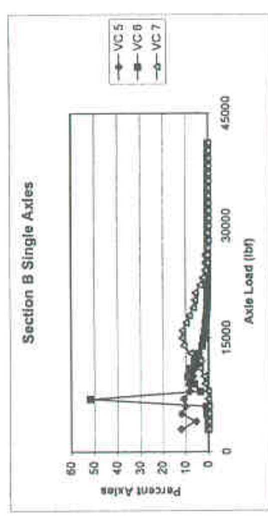
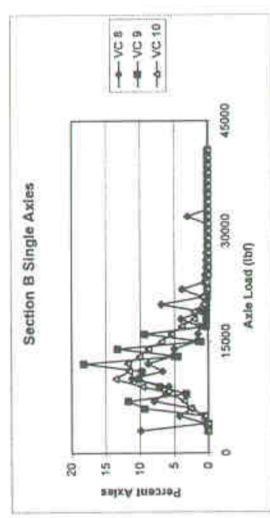
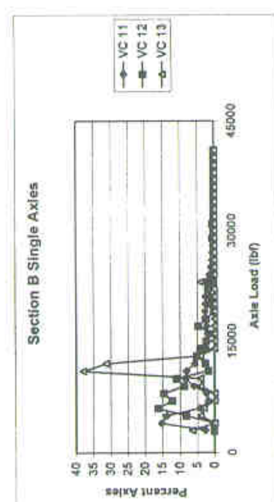
Tridem Axles (COV)

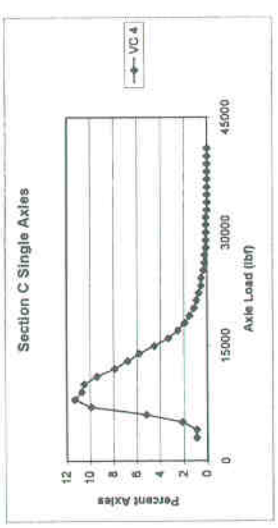
	Load Group (lbf)															
VC	12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000
4	430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	616	616	N/A	N/A	N/A	N/A
5	396	616	616	616	616	616	513	616	616	616	616	616	616	616	616	N/A
6	207	249	295	375	299	515	349	453	370	364	429	442	488	490	430	N/A
7	188	132	138	106	106	101	95	74	86	67	59	67	63	80	77	128
8	146	155	202	177	253	225	220	183	145	123	169	166	185	158	179	162
9	46	67	85	250	218	171	428	184	275	304	262	332	318	250	292	279
10	73	50	51	49	65	44	42	40	43	53	53	60	106	64	75	77
11	134	100	119	123	188	177	183	370	305	338	257	228	291	274	346	274
12	185	219	162	146	211	145	266	186	137	243	155	168	152	336	175	205
13	128	131	152	96	100	109	135	113	139	93	155	87	82	87	146	118

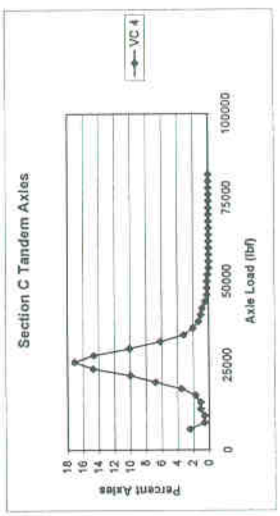
	Load Group (lbf)														
VC	60000	63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000	102000
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	616	N/A	N/A	N/A	N/A	616	N/A	N/A	N/A	N/A	N/A	N/A
6	616	578	616	616	616	616	N/A	455	N/A	616	N/A	616	N/A	616	N/A
7	116	116	124	133	280	177	180	208	227	275	275	320	416	376	557
8	208	197	267	305	389	337	509	603	616	302	581	616	616	583	497
9	262	373	302	301	317	365	385	475	495	491	396	521	376	616	616
10	91	116	125	149	158	175	182	241	220	240	269	295	358	361	402
11	525	470	415	570	580	N/A	N/A	616	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	204	229	339	272	322	571	517	392	402	534	458	416	616	596	477
13	112	126	215	153	153	207	235	295	356	386	319	284	296	557	545

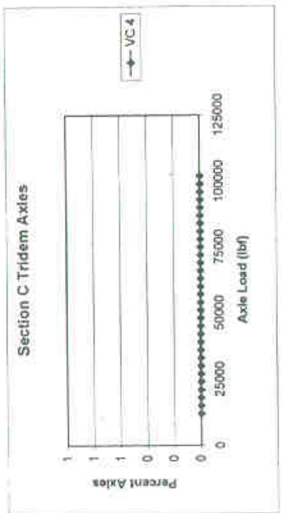
APPENDIX AA.8 – Normalized Axle Load Spectra for Level 1 Inputs for the Example Problems

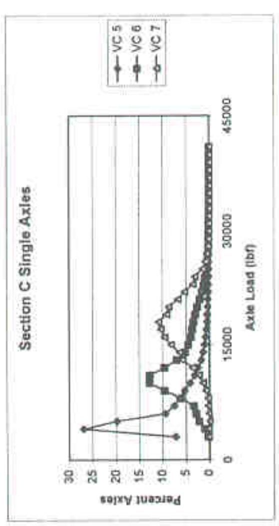

Section A Single Axles
Section A Tandem Axles
Section A Tridem Axles
Percent Axles
Axle Load (lbf)
VC 4
VC 5
VC 6
VC 7
VC 8
VC 9
VC 10
VC 11
VC 12
VC 13

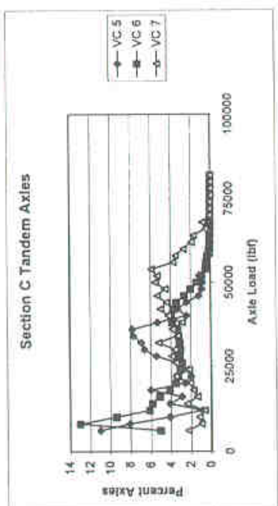

Section B Tridem Axles
VC 4
Percent Axles
Axle Load (lbf)

Section B Tridem Axles
VC 5
VC 6
VC 7
Percent Axles
Axle Load (lbf)

Section B Tridem Axles
VC 8
VC 9
VC 10
Percent Axles
Axle Load (lbf)

Section B Tridem Axles
VC 11
VC 12
VC 13
Percent Axles
Axle Load (lbf)

Section B Tandem Axles
VC 4
Percent Axles
Axle Load (lbf)

Section B Tandem Axles
VC 5
VC 6
VC 7
Percent Axles
Axle Load (lbf)

Section B Tandem Axles
VC 8
VC 9
VC 10
Percent Axles
Axle Load (lbf)

Section B Tandem Axles
VC 11
VC 12
VC 13
Percent Axles
Axle Load (lbf)

Section B Single Axles
VC 4
Percent Axles
Axle Load (lbf)

Section B Single Axles
VC 5
VC 6
VC 7
Percent Axles
Axle Load (lbf)

Section B Single Axles
VC 8
VC 9
VC 10
Percent Axles
Axle Load (lbf)

Section B Single Axles
VC 11
VC 12
VC 13
Percent Axles
Axle Load (lbf)

