Part 3

User’s Manual
TrafLoad User’s Manual

prepared for

National Cooperative Highway Research Program
Project 1-39

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July 2004
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Chapter 1

Getting Started

This User’s Manual is Part 3 of this report. It assumes that users are familiar with Part 2 – “Guidelines for Collecting Traffic Data for Pavement Design.” For users wishing to understand more details about how TrafLoad performs its calculations, Part 4 describes each of the algorithms used to estimate vehicle classification statistics, load spectra, and traffic growth rates.

This chapter provides basic information you need to get started using the TrafLoad software. Section 1.1 describes the purpose of the software and what its inputs and outputs are. Section 1.2 covers the installation process, including hardware and software requirements. Section 1.3 provides a guide to the rest of the User’s Manual and other TrafLoad documentation.
1.1 System Overview

Purpose

The TrafLoad software is a product of NCHRP Project 1-39, “Traffic Data Collection, Analysis, and Forecasting for Mechanistic Pavement Design.” The purpose of the software is to produce traffic data for input to the 2002 AASHTO pavement design software (“2002 Software”) created under NCHRP Project 1-37A. This design software is based on a new mechanistic-empirical approach to pavement design. It relies on Axle Load Spectra rather than Equivalent Single Axle Loads (ESALs). For each of four axle types, the Load Spectra (LS) specify the percentages of axles falling into each of several load ranges. The load ranges are listed in Table 1.

Inputs

The primary inputs to TrafLoad are classification counts and load spectra. The number and locations of counts, and the amount of data to be provided for each location, must be carefully selected to provide valid traffic estimates for a given pavement design site.

Part 2 of this report – “Guidelines for Collecting Traffic Data for Pavement Design” – provides a complete discussion of how to develop an appropriate traffic count program to support pavement design. It is strongly recommended that TrafLoad users familiarize themselves with the contents of these Guidelines prior to using the software. They cover the important topic of data quality. TrafLoad assumes that its input data have already been quality checked, so it is imperative that quality control procedures have been applied prior to loading any data into the system. The Guidelines describe TrafLoad’s procedures for minimizing estimation errors due to variations in axle weight distributions across vehicle classes, as well as due to locational and temporal variations in traffic characteristics.

TrafLoad accepts standard FHWA classification count and weight data files. For classification counts, either “C records” or “4 cards” are accepted. For weight data, either “W records” or “7 cards” are accepted. See Section 6 of the FHWA Traffic Monitoring Guide (TMG) (http://www.fhwa.dot.gov/ohim/tmguide/tmg6.htm) for further information on the format of C and W records.
Table 1. Load Ranges Used for Load Spectra

<table>
<thead>
<tr>
<th>Load Range</th>
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<th>Tandem</th>
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<tbody>
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1 One kip = 1,000 pounds = 4.448 kN.
Outs

TrafLoad produces the following types of summary data for a pavement design location:

**Vehicle Classification:**
- Annual Average Daily Traffic by vehicle class, lane, and direction;
- Monthly and Hourly Traffic Distribution Factors by vehicle class; and
- Truck Traffic Classification Group and Annual Average Daily Truck Traffic (AADTT) – for “3B” sites, which do not have classification counts.

**Load Spectra:**
- Design-lane Axle Groups per Vehicle by vehicle class; and
- Design-lane Axle Load Distribution Factors (percent of axles by load range for different vehicle class/axle type combinations).

**Traffic Growth Forecasts:**
- Traffic Growth Rates (over the life of the pavement).

For each site, these three types of outputs are written to text files with user-assigned names. Vehicle classification outputs are included in a single file. LS outputs are provided in five different files (four containing load spectra for each of four axle types, and one with the axle groups per vehicle information). Traffic growth forecasts are in a single file. Documentation of the different output files produced by TrafLoad is provided in Appendix A. TrafLoad output files are designed to be read directly by the 2002 Software.
1.2 System Installation

Software Characteristics

TrafLoad is a stand-alone desktop application that runs under Windows® operating systems (Windows NT, 2000, and XP). TrafLoad was developed with Microsoft Visual Basic and Microsoft Visual C++. It uses a Microsoft Access database, but users need not have Access installed on their computers to use TrafLoad. Active X Data Objects (ADO) version 2.7 is used for database connectivity.

System Requirements

Because TrafLoad processes significant volumes of data, it is best to run it on a computer with a fast processor and plenty of memory. Minimum hardware and software requirements are as follows:

- Intel Pentium III, 500+ MHz, 128+ MB RAM;
- Windows NT 4.0, Windows XP, or Windows 2000 (service pack 4)¹;
- MDAC 2.8;
- Hard Drive with 500+ MB free disk space;
- Microsoft-compatible mouse or other pointing device;
- CD-ROM;
- Windows-compatible laser, inkjet, or standard dot-matrix printer;
- SVGA 15” color monitor (800x600 pixels); and
- Internet Explorer version 3.01 or later.

Installation Procedure

Installation should be performed by someone who has Administrator Privileges on your computer.

1. Close all open applications.

2. Insert the TrafLoad Installation CD into your CD-ROM drive.

3. Review the Release Notes file provided on the TrafLoad installation CD prior to proceeding with the installation.

¹ TrafLoad has received limited testing, and appears to perform without problems, under Windows 98, Second Edition. TrafLoad has not been tested with any earlier version of the Windows operating system.
4. Click **Start-Run**, and type `D:\ SETUP` for CD installation (substitute the correct CD drive letter) in the **Open** box.

5. Follow all on-screen instructions. If you get any messages saying that the version of a file on the CD is older than the one on your computer, and asking if you want to keep the file on your computer, always select the “Yes” option.

6. Click the **Finish** button.

The installation procedure will create a TrafLoad directory. The first time you run the program, it will create the following set of folders in your TrafLoad directory:

- INPUT;
- LOG;
- OUTPUT;
- TMP; and
- USR.

All of the output files produced by TrafLoad are written to the OUTPUT folder. Log files containing the results of data processing runs are written to the LOG folder – these can be used to track down any issues that prevent successful processing. The INPUT folder is provided as a default location for storage of classification and weigh-in-motion (WIM) data files to be loaded into TrafLoad, though these can be stored in any location of your choice. The USR directory is provided for storage of different TrafLoad databases created by the user. The TMP directory is for temporary storage of intermediate outputs during TrafLoad’s calculations.
1.3 TrafLoad Documentation Guide

The remainder of this User’s Manual provides detailed instructions on how to use TrafLoad to produce required inputs for the 2002 Software.

Chapter 2 presents a step-by-step set of procedures for using TrafLoad, and covers three “phases” of using the software:

1. Setting up factor groups and vehicle classification categories (typically a one-time activity);

2. Loading statewide traffic data from permanent WIM and vehicle classification data sites (an annual activity); and

3. Producing traffic data outputs for particular pavement sites.

Chapter 3 provides detailed documentation for each menu item and screen.

A Glossary contains definitions of abbreviations used in this User’s Manual and selected additional reference information.

Appendix A includes sample TrafLoad output files.

Appendix B provides documentation of the TrafLoad database.
Using TrafLoad

This chapter describes the workflow process of using TrafLoad to produce traffic data needed for the 2002 Software. It presents the sequence of steps that you need to take to set up the system, assemble the necessary input data, enter data into the system, and process the data. Chapter 3 provides specific instructions on how to use each of the TrafLoad screens to perform the procedures referenced in the workflow steps. We recommend that, before using any of the screens, you read the Chapter 3 description of the screen.
2.1 Overview

There are three distinct phases to using TrafLoad:

1. The Setup phase involves defining a number of groupings for aggregation and factoring of traffic data;

2. The Statewide Traffic Data Loading phase covers loading of statewide traffic data for vehicle classification and WIM sites; and

3. The Pavement Site Data Processing phase covers activities required to produce required traffic-data outputs for a particular pavement design site.

The following sections cover each of these three phases.
2.2 Setup Phase

After TrafLoad is installed, a setup process is required involving:

- Definition of vehicle classification schemes used to collect data at particular sites;
- Definition of vehicle classification groupings to be used in the analysis procedures;
- Definition of seasonal and temporal factor groups that establish categories for grouping traffic data sites based on similar temporal patterns; and
- Definition of truck weight road groups (TWRG) that establish categories for grouping WIM data sites based on similar axle loading characteristics.

Table 2 summarizes the different categories and classifications to be defined in TrafLoad. (See Part 2 for detailed guidance.) Steps S1 to S5 below describe how to set them up.

**Table 2. Categories for Grouping and Factoring of Traffic Data**

<table>
<thead>
<tr>
<th>Category</th>
<th>Used for…</th>
<th>Example Approach</th>
<th>For More Information, See…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seasonal Factor Groups</td>
<td>Adjusting Level 2 classification counts to reflect monthly variations in the composition of truck traffic</td>
<td>Urban</td>
<td>Part 2, Section 3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural Interstate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural non-Interstate</td>
<td></td>
</tr>
<tr>
<td>Day-of-Week Factor Groups</td>
<td>Adjusting Level 2 classification counts to reflect day-of-week variations in the composition of truck traffic</td>
<td>Business-week pattern</td>
<td>Part 2, Section 3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Through pattern</td>
<td></td>
</tr>
<tr>
<td>Time-of-Day Factor Groups</td>
<td>Adjusting Level 2B classification counts to reflect hourly variations in the composition of truck traffic</td>
<td>Business-day pattern</td>
<td>Part 2, Section 3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Through pattern</td>
<td></td>
</tr>
<tr>
<td>Seasonal LS Factor Groups</td>
<td>Adjusting WIM data to reflect monthly variations in average pavement damage per vehicle</td>
<td>Urban</td>
<td>Part 2, Section 2.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural Interstate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other (to reflect roads with spring-thaw restrictions or higher weights during winter freeze)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Categories for Grouping and Factoring of Traffic Data (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Used for…</th>
<th>Example Approach</th>
<th>For More Information, See…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Vehicle Class Scheme</td>
<td>Optional – can be used to accommodate different vehicle classification schemes at particular classification count and WIM sites. Vehicle classes in user-defined schemes must be mapped to the 10 FHWA truck and bus classes</td>
<td>Short (FHWA 4 - 7)</td>
<td>Part 2, Section 3.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long (FHWA 8 - 12)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Very Long (FHWA 13)</td>
<td></td>
</tr>
<tr>
<td>Classification Vehicle Class Groups</td>
<td>Aggregating the 10 FHWA truck and bus classes into fewer categories for purposes of performing day-of-week, time-of-day, and seasonal adjustments to classification counts</td>
<td>FHWA Vehicle Classes 5 - 7</td>
<td>Part 2, Section 3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other FHWA Truck and Bus Classes</td>
<td></td>
</tr>
<tr>
<td>WIM Vehicle Class Groups</td>
<td>Aggregating the 10 FHWA truck and bus classes into fewer categories for purposes of performing seasonal adjustments to WIM data</td>
<td>One group for each common vehicle class, with less common classes incorporated</td>
<td>Part 2, Section 2.3</td>
</tr>
<tr>
<td>Truck Weight Road Groups</td>
<td>Grouping of roads with similar axle loadings for a given WIM vehicle class group – used to derive Load Spectra for pavement design sites without site-specific WIM data</td>
<td>For each VC group: Urban, Rural Interstate – N/S, Rural Interstate – E/W, Rural Other – light, Rural Other – heavy</td>
<td>Part 2, Section 2.4</td>
</tr>
</tbody>
</table>

**Step S1: Launch TrafLoad and Create a New Database**

When you launch TrafLoad for the first time, it will ask you to select an existing database or create a new one. Select the option to create a new database and assign it a name of your choosing. For the purposes of this manual, we will call it the “Baseline” database.