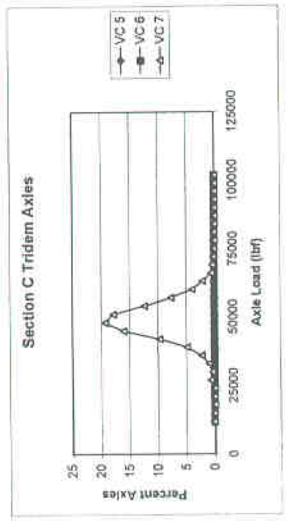

Section C Single Axles
Percent Axles
Axle Load (lbf)
VC 4

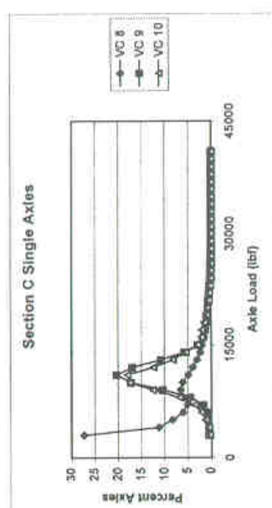

Section C Tandem Axles
Percent Axles
Axle Load (lbf)
VC 4

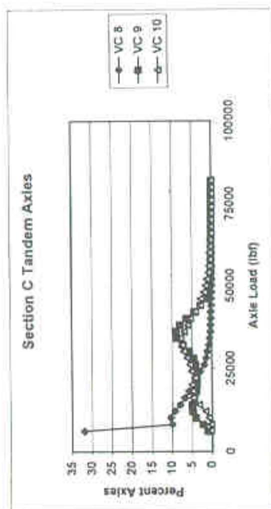

Section C Tridem Axles
Percent Axles
Axle Load (lbf)
VC 4


Section C Single Axles
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7

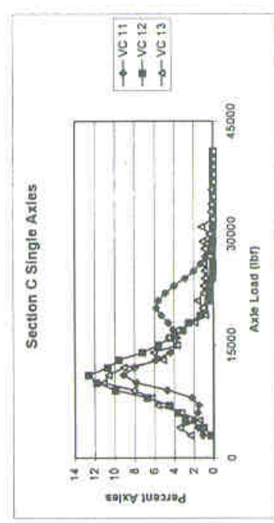

Section C Tandem Axles
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7

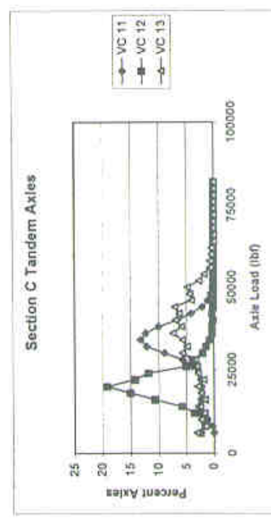

Section C Tridem Axles
Percent Axles
Axle Load (lbf)
VC 5
VC 6
VC 7

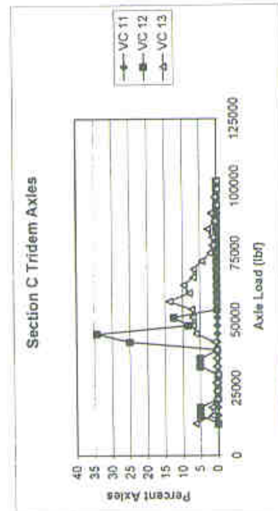

Section C Single Axles
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10


Section C Tandem Axles
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10

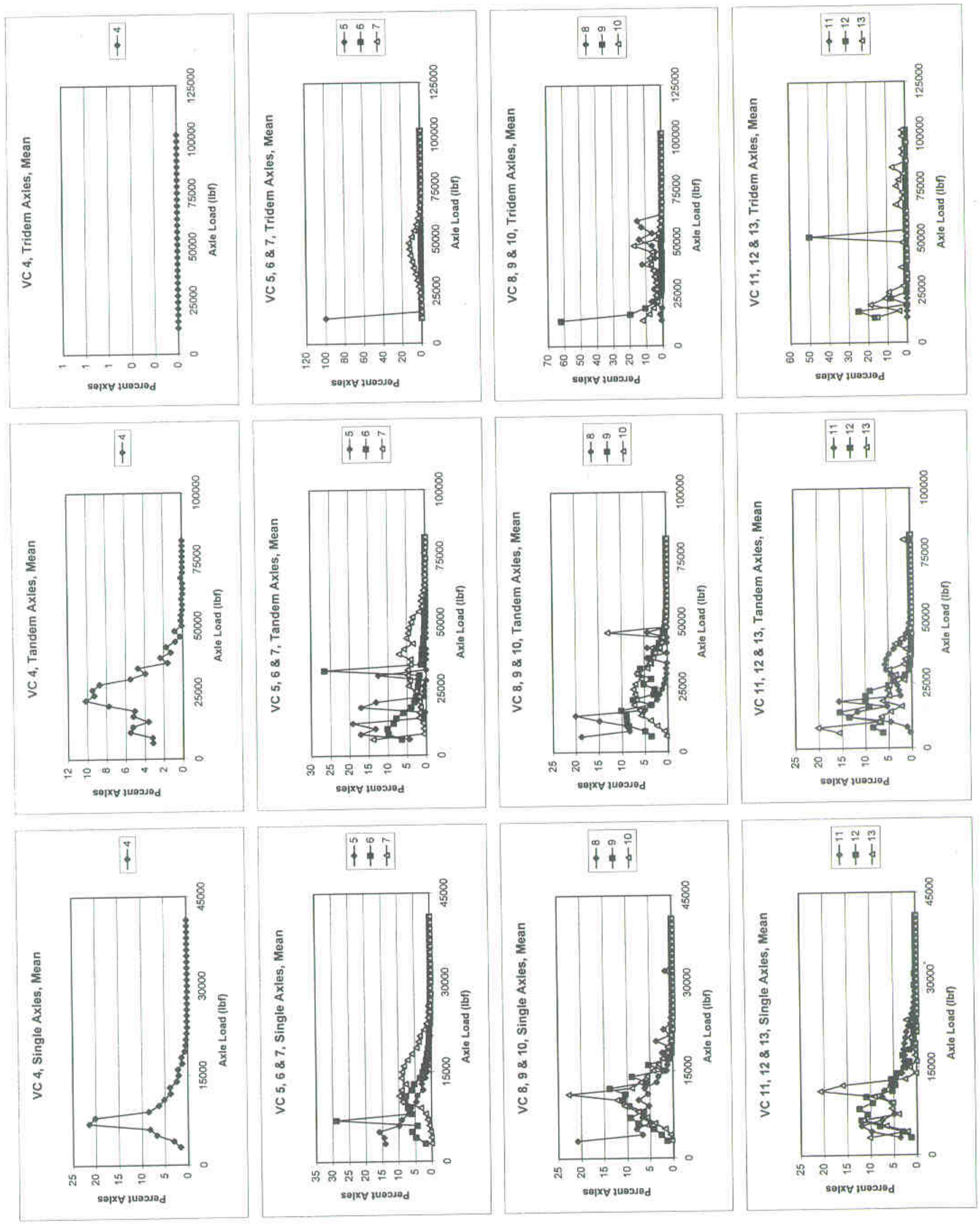

Section C Tridem Axles
Percent Axles
Axle Load (lbf)
VC 8
VC 9
VC 10

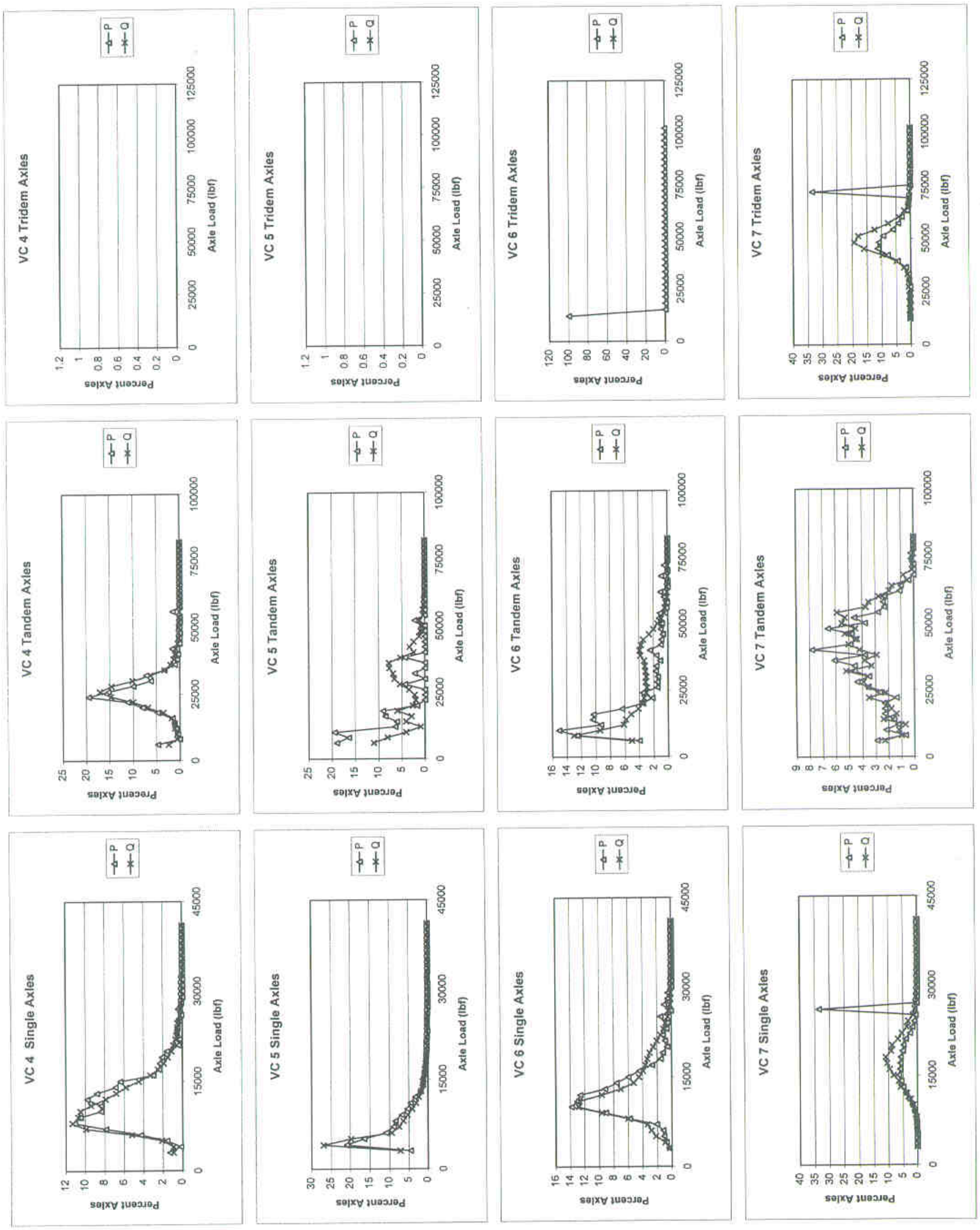

Section C Single Axles
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13

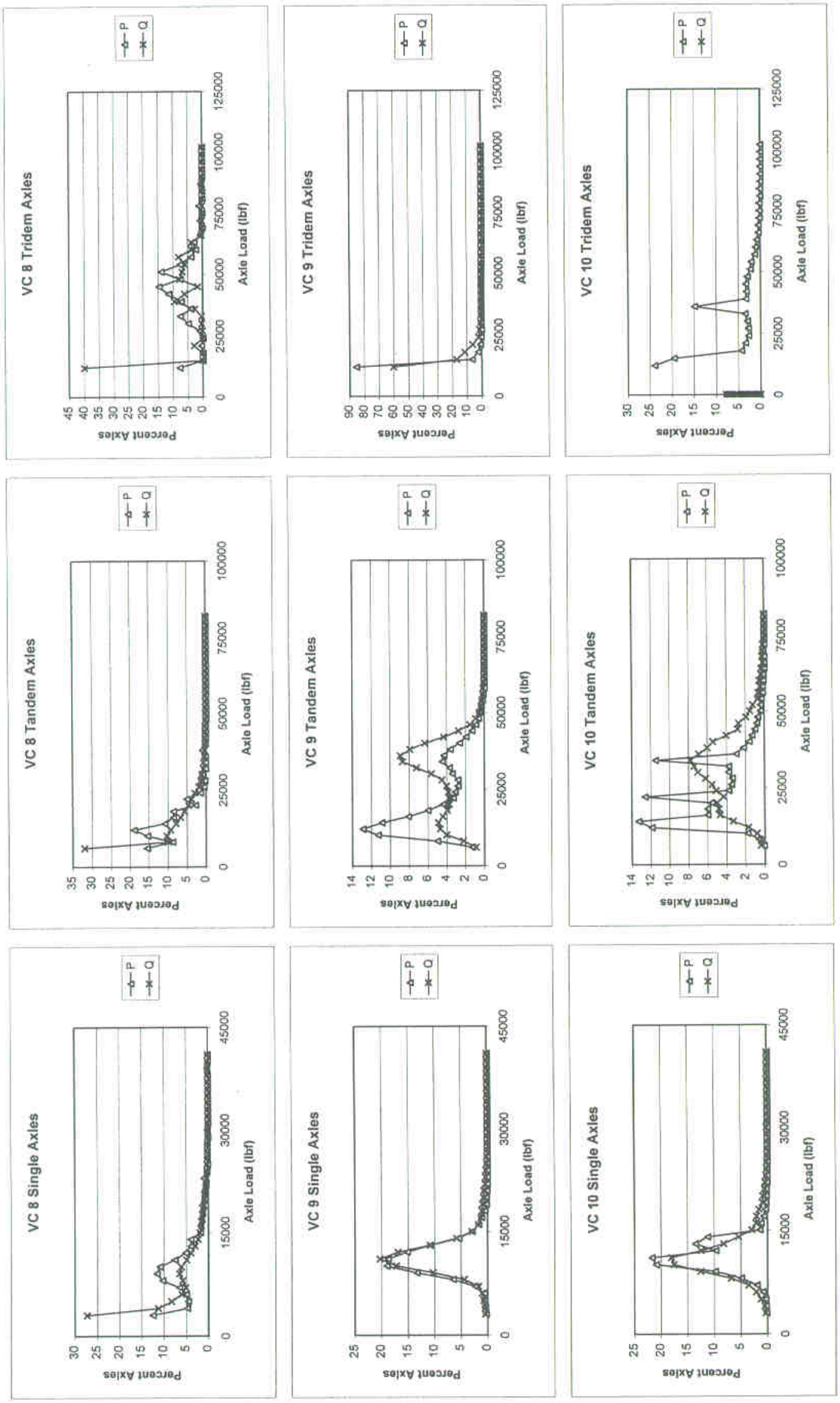

Section C Tandem Axles
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13


Section C Tridem Axles
Percent Axles
Axle Load (lbf)
VC 11
VC 12
VC 13

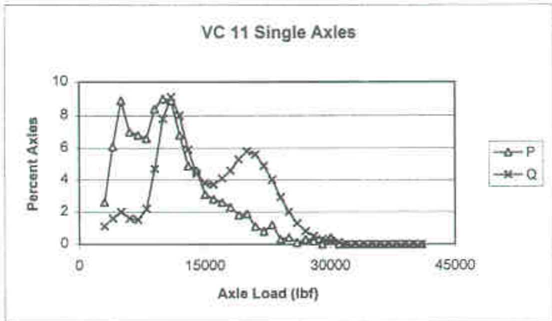
APPENDIX AA.9 – Axle Load Spectra from Other Roadways Used to Determine the Regional Values for the Level 2 and Level 3 Inputs to the Example Problems

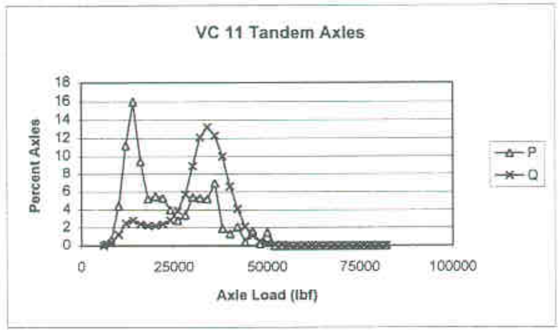

VC 4, Single Axles, Mean
VC 4, Tandem Axles, Mean
VC 4, Tridem Axles, Mean
VC 5, 6 & 7, Single Axles, Mean
VC 5, 6 & 7, Tandem Axles, Mean
VC 5, 6 & 7, Tridem Axles, Mean
VC 8, 9 & 10, Single Axles, Mean
VC 8, 9 & 10, Tandem Axles, Mean
VC 8, 9 & 10, Tridem Axles, Mean
VC 11, 12 & 13, Single Axles, Mean
VC 11, 12 & 13, Tandem Axles, Mean
VC 11, 12 & 13, Tridem Axles, Mean
Percent Axles
Axle Load (lbf)

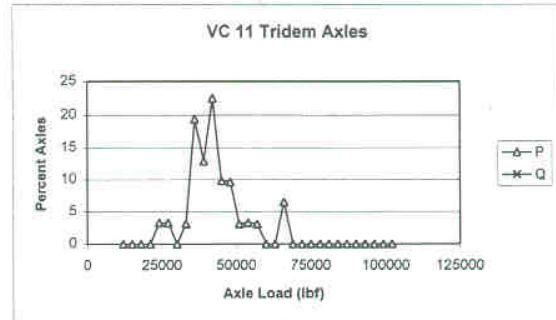

VC 4 Single Axles
VC 4 Tandem Axles
VC 4 Tridem Axles
VC 5 Single Axles
VC 5 Tandem Axles
VC 5 Tridem Axles
VC 6 Single Axles
VC 6 Tandem Axles
VC 6 Tridem Axles
VC 7 Single Axles
VC 7 Tandem Axles
VC 7 Tridem Axles
Percent Axles
Axle Load (lbf)
P
Q

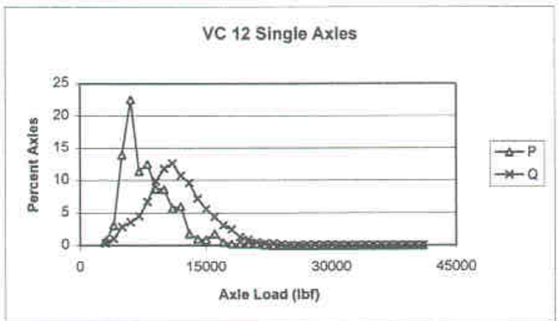


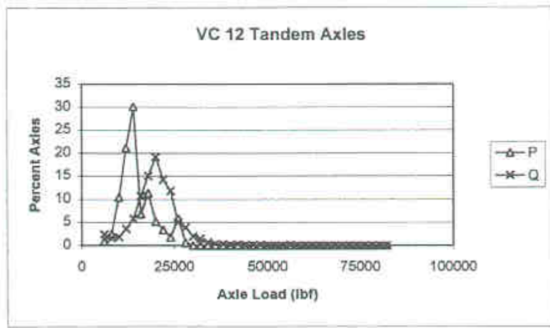
VC 8 Single Axles
VC 8 Tandem Axles
VC 8 Tridem Axles
VC 9 Single Axles
VC 9 Tandem Axles
VC 9 Tridem Axles
VC 10 Single Axles
VC 10 Tandem Axles
VC 10 Tridem Axles
Percent Axles
Axle Load (lbf)
P
Q

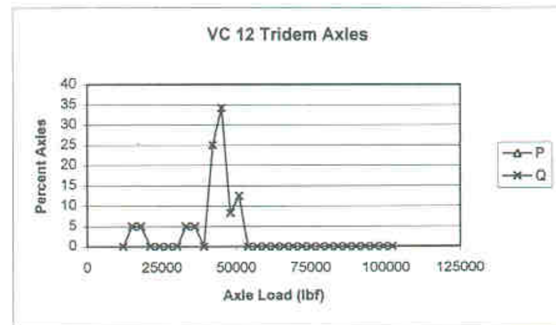

VC 11 Single Axles
Percent Axles
Axle Load (lbf)
P
Q

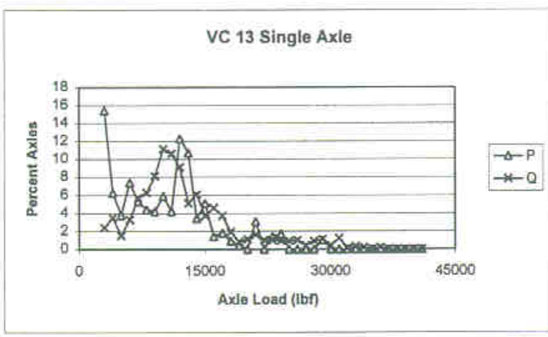

VC 11 Tandem Axles
Percent Axles
Axle Load (lbf)
P
Q

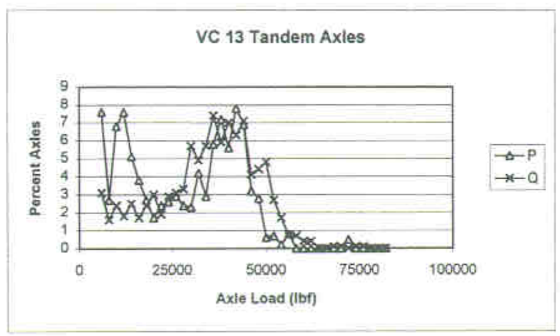

VC 11 Tridem Axles
Percent Axles
Axle Load (lbf)
P
Q

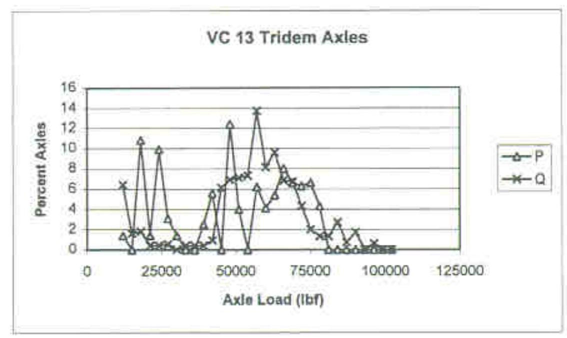

VC 12 Single Axles
Percent Axles
Axle Load (lbf)
P
Q

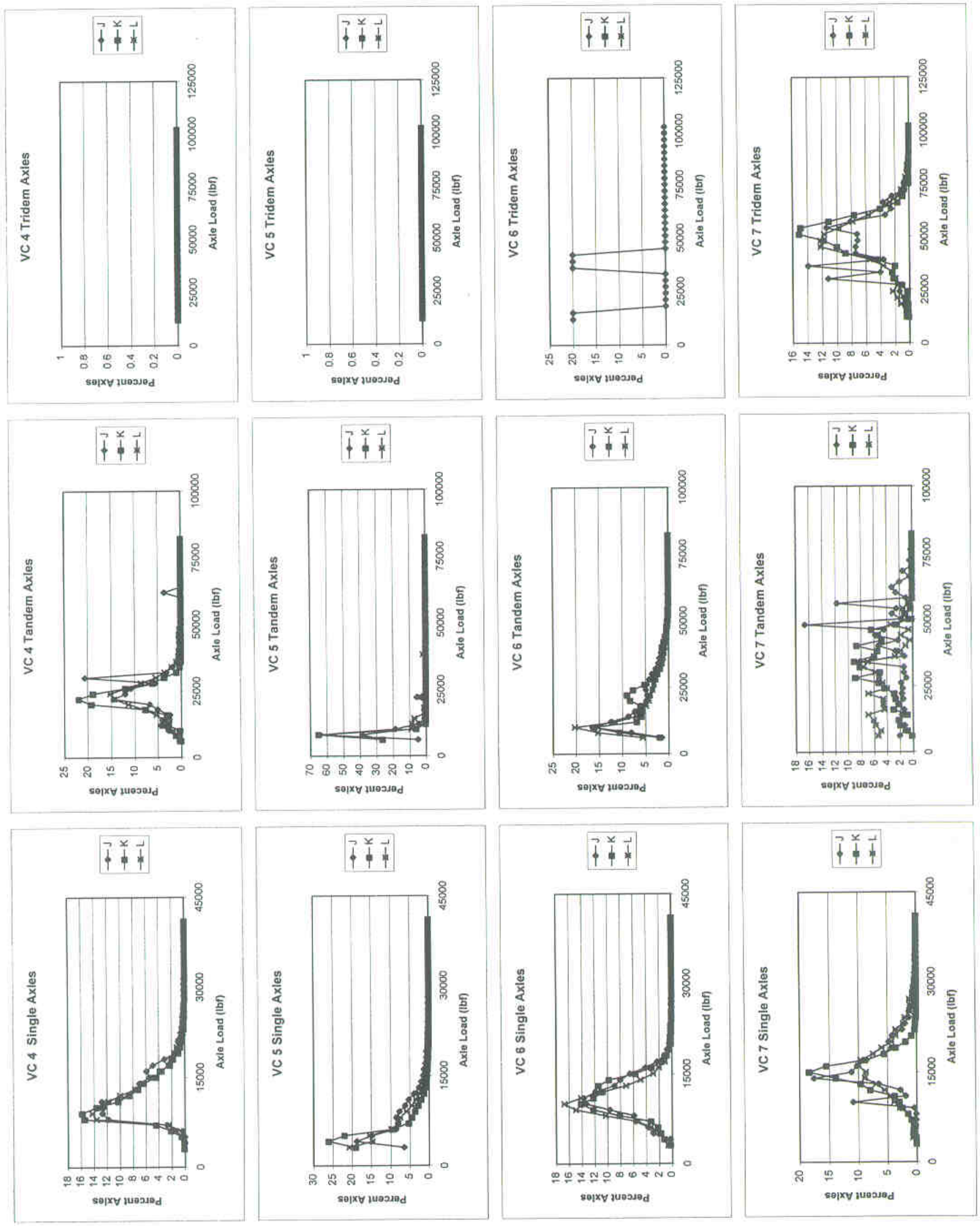

VC 12 Tandem Axles
Percent Axles
Axle Load (lbf)
P
Q

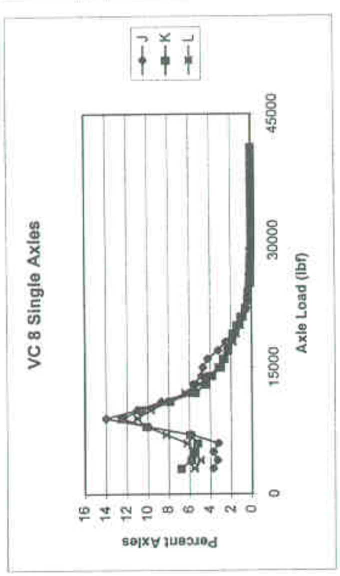

VC 12 Tridem Axles
Percent Axles
Axle Load (lbf)
P
Q

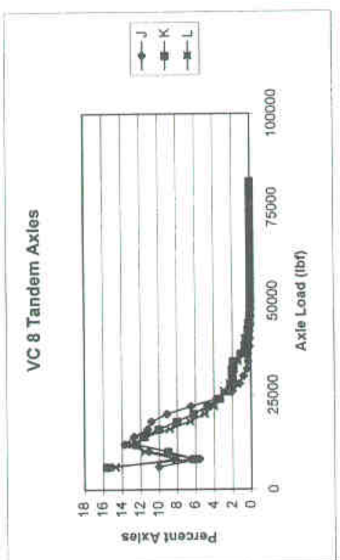

VC 13 Single Axle
Percent Axles
Axle Load (lbf)
P
Q

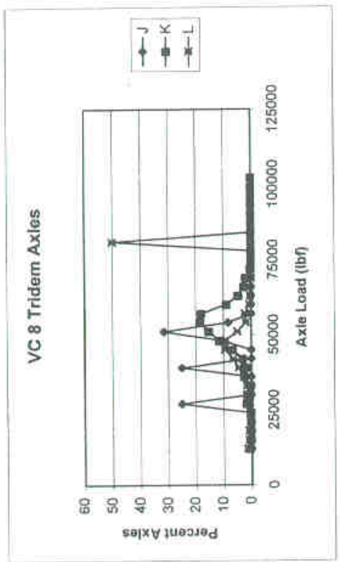

VC 13 Tandem Axles
Percent Axles
Axle Load (lbf)
P
Q

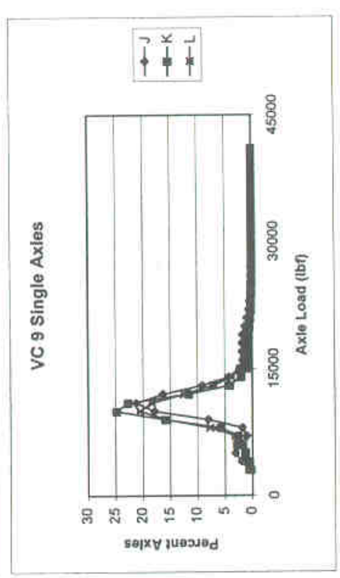

VC 13 Tridem Axles
Percent Axles
Axle Load (lbf)
P
Q

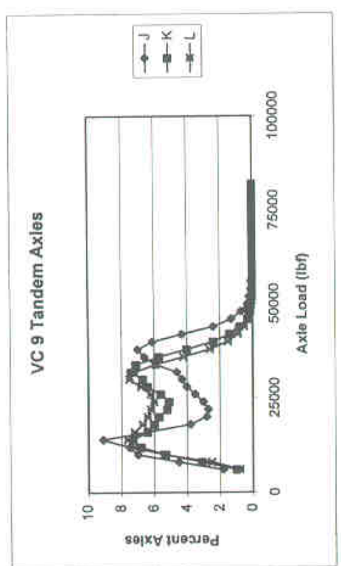

VC 4 Single Axles
VC 4 Tandem Axles
VC 4 Tridem Axles
VC 5 Single Axles
VC 5 Tandem Axles
VC 5 Tridem Axles
VC 6 Single Axles
VC 6 Tandem Axles
VC 6 Tridem Axles
VC 7 Single Axles
VC 7 Tandem Axles
VC 7 Tridem Axles
Percent Axles
Axle Load (lbf)
J
K
L