The next time you launch TrafLoad, the database that you were using in the prior session will automatically be opened. To create a new TrafLoad database after the initial session, select **New TrafLoad Database** from the **File** menu. The system will ask if you want to copy site information and factor group definitions from the current database. Answer **Yes** if you have...
already followed the steps below to define factor groups and wish to carry these definitions forward to your new database; otherwise answer No to create a clean database.

See Section 3.1 for more details on managing TrafLoad databases.

**Step S2: Define Alternative Vehicle Classification Schemes**

If any of your WIM or classification data have been collected using definitions of vehicle classes that vary from the standard 13 FHWA vehicle classes, you will need to define alternative vehicle classification schemes in TrafLoad. In particular, this step will be needed if any of the data have been collected using length classes or more than 13 classes. You can define as many alternative schemes as you need. Each scheme must be given a name, and each type of vehicle class in the scheme must be mapped into the 10 standard FHWA truck and bus classes (FHWA Classes 4 - 13).\(^1\)

Select Alternative Vehicle Classification Scheme from the Setup menu to access the Define Alternative Vehicle Class Scheme screen.

See Section 3.2.6 for specific instructions on how to use this screen.

**Step S3: Define Vehicle Classification Groups for WIM and Classification Counts**

Follow the suggested procedures in Part 2 to aggregate the 10 FHWA truck and bus classes into a smaller set of classes to be used in the factoring procedures. One purpose of these groupings is to avoid sparsely populated datasets, so, in developing the groups, it is recommended that vehicle classes that are relatively uncommon be grouped with more commonly observed classes. Up to 10 vehicle class groups can be set up for Classification Counts and separately for WIM data. To set up vehicle class groups, select Vehicle Class Groups from the Setup menu to access the Define Vehicle Class Groups screen.

See Section 3.2.7 for instructions on using this screen.

---

\(^1\) The actual restriction in the current version of TrafLoad is that all classes must be mapped into classes that are numbered from 4 to 13. Thus, if you distinguish two kinds of FHWA Class 13 vehicle (say you call them Classes 13 and 14), you can retain this distinction by eliminating some other FHWA distinction (say between Classes 11 and 12). To accomplish this, use the Define Alternative Vehicle Class Scheme screen to map your Classes 11 and 12 into TrafLoad Class 11 and to map your Classes 13 and 14 into TrafLoad Classes 12 and 13. If you do this for a site, be sure to provide the 2002 Guide pavement design software both traffic and load spectra data for the site; otherwise the pavement design software will use its own defaults, which correspond to conventional FHWA classes.
Step S4: Define Factor Groups for Classification Counts

Continuous classification counts are used to calculate seasonal, day-of-week, and time-of-day traffic ratios. This is accomplished through defining the following sets of factor groups:

- A set of seasonal or monthly factor groups;
- A set of day-of-week (DOW) factor groups; and
- A set of time-of-day (TOD) factor groups.

Most or all of your classification count locations should be assigned to a member of each type of group to support calculation of meaningful statistics.

Follow the suggested procedures in Part 2 to define seasonal, DOW, and TOD groupings.

To set up seasonal factor groups, select Seasonal Factor Groups from the Setup menu to access the Define Seasonal Factor Groups screen.

To set up day-of-week factor groups, select Day-of-Week Factor Groups from the Setup menu to access the Define Day-of-Week Factor Groups screen.

To set up time-of-day factor groups, select Time-of-Day Factor Groups from the Setup menu to access the Define Time-of-Day Factor Groups screen.

Classification count sites are assigned to these groups in Step L3. See Sections 3.2.2, 3.2.3, and 3.2.4 for documentation of the three screens for setting up classification factor groups.

Step S5: Define Groups for WIM Data

Each WIM site must be assigned to a seasonal Load Spectra (LS) factor group, and most or all WIM sites should be assigned to a truck weight road group (TWRG).

The seasonal LS factor groups should each contain sites with similar monthly variations in truckload characteristics. The TWRGs should each contain sites with similar axle loadings for a given set of vehicle classes. Each direction of travel for a site can be assigned to a different TWRG.

Follow the suggested procedures in Part 2 to define these three types of groups.

To set up seasonal LS factor groups, select Seasonal LS Factor Groups from the Setup menu to access the Define Seasonal Factor Groups screen.

To set up TWRGs, select Truck Weight Road Groups from the Setup menu to access the Define Truck Weight Road Groups screen.

WIM sites are assigned to these groups in Step L7. See Sections 3.2.5 and 3.2.6 for documentation on the two screens for setting up WIM data factor groups.
2.3 Statewide Traffic Data Loading Phase

This phase involves entering information about each permanent vehicle classification count and WIM site, and loading data for these sites. This data is used by TrafLoad to produce estimates of traffic loading characteristics for pavement design sites where site-specific traffic data is either limited or missing altogether.

In general, quality-checked data from all permanent classification count sites and WIM sites should be loaded into TrafLoad in order to provide the best possible dataset for pavement design. The information should be updated on an annual basis.

Step L1: Open or Create a New TrafLoad Database

When you launch TrafLoad, the database that you used in your prior TrafLoad session (in this example, the “Baseline” database) will automatically open. If you want to use a different database other than the one shown in the Main Window caption, select Open Database from the File menu, and select the database you wish to use. If you are entering data for a subsequent year, you may wish to create a new copy of the database by saving your “Baseline” database (which contains all of your factor groups and classification schemes and categories) to a new name. To do this (assuming that the “Baseline” database is open), select Save TrafLoad Database As from the File menu, and enter the new database name (e.g., “TrafLoad2004”).

See Section 3.1 for more information on managing TrafLoad databases.

Step L2: Remove Old Sites and Their Data

If your TrafLoad database is getting too large, or if you have loaded data into TrafLoad for sites that are no longer representative of current conditions, you can delete all existing traffic data for selected sites.

Prior to deleting information, it is good practice to create a copy of your existing TrafLoad database. To do this, use Save TrafLoad Database As from the File menu.

To delete a site, select Site Information from the Setup menu to access the Maintain Site Information screen. Select the site to be removed from the pick list at the top of the screen, and click on the Delete Site and Associated Data button.

See Section 3.2.1 for further information on managing site information in TrafLoad.
Step L3: Set Up Classification Count Sites in TrafLoad

Assemble Data for Level 1 and 2 Classification Count Sites

A Level 1A classification count site is a site for which there is a dataset containing a minimum of one full week of classification counts for 12 consecutive months. Each dataset must be in standard FHWA “C record” or “4 card” format. IMPORTANT: TrafLoad assumes that complete data are available for sites that you designate as 1A sites. If there are missing data,² then TrafLoad will not calculate vehicle class statistics for the site. Quality checks should also ensure that each classification record contains valid entries for: site ID, lane, direction, vehicle class, year, month, day, and hour.

Once input data files are assembled, it is recommended that the following table be prepared with a row for each count site to facilitate the data entry and loading process:

Table 3. Vehicle Classification Site Information

<table>
<thead>
<tr>
<th>Site Name or Number</th>
<th>Site ID in the Data File</th>
<th>Site Description</th>
<th>Vehicle Class Scheme</th>
<th>Factor Groups</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your agency’s official identification name or number for the site – must be unique</td>
<td>identifier for the site/station in each record of the data file (6 characters for C and W records, 3 characters for 3 and 7 cards)</td>
<td>(Optional) Descriptive information about the site</td>
<td>(Optional – only needed if vehicle counts are based on a classification scheme different from the FHWA standard 13 classes) Name of scheme</td>
<td>Seasonal Factor Group name DOW Factor Group name TOD Factor Group name</td>
<td>Start and End dates of data to be processed</td>
</tr>
</tbody>
</table>

Create Sites in TrafLoad

Before you can load the classification count data, you must create a site description record in TrafLoad for every Classification Count site. To do this, select Site Information from the Setup menu to access the Maintain Site Information screen. If you try to load data for a site prior to setting up a site description record, the loading procedure will give you the options of completing the Maintain Site Information screen or canceling the data loading request. Enter the name or number of the site (as you want it to appear on pick lists throughout the system), along with a description of the site (optional), and then complete the information in the Vehicle Class Information section of the screen (see Table 3). The “Site identifier in data files” window must be set to contain the identifier used in the data files (but it need not be

² A 1A site must have data for one full week for 12 consecutive months; therefore, your quality checks should ensure that there are at least 84 days of data, and that each day of data includes 24 hours of data for each lane and vehicle class.
identical to the site name or number). For “C” and “W” records, this identifier must be six characters long. For “4” and “7” cards, it must be three characters long. Click the Add or Change Site button to save the information.

Section 3.2.1 provides documentation for the Maintain Site Information screen.

**Step L4: Load Vehicle Classification Data into TrafLoad**

Once you have entered site information for each vehicle classification location, you can load the associated data files by selecting Open FHWA Vehicle Classification File from the File menu. The Submit Vehicle Classification Files screen will appear. Use the Directory list (in the left-hand pane) to navigate to the directory where your file(s) are located. The files in this directory will appear in the Available Files pane. Highlight files to be selected for loading and use the right arrow button to select them. The left arrow button can be used to deselect files if need be. Then, click either Validate or Import.

If you click Import, the selected files will be loaded into the database. You should expect this process to take some time – the amount of time is dependent on the amount of data in the input files, the number of files selected, and possibly on the way the file is sorted. When processing is complete, a tone will sound, the progress window will disappear, and all files will have disappeared from the Selected Files pane.

If you click Validate, the selected files will be examined but not loaded into the database. This step will generate any warning messages about invalid files that would have been generated by Import, but it requires much less processing time.

If you have not yet set up a site for the files you wish to load, you will be given the options of completing the Site Information screen to create the site, or canceling your loading request.

If you have a large volume of data to load, it is recommended that you load files in relatively small batches. It is also recommended that you monitor the size of your TrafLoad database, and periodically use the Compress TrafLoad Database option on the Tools menu to release unused space in the database.

See Section 3.3.1 for further information on loading vehicle classification data files into TrafLoad.

**Step L5: Process Vehicle Classification Data**

After loading the raw vehicle classification data files, use the Calculate Vehicle Classification Statistics option on the Processes menu to access the Process Vehicle Classification Data screen. Select a set of files for processing, and click Process Data. Do

---

3 Each new site found on an import record is validated for existence in the database. If the import file is highly unsorted with respect to site, this validation will occur often; i.e., each time the site identifier on a record is different from that on the previous record. Thus, a performance gain may be obtained by sorting the import file(s) by the site identifier field.
not select the option to write output files at this point. After processing is complete, a prompt will appear asking if you want to delete intermediate results. Respond “Yes” to this prompt.4

See Section 3.4.1 for further information on using the Process Vehicle Classification Data screen.

**Step L6: Review Vehicle Classification Data**

**Review Results for Each Site**

Once you process vehicle classification data for a given site, it is recommended that you carefully review the results, and verify that they appear to be valid and representative of traffic characteristics at the site based on the data you have loaded. If there are data problems, correct them and repeat Steps L4 and L5 to re-load and process the input files. Classification data for the same date/time/lane/direction will replace the previously loaded data.

Select Site Vehicle Class Statistics from the View menu. This brings up the Vehicle Classification Summary screen. You can use this screen to review the following statistics for a given site:

- Annual Average Daily Traffic (AADT) by vehicle class (4 - 13) for each lane/direction and for the roadway as a whole;
- Annual Average Day of Week (AADW) traffic by vehicle class for a selected lane/direction;
- Monthly Average Daily Traffic for each of the 12 months (MADT) by vehicle class; and
- Monthly Average Day of Week (MADW) traffic by vehicle class for a selected month, and a selected lane/direction.

**Review Aggregate Results by Factor Group and Vehicle Class Group**

Once all of the classification sites are processed, you can review truck traffic statistics that TrafLoad has calculated using all of the classification data for sites that have been assigned to seasonal and day-of-week factor groups. Select the Vehicle Class Averages and Factors item from the View menu. This brings up the Vehicle Classification Group Statistics screen that shows:

- Monthly traffic ratio (the ratio of the MADT to AADT) for each of the vehicle class groups (defined in Step S3) for a selected seasonal factor group (defined in Step S4); and
- Day-of-week traffic ratio (the ratio of the AADW to AADT) for each of the vehicle class groups (defined in Step S3) for a selected day-of-week factor group (defined in Step S4).

---

4 The option to save intermediate results has been included for users wishing to trace through the details of the calculations.
See Chapter 2 of the Procedures Manual (Part 4 of this report) for detailed information on how TrafLoad calculates these statistics.

See Section 3.5.3 for further information on using the Vehicle Classification Summary screen, and Section 3.5.4 for further information on using the Vehicle Classification Group Statistics screen.

**Step L7: Set Up WIM Sites in TrafLoad**

**Assemble Data for Each Permanent WIM Site**

Information for each permanent WIM site should be entered into TrafLoad. Every WIM site must have a “Current LS Dataset” that is representative of current conditions. Current LS Datasets should be for a period of up to 12 months that is representative of current loading conditions, where there is confidence that WIM equipment was properly calibrated.

In addition, a WIM site may have a “Seasonal LS Dataset” that can be used to create seasonal factors. A Seasonal LS Dataset must have at least one full week of data preferably for 12 consecutive months or, at a minimum, for each of the 12 months of the year within a 24-month period.

The Current LS Dataset may or may not be the same dataset as the Seasonal LS Dataset. For example, if you have good data for March-June 2003, no data for January-February 2003, and then a good full data set for January-December 2002, you can specify January-December 2002 as the Seasonal LS Dataset, and March-June 2003 as the Current LS Dataset.

Each WIM dataset must be in standard FHWA “W record” or “7 card” format. The data should be quality checked to ensure that each weight record contain valid entries for: site ID, lane, direction, vehicle class, weight, number of axles, year, month, day and hour.

Once these data files are assembled, it is recommended that the following information be assembled for each WIM site to facilitate the data loading process:

**Table 4. WIM Site Information**

<table>
<thead>
<tr>
<th>Site Name or Number</th>
<th>Site ID in the Data File</th>
<th>Site Description</th>
<th>Vehicle Class Scheme</th>
<th>Factor Groups</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your agency’s official identification name or number for the site</td>
<td>Identifier for the site/station in each record of the data file (6 characters for C and W records, 3 characters for 3 and 7 cards)</td>
<td>(Optional) Descriptive information about the site</td>
<td>(Optional) Name of scheme – if different from standard FHWA 13 classes</td>
<td>Seasonal LS Factor Group name TWRG name (for each design lane)</td>
<td>Start Date (for Current LS Dataset) and/or End Date (for Seasonal LS Dataset) Design Lane for each Direction</td>
</tr>
</tbody>
</table>
Create/Update Sites with WIM Information

To enter information for your WIM sites, select **Site Information** from the **Setup** menu to access the **Maintain Site Information** screen.

Most (if not all) of your WIM sites should correspond to a classification site that you have already added to the system. If this is the case, simply select the site from the pick list at the top, and enter the additional items in the WIM Information section.

If the site is not already there, type in a name and description for the site. Enter the name or number of the site (as you want it to appear on pick lists throughout the system), along with a description of the site, and then complete the information in the WIM Information section of the screen.

Click the **Add or Change Site** button to save the information.

Section 3.2.1 provides documentation for the **Maintain Site Information** screen.

**Step L8: Load WIM Data for Each Site**

Once you have entered site information for each WIM location, you can load the associated data files by selecting **Open FHWA Weight Records** from the **File** menu. The **Submit Vehicle Weight Files** screen will appear. Use the Directory list (in the left-hand pane) to navigate to the directory where your file(s) are located. The files in this directory will appear in the **Available Files** pane. Highlight files to be selected for loading and use the right arrow button to select them. The left arrow button can be used to deselect files if need be. Then, click either **Validate** or **Import**.

If you click **Import**, the selected files will be loaded into the database. You should expect this process to take some time – the amount of time is dependent on the amount of data in the input files, the number of files selected, and possibly on the way the file is sorted. When processing is complete, a tone will sound, the progress window will disappear, and all files will have disappeared from the **Selected Files** pane.

If you click **Validate**, the selected files will be examined but not loaded into the database. This step will generate any warning messages about invalid files that would have been generated by **Import**, but it requires much less processing time.

If you have not yet set up a site for the files you wish to load, you will be given the options of completing the **Site Information** screen to create the site, or canceling your loading request.

If you have a large volume of data to load, it is recommended that you load files in relatively small batches. It is also recommended that you monitor the size of your TrafLoad database, and periodically use the **Compress TrafLoad Database** option on the **Tools** menu to release unused space in the database.

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5 See Footnote 2.
See Section 3.3.2 for further information on loading WIM data files into TrafLoad.

**Step L9: Review Raw WIM Data**

Once you load WIM data for a given site, it is recommended that you carefully review the results, and verify that they appear to be valid and representative of traffic characteristics at the site based on the data you have loaded. If there are data problems, you will need to delete the site, correct them, and repeat Steps L7, L8, and L9 to re-load and process the input file.

Select **Site Source Load Spectra** from the **View** menu. This brings up the **Site Load Spectra Summary** screen. You can use this screen to review the following information for a given site, direction/lane, vehicle class, and date:

- Number of vehicles;
- Rigid and flexible ESALs; and
- Load Spectra for Single, Tandem, Tridem, and Quad axles.
2.4 Pavement Site Data Processing Phase

The following steps are required to prepare traffic data for one or more pavement designs.

**Step P1: Determine Type of Site for Pavement Design**

You will need to determine what “level” of classification and WIM data are available for your pavement design location. Table 5 summarizes the different levels for WIM data; Table 6 summarizes the levels for classification data.

**Table 5. WIM Traffic Data Levels**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design-lane WIM data have been collected for a location either at the pavement design site, or close enough to provide an accurate representation of loading conditions at the design site.</td>
</tr>
<tr>
<td>2</td>
<td>Site-specific WIM data are not available; design information to be based on average Load Spectra for a selected Truck Weight Road Group (TWRG).</td>
</tr>
<tr>
<td>3</td>
<td>Site-specific WIM data are not available; not enough is understood about axle-weight distributions at the site to allow it to be assigned to a TWRG. Design information to be based on statewide average Load Spectra.</td>
</tr>
</tbody>
</table>

**Table 6. Classification Count Data Levels**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Continuous automatic vehicle classification counts (at least one week of data for 12 consecutive months) are available for the design site.</td>
</tr>
<tr>
<td>1B</td>
<td>Short-duration classification counts (at least 48 hour period(s) recommended) are available for the site AND it is associated with a Level 1A site (on the same road; reasonably near/similar truck characteristics; similar seasonal, time-of-day, and day-of-week variations). The short-duration counts must be in the same year as the associated Level 1A site’s data.</td>
</tr>
<tr>
<td>2A</td>
<td>Short-duration classification counts from automated vehicle classifiers (AVCs) (minimum of 24 hours; 48 hours recommended) are available. The site is not on the same road as a Level 1A site.</td>
</tr>
<tr>
<td>2B</td>
<td>Short-duration manual classification counts are available.</td>
</tr>
<tr>
<td>3A</td>
<td>Only Annual Average Daily Traffic (AADT) is available (no classification counts), but the site is on the same road as a Level 1 or Level 2 site and has a similar traffic mix.</td>
</tr>
<tr>
<td>3B</td>
<td>Only Annual Average Daily Truck Traffic (or AADT and Percent Trucks) is available.</td>
</tr>
</tbody>
</table>
Step P2: Enter Pavement Design Site Information for Vehicle Classification

If your pavement design site is a Level 1A site for classification and you have already added the site to TrafLoad and loaded the necessary classification count data, you can skip this step and go on to Step P4.

Otherwise, you will need to assemble vehicle classification-related information required to add your site to TrafLoad. Table 7 summarizes data requirements for the different levels of classification data sites. Follow the procedures in Step L3 to add your sites to TrafLoad and enter the required Classification data.

Table 7. Data Requirements for Classification Count Processing by Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Site ID in the Data File</th>
<th>Alternative Vehicle Class Scheme</th>
<th>Factor Groups</th>
<th>File Name(s)/Location(s)</th>
<th>Associated Site Number/Name</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>✓</td>
<td>✓</td>
<td>Seasonal&lt;sup&gt;1&lt;/sup&gt; DOW&lt;sup&gt;2&lt;/sup&gt; TOD&lt;sup&gt;3&lt;/sup&gt;</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1B</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2A</td>
<td>✓</td>
<td>✓</td>
<td>Seasonal DOW</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2B</td>
<td>✓</td>
<td>✓</td>
<td>Seasonal DOW TOD</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

<sup>1</sup>Not all Level 1A sites need to be assigned to seasonal factor groups, but users should try to have sufficient numbers of 1A sites in each seasonal factor group category to ensure statistically valid results.