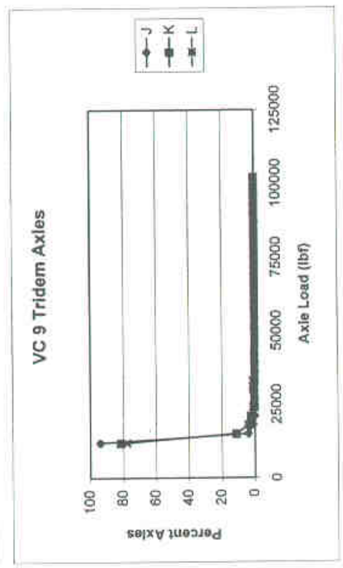

VC 8 Single Axles
Percent Axles
Axle Load (lbf)
J
K
L

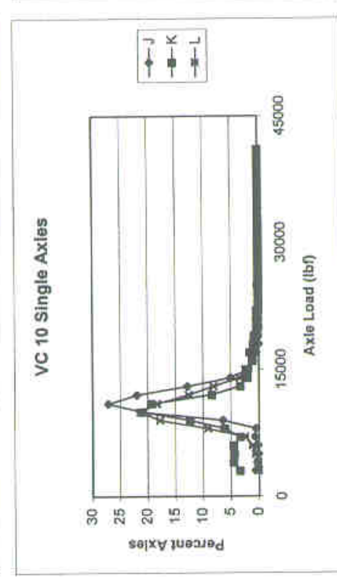

VC 8 Tandem Axles
Percent Axles
Axle Load (lbf)
J
K
L

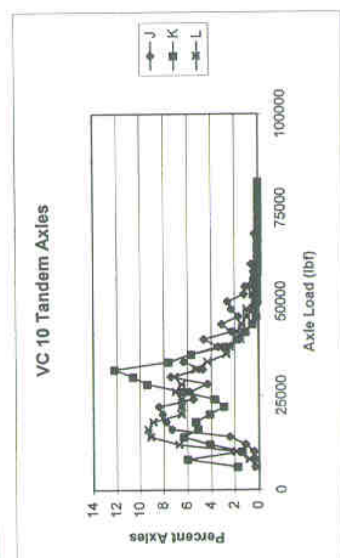

VC 8 Tridem Axles
Percent Axles
Axle Load (lbf)
J
K
L

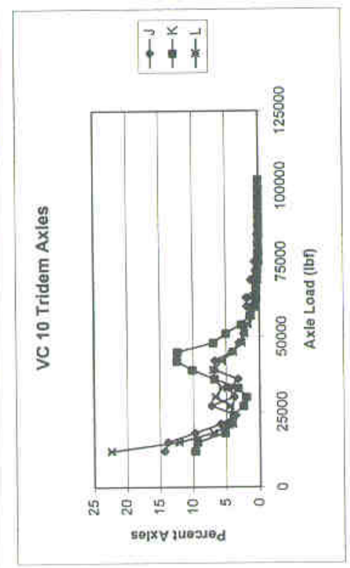

VC 9 Single Axles
Percent Axles
Axle Load (lbf)
J
K
L

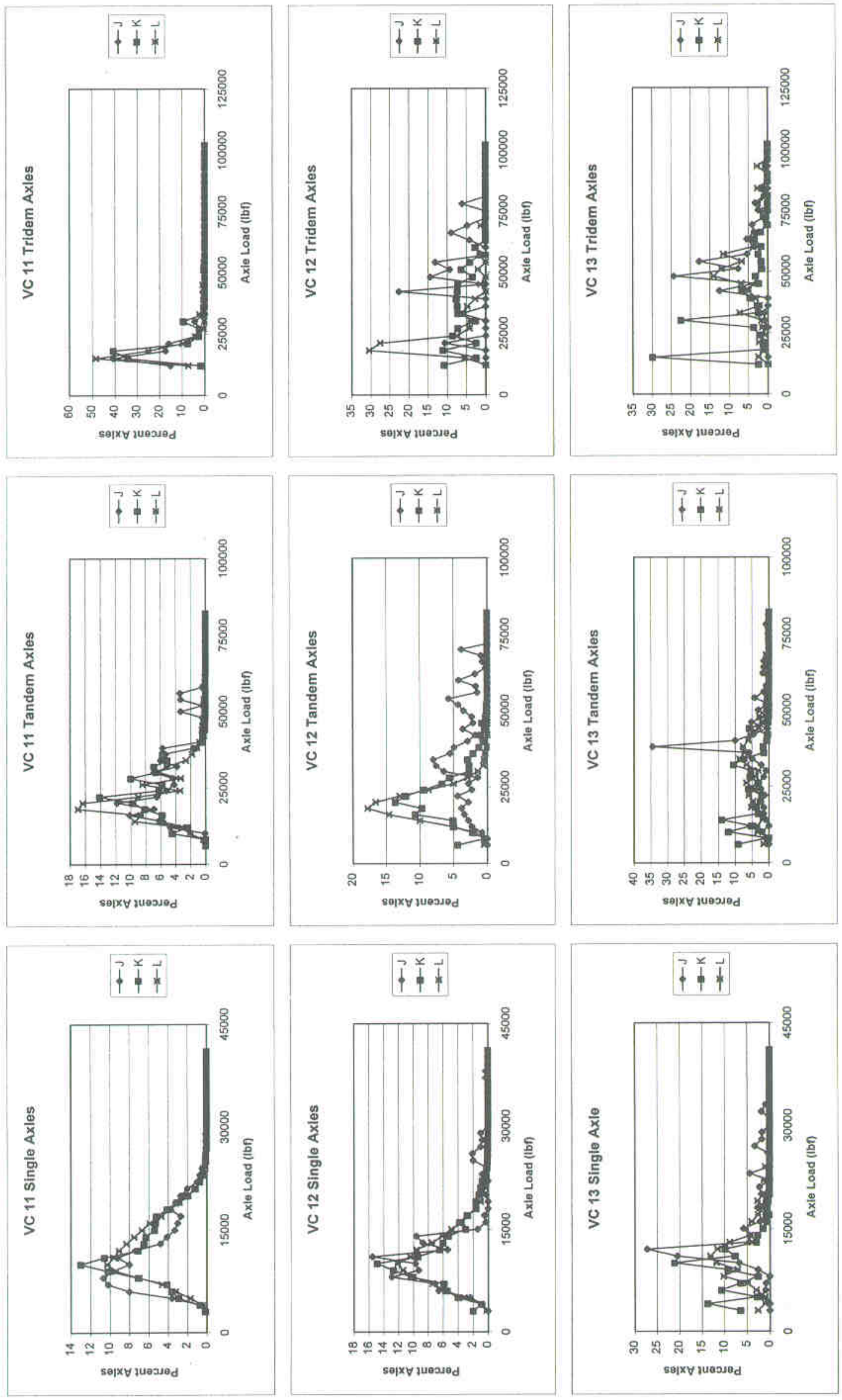

VC 9 Tandem Axles
Percent Axles
Axle Load (lbf)
J
K
L


VC 9 Tridem Axles
Percent Axles
Axle Load (lbf)
J
K
L

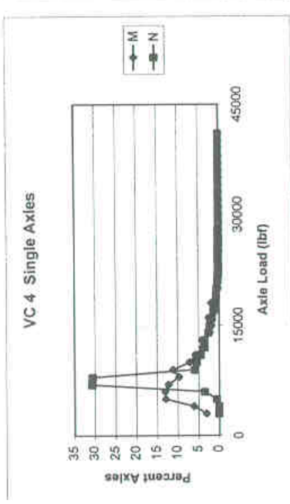

VC 10 Single Axles
Percent Axles
Axle Load (lbf)
J
K
L

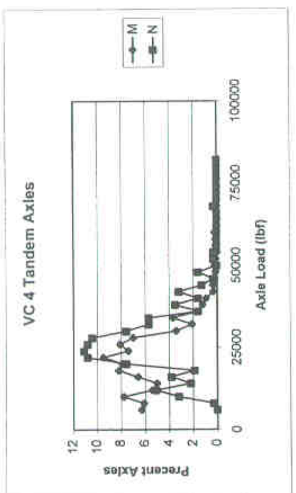

VC 10 Tandem Axles
Percent Axles
Axle Load (lbf)
J
K
L

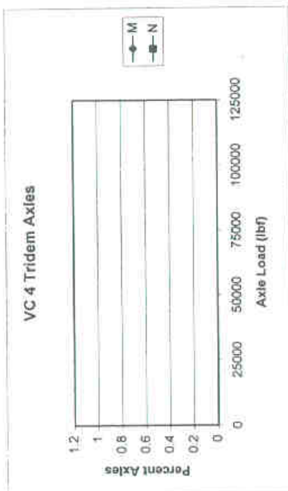

VC 10 Tridem Axles
Percent Axles
Axle Load (lbf)
J
K
L

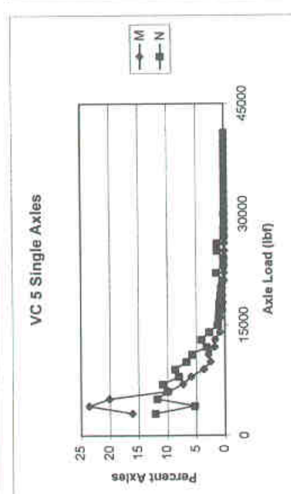


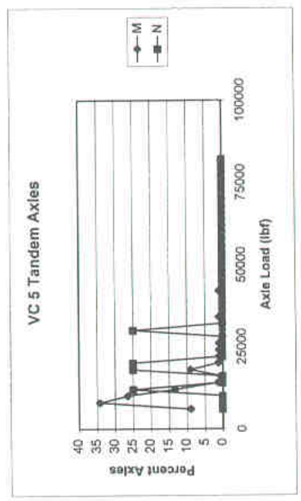
VC 11 Single Axles
VC 11 Tandem Axles
VC 11 Tridem Axles
VC 12 Single Axles
VC 12 Tandem Axles
VC 12 Tridem Axles
VC 13 Single Axle
VC 13 Tandem Axles
VC 13 Tridem Axles
Percent Axles
Axle Load (lbf)
J
K
L