<sup>2</sup>Not all Level 1A sites need to be assigned to day-of-week factor groups, but users should try to have sufficient numbers of 1A sites in each day-of-week factor group category to ensure statistically valid results.

<sup>3</sup>TOD factor groups are required only if system will be expected to process data for Level 2B sites. Not all Level 1A sites need to be assigned to time-of-day factor groups, but users should try to have sufficient number of 1A sites in each time-of-day factor group category to ensure statistically valid results.
Step P3: Load Classification Data for the Pavement Design Site

If your site is a Level 1A, 1B, 2A, or 2B site, load the file(s) containing classification count information into TrafLoad using the procedure described in Step L4. If it is a Level 1B or 3A site, make sure that the data for the associated site has been loaded.

Note: When loading data for a 2A site, TrafLoad will check to make sure that there are at least 24 hours of data for the first lane in the input file. TrafLoad will check only one lane of data and assume that the same hours of data are available across all of the lanes – you are responsible for making sure there is a complete dataset for all lanes and directions.

Step P4: Enter Pavement Design Site Information for WIM

If your pavement design site is a Level 1 WIM site, and you have not yet added it to TrafLoad and loaded the data, make sure you have assembled the required information in Table 4, and follow the procedure in Step L7 to enter site information related to WIM. If your site is a Level 2 or 3 WIM site, skip to Step P6.

Step P5: Load WIM Data for the Pavement Design Site

If your pavement design site is a Level 1 WIM site, follow the procedure in Step L8 to load its data file(s) into TrafLoad.

Step P6: Process Vehicle Classification Data for Pavement Design Site and Create Output File

Select the Calculate Vehicle Classification Statistics option on the Processes menu to access the Process Vehicle Classification Data screen. Pick your pavement design site from the list of sites.

Choose the option to produce an output file, and select the design direction – you can either select a particular lane for the design direction, or enter a 0 to report results for all lanes in the selected direction. (If results are reported for all lanes, the 2002 Software will estimate the portion of total traffic that is in the design lane.) Enter a file name for the output (with no path information).

Click Process Data. For all but 3B classification sites, TrafLoad will create an output file (in your TrafLoad OUTPUT directory), including AADT by vehicle class, hourly distribution factors, and monthly distribution factors by vehicle class. The file also contains directional distribution factors required by the 2002 Software – these are always set to 1.0.
If your pavement design is for a 3B classification site, TrafLoad will create a file with the AADTT and Truck Traffic Classification (TTC) Group that you entered into the Site Description screen.

You can review the results for your pavement design site in the Vehicle Classification Site Summary screen by selecting the Site Vehicle Class Statistics from the View menu, as described above in Step L6.

See Section 3.4.1 for further information on using the Process Vehicle Classification Data screen.

**Step P7: Process WIM Data for Pavement Design Site and Create Output File**

Select the Perform Load Spectra Calculations option on the Processes menu to access the Process Load Spectra Data screen. If your pavement design site is a Level 1 WIM site, select it from the list of sites, and choose the “Output Single Site” option. Select the design direction at the bottom of the screen.

If your site is a Level 2 or 3 WIM site, select the Truck Weight Road Group output option, and select the representative truck weight road group from the pick list. For Level 2 sites, select the appropriate Truck Weight Road Group; for Level 3 sites, choose the “Output Statewide Average” option to obtain an output file containing statewide averages (based on a weighted average of TWRG information).

For all options, enter a file name for the output (with no path information), an identifier for the pavement design site to appear in the output file header information, and a pavement type (rigid or flexible).

A set of four output files (one for each axle type) will be created (in your TrafLoad OUTPUT directory) with LS data for your selected site, TWRG, or statewide.

In addition, a fifth file containing the number of axles per truck (by vehicle class and axle type) is produced.

See Section 3.4.2 for further information on using the Process Load Spectra Data screen.

**Step P8: Review Load Spectra Processing Results**

Once individual WIM sites or truck-weight road groups are processed, you can review results of the TrafLoad LS estimation process – either for an individual site or for a selected TWRG. Data for a “Current LS Dataset” will reflect application of seasonal factors based on the assigned Seasonal LS Factor Group. Data for a TWRG will reflect the aggregation of characteristics from WIM sites assigned to the selected TWRG.
To view TrafLoad LS results, select the Site and TWRG Output Spectra item from the View menu. This screen shows Load Spectra for a selected month and day of the week, WIM vehicle class group, design lane, and pavement design type.

See Chapter 3 of the Procedures Manual (Part 4) for detailed information on how TrafLoad performs these calculations.

See Section 3.5.1 for further information on using the Site Load Spectra Summary screen, and Section 3.5.2 for further information on using the Site and Truck Weight Road Group Output Spectra screen.

**Step P9: Forecast Truck Volumes**

The 2002 Software requires estimates of truck traffic growth rates over the life of the pavement for your design site. Prior to producing the truck volume forecasts, you must have successfully performed Step P6 to process the Vehicle Classification data for your pavement design site.

Truck volume forecasts can be produced using two different methods – either Linear or Exponential. See Part 2, Section 3.6 for details on the options, and Part 4 (Procedures Manual), Section 2.5 for details on the calculations. If you select a Linear method, you have three options:

1. Enter the growth in vehicles per year for single-unit and combination trucks;
2. Enter the base and future years, and the total expected increase between these two years in the number of single-unit and combination trucks; or
3. Enter the base and future years, and the corresponding estimates of AADTT for single-unit and combination trucks for the two years. The software will automatically fill the base-year AADTT values with the values that have been calculated for the site.

If you select the Exponential method, you also have three different options:

1. Enter the growth rate (percent per year) for single-unit and combination trucks;
2. Enter the base and future years, and the percent increase between these two years in the number of single-unit and combination trucks; or
3. Enter the base and future years, and the corresponding estimates of AADTT for single-unit and combination trucks for the two years. As with the linear case, the software will automatically fill the base-year AADTT values with the values that have been calculated for the site.

To perform the forecast, select Forecast Truck Volumes from the Processes menu.
On the Forecast Truck Volumes screen, make the following selections:

- Pick your vehicle classification site from the list.
- Choose the option to produce an output file, and enter a name for the file.
- (Optional) Enter a name for the pavement design site to appear in the output file. (This is automatically set to the name of the selected site.)
- Select the same direction/lane combination that you used for the Vehicle Classification data processing step. This is important to ensure consistency between the AADT forecast information and the base AADT estimates that were previously generated.
- Select the method to be used (linear or exponential), and then select an option for how you want to specify the input information. Enter the required inputs, and then select **Process Data**.

**Note:** If you select the third option (enter AADT for base and forecast year), the base-year and associated AADT estimate will be filled in for you based on the Vehicle Classification data processing step. You can choose to use this information, or override it by entering your own data.

An output file will be produced (in your TrafLoad OUTPUT directory) containing the growth rates (exponential method) or annual growth increments (linear) by vehicle class for the selected direction or lane.

See Section 3.4.3 for further information on using the **Forecast Truck Volumes** screen.
This chapter provides detailed information on how to use each menu item and screen of the TrafLoad system.

Information is provided in five sections:

- Section 3.1 covers creation and maintenance of TrafLoad databases;
- Section 3.2 covers setting up information about sites, factor groups, and vehicle classification categories;
- Section 3.3 covers loading traffic data into TrafLoad;
- Section 3.4 covers processing of traffic data and creation of output files; and
- Section 3.5 covers on-screen review of raw and processed data.

The table below shows each TrafLoad menu item in the order in which it appears in the program, and indicates the page on which reference information can be found:
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3.1 TrafLoad Databases

TrafLoad operates using a standard Microsoft Access database that contains information about traffic data collection and pavement design sites; user-defined groupings and categories; raw traffic data that is loaded into the system; and results of calculations. The software is designed with the flexibility to work with different copies of the database. This is intended to allow agencies to periodically make a new copy of the TrafLoad database to contain a new set of data.

The current version of TrafLoad is designed as a single-user system – therefore if TrafLoad is to be actively used by more than one individual in an agency, each user should work with their own copy of a master database.

When TrafLoad is launched for the first time, the user is given the option of selecting an existing TrafLoad database or creating a new one. In subsequent sessions, TrafLoad opens the last database in use when it is launched. In any TrafLoad session, the user can open a different TrafLoad database, make a copy of the existing TrafLoad database (assigning the copy a new name), or create a new TrafLoad database. New TrafLoad databases are created based on a standard template that is packaged with the software. An option is also provided to copy basic information from an existing TrafLoad database on sites, factor groups, and classification categories to the newly created database.

3.1.1 Opening an Existing TrafLoad Database

Menu Option: File – Open TrafLoad Database

Screen: Open a TrafLoad Database

Instructions:

- Use the standard Windows Explorer options to select a directory and navigate to the TrafLoad Database you wish to open. All TrafLoad databases are in Microsoft Access format and have an MDB extension.

- Click on the name of the file you wish to open.

- Click the Open button to open the database and close the window.

- Click the Cancel button to ignore your selection and close the window.
3.1.2 Creating a New TrafLoad Database

Menu Option: File – New TrafLoad Database

Screen: Save <TrafLoad Database Name> As …

Instructions:

- You are given the option of copying site information and factor group definitions from the existing TrafLoad database to the new database. If you select Yes, the new database will contain all of the site description information, along with all of the definitions of groups and categories that you have set up in your existing database. It will not contain any of the traffic data that you have loaded, or any results of TrafLoad calculations. Select No to start from scratch with an empty TrafLoad database.

- Navigate to the directory where you want the new file to be located.

- Enter a name for the new file. (The .mdb extension will automatically be appended to this name.)

- Click the Save button to create the new database file, make it active, and close the window.

- Click the Cancel button to close the window without creating the new file.

3.1.3 Creating a Copy of an Existing TrafLoad Database

Menu Option: File – Save TrafLoad Database As

Screen: Save <TrafLoad Database Name> As …

Instructions:

- Make sure that the file you wish to copy is currently active – its name should appear on the top of the TrafLoad main window.

- Navigate to the directory where you want the new copy of the database to be located.

- Enter a name for the new file. (The .mdb extension will automatically be appended to this name.)

- Click the Save button to create the new database file, make it active, and close the window.

- Click the Cancel button to close the window without creating the new file.
3.1.4 Compacting TrafLoad Databases

Menu Option: Tools – Compress TrafLoad Database

Screen: TrafLoad Processing Screen

Instructions:

- This option should be selected periodically as you are loading and processing data in order to release unused space in the TrafLoad database.

- The compress process is launched when you select the menu option, and it takes a few minutes (depending on the database size and your computer’s processing speed). The Processing Screen will close automatically when the process is complete.

3.1.5 Technical Information on the Database

You do not need to know anything about the TrafLoad database structure to operate the software. However, a description of each table is provided in Appendix B for experienced users who wish to view the information in the database via Microsoft Access. Note that editing data via Microsoft Access is strongly discouraged, as it can result in unpredictable system behavior. It is advisable to create a backup of the database prior to opening it with Access.
3.2 Setting up Sites, Categories, and Factor Groups

3.2.1 Maintaining Site Information

Menu Option: Setup – Site Information

Screen: Maintain Site Information

Instructions:

- Use the **Maintain Site Information** screen to add and modify information about all permanent WIM and classification sites, and to enter information about a pavement design site for which you want to conduct an analysis. You must add a site prior to loading or processing data for that site. You may use the same site definition for a site where both WIM and Vehicle Classification data are collected. Vehicle Classification information must be entered for all pavement design sites. WIM information need only be entered for pavement design sites with site-specific WIM data. See the field-level documentation for information about which items are required for different types of sites.

- To add a new site to the database, click the **Add** button, enter a unique name or number for the new site, and then click **OK**. You can then enter a description for the site (recommended but not required). Prior to loading and processing data for this site, you must complete all other required information.

- To remove a site and all of its associated information (including traffic data and processed statistics), select the site from the **Site name or number** field/pick list and click the **Delete** button. **IMPORTANT**: If you delete a site that was a member of a vehicle classification factor group, you will need to reprocess data for another one of the classification sites assigned to that group to recalculate the traffic ratios (factors) for that group. Similarly, if the deleted site was a member of an LS seasonal factor group or truck weight road group (TWRG), you will need to reprocess data for another one of the WIM sites in those groups to recalculate the seasonal factor group and TWRG statistics.

- Once a site has been added, you can modify or supplement its information by selecting it from the **Site name or number** field/pick list, revising the information, and then clicking the **OK** button. **IMPORTANT**: If you make changes to the site information after you have loaded and processed data for that site, you must be prepared to reprocess data to have those changes take effect. Several options affect how data are processed (e.g., Beginning Data Month, choice of seasonal factor group). If you change a seasonal, time-of-day, or day-of-week factor group for a Level 1A classification site, you will need to reprocess data for at least one other Level 1A classification site in the old group(s) to ensure that information for those factor groups are properly recalculated. Similarly, if you change a seasonal LS factor group or Truck Weight Road Group (TWRG) for a WIM site,
you will need to reprocess data for another WIM site assigned to the old group(s), and reprocess the TWRG as well.

**Fields:**

- **Site name or number** – Unique identifier for the site – used on pick lists throughout the system. Always required.

- **Description** – Brief description of the site to provide additional information to assist the user in identifying the site location and characteristics – recommended but not required.

**Vehicle Class Information**

- **Site identifier in data files** – Site ID used in the standard FHWA traffic data files. This must match the ID in the data files exactly, or the traffic data loading process will not be successful. For “C” and “W” records, this ID is six characters long; for “4” and “7” cards, it is three characters long. Required for all sites where vehicle classification data is to be loaded (Levels 1A, 1B, 2A, and 2B).

- **Level of class site** – Pick list indicating what level of vehicle classification data is available for the site. See Table 6 for brief descriptions of each level; see Part 2 for more details on the type of required data for each level. A level must be selected for a pavement design site or for a site for which vehicle classification data is to be loaded. IMPORTANT: TrafLoad assumes that the input data have been quality-checked and meet the requirements of the designated level – if data are missing from the input file, or if you include data that have failed your quality-checking procedures, you will not get valid results.

- **Beginning Data Month** – Month and year to begin loading of vehicle classification data, in MM/YYYY format (you must enter the “/” character). Required only for Level 1A classification sites. Data prior to the first day of this month and year will be ignored.

- **Ending Data Month** – Month and year to end loading of vehicle classification data, in MM/YYYY format (you must enter the “/” character). Required only for Level 1A classification sites. Data after the last day of this month and year will be ignored.

- **Associated site** – Associated site (pick list) providing vehicle class data to be used for estimating vehicle class statistics for a Level 1B or 3A site. Only required for Level 1B or 3A sites. (Note that, if you are associating a 1B or 3A site with a higher level site, you should enter the higher level site first.)

- **Seasonal factor group** – Name of seasonal factor group (pick list) – Optional for 1A sites; required for Level 2A and 2B sites. Used to develop seasonal factors for each seasonal factor group (from Level 1A site data) and to determine which seasonal factors to apply to data from Level 2A and 2B sites for estimating vehicle class statistics for these sites.
- **Day-of-week factor group** – Name of day-of-week factor group (pick list) – Optional for 1A sites; required for Level 2B sites and for Level 2A sites for which hourly counts are not available for all 168 hours of the week. Used to develop day-of-week factors for each day-of-week factor group (from Level 1A site data) and to determine which day-of-week factors to apply to data from Level 2A and 2B sites for estimating vehicle class statistics for these sites.

- **Time-of-day factor group**¹ - Name of time-of-day factor group (pick list) – Optional for 1A sites; required for Level 2B sites. Used to develop time-of-day factors for each time-of-day factor group (from Level 1A site data) and to determine which time-of-day factors to apply to data from Level 2B sites for estimating vehicle class statistics for these sites.

- **Alternate class scheme for class** – Name of the alternate vehicle classification scheme (if any) that has been used to collect vehicle classification data at this site. This is only required where vehicle classification data are to be loaded (Levels 1A, 1B, 2A, and 2B) AND a vehicle classification scheme that differs from the standard FHWA 13-class scheme has been used. When data for this site are loaded, the alternative scheme definition is used to translate the source data classifications to the 10 standard FHWA truck and bus classes.

- **3A and 3B sites, AADTT** – Annual Average Daily Truck Traffic, required only for Level 3 sites. You must enter *either* AADTT *or* AADT and Percent Trucks for a Level 3 site.

- **3A and 3B sites, AADT** – Annual Average Daily Traffic (you must also enter Percent Trucks).

- **3A and 3B sites, Percent Trucks** – The percent of AADT represented by trucks (FHWA Vehicle Classes 4 and above).

- **3B only, Truck Traffic Classification Group** – Pick from a list of Truck Traffic Classification Groups defined by the 2002 Software – required only for 3B sites. This information is passed through to the 2002 Software.

- **Use Business Day Hourly Distribution Factors** (for 2B Sites Only) – if checked, TrafLoad will produce a file with the typical business day hourly distribution factors (see Part 2, Table 3.2). Leave this option unchecked if you would prefer to use the defaults in the 2002 Software; in which case, TrafLoad will not produce any HDFs.

**WIM Information**

- **Site identifier in data files** – Site ID (up to six characters) used in the standard FHWA traffic data files. This must match the ID in the data files exactly, or the traffic data loading process will not be successful. Required for all sites where WIM data is to be loaded (Level 1).

¹ Time-of-day factor groups need not be specified if none of the sites are Level 2B sites.
Design direction/lane – Select the design lane to be used for WIM data processing for the design direction. One or both directions may be identified as design directions. Design lanes are identified separately for each direction. WIM data will be used only for the specified design lane(s) and direction(s).

Truck Weight Road Group (by direction) – Name of truck weight road group (pick list) – Optional for sites where WIM data are loaded. Used to develop Load Spectra for Truck Weight Road Groups that are produced for Level 2 WIM site analysis. If the site includes WIM data for both directions, Truck Weight Road Groups are specified separately for each direction (they can be the same or different).

Site is Current LS/Both Seasonal and Current LS – Selection of WIM site type is required for all sites where WIM data is to be loaded (Level 1). All WIM sites must have a current load spectra data set. Any WIM site with data for each of the 12 calendar months over a period of no more than 24 months for which the WIM equipment has been consistently calibrated over this period of time can be classified as a Seasonal LS site. Seasonal LS sites are used for calculating seasonal factors to be used for sites where data for only selected months of the year are available. A site that has data set(s) meeting criteria for both Seasonal and Current LS data sets should be classified as Both.

End date of seasonal data (MM/YYYY) – This is required for all sites that have been classified as having Seasonal LS data sets. When the WIM data is processed for such a site, TrafLoad will begin with this month and year, and look backwards in time for up to 24 months until it has found data for each calendar month. Only one month of data for each calendar month will be processed. If two months of data are included in the file for the 24-month period ending with the specified end date, only the later month of data will be processed; if better data are known to be available for the earlier month, data for the later month should be deleted from the file. If this date is not specified, TrafLoad will treat it as being 24 months after the first month in this dataset.

Begin date of Current LS data (MM/YYYY) – When a WIM data file is processed for a site that has been classified as having a Current LS data set, TrafLoad will process data for up to a 12-month period starting with this month and year. If this date is missing, TrafLoad will use the 12-month period ending with the last date that appears in the dataset. This date should not be specified if you expect to add data periodically to the end of the dataset and you expect always to want the last 12 months of data to be used.

Seasonal LS Factor Group – Name of seasonal LS factor group (pick list) – Required for sites with Current LS data sets but not Seasonal LS data sets. Optional for sites with Seasonal LS data sets. Used to calculate factors required to adjust Current LS data sets to reflect seasonal variations in loading characteristics.

Alternate Class Scheme for WIM – Name of the alternate vehicle classification scheme (if any) that has been used to collect WIM data at this site. This is only required where a vehicle classification scheme that differs from the standard FHWA 13-class scheme has been used. When data for this site are loaded, the alternative scheme definition is used to translate the source data classifications to the 10 standard FHWA truck and bus classes.
3.2.2 Creating Seasonal Factor Groups

Menu Option: Setup – Seasonal Factor Groups

Screen: Define Seasonal Factor Groups

Instructions:

- Use the Define Seasonal Factor Groups screen to set up categories of locations with similar patterns of seasonal variations in truck volumes.

- To enter a new seasonal factor group, click add, enter a unique name for the group, click OK, and enter an optional description for the group in the Description window.

- To change the name of an existing seasonal factor group, select it from the Groups pick list, and type in or modify its name.

- To change the description of an existing seasonal factor group, select it from the Groups pick list and modify its description.

- To delete an existing group, select it from the Groups field/pick list, and click the Delete button. When a prompt appears asking if you are sure that you want to delete the group, click Yes. CAUTION: Prior to deleting any groups, you should check to see which sites have been assigned to that group. You will need to assign these sites to new groups, and then repeat Vehicle Classification data processing for each of these sites.

- Sites are assigned to seasonal factor groups using the Maintain Site Information screen. Each seasonal factor group must contain at least one Level 1A site.

3.2.3 Creating Day-of-Week Factor Groups

Menu Option: Setup – Day-of-Week Factor Groups

Screen: Define Day-of-Week Factor Groups

Instructions:

- Use the Define Day-of-Week Groups screen to set up categories of locations with similar patterns of day-of-week variations in truck volumes.

- To enter a new day-of-week factor group, click add, enter a unique name for the group, click OK, and enter an optional description for the group in the Description window.

- To change the name of an existing factor group, select it from the Groups pick list, and type in or modify its name.
To change the description of an existing factor group, select it from the Groups pick list and modify its description.