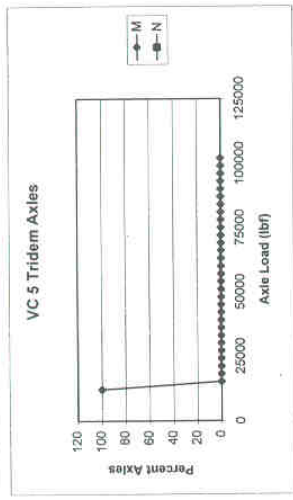

VC 4 Single Axles
Percent Axles
Axle Load (lbf)
M
N

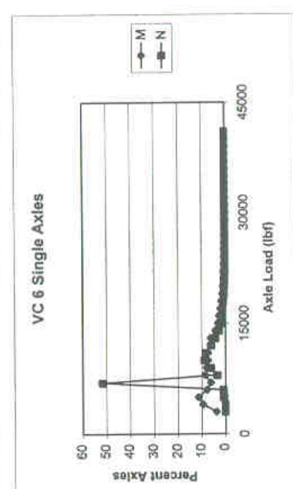

VC 4 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N

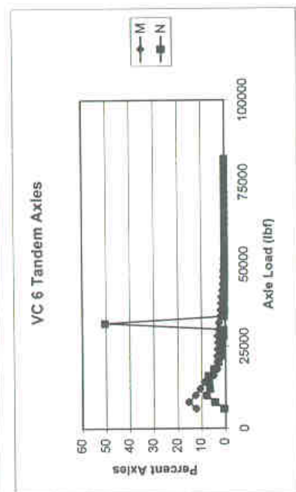

VC 4 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

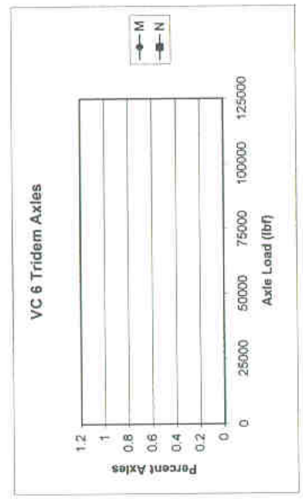

VC 5 Single Axles
Percent Axles
Axle Load (lbf)
M
N

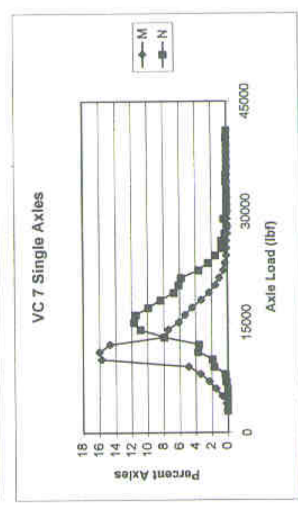

VC 5 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N


VC 5 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

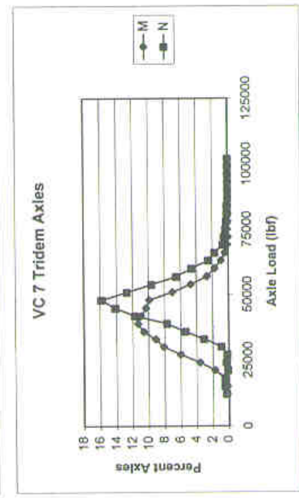

VC 6 Single Axles
Percent Axles
Axle Load (lbf)
M
N

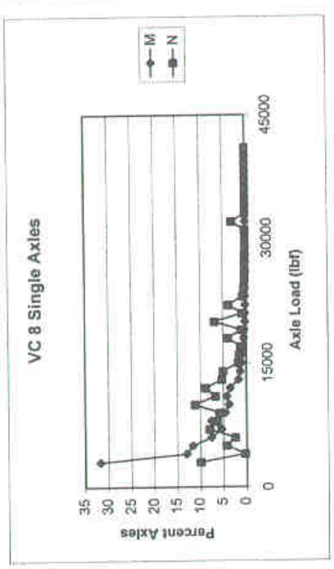

VC 6 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N

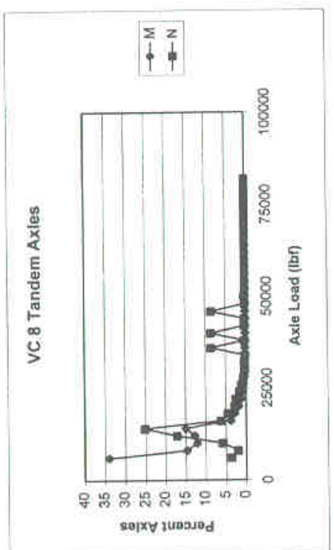

VC 6 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

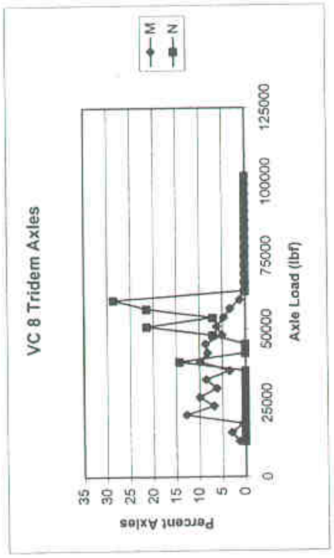

VC 7 Single Axles
Percent Axles
Axle Load (lbf)
M
N

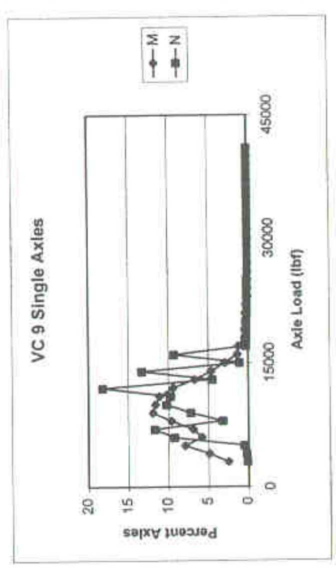

VC 7 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N

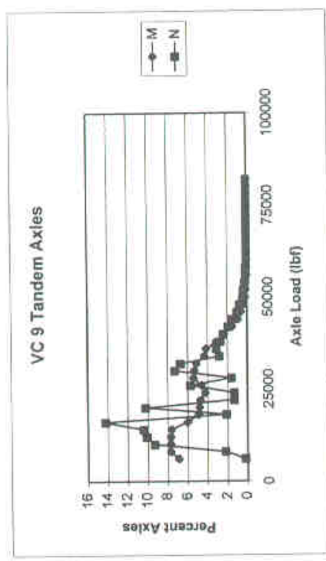

VC 7 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

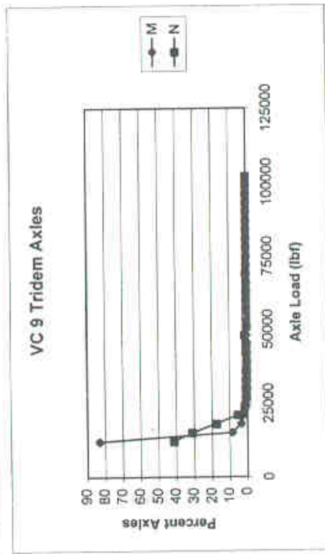

VC 8 Single Axles
Percent Axles
Axle Load (lbf)
M
N

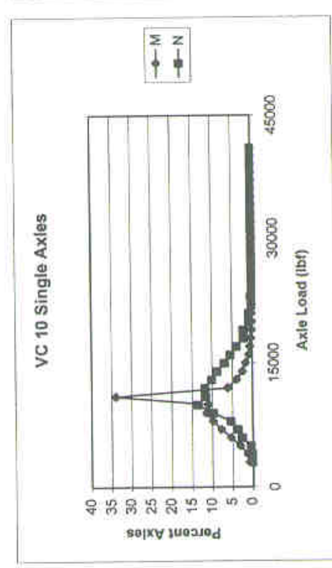

VC 8 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N

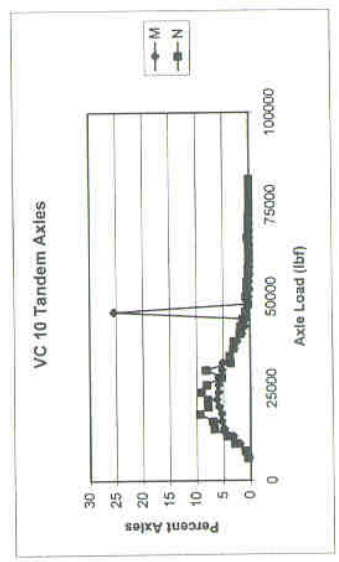

VC 8 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

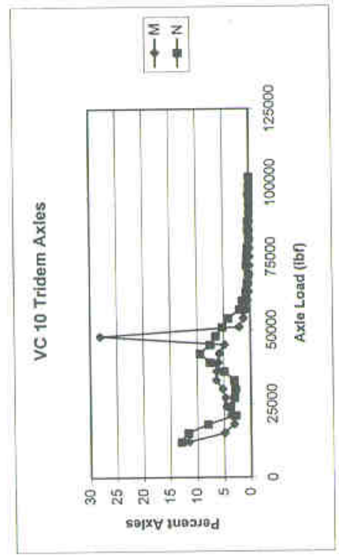

VC 9 Single Axles
Percent Axles
Axle Load (lbf)
M
N

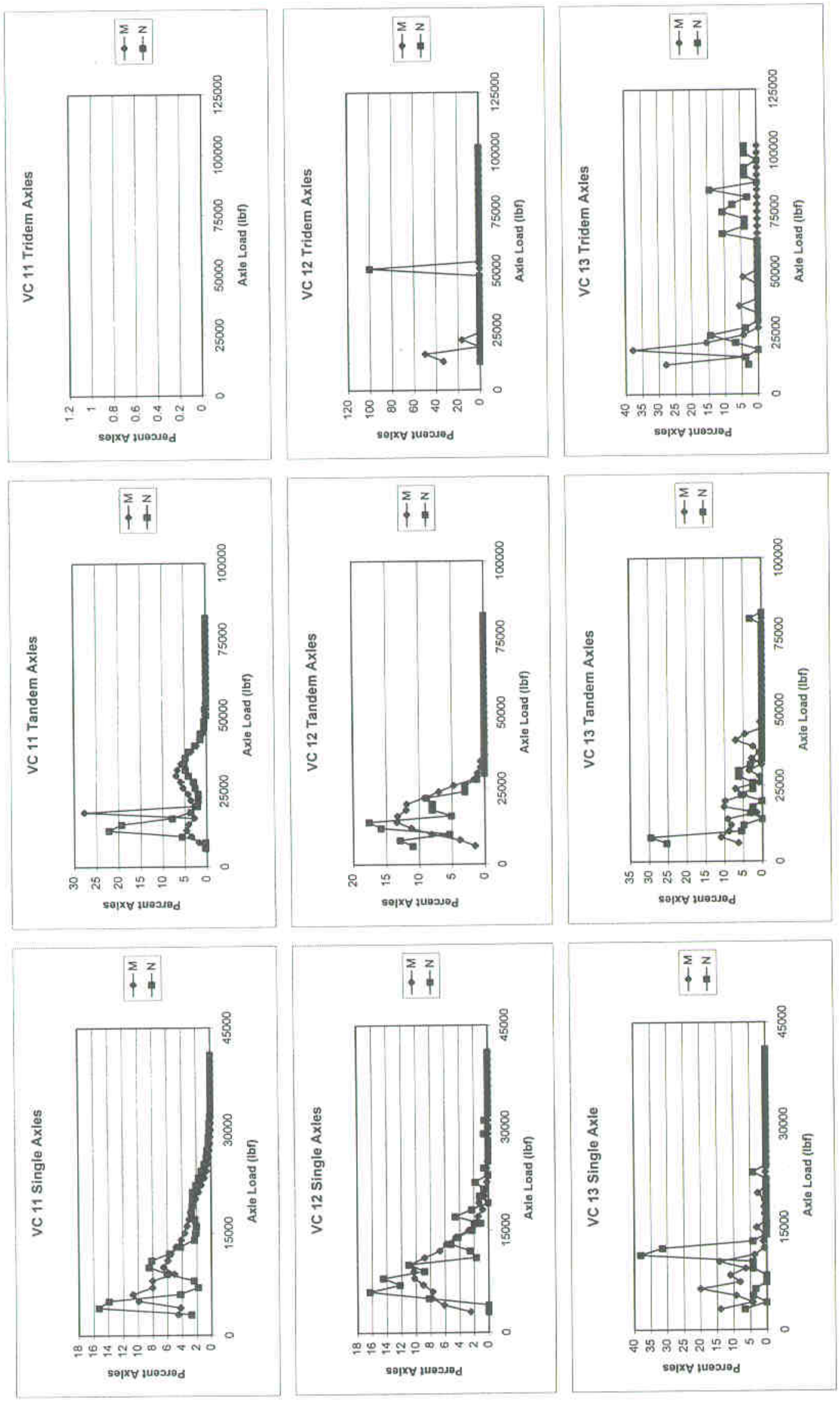

VC 9 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N


VC 9 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N


VC 10 Single Axles
Percent Axles
Axle Load (lbf)
M
N

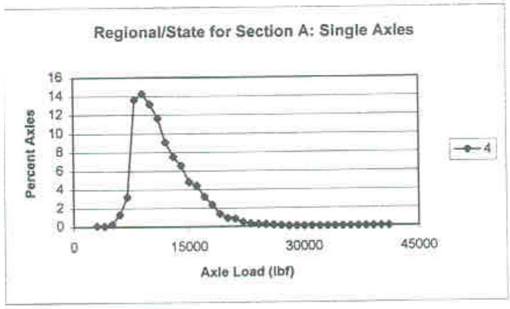

VC 10 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N

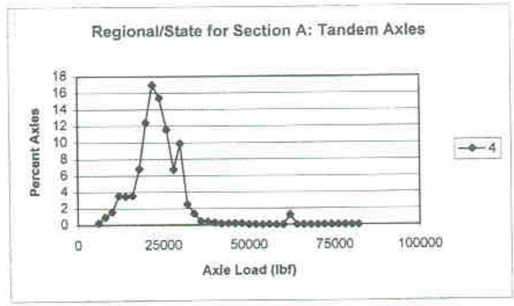

VC 10 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

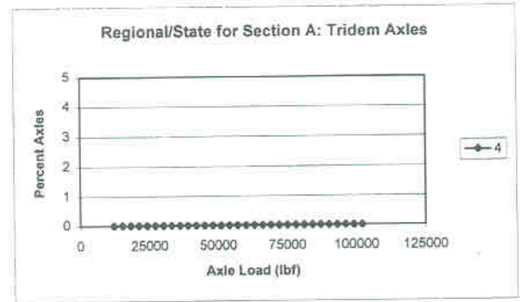


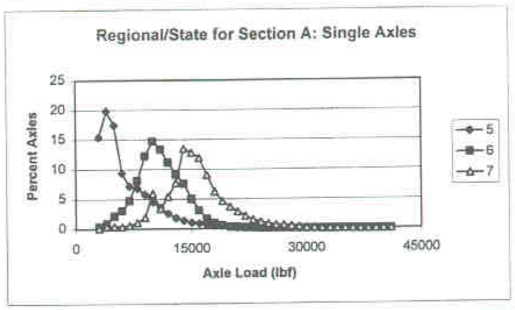
VC 11 Single Axles
Percent Axles
Axle Load (lbf)
M
N
VC 11 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N
VC 11 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N
VC 12 Single Axles
Percent Axles
Axle Load (lbf)
M
N
VC 12 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N
VC 12 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N
VC 13 Single Axle
Percent Axles
Axle Load (lbf)
M
N
VC 13 Tandem Axles
Percent Axles
Axle Load (lbf)
M
N
VC 13 Tridem Axles
Percent Axles
Axle Load (lbf)
M
N

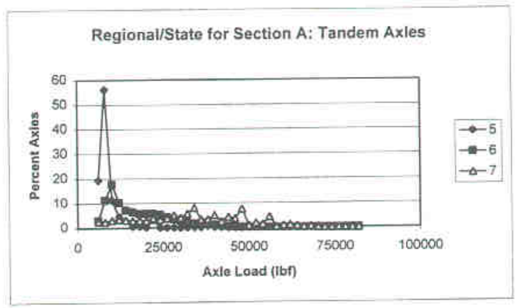
APPENDIX AA.10 – Regional Axle Load Spectra Used for Level 2 and Level 3 Inputs to the Example Problems

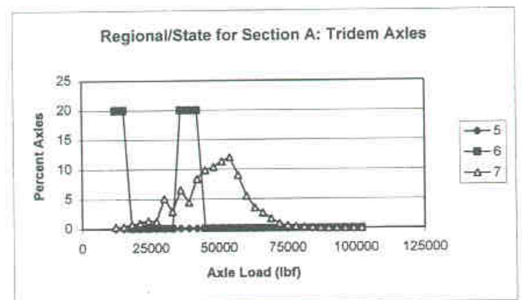

Regional/State for Section A: Single Axles
Percent Axles
Axle Load (lbf)
4

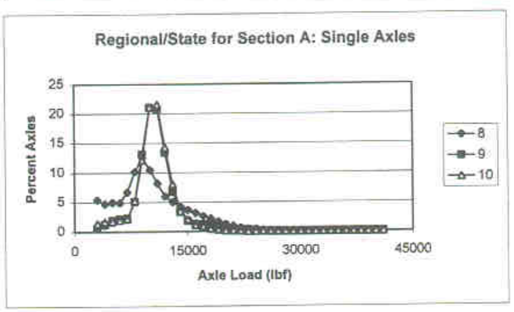

Regional/State for Section A: Tandem Axles
Percent Axles
Axle Load (lbf)
4

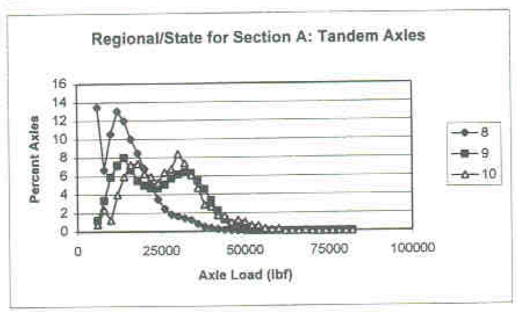

Regional/State for Section A: Tridem Axles
Percent Axles
Axle Load (lbf)
4

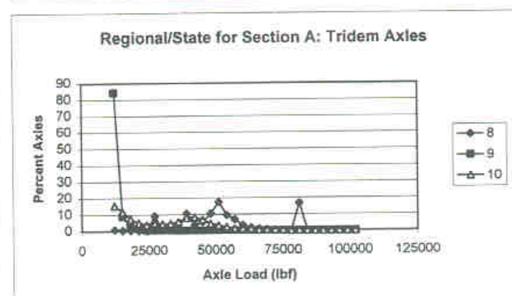

Regional/State for Section A: Single Axles
Percent Axles
Axle Load (lbf)
5
6
7

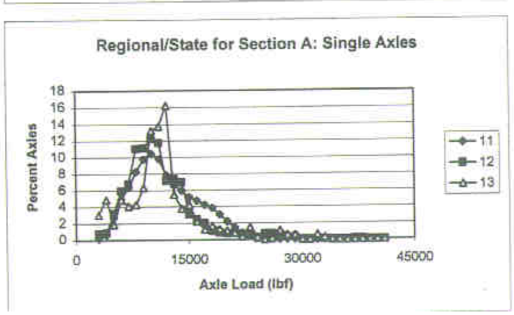

Regional/State for Section A: Tandem Axles
Percent Axles
Axle Load (lbf)
5
6
7

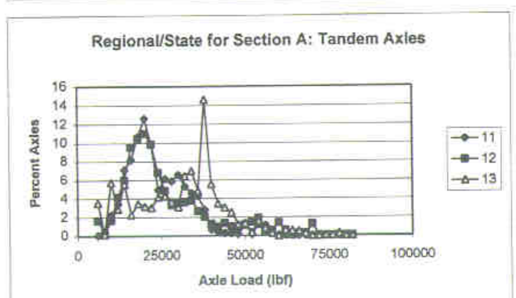

Regional/State for Section A: Tridem Axles
Percent Axles
Axle Load (lbf)
5
6
7

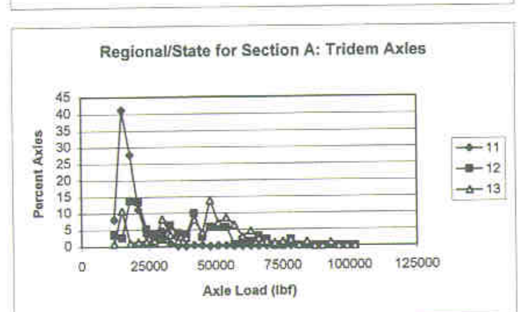

Regional/State for Section A: Single Axles
Percent Axles
Axle Load (lbf)
8
9
10

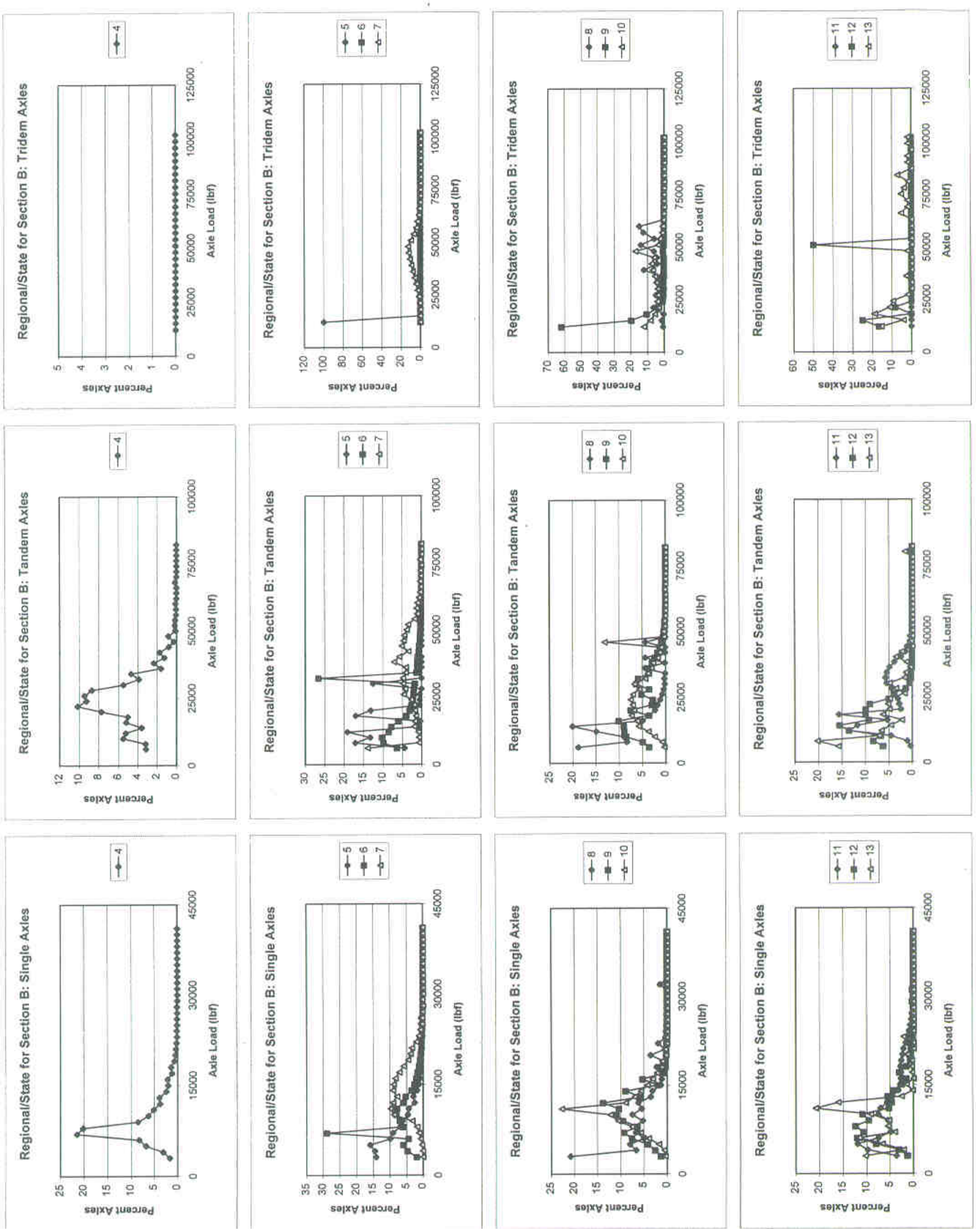

Regional/State for Section A: Tandem Axles
Percent Axles
Axle Load (lbf)
8
9
10


Regional/State for Section A: Tridem Axles
Percent Axles
Axle Load (lbf)
8
9
10

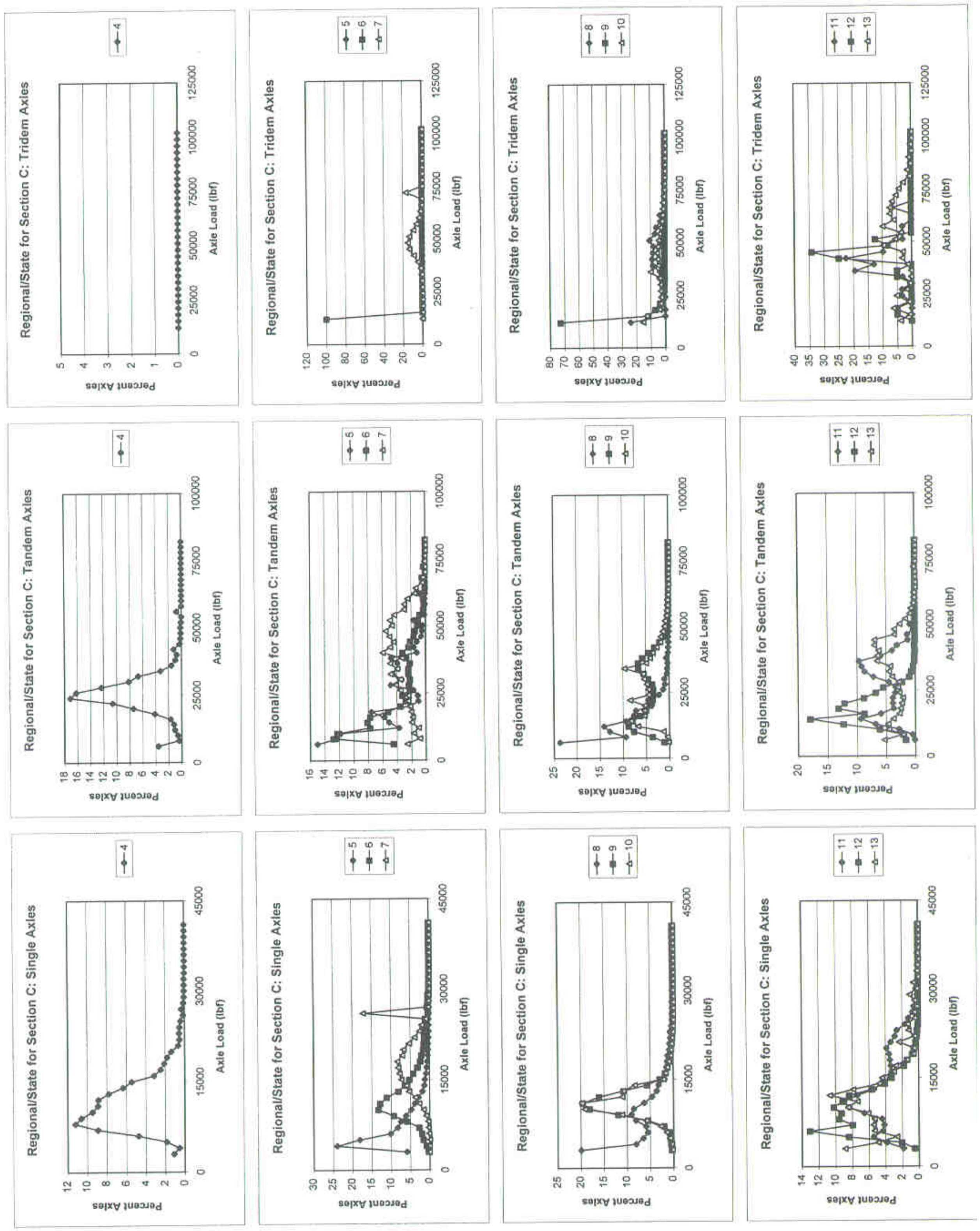

Regional/State for Section A: Single Axles
Percent Axles
Axle Load (lbf)
11
12
13