To delete an existing group, select it from the Groups field/pick list, and click the Delete button. When a prompt appears asking if you are sure that you want to delete the group, click Yes. **CAUTION:** Prior to deleting any groups, you should check to see which sites have been assigned to that group. You will need to assign these sites to a new group, and then repeat Vehicle Classification data processing for each of these sites.

Sites are assigned to day-of-week factor groups using the Maintain Site Information screen. Each day-of-week factor group must contain at least one Level 1A site.

**3.2.4 Creating Time-of-Day Factor Groups**

**Menu Option:** Setup – Time-of-Day Factor Groups

**Screen:** Define Time-of-Day Factor Groups

**Instructions:**

- Use the Define Time-of-Day Factor Groups screen to set up categories of locations with similar patterns of hourly variations in truck volumes.
- To enter a new time-of-day factor group, click add, enter a unique name for the group, click OK, and enter an optional description for the group in the Description window.
- To change the name of an existing factor group, select it from the Groups pick list and type in or modify its name.
- To change the description of an existing factor group, select it from the Groups field/pick list, and modify its description.
- To delete an existing group, select it from the Groups field/pick list, and click the Delete button. When a prompt appears asking if you are sure that you want to delete the group, click Yes. **CAUTION:** Prior to deleting any groups, you should check to see which sites have been assigned to that group. You will need to assign these sites to new groups, and then repeat Vehicle Classification data processing for each of these sites.
- Sites are assigned to time-of-day factor groups using the Maintain Site Information screen. Each time-of-day factor group must contain at least one Level 1A site.

**3.2.5 Creating Seasonal LS Factor Groups**

**Menu Option:** Setup – Seasonal LS Factor Groups

**Screen:** Define Seasonal LS Factor Groups
Instructions:

- Use the Define Seasonal LS Groups screen to set up categories of WIM locations with similar seasonal patterns of axle loadings.

- To enter a new Seasonal LS factor group, click add, enter a unique name for the group, click OK, and enter an optional description for the group in the Description window.

- To change the name of an existing factor group, select it from the Groups pick list and type in or modify its name.

- To change the description of an existing factor group, select it from the Groups pick list and modify its description.

- To delete an existing group, select it from the Groups field/pick list, and click the Delete button. When a prompt appears asking if you are sure that you want to delete the group, click Yes. CAUTION: Prior to deleting any groups, you should check to see which sites have been assigned to that group. You will need to assign these sites to new groups, and then repeat WIM data processing for each of these sites.

- Sites are assigned to seasonal LS factor groups using the Maintain Site Information screen.

### 3.2.6 Creating Alternate Vehicle Classification Schemes

**Menu Option:** Setup – Alternate Vehicle Class Scheme

**Screen:** Define Alternate Vehicle Class Scheme

**Instructions:**

- Use the Define Alternate Vehicle Class Scheme screen to define schemes used to classify vehicles that are different from the standard FHWA 13-category classification scheme. If you have only a few vehicle classes (e.g., short, medium, and long), you will typically select one FHWA vehicle class that is representative of each of your vehicle classes. If you use many vehicle classes, you can also map more than one of your vehicle classes to an individual FHWA class. If you use only the FHWA scheme, it is not necessary to use this screen.

- To enter a new vehicle classification scheme:
  
  - Click add, enter a unique name for the scheme, click OK, and then enter an optional description for the scheme in the Description window.
Enter the identifiers of each of the vehicle classes in your scheme next to its corresponding FHWA class. Use the Ignore field to input identifiers of vehicle classes that should not be loaded by TrafLoad. Use a comma to separate multiple identifiers that correspond to the same FHWA class number. Make sure that the identifiers you use are those that have been used in your Vehicle Classification input file(s) and that you identify one of the FHWA classes for every one of your classes that you want processed by TrafLoad. (Data for classes that you do not enter on the screen will be ignored.)

- To change the name of an existing alternate vehicle classification scheme, select it from the Groups pick list and type in or modify its name.

- To modify an existing vehicle classification scheme, select it from the Scheme Identifiers field/pick list and edit the description or mappings of the scheme’s class identifiers to FHWA identifiers.

- To delete an existing vehicle classification scheme, select it from the Scheme Identifier field/pick list, and click the Delete button. When a prompt appears asking if you are sure that you want to delete the scheme, click Yes. CAUTION: If you delete a scheme that has been assigned to one or more sites, make sure that you modify the scheme selection for the site(s) prior to loading any new data for them.

### 3.2.7 Creating Vehicle Class Groups

**Menu Option:** Setup – Vehicle Class Groups

**Screen:** Define Vehicle Class Groups

**Instructions:**

- Use the Define Vehicle Class Groups screen to define up to 10 groupings of the standard FHWA vehicle classes to be used in application of seasonal and temporal factors. You must separately define vehicle class groups for vehicle classification data processing. However, the procedures for both are identical.

- To define vehicle class groups:
  - Use the tabs to choose “VC data” to define groups for vehicle classification data processing or “WIM data” to define groups for WIM data processing.

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2 The actual restriction in the current version of TrafLoad is that all classes must be mapped into classes that are numbered from 4 to 13. These are normally assumed to represent FHWA Classes 4 to 13; this is not a requirement, and there are circumstances in which alternative interpretations of these numbers can be useful. Thus, if you distinguish two kinds of FHWA Class 13 vehicle (say you call them Classes 13 and 14), you can retain this distinction by eliminating some other FHWA distinction (say between Classes 11 and 12). To accomplish this, use the Define Alternative Vehicle Class Scheme screen to map your Classes 11 and 12 into TrafLoad Class 11 and to map your Classes 13 and 14 into TrafLoad Classes 12 and 13. If you do this for a site, be sure to provide the 2002 Guide pavement design software both traffic and load spectra data for the site; otherwise the pavement design software will use its own defaults, which correspond to conventional FHWA classes.
Enter comma-separated lists of the FHWA vehicle classes to be included in each vehicle class group. You must enter all FHWA truck and bus Classes (4 - 13). Space for 10 groups is provided, but you do not need to define 10 groups – for example, you could define only two groups with FHWA Classes 5 - 7 in one group, and Classes 4 and 8 - 13 in the other. In this example you would leave the spaces next to Groups 3 - 10 blank. See Part 2, Pages 2-17 and 2-33 for a further discussion of vehicle class groups.

Click Close. If you have not included FHWA Classes 4 - 13, you will be prompted to do so before the information can be saved.

- Make sure that you have defined groupings for both WIM and VC.
- To modify an existing set of groups, select the WIM or Vehicle class data tab and make changes to the data. **CAUTION**: If you change group definitions after processing data, you will need to reprocess all of the data in order to recalculate the seasonal and temporal factors for the revised groups.

### 3.2.8 Creating Truck Weight Road Groups

**Menu Option:** Setup – Truck Weight Road Groups

**Screen:** Define Truck Weight Road Groups

**Instructions:**

- Use the **Define Truck Weight Road Groups** screen to set up categories of WIM locations with similar axle loadings for each axle type.

- To enter a new Truck Weight Road Group, click **Add**, enter a unique name for the group, and enter an optional description for the group in the **Description** window. You will also need to enter a relative weight that will be used in obtaining a statewide average set of load spectra. (The statewide averages are obtained as weighted averages of the load spectra for individual Truck Weight Road Groups. The weights that are entered, one for each TWRG, are dimensionless and will be normalized so that they sum to 1.0; hence, the weights that you enter need not be between 0 and 1.)

- To change the name of an existing Truck Weight Road Group, select it from the **Groups** pick list and type in or modify its name.

- To change the description of an existing Truck Weight Road Group, select it from the **Groups** pick list and modify its description.

- To delete an existing group, select it from the **Groups** field/pick list and click the delete button. When a prompt appears asking if you are sure that you want to delete the group, click **Yes**. **CAUTION**: Prior to deleting any Truck Weight Road Groups, you should check to see which sites have been assigned to that group. You will need to assign these
sites to a new group, and then repeat WIM data processing for these Truck Weight Road Groups.

- Sites are assigned to Truck Weight Road Groups using the Maintain Site Information screen.
### 3.3 Loading Data into TrafLoad

#### 3.3.1 Loading FHWA Vehicle Classification Files

**Menu Option:** File – Open FHWA Vehicle Classification Files

**Screen:** Submit Vehicle Classification Files

**Instructions:**

- Make sure that you have set up a site using the **Setup – Site Information** menu option prior to loading any data for that site, and that you have prepared one or more files in either standard FHWA “C record” format or “4 card” format. Note that TrafLoad does not perform validation checking on data (including checks for bad record flags), so these checks must be done prior to loading data and all bad records should be removed.

- Use the standard Windows Explorer options on the left-hand pane of the screen to select a directory where your input file(s) are located.

- Highlight one or more files in the middle pane of the screen (click on the first file, and then use **Shift-Click**, **Ctrl-Click**, or **Select all**).

- Use the right arrow button on the screen to select the highlighted files.

- To retrieve more files from a different directory, repeat the previous three steps.

- Review the list of files that you have prepared. To load all of the files on the list, click **Import** (or **Validate**, explained next). To work on only a subset of the files in the right pane, click and select those files (Ctrl-Click for multiple), and then click **Import**. TrafLoad will read each file and store the data required for later processing, removing the highlight from the file after it has been processed. If the site identifier used in the **Maintain Site Information** screen does not match any site ID in the data file, you will be given the option to create a new site, to skip the file, or to cancel the loading request.

- To validate the data before loading, click **Validate** to operate on the selected files in the right pane (or on all files if none are selected). This will perform some checking of the input files for valid site IDs and lane and direction values, but it will not save that data to the TrafLoad database. During validation, you can create sites if prompted and/or **Skip** any files for which errors are reported. Skipping files causes their removal from the right pane. Thus, after this validation step, clicking **Import** will result in the system being able to import all files without any user intervention necessitated by exceptions in this data.

- Click on the **Clear** button to remove all of the files from the list so that you can start over.

- Click the **Close** button to exit the screen without loading any new files.
3.3.2 Loading FHWA Weight Files

Menu Option: File – Open FHWA Weight Files

Screen: Submit Vehicle Weight Files

Instructions:

- Make sure that you have set up a site using the Setup – Site Information menu option prior to loading any data for that site, and that you have prepared one or more files in either standard FHWA “W record” format or “7 card” format. Note that TrafLoad does not perform validation checking on data (including checks for bad record flags), so these checks must be done prior to loading data and all bad records should be removed.

- Use the standard Windows Explorer options on the left-hand pane of the screen to select a directory where your input file(s) are located.

- Highlight one or more files in the middle pane of the screen (click on the first file, and then use Shift-Click, Ctrl-Click, or Select all).

- Use the right arrow button on the screen to select the highlighted files.

- To retrieve more files from a different directory, repeat the previous three steps.