Regional/State for Section A: Tandem Axles
Percent Axles
Axle Load (lbf)
11
12
13


Regional/State for Section A: Tridem Axles
Percent Axles
Axle Load (lbf)
11
12
13



Regional/State for Section B: Single Axles
Regional/State for Section B: Tandem Axles
Regional/State for Section B: Tridem Axles
Percent Axles
Axle Load (lbf)
4
5
6
7
8
9
10
11
12
13


Regional/State for Section C: Single Axles
Regional/State for Section C: Tandem Axles
Regional/State for Section C: Tridem Axles
Percent Axles
Axle Load (lbf)
4
5
6
7
8
9
10
11
12
13

APPENDIX AA.11 – Tabulation of A Summary of the Output from the Traffic Module for the Example Problems

Appendix AA.11 includes a summary of the output files for the three example problems. The following summarizes the page numbers for the output data and comparison of the differences between the truck traffic estimate using each level of inputs:

- Example Problem/Roadway A (pages A.11-2 thru A.11-__)
- Example Problem/Roadway B (pages A.11-__ thru A.11-__)
- Example Problem/Roadway C (pages A.11-__ thru A.11-__)

SECTION A

YEAR 1	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	349	264	288	217	230	326	439	493	428	312
Level 2	266	343	327	220	204	277	405	504	470	321
Level 3	249	343	337	239	231	316	423	481	427	283
Level 4	192	186	259	209	228	284	355	399	358	261
Level 1 - Level 2	83	-79	-39	-3	26	48	34	-11	-42	-10
Level 1 - Level 3	101	-79	-49	-21	-1	10	15	12	1	29
Level 1 - Level 4	157	78	29	8	2	42	83	94	70	51

YEAR 5	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	409	308	337	254	269	381	513	576	501	365
Level 2	312	401	383	257	238	324	473	589	549	376
Level 3	291	401	394	279	270	370	495	562	500	331
Level 4	225	218	303	245	267	332	415	467	419	305
Level 1 - Level 2	97	-92	-46	-3	31	57	40	-13	-49	-11
Level 1 - Level 3	118	-93	-57	-25	-1	11	18	14	1	33
Level 1 - Level 4	184	91	34	9	3	49	98	109	82	59

YEAR 10	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	497	375	410	309	327	464	624	701	609	444
Level 2	379	487	466	313	290	395	576	717	668	458
Level 3	354	488	480	340	328	450	603	684	608	403
Level 4	273	265	369	298	324	404	505	568	509	371
Level 1 - Level 2	118	-112	-56	-4	38	69	48	-15	-59	-14
Level 1 - Level 3	143	-113	-70	-30	-1	14	21	17	1	41
Level 1 - Level 4	224	110	41	12	3	59	119	133	100	72

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
206	137	97	75	58	45	33	24	16	11	8	6	4
195	129	90	74	62	53	43	31	22	14	10	7	4
165	106	75	60	50	42	34	24	17	11	8	5	3
164	111	76	62	47	38	29	22	16	12	8	6	5
11	8	7	1	-4	-8	-10	-7	-6	-3	-2	0	0
41	31	21	16	8	3	-1	0	-1	0	0	1	1
41	26	20	14	11	8	4	2	0	-1	-1	0	-1

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
241	161	113	88	68	53	39	28	19	13	9	7	4
228	151	105	87	73	62	51	36	26	17	11	8	5
193	124	88	70	59	50	40	28	20	13	9	6	4
192	130	89	72	55	44	34	26	19	14	10	7	6
13	10	8	2	-4	-9	-12	-9	-7	-3	-2	0	0
47	36	25	18	9	4	-1	0	-1	0	0	1	1
48	31	24	16	13	9	5	2	0	-1	-1	0	-1

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
293	195	138	107	83	65	47	34	23	16	11	9	5
277	183	128	105	88	76	62	44	31	20	14	10	6
235	151	107	85	72	60	48	34	24	16	11	8	4
234	158	109	88	67	54	41	31	23	18	12	9	7
16	12	9	2	-5	-11	-14	-11	-8	-4	-3	0	0
58	44	31	22	11	4	-1	0	-1	0	0	1	1
59	37	29	20	16	11	6	2	0	-1	-1	0	-2

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
1	1	1	0	0	0	0	0	0	0	0	0	0
2	2	1	0	0	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0	0	0	0	0
4	3	2	1	1	1	1	0	0	0	0	0	0
-1	-1	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-2	-2	-1	-1	-1	-1	-1	0	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
2	1	1	0	0	0	0	0	0	0	0	0	0
3	2	1	1	0	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0	0	0	0	0
4	3	2	2	1	1	1	1	0	0	0	0	0
-1	-1	-1	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-3	-2	-1	-1	-1	-1	-1	-1	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
2	1	1	0	0	0	0	0	0	0	0	0	0
3	3	2	1	0	0	0	0	0	0	0	0	0
3	2	1	0	0	0	0	0	0	0	0	0	0
5	4	2	2	1	1	1	1	1	0	0	0	0
-1	-2	-1	0	0	0	0	0	0	0	0	0	0
-1	-1	0	0	0	0	0	0	0	0	0	0	0
-3	-3	-1	-2	-1	-1	-1	-1	0	0	0	0	0

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	185	284	227	274	278	230	223	208	212
0	0	0	155	385	247	250	264	215	184	170	174
0	0	0	163	404	292	291	293	238	194	177	168
0	0	0	142	227	237	245	242	221	189	179	161
0	0	0	30	-101	-20	23	14	16	39	38	38
0	0	0	22	-120	-65	-17	-15	-8	29	31	44
0	0	0	43	57	-10	29	36	10	33	28	50

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	216	332	266	320	325	270	261	243	248
0	0	0	182	451	289	293	309	251	216	199	203
0	0	0	191	473	341	340	343	279	226	207	197
0	0	0	167	265	278	287	283	259	222	210	189
0	0	0	35	-119	-24	27	16	18	45	44	44
0	0	0	25	-140	-76	-20	-18	-9	34	36	51
0	0	0	50	67	-12	33	43	11	39	33	59

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	263	404	323	390	395	328	317	296	301
0	0	0	221	548	352	357	376	306	262	242	247
0	0	0	232	575	415	414	417	339	276	252	239
0	0	0	203	323	338	349	344	315	270	255	230
0	0	0	42	-144	-29	33	19	22	55	54	54
0	0	0	31	-171	-92	-24	-22	-11	42	44	62
0	0	0	61	81	-15	41	52	14	48	40	72

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
182	190	197	216	207	168	118	83	45	27	16	10	4
150	158	170	183	184	180	155	130	93	61	35	19	12
150	148	155	168	180	181	153	118	80	49	28	15	9
155	155	160	172	174	154	122	88	59	39	26	18	12
32	32	28	33	22	-12	-37	-48	-49	-34	-20	-9	-7
31	43	43	48	27	-14	-35	-35	-35	-22	-12	-5	-4
26	35	38	44	33	14	-4	-6	-14	-12	-10	-8	-8

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
212	222	231	253	242	196	138	97	52	32	18	11	5
175	185	199	214	216	210	181	153	109	72	41	22	13
176	173	181	196	210	212	179	138	93	58	32	18	10
182	181	187	201	203	180	143	103	69	46	30	21	15
37	38	32	39	26	-14	-43	-56	-57	-40	-23	-11	-8
37	50	50	56	31	-16	-41	-41	-41	-26	-14	-6	-5
31	41	44	52	39	16	-5	-7	-17	-14	-12	-10	-9

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
258	271	281	307	294	239	168	118	63	39	22	14	6
213	225	242	260	262	256	221	186	133	87	50	27	16
214	210	220	239	256	258	218	168	113	70	39	22	13
221	221	227	245	247	219	174	126	83	56	37	26	18
45	46	39	47	32	-17	-52	-68	-69	-48	-28	-13	-10
45	61	61	68	38	-19	-50	-50	-50	-31	-17	-8	-6
37	50	54	63	47	20	-6	-8	-20	-17	-15	-12	-11

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
3	1	2	1	0	0	0	0	0	0	1	0	0
6	3	3	3	0	0	1	0	0	0	0	0	0
5	2	2	2	0	0	1	0	0	0	0	0	0
8	6	4	3	2	1	1	1	1	1	1	0	0
-3	-2	-1	-2	0	0	-1	0	0	0	1	0	0
-2	-1	0	0	0	0	-1	0	0	0	1	0	0
-5	-5	-2	-2	-2	-1	-1	-1	-1	-1	0	0	0

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
4	1	2	2	0	0	0	0	0	0	1	0	0
7	3	4	4	0	0	1	0	0	0	0	0	0
6	3	2	2	0	0	1	0	0	0	0	0	0
10	7	5	3	2	2	1	1	1	1	1	0	0
-4	-2	-1	-2	0	0	-1	0	0	0	1	0	0
-2	-1	0	0	0	0	-1	0	0	0	1	0	0
-6	-6	-3	-2	-2	-1	-1	-1	-1	-1	1	0	0

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
4	2	3	2	0	0	0	0	0	0	1	0	0
9	4	4	5	0	1	1	0	0	0	1	0	0
7	3	2	2	0	0	1	0	0	0	0	0	0
12	9	6	4	3	2	2	1	1	1	1	0	0
-5	-2	-2	-3	0	0	-1	0	0	0	1	0	0
-3	-2	0	-1	0	0	-1	0	0	0	1	0	0
-8	-7	-3	-2	-2	-2	-1	-1	-1	-1	1	0	0

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	843	146	58	36	16	8	6	18	8
0	0	0	0	915	119	44	24	9	17	10	8	7
0	0	0	0	948	114	62	28	15	16	12	8	9
0	0	0	0	619	139	88	75	36	27	35	20	16
0	0	0	0	-71	27	14	12	7	-9	-4	10	0
0	0	0	0	-105	32	-4	8	1	-9	-6	10	-2
0	0	0	0	224	7	-30	-38	-20	-20	-29	-2	-9

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	987	171	68	43	18	9	7	21	9
0	0	0	0	1070	139	52	28	10	20	12	9	9
0	0	0	0	1109	133	73	33	17	19	14	9	11
0	0	0	0	724	163	104	87	42	32	41	23	19
0	0	0	0	-84	32	16	14	8	-11	-5	12	0
0	0	0	0	-122	38	-5	10	1	-10	-7	12	-2
0	0	0	0	263	8	-35	-45	-24	-23	-34	-2	-10

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	1201	208	83	52	22	11	9	25	11
0	0	0	0	1302	170	63	34	12	24	15	11	10
0	0	0	0	1349	162	88	40	21	23	17	11	13
0	0	0	0	881	198	126	106	51	39	49	28	23
0	0	0	0	-102	39	20	18	10	-13	-6	15	1
0	0	0	0	-149	46	-6	12	2	-12	-8	14	-3
0	0	0	0	320	10	-43	-54	-29	-28	-41	-3	-12

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
9	14	17	14	10	5	6	2	2	2	0	0	0
17	11	11	15	23	14	10	5	3	2	1	0	0
15	10	15	13	18	12	10	6	4	2	1	1	0
16	16	18	13	13	12	10	8	4	4	5	3	2
-8	2	6	-1	-13	-9	-4	-3	-1	0	-1	0	0
-6	4	2	1	-7	-7	-4	-4	-2	0	-1	0	0
-7	-2	-1	1	-3	-7	-5	-6	-3	-1	-5	-3	-2

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
11	16	20	17	12	6	7	3	2	3	0	0	0
20	13	12	18	27	17	12	6	4	3	1	0	0
17	11	17	15	21	14	11	7	5	2	1	1	0
19	18	21	16	16	14	12	10	5	4	6	4	3
-10	3	7	-1	-15	-11	-5	-3	-2	0	-1	0	0
-7	5	2	2	-9	-9	-5	-5	-3	0	-1	0	0
-9	-2	-2	1	-4	-8	-5	-7	-3	-2	-5	-4	-2

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
13	20	24	20	15	7	8	3	2	4	1	0	0
25	16	15	22	33	20	15	7	4	3	2	1	0
21	14	21	18	25	18	14	9	6	3	1	1	0
23	22	26	19	19	17	15	12	6	5	7	5	3
-12	3	9	-2	-18	-13	-6	-4	-2	0	-1	0	0
-8	6	2	2	-11	-11	-6	-6	-4	1	-1	0	0
-10	-3	-2	1	-4	-10	-6	-9	-4	-2	-6	-4	-3

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	57	0	0	0	0	0	0	0	0	0	0	0
0	19	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0
2	2	0	1	0	0	0	0	0	0	0	0	0
0	38	0	0	0	0	0	0	0	0	0	0	0
0	46	0	0	0	0	0	0	0	0	0	0	0
-2	54	0	-1	0	0	0	0	0	0	0	0	0

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	66	0	0	0	0	0	0	0	0	0	0	0
0	22	0	0	0	0	0	0	0	0	0	0	0
0	12	0	0	0	0	0	0	0	0	0	0	0
3	3	1	1	0	0	0	0	0	0	0	0	0
0	44	0	0	0	0	0	0	0	0	0	0	0
0	54	0	0	0	0	0	0	0	0	0	0	0
-2	64	0	-1	0	0	0	0	0	0	0	0	0