- Review the list of files that you have prepared. To load all of the files on the list, click Import (or Validate, explained next). To work on only a subset of the files in the right pane, click and select those files (Ctrl-Click for multiple), and then click Import. TrafLoad will read each file and store the data required for later processing, removing the highlight from the file after it has been processed. If the site identifier used in the Maintain Site Information screen does not match any site ID in the data file, you will be given the option to create a new site, to skip the file, or to cancel the loading request.

- To validate the data before loading, click Validate to operate on the selected files in the right pane (or on all files if none are selected). This will perform some checking of the input files for valid site IDs and lane and direction values, but it will not save that data to the TrafLoad database. During validation, you can create sites if prompted and/or Skip any files for which errors are reported. Skipping files causes their removal from the right pane. Thus, after this validation step, clicking Import will result in the system being able to import all files without any user intervention necessitated by exceptions in this data.

- Click on the Clear button to remove all of the files from the list so that you can start over.

- Click the Close button to exit the screen without loading any new files.
3.4 Processing Data

3.4.1 Processing Vehicle Classification Data

Menu Option: Processes – Calculate Vehicle Classification Statistics

Screen: Process Vehicle Classification Data

Instructions:

- Enter a name for the TrafLoad processing run, and your name or initials. These items are used for internal management of data processing tasks.

- Select one or more sites for processing. If you would like to produce an output file for a site, you must select only one site in this list.

- To produce an output file:
  - Click a check into the Write output file to option, and enter a name for the output file.
  - The contents of the Design site name field will appear in the header information of your output file to identify the location of your pavement design site. This is set to the site name that you have selected for the output, but you can change it if you wish.
  - The Design direction pick list will contain the directions for lanes included in the input data for the site, assuming that the data were successfully summarized. Select which direction to include in the output file.
  - Once you have selected a design direction, the design lane pick list will include all of the lanes of data available for that direction. You can select a specific design lane, or select 0 to produce an output file that aggregates information for all lanes in the selected direction. In the latter event, the 2002 Software will estimate the share of total truck and bus traffic that will operate in the design lane. If there is only one lane in the selected direction, it doesn’t matter whether you pick 0 or the lane number.

- Click Process to calculate vehicle statistics (and, optionally, produce an output file), or Close to exit the screen without performing any calculations. After processing is complete, a prompt will appear asking if you want to delete intermediate results. Respond “Yes” to this prompt. The output file will be created in the OUTPUT folder.

---

3 The option to save intermediary results has been included for users wishing to trace through the details of the calculations.
3.4.2 Processing WIM Data

**Menu Option:** Processes – Perform Load Spectra Calculations

**Screen:** Process Load Spectra Data

**Instructions:**

- Enter a name for the TrafLoad processing run, and your name or initials. These items are used for internal management of data processing tasks.

- Select one of the three processing grouping options: Single site, TWRG, or statewide.

- To produce an output file for a single site:
  - Select the site from the list of available sites. This list contains sites for which weight data has been loaded.
  - The **Design direction** pick list will contain the directions for lanes included in the input data for the site. Select which direction to use in the output file. Data for the lane that was designated as the design lane for this direction will be used in your output.
  - The contents of the **Design site name** field will appear in the header information of your output file to identify the location of your pavement design site. This is set to the site name that you have selected for the output, but you can change it if you wish.

- To produce an output file for a truck weight road group, select the truck weight road group from the pick list.

- For all three options:
  - Enter a name for the output files. TrafLoad will produce five output files (one containing load spectra for each of four axle classes, and one with the number of axle groups per vehicle). The file names used by TrafLoad will distinguish the contents of the files (“SingleAxle,” etc.) and will append your name to the TrafLoad name.
  - Select a pavement type (rigid or flexible).
  - Click **Process** to calculate load spectra and/or produce an output file, or **Close** to exit the screen without performing any calculations. Load spectra processing is slow, and there is a point in the processing sequence at which the **Progress** bar may not move for several minutes. The output files will be created in the OUTPUT folder.
3.4.3 Forecasting Truck Volume Growth

Menu Option: Processes – Forecast Truck Volumes

Screen: Forecast Truck Volumes

Instructions:

- Make sure that you have already successfully processed Vehicle Classification data for a site prior to forecasting traffic growth.
- Enter a name for the TrafLoad processing run, and your name or initials. These items are used for internal management of data processing tasks.
- Select a site for processing.
- Enter a name for the output file to be produced.
- The contents of the Design site field will appear in the header information of your output file to identify the location of your pavement design site. This is set to the site name that you have selected for the output, but you can change it if you wish.
- For Level 1 or 2 sites, select Design direction and lane(s) from the pick lists – these should match the direction and lane(s) that you used for your Vehicle Classification output file. For Level 3A sites, select a Design direction. (For Level 3B sites, no selection is required.)
- Select the Type of growth method to be used for forecasting – either linear or exponential.
- Select one of the three available methods for forecasting – these determine what input data you will need to provide.
- Enter required input data – separate inputs are required for single-unit and combination trucks:
  - If you selected the first option (Growth Rate), enter the expected annual increase (linear) or the expected percent increase (exponential) in the number of trucks.
  - If you selected the second option (Base and Forecast Year, increase), enter the base year, the forecast year, and the expected increase in the number of trucks (linear), or the overall percent increase in trucks (exponential) between these two years.
  - If you selected the third option (AADT for both a base and forecast year), enter the base year, the forecast year, the AADT for the base year, and the AADT for the forecast year. For this option, the base-year AADT that was calculated in the Vehicle Classification data processing procedure will be automatically filled in. You can choose to keep this figure or overwrite it with your own estimate.
- Click **Process** to perform the AADT forecast and produce an output file, which will be created in the OUTPUT folder.

- Click **Close** to exit the screen.
3.5 Reviewing TrafLoad Data

3.5.1 Viewing Source Load Spectra for a WIM Site

Menu Option: View – Site Source Load Spectra

Screen: Site Load Spectra Summary

Instructions:

- Use this screen to view load spectra information that was loaded for a particular WIM site.
- Select the WIM site of interest from the Site pick list.
- Select a Direction/Lane combination from the pick list. This pick list will contain all of the lanes of data that were loaded from the input file.
- Select an FHWA vehicle class (4 - 13) from the Vehicle Class pick list.
- Select a year/month/day of week from the pick list.
- The screen will show the load spectra for the selected site, direction/lane, vehicle class, and day. In addition, it shows the total number of vehicles for that day, and the Rigid and Flexible ESALs.
- To copy data from the display to a spreadsheet, select the cells to be copied, and click the Copy Selection button. The data can now be pasted into your spreadsheet file. If the entire sheet is selected, the row and column headings will also be copied.
- Click the Close button to close the screen.

3.5.2 Viewing Output Load Spectra for a WIM Site or TWRG

Menu Option: View – Site and TWRG Output Spectra

Screen: Site and Truck Weight Road Group Output Spectra

Instructions:

- After processing WIM data (see Section 3.4.2), use this screen to view the resulting load spectra by WIM vehicle class group produced for a selected month – at a selected WIM site or for a selected Truck Weight Road Group (TWRG).
- To view information for a site, select the Site radio button, and then select the site of interest from the Site pick list.
To view information for a Truck Weight Road Group, select the TWRG radio button and select the TWRG of interest from the pick list.

Select a pavement type (flexible or rigid) that you wish to view.

Select the WIM Vehicle class of interest.

Select a Design Direction/Lane combination from the pick list. This pick list will contain all of the lanes of data that were loaded from the input file.

Select a month from the pick list.

The screen will show the load spectra for the selected site, WIM vehicle class group, and month/day.

To copy data from the display to a spreadsheet, select the cells to be copied, and click the Copy Selection button. The data can now be pasted into your spreadsheet file. If the entire sheet is selected, the row and column headings will also be copied.

Click the Close button to close the screen.

3.5.3 Viewing Vehicle Class Statistics for a Classification Count Site

Menu Option: View – Site Vehicle Class Statistics

Screen: Vehicle Classification Summary

Instructions:

Use this screen to view one of the following four types of summary statistics calculated by TrafLoad for a selected site:

- Annual Average Daily Traffic (AADT) by vehicle class (4 - 13) for each lane/direction and for the roadway as a whole;
- Annual Average Day of Week (AADW) traffic by vehicle class for a selected lane/direction;
- Monthly Average Daily Traffic for each of the 12 months (MADT) by vehicle class; and
- Monthly Average Day of Week traffic (MADW) by vehicle class for a selected month, and a selected lane/direction.

To view AADT:

- Select the AADT radio button.
- Select the site from the pick list.
To view AADW:
- Select the AADW radio button.
- Select the site from the pick list.
- Select a direction/lane from the pick list.

To view MADT:
- Select the MADT radio button.
- Select the site from the pick list.
- Select a month from the pick list.

To view MADW:
- Select the MADW radio button.
- Select the site from the pick list.
- Select a direction/lane from the pick list.
- Select a month from the pick list.

To copy data from the display to a spreadsheet, select the cells to be copied and click the Copy Selection button. The data can now be pasted into your spreadsheet file. If the entire sheet is selected, the row and column headings will also be copied.

Click the Close button to close the screen.

### 3.5.4 Viewing Vehicle Class Averages and Factors

**Menu Option:** View – Vehicle Class Averages and Factors

**Screen:** Vehicle Classification Group Statistics

**Instructions:**
- Use this screen to view one of the following two types of summary statistics calculated by TrafLoad for a selected site:
  - Monthly traffic ratios (the ratio of MADT to AADT) for each of the vehicle class groups for a selected seasonal factor group; and
  - Day-of-week traffic ratio (the ratio of the AADW to AADT) for each of the vehicle class groups for a selected day-of-week factor group.
- Select either Monthly traffic ratios or Day-of-Week traffic ratios.
- To copy data from the display to a spreadsheet, select the cells to be copied and click the **Copy Selection** button. The data can now be pasted into your spreadsheet file. If the entire sheet is selected, the row and column headings will also be copied.

- Click the **Close** button to close the screen.
Glossary

This Glossary contains definitions of abbreviations used in this User’s Manual and identifies the section or step (in Chapter 2) in which the specialized abbreviations are defined.

AADT  Annual average daily traffic (1.1).
AADTT Annual average daily truck traffic (1.1).
AADW  Annual average day of the week (Step L6).
AVC   Automatic vehicle classifier.
DDF   Directional distribution factors (A.1).
DOW   Day of week (Step S4).
FHWA  Federal Highway Administration.
HDF   Hourly distribution factors (A.1).
LS    Load spectra (1.1).
MADT  Monthly average daily traffic (Step L6).
MADW  Monthly average day of the week (Step L6).
MDF   Monthly distribution factors (A.1).
TOD   Time of day (Step S4).
TTC Group Truck traffic classification group (Step P6).
GLOSSARY

TWRG  Truck Weight Road Group (2.2).
WIM  Weigh in motion (1.3).