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	81	0	0	0	0	0	0	0	0	0	0	0
0	27	0	0	0	0	0	0	0	0	0	0	0
0	14	0	0	0	0	0	0	0	0	0	0	0
3	3	1	1	0	0	0	0	0	0	0	0	0
0	54	0	0	0	0	0	0	0	0	0	0	0
0	66	0	0	0	0	0	0	0	0	0	0	0
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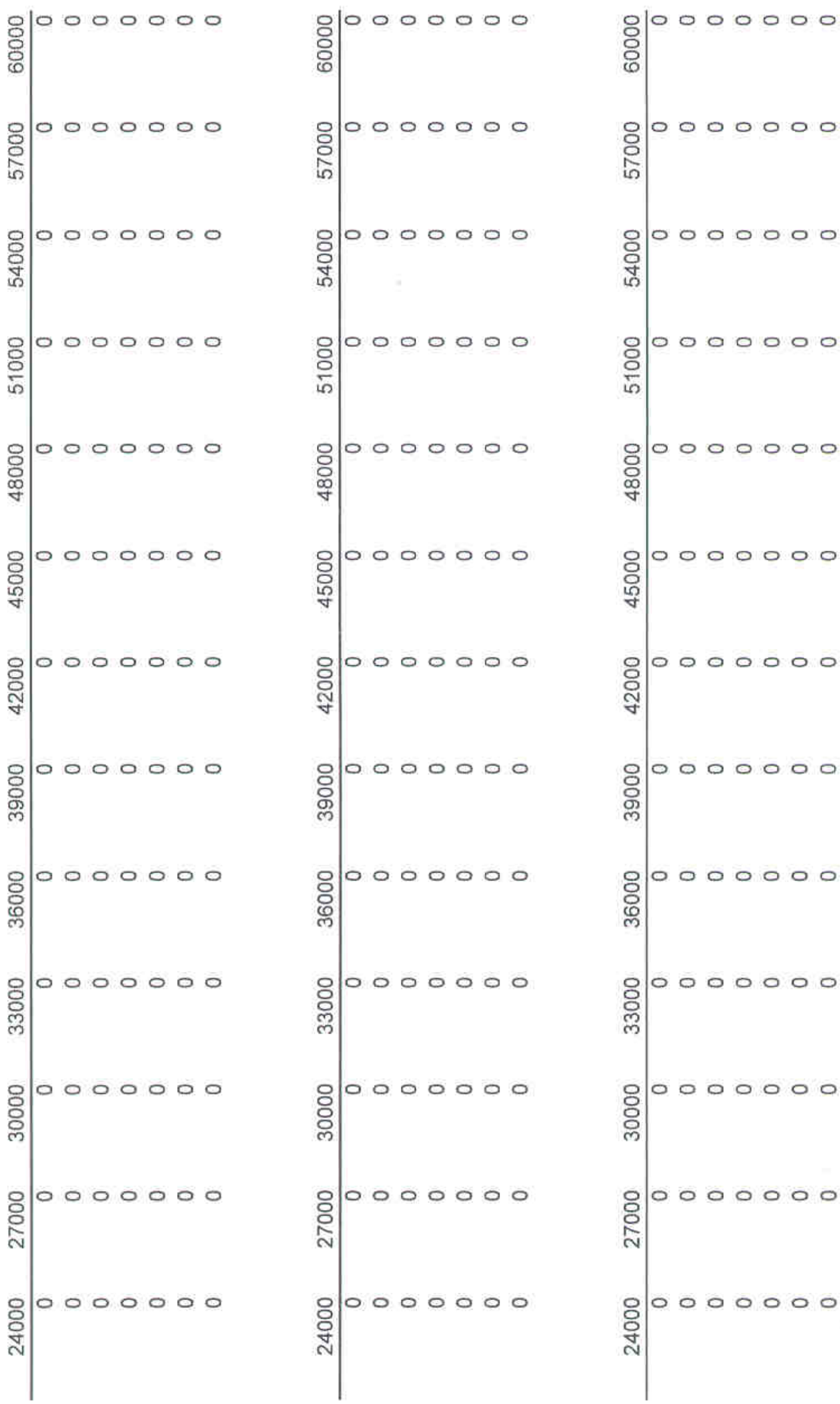
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48000
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57000
60000

63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
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0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0	0	0

63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
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0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
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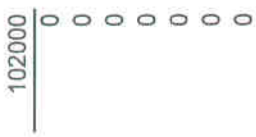
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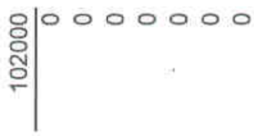
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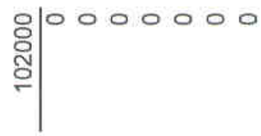
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SECTION B

YEAR 1

	Single Axles									
	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	21	8	20	30	51	26	29	35	33	41
Level 2	32	27	34	31	40	29	30	32	31	32
Level 3	30	26	32	30	37	28	30	32	32	33
Level 4	30	30	40	31	32	38	45	49	43	31
Level 1 - Level 2	-11	-19	-14	-1	11	-3	-1	3	1	10
Level 1 - Level 3	-9	-17	-13	0	14	-2	-1	2	1	8
Level 1 - Level 4	-9	-22	-21	-1	19	-12	-16	-14	-10	10

YEAR 5

	Single Axles									
	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	24	9	23	35	60	30	34	41	38	48
Level 2	37	32	40	36	46	34	35	37	37	37
Level 3	35	30	38	35	44	33	35	38	37	39
Level 4	35	35	47	36	38	45	53	57	50	37
Level 1 - Level 2	-13	-22	-17	-1	13	-4	-1	3	2	11
Level 1 - Level 3	-11	-20	-15	0	16	-2	-1	3	1	10
Level 1 - Level 4	-11	-26	-24	-1	22	-14	-19	-16	-12	12

YEAR 10

	Single Axles									
	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	29	11	28	43	73	37	41	49	47	59
Level 2	45	39	49	44	56	41	42	46	45	45
Level 3	42	36	46	43	53	40	42	46	45	47
Level 4	42	43	58	44	46	54	64	69	61	45
Level 1 - Level 2	-16	-27	-20	-2	16	-4	-1	4	2	14
Level 1 - Level 3	-13	-25	-18	0	20	-3	-1	3	2	12
Level 1 - Level 4	-13	-31	-29	-2	27	-17	-23	-20	-15	14

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
18	28	6	17	4	5	3	6	2	5	1	1	2
17	19	7	11	4	4	2	4	1	3	1	1	1
17	20	7	12	4	4	3	4	2	3	1	1	1
20	14	10	8	6	5	4	3	2	2	1	1	1
1	8	-1	6	0	1	0	2	0	2	1	0	1
1	7	-1	5	0	1	0	2	0	2	0	0	1
-2	14	-3	10	-1	0	-1	3	0	3	0	0	1

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
21	32	8	20	5	6	3	6	2	5	2	1	2
20	23	9	13	5	4	3	4	2	3	1	1	1
20	24	9	14	5	4	3	4	2	3	1	1	1
24	16	11	9	7	5	4	3	2	2	1	1	1
1	10	-1	7	0	1	0	2	0	2	1	0	1
1	9	-1	6	0	1	0	2	0	2	1	0	1
-2	16	-4	11	-2	0	-1	3	0	3	0	0	2

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
26	39	9	25	6	7	4	8	3	6	2	1	3
25	27	11	16	6	5	3	5	2	4	1	1	1
25	29	11	17	6	5	4	5	2	4	1	1	1
29	20	14	11	8	7	5	4	3	2	2	1	1
1	12	-1	9	0	2	0	3	1	3	1	0	1
1	11	-1	8	0	2	0	3	0	3	1	0	1
-3	20	-5	14	-2	0	-1	4	0	4	1	0	2

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
2	0	0	0	0	0	2	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
2	0	0	0	0	0	2	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	2	0	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
2	0	0	0	0	0	2	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0
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1	0	0	0	0	0	1	0	0	0	0	0	0
2	0	0	0	0	0	2	0	0	0	0	0	0

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	4	10	27	42	34	39	18	38	7
0	0	0	19	25	32	37	31	29	19	27	11
0	0	0	19	25	33	38	33	31	19	28	12
0	0	0	18	32	29	28	28	25	22	21	18
0	0	0	-14	-15	-5	5	4	10	-1	11	-4
0	0	0	-15	-14	-6	4	2	8	-1	10	-5
0	0	0	-14	-22	-2	13	7	14	-4	17	-12

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	5	12	32	49	40	46	21	44	8
0	0	0	22	30	37	43	36	34	23	32	13
0	0	0	22	29	38	44	38	37	22	33	13
0	0	0	21	38	34	33	32	30	26	24	22
0	0	0	-17	-18	-5	6	4	12	-1	13	-5
0	0	0	-17	-17	-7	5	2	9	-1	12	-5
0	0	0	-16	-25	-2	16	8	16	-4	20	-13

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	6	15	39	60	49	56	26	54	10
0	0	0	27	36	45	52	44	41	27	38	16
0	0	0	27	35	47	53	47	45	27	40	16
0	0	0	26	46	41	41	39	36	31	30	26
0	0	0	-21	-21	-7	8	5	15	-2	15	-6
0	0	0	-21	-21	-8	6	2	11	-1	14	-7
0	0	0	-19	-31	-3	19	10	20	-5	24	-16

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
6	17	7	30	28	8	10	8	9	6	4	5	2
10	16	11	23	21	11	11	9	8	5	4	4	2
11	17	12	24	21	11	12	9	9	6	4	5	2
18	17	18	19	19	17	13	10	6	4	3	2	1
-4	1	-4	8	7	-2	0	-1	1	0	1	0	1
-4	0	-5	7	7	-3	-1	-1	0	0	1	0	1
-11	0	-11	12	9	-8	-3	-2	2	1	2	3	1

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
7	20	8	36	33	10	12	9	10	7	5	6	3
12	18	13	27	25	12	13	10	9	6	4	5	2
12	20	14	28	25	13	14	11	10	7	5	5	2
21	20	21	22	22	20	16	11	7	5	3	2	2
-5	2	-5	9	8	-3	0	-1	1	0	1	1	1
-5	0	-6	8	8	-4	-2	-2	0	0	1	0	1
-13	0	-13	14	10	-10	-3	-2	3	1	2	3	1

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
9	24	10	43	40	12	15	11	13	8	6	7	4
15	22	16	32	30	15	15	12	11	8	5	6	2
15	24	17	34	30	16	17	13	12	8	6	6	3
25	25	25	27	27	24	19	14	9	6	4	3	2
-5	2	-6	11	10	-3	-1	-1	1	0	1	1	1
-6	0	-7	9	9	-4	-2	-2	0	0	1	0	1
-16	0	-15	16	13	-12	-4	-3	3	2	2	4	2

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
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1	1	1	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0	0	0
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50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
2	1	1	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0
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50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
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2	1	1	0	0	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0
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0	1	0	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0

76000	78000	80000	82000	Tridem Axles 12000	15000	18000	21000	24000	27000	30000	33000	36000
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0	0	0	0	65	21	12	6	2	2	1	2	1
0	0	0	0	71	23	13	6	2	2	1	2	1
0	0	0	0	66	15	9	8	4	3	4	2	2
0	0	0	0	-22	11	6	0	0	-1	-1	-1	0
0	0	0	0	-29	9	5	0	0	-1	-1	-1	0
0	0	0	0	-23	17	9	-2	-1	-2	-3	-2	-1

76000	78000	80000	82000	Tridem Axles 12000	15000	18000	21000	24000	27000	30000	33000	36000
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0	0	0	0	76	25	14	7	3	2	2	2	2
0	0	0	0	83	27	15	7	3	2	2	2	2
0	0	0	0	77	17	11	9	5	4	5	3	2
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0	0	0	0	-34	10	6	0	0	-1	-1	-1	-1
0	0	0	0	-27	20	10	-2	-2	-3	-4	-2	-1

76000	78000	80000	82000	Tridem Axles 12000	15000	18000	21000	24000	27000	30000	33000	36000
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0	0	0	0	92	31	17	8	3	2	2	2	2
0	0	0	0	102	33	19	8	3	3	2	2	2
0	0	0	0	94	21	14	12	6	4	6	3	3
0	0	0	0	-31	15	8	0	0	-1	-1	-1	-1
0	0	0	0	-41	13	7	0	0	-1	-1	-1	-1
0	0	0	0	-33	25	12	-3	-2	-3	-5	-2	-2

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
3	2	2	3	6	2	3	4	0	1	1	0	1
3	2	2	4	4	1	2	2	0	0	0	0	0
3	2	2	3	3	2	2	2	0	0	0	0	0
2	2	2	2	2	2	1	1	1	0	1	0	0
0	0	0	0	2	0	1	2	0	0	0	0	0
0	0	0	0	3	0	1	2	0	0	0	0	0
1	0	-1	2	5	0	2	3	0	0	0	0	0

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
3	2	2	4	7	2	4	5	0	1	1	0	1
3	2	2	4	4	2	2	3	0	1	0	0	0
3	2	2	4	4	2	2	3	0	0	0	0	0
2	2	3	2	2	2	2	1	1	1	1	0	0
0	0	0	0	3	0	1	2	0	0	0	0	0
0	0	0	0	3	0	1	2	0	0	0	0	0
1	0	-1	2	5	0	2	4	0	0	0	0	1

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
4	2	2	5	9	2	5	6	0	1	1	0	1
4	3	3	5	5	2	3	3	0	1	0	0	1
4	3	3	5	5	2	3	3	0	1	0	0	0
3	3	3	2	2	2	2	1	1	1	1	1	0
0	0	0	0	3	0	2	3	0	1	0	0	1
0	-1	0	0	4	0	2	3	0	1	0	0	1
1	0	-1	2	6	0	3	4	0	0	0	0	1

Quadruple Axles

78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
1	0	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0

Quadruple Axles

78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
1	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0

Quadruple Axles

78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
1	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0

24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
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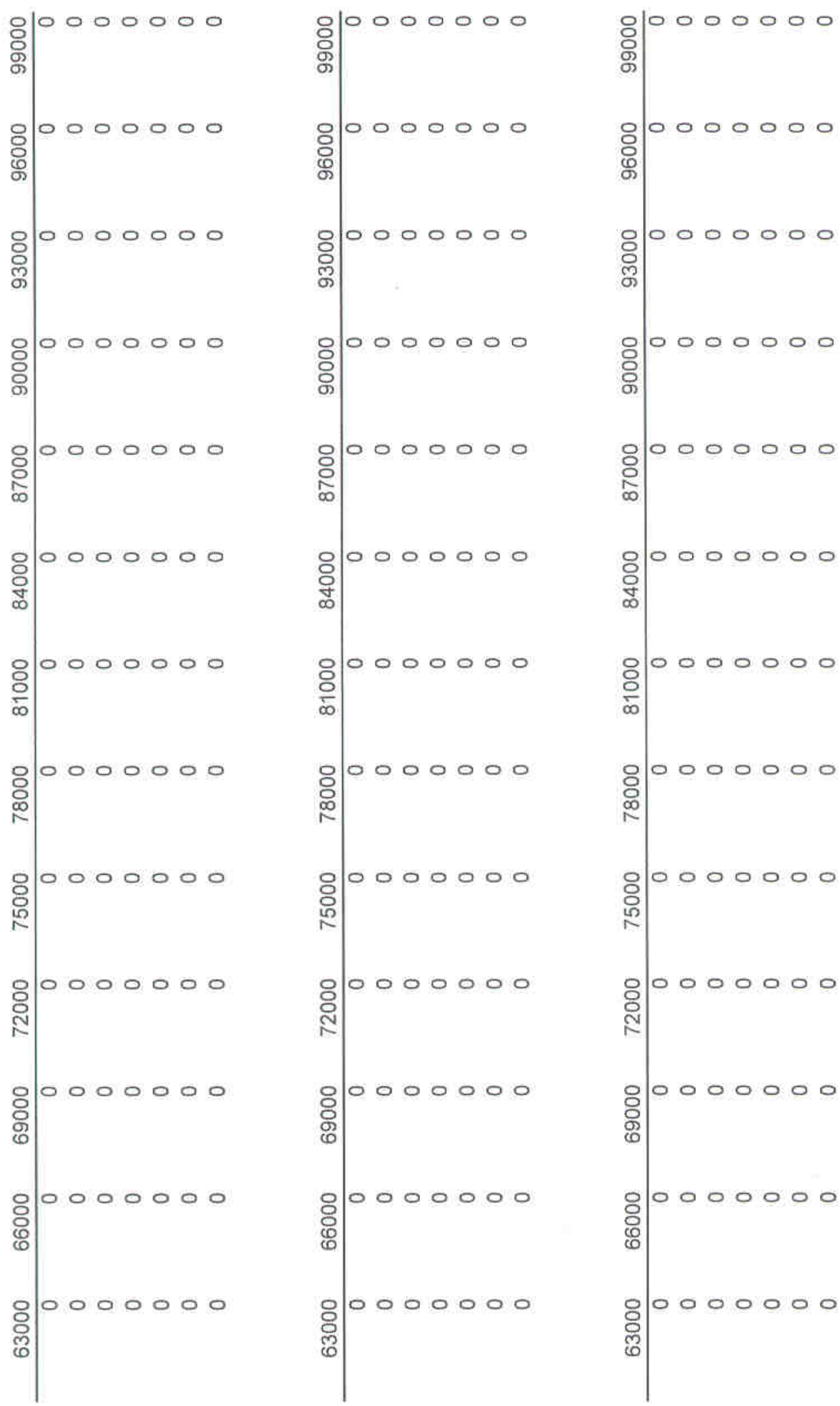

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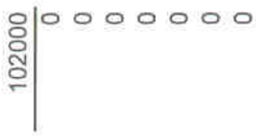
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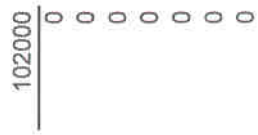
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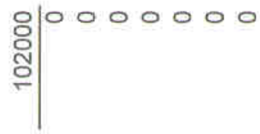
102000

SECTION C

YEAR 1

	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	145	199	156	97	98	141	236	343	382	315
Level 2	113	174	143	100	111	173	275	369	379	308
Level 3	120	188	155	108	120	180	276	365	372	303
Level 4	122	108	159	138	159	213	282	329	298	215
Level 1 - Level 2	33	25	13	-3	-13	-32	-39	-27	3	7
Level 1 - Level 3	26	10	1	-11	-21	-39	-40	-22	9	12
Level 1 - Level 4	23	90	-3	-41	-61	-72	-46	14	83	100

YEAR 5

	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	170	232	182	114	115	165	276	401	447	369
Level 2	132	204	167	117	130	203	322	432	443	360
Level 3	140	220	181	127	140	211	323	427	435	355
Level 4	143	127	186	162	186	249	330	384	349	252
Level 1 - Level 2	38	29	15	-3	-16	-38	-45	-31	3	9
Level 1 - Level 3	30	12	1	-13	-25	-45	-47	-26	11	14
Level 1 - Level 4	27	106	-3	-48	-71	-84	-54	16	97	117

YEAR 10

	Single Axles 3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Level 1	207	283	222	138	140	201	336	488	543	449
Level 2	160	248	204	142	159	247	391	525	539	438
Level 3	170	268	220	154	170	256	393	519	530	431
Level 4	174	154	226	197	226	303	402	468	425	306
Level 1 - Level 2	47	35	18	-4	-19	-46	-55	-38	4	11
Level 1 - Level 3	37	15	2	-16	-31	-55	-57	-32	13	17
Level 1 - Level 4	33	129	-4	-58	-87	-102	-66	20	118	142

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
208	121	70	48	38	33	30	26	22	17	13	9	6
212	123	71	47	36	27	23	19	16	11	10	6	5
209	124	73	49	38	29	24	20	17	12	11	7	5
131	87	57	47	35	28	22	17	12	9	6	4	3
-4	-2	-1	0	1	5	7	7	6	6	3	3	1
-2	-3	-3	-2	0	4	5	6	5	5	2	2	1
76	34	13	1	2	5	8	9	10	8	7	4	2

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
243	141	82	56	44	38	35	30	26	20	15	10	7
248	144	83	55	42	32	27	22	19	13	11	7	5
245	145	86	57	44	34	29	24	20	14	12	8	6
154	101	67	54	41	33	26	20	14	11	7	5	4
-5	-2	-1	0	2	6	8	8	7	7	4	3	1
-2	-3	-4	-2	0	4	6	6	6	6	3	2	1
89	40	15	1	3	5	9	10	12	9	8	5	3

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
295	172	100	68	53	47	42	36	32	24	18	13	8
301	175	102	68	51	39	32	27	23	16	14	9	7
298	176	104	70	54	42	35	29	24	17	15	10	7
187	123	82	66	50	40	31	24	17	13	9	6	5
-6	-3	-2	0	2	8	10	10	9	8	4	4	2
-3	-4	-5	-2	0	5	8	8	7	7	3	3	1
109	49	18	1	3	6	11	13	14	11	9	6	4

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
4	2	1	1	0	0	0	0	0	0	0	0	0
5	2	1	1	1	0	0	0	0	0	0	0	0
6	2	1	1	1	0	0	0	0	0	0	0	0
3	2	1	1	1	1	1	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	-1	0	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
5	3	1	1	1	0	0	0	0	0	0	0	0
6	2	1	1	1	0	0	0	0	0	0	0	0
7	3	2	1	1	0	0	0	0	0	0	0	0
3	2	1	1	1	1	1	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	-1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	-1	0	0	0	0	0	0

26000	27000	28000	29000	30000	31000	32000	33000	34000	35000	36000	37000	38000
6	3	2	1	1	0	0	0	0	0	0	0	0
7	3	2	1	1	0	0	0	0	0	0	0	0
8	3	2	1	1	0	1	0	0	0	0	0	0
4	3	2	1	1	1	1	0	0	0	0	0	0
-1	0	0	0	-1	0	0	0	0	0	0	0	0
-2	0	0	0	-1	0	0	0	0	0	0	0	0
3	0	0	-1	0	0	-1	0	0	0	0	0	0

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	98	100	140	150	160	142	132	120	119
0	0	0	98	144	260	278	250	202	168	128	114
0	0	0	102	143	254	268	242	196	164	125	112
0	0	0	112	160	196	213	212	193	164	156	142
0	0	0	0	-45	-120	-128	-91	-60	-35	-8	5
0	0	0	-5	-44	-114	-118	-82	-54	-32	-5	7
0	0	0	-15	-60	-56	-63	-52	-51	-31	-36	-23

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	114	117	164	175	187	166	155	141	139
0	0	0	115	169	304	325	293	236	196	150	133
0	0	0	120	168	297	314	283	229	192	147	131
0	0	0	132	187	229	249	248	226	192	182	166
0	0	0	-1	-52	-140	-150	-106	-70	-41	-9	6
0	0	0	-5	-51	-133	-138	-96	-63	-37	-6	8
0	0	0	-17	-70	-66	-74	-61	-60	-37	-42	-27

			Tandem Axles								
39000	40000	41000	6000	8000	10000	12000	14000	16000	18000	20000	22000
0	0	0	139	142	199	213	227	202	188	171	169
1	0	0	140	205	370	395	356	287	238	182	162
1	0	0	146	204	361	382	344	279	233	178	159
0	0	0	160	228	279	303	302	274	233	222	202
-1	0	0	-1	-64	-171	-182	-129	-85	-50	-11	8
-1	0	0	-7	-62	-162	-168	-117	-77	-45	-7	10
0	0	0	-21	-86	-80	-90	-75	-72	-45	-51	-33

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
122	130	146	177	220	261	266	233	183	129	83	47	29
111	108	119	139	166	196	194	172	129	92	60	37	24
111	108	118	135	161	188	187	165	124	89	58	36	23
137	139	142	155	157	140	110	79	53	35	23	16	11
12	22	27	38	54	66	72	61	54	37	23	10	5
11	22	28	42	59	73	79	68	59	40	25	11	6
-15	-9	3	22	63	122	156	154	131	94	60	31	19

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
143	152	171	207	257	306	311	273	215	151	97	55	34
130	126	139	162	194	229	227	201	151	108	71	43	28
130	126	138	158	189	220	218	193	145	104	68	42	27
160	162	167	181	183	163	129	92	62	41	27	18	12
14	25	32	45	63	77	84	72	63	43	26	12	6
13	25	33	49	69	85	93	79	70	47	29	13	7
-17	-10	4	26	74	142	182	181	153	110	70	37	22

24000	26000	28000	30000	32000	34000	36000	38000	40000	42000	44000	46000	48000
174	185	208	252	313	372	378	332	261	184	118	67	42
158	154	169	197	236	279	276	245	184	131	86	53	34
158	154	168	193	230	268	265	235	177	127	83	51	33
195	197	203	220	223	199	157	112	75	50	33	22	15
16	31	39	55	77	93	102	87	77	53	32	15	8
16	31	40	59	83	104	113	97	85	58	35	16	9
-21	-13	5	32	90	173	221	220	186	134	85	45	26

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
18	12	7	4	4	1	0	0	0	0	0	0	0
16	13	7	4	2	1	1	0	0	0	0	0	0
16	13	7	4	2	1	1	0	0	0	0	0	0
7	5	3	2	2	1	1	1	1	0	0	0	0
1	-1	0	0	2	0	0	0	0	0	0	0	0
2	-1	0	0	2	0	0	0	0	0	0	0	0
11	7	4	2	2	0	0	0	-1	0	0	0	0

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
21	14	9	5	4	1	1	0	0	0	0	0	0
19	15	8	5	2	1	1	0	0	0	0	0	0
19	15	8	5	2	1	1	0	0	1	0	0	0
8	6	4	3	2	1	1	1	1	1	0	0	0
1	-1	0	0	2	0	0	0	0	0	0	0	0
2	-1	1	0	2	0	0	0	0	0	0	0	0
12	8	5	2	3	0	0	0	-1	0	0	0	0

50000	52000	54000	56000	58000	60000	62000	64000	66000	68000	70000	72000	74000
25	17	11	6	5	1	1	1	0	0	0	0	0
23	18	10	6	3	1	1	0	0	1	0	0	0
23	18	10	6	3	1	1	0	0	1	0	0	0
10	7	5	3	2	2	1	1	1	1	1	0	0
2	-1	1	0	2	0	0	0	0	0	0	0	0
2	-1	1	0	2	0	0	0	0	0	0	0	0
15	10	6	3	3	0	-1	0	-1	0	-1	0	0

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	701	188	128	70	23	15	8	5	5
0	0	0	0	839	132	78	41	15	9	8	8	12
0	0	0	0	800	125	74	39	14	9	8	8	12
0	0	0	0	575	129	81	68	32	23	30	16	12
0	0	0	0	-138	56	50	29	8	6	0	-4	-7
0	0	0	0	-99	63	54	31	9	6	0	-4	-7
0	0	0	0	127	60	47	2	-9	-8	-22	-11	-8

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	820	220	150	81	27	18	9	6	6
0	0	0	0	982	155	91	48	17	11	10	10	14
0	0	0	0	936	146	87	46	16	11	9	10	14
0	0	0	0	672	150	94	79	37	27	35	19	15
0	0	0	0	-162	65	58	33	10	7	0	-4	-8
0	0	0	0	-116	74	63	36	10	7	0	-4	-8
0	0	0	0	148	70	55	2	-10	-9	-26	-13	-9

				Tridem Axles								
76000	78000	80000	82000	12000	15000	18000	21000	24000	27000	30000	33000	36000
0	0	0	0	998	268	182	99	32	22	11	7	7
0	0	0	0	1195	188	111	58	21	13	12	12	17
0	0	0	0	1139	178	105	55	20	13	11	12	17
0	0	0	0	818	183	115	96	45	33	43	23	18
0	0	0	0	-197	80	71	41	12	8	-1	-5	-9
0	0	0	0	-141	89	77	44	13	9	0	-5	-10
0	0	0	0	180	85	67	3	-13	-11	-32	-16	-11

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
13	10	7	12	11	10	11	6	5	2	1	1	0
15	17	16	14	15	10	9	4	4	2	1	3	0
16	17	17	15	16	11	9	4	4	3	1	3	0
12	12	14	10	10	9	7	6	3	3	4	3	2
-2	-7	-10	-2	-4	0	2	2	1	0	0	-2	0
-3	-8	-10	-2	-5	0	2	2	1	0	0	-2	0
0	-2	-7	2	1	2	3	0	2	0	-3	-2	-2

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
15	11	8	14	13	12	13	7	5	3	1	1	0
18	19	19	16	18	12	10	5	4	3	1	3	0
18	20	20	17	19	12	10	5	5	3	1	3	0
14	14	17	11	12	10	9	7	4	3	5	3	2
-3	-8	-11	-2	-5	0	3	2	1	0	0	-2	0
-3	-9	-12	-3	-6	0	2	2	1	0	0	-3	0
1	-3	-9	3	1	2	4	0	2	-1	-4	-2	-2

39000	42000	45000	48000	51000	54000	57000	60000	63000	66000	69000	72000	75000
18	14	10	17	16	15	15	9	7	3	1	1	0
22	24	23	20	22	15	12	6	5	4	1	4	0
22	25	24	21	23	15	13	6	6	4	1	4	0
18	17	20	14	14	13	11	9	4	4	6	4	3
-3	-10	-14	-3	-6	0	3	2	1	0	0	-3	0
-4	-11	-14	-3	-7	0	3	2	1	0	0	-3	0
1	-3	-11	4	2	2	5	-1	2	-1	-5	-3	-2

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
-2	-2	0	0	0	0	0	0	0	0	0	0	0

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	1	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-2	-2	0	0	0	0	0	0	0	0	0	0	0

									Quadruple Axles			
78000	81000	84000	87000	90000	93000	96000	99000	102000	12000	15000	18000	21000
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
2	3	0	1	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	0	0	0	0	0
-2	-2	0	-1	0	0	0	0	0	0	0	0	0

24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
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24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
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24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	54000	57000	60000
0	0	0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0	0	0

63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
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0	0	0	0	0	0	0	0	0	0	0	0	0
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63000	66000	69000	72000	75000	78000	81000	84000	87000	90000	93000	96000	99000
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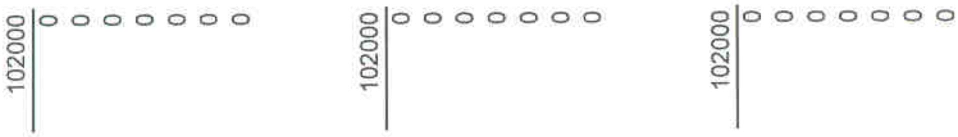
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