**Groups and Datasets Used by TrafLoad**

Alternate Vehicle Classification Scheme – Step S2.
DOW Factor Groups (for classification counts) – Step S4.
Seasonal Factor Groups (for classification counts) – Step S4.
Seasonal LS Dataset – Step L7.
Seasonal LS Factor Groups – Step S5.
Vehicle Classification Groups – Step S3.

**Levels of Classification Site**

1A  Site for which AVC data are available for periods of at least one week for at least 12 consecutive months.
1B  AVC site that is reasonably near a Level 1A site on the same road.
2A  Site for which an AVC count is available for a period of at least 48 hours.
2B  Site for which a manual classification count for a minimum of six weekday hours is available.
3A  Any other site for which volume counts are available and that is on the same road as a Level 1 or 2 site.
3B  Any other volume-count site.

**Levels of WIM Site**

1  Site for which site-specific WIM data are available.
2  Non-Level 1 WIM sites that have been assigned to a TWRG.
3  All other WIM sites.
Output File Documentation

This Appendix documents the format of the TrafLoad output files. These files are created in the OUTPUT folder. The following types of output files are provided:

- Table A.1 Vehicle Classification – Level 1, 2, or 3A;
- Table A.2 Vehicle Classification – Level 3B;
- Table A.3 Traffic Growth;
- Table A.4 Load Spectra; and
- Table A.5 Axle Groups Per Vehicle.
A.1 Vehicle Classification – Level 1, 2, or 3A

This output file has five sections, documented below. Items common to several sections include:

- SITE_ID – an internal identifier (the unique key in the TrafLoad SITE_DESCRIPTION table).
- SITE_NAME – the user-assigned site identifier.
- VC_ID – the vehicle classification group defined in the TrafLoad Define Vehicle Class Groups screen.
- DIRECTION – coded as defined in the original data input files; generally consistent with the FHWA Traffic Monitoring Guide (1-North, 2-Northeast, 3-East, 4-Southeast, 5-South, 6-Southwest, 7-West, 8-Northwest, 9-N/S or NE/SW combined, 0-E/W or SE/NW combined).
- LANE – coded as defined in the original data input files; generally consistent with the FHWA Traffic Monitoring Guide (1 – outside or rightmost lane, 2-9 – other lanes).

Section 1 – Header Block/Lanes Identification

This block contains comments, identifying the site and type of output file.

It also includes two data items: NLANES and LANE. If the AADT and HDF data reported in the output file are for a single lane, the NLANES item is given a value of 1, and the LANE item indicates the ID of the lane for which data are produced. If the data are aggregated for all lanes in a direction, the NLANES item is the total number of lanes represented, and the LANE item is given a value of “ALL.”

```
; SITE,60
; AADT LEVEL,1A, (1A)
; MODULE,CLASSIFICATION COUNTS
; NLANES - number of lanes represented in the output of AADT and HDF
; NLANES,1
; LANE,1
```

Section 2 – AADT Block

This block contains AADT for each vehicle class, for a selected lane/direction or aggregated data for all lanes in a selected direction.
It starts with a header row defining the data structure for the following set of comma-delimited records (rows). Each row of data begins with the key word “AADT.”

<table>
<thead>
<tr>
<th>; AADT,site_id,site_name,vc_id,direction,aadt</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADT,60,&quot;P11&quot;,&quot;4&quot;,&quot;1&quot;,&quot;2.6&quot;</td>
</tr>
<tr>
<td>AADT,60,&quot;P11&quot;,&quot;5&quot;,&quot;1&quot;,&quot;155.9&quot;</td>
</tr>
<tr>
<td>AADT,60,&quot;P11&quot;,&quot;6&quot;,&quot;1&quot;,&quot;15.9&quot;</td>
</tr>
<tr>
<td>AADT,60,&quot;P11&quot;,&quot;7&quot;,&quot;1&quot;,&quot;1.0&quot;</td>
</tr>
<tr>
<td>AADT,60,&quot;P11&quot;,&quot;8&quot;,&quot;1&quot;,&quot;16.8&quot;</td>
</tr>
</tbody>
</table>

**Section 3 – MDF Block**

This block contains Monthly Distribution Factors (MDFs) for each vehicle class group (up to 10), and month (1-12).

It starts with a header row defining the data structure for the following set of comma-delimited records (rows). Each row of data begins with the keyword “MDF.”

<table>
<thead>
<tr>
<th>; MDF,site_id,site_name,vc_id,month(1-12),mdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;1&quot;,&quot;0.075612&quot;</td>
</tr>
<tr>
<td>MDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;2&quot;,&quot;0.082991&quot;</td>
</tr>
<tr>
<td>MDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;3&quot;,&quot;0.083950&quot;</td>
</tr>
<tr>
<td>MDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;4&quot;,&quot;0.083326&quot;</td>
</tr>
<tr>
<td>MDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;5&quot;,&quot;0.083197&quot;</td>
</tr>
</tbody>
</table>

**Section 4 – HDF Block**

This block contains Hourly Distribution Factors (HDFs) for each vehicle class and month (1-12).

It starts with a header row defining the data structure for the following set of comma-delimited records (rows). Each row of data begins with the keyword “HDF.”

HDFs are provided as follows:

<table>
<thead>
<tr>
<th>; HDF,site_id,site_name, direction, hour(1-24),hdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;1&quot;,&quot;0.008221&quot;</td>
</tr>
<tr>
<td>HDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;2&quot;,&quot;0.008177&quot;</td>
</tr>
<tr>
<td>HDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;3&quot;,&quot;0.006897&quot;</td>
</tr>
<tr>
<td>HDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;4&quot;,&quot;0.007442&quot;</td>
</tr>
<tr>
<td>HDF,60,&quot;P11&quot;,&quot;1&quot;,&quot;5&quot;,&quot;0.010028&quot;</td>
</tr>
</tbody>
</table>

This block may be omitted for Level 2B and 3A sites.
Section 5 – DDF Block

This block contains Directional Distribution Factors (DDFs) for each vehicle class group (up to 10). Since TrafLoad output for Levels 1 and 2 is always for a single direction, these factors are always set to 1.0. The block starts with a header row defining the data structure for the following set of comma-delimited records (rows). Each row of data begins with the keyword “DDF.”

<table>
<thead>
<tr>
<th>DDF,site_id,site_name,vc_id,direction,ddf</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDF,60,&quot;P11,&quot;4,1,1.0</td>
</tr>
<tr>
<td>DDF,60,&quot;P11,&quot;5,1,1.0</td>
</tr>
<tr>
<td>DDF,60,&quot;P11,&quot;6,1,1.0</td>
</tr>
<tr>
<td>DDF,60,&quot;P11,&quot;7,1,1.0</td>
</tr>
<tr>
<td>DDF,60,&quot;P11,&quot;8,1,1.0</td>
</tr>
</tbody>
</table>

This block is omitted for Level 3A sites.
A.2 Vehicle Classification – Level 3B

The output file for Level 3B Vehicle Classification sites simply passes through the truck traffic classification (TTC) group and the AADTT entered by the user on the Site Maintenance screen. These items are provided on two different lines.

Items in the file are:

- SITE_ID – an internal identifier (the unique key in the TrafLoad SITE_DESCRIPTION table).
- SITE_NAME – the user-assigned site identifier.
- TTC_GROUP – the TTC group number.
- AADTT – annual average daily truck traffic.

```plaintext
; SITE,61
; AADTT LEVEL,3B,(3B)
; MODULE,CLASSIFICATION COUNTS
; TTC,site_id,site_name,ttc_group
; AADTT,site_id,site_name, aadtt
TTC,61,"site3b","7
AADTT,61,"site3b","300.0
```
A.3 Traffic Growth

This output file has two sections, documented below. Items include:

- **SITE_ID** – an internal identifier (the unique key in the TrafLoad SITE_DESCRIPTION table).
- **SITE_NAME** – the user-assigned site identifier.
- **VC_ID** – the vehicle classification group defined in the TrafLoad Define Vehicle Class Groups screen.
- **DIRECTION** – coded as defined in the original data input files; generally consistent with the FHWA Traffic Monitoring Guide (1-North, 2-Northeast, 3-East, 4-Southeast, 5-South, 6-Southwest, 7-West, 8-Northwest, 9-N/S or NE/SW combined, 0-E/W or SE/NW combined).
- **LANE** – coded as defined in the original data input files; generally consistent with the FHWA Traffic Monitoring Guide (1-outside or rightmost lane, 2-9 – other lanes).
- **MODEL_TYPE_NUMBER** – 1 for linear forecasts; 2 for exponential.
- **MODEL_TYPE_ABBR** – L for linear forecasts; E for exponential.
- **INPUT_TYPE** – method used to specify model inputs (1, 2, or 3) – see the Information Provided section of the Forecast Truck Volumes screen.
- **RATE_PARAMETER** – the annual increment in traffic for linear forecasts or the annual percentage growth rate for exponential forecasts.

**Section 1 – Header Block/Lanes Identification**

This block contains comments identifying the site and type of output file. It also includes two data items: NLANES and LANE. If the AADT forecast data reported in the output file are for a single lane, the NLANES item is given a value of 1, and the LANE item indicates the ID of the lane for which data are produced. If the data are aggregated for all lanes in a direction, the NLANES item is the total number of lanes represented, and the LANE item is given a value of “ALL.”
Section 2 – AADT Forecast Block

This block contains AADT growth forecasts for two vehicle class groupings (singles and combinations) for a selected lane/direction or aggregated data for all lanes in a selected direction. The type of forecasting approach is described in the file. If the linear method was used, growth is expressed in terms of the annual increment in the number of vehicles. If the exponential method was used, an annual percentage growth rate is provided.

The block starts with a header row defining the data structure for the following set of comma-delimited records (rows). Each row of data begins with the key word “AADTFORECAST.”

```
; AADTFORECAST,site_id,site_name,vc_id,direction,model_type_number,(model_type_abbr),input_type,rate_parameter
; When model type is 2 (Exponential) rate parameter is P, annual percentage growth
; When model type is 1 (Linear) rate parameter is b, annual ADT increment
AADTFORECAST,60,"P11","4",1,1,(L),3,0.220933
AADTFORECAST,60,"P11","5",1,1,(L),3,13.336388
AADTFORECAST,60,"P11","6",1,1,(L),3,1.361230
AADTFORECAST,60,"P11","7",1,1,(L),3,0.081450
AADTFORECAST,60,"P11","8",1,1,(L),3,2.117753
```
A.4 Load Spectra

Four separate output files are produced with Load Spectra – one for each axle type:

- 1 – Single;
- 2 – Tandem;
- 3 – Tridem; and
- 4 – Quad.

Each file has an identical format – a header line listing the data structure, and then a set of rows with load spectra for each month and vehicle class.

Items include:

- AnalysisSite – the user-assigned name of the pavement design site for which WIM data are being used.
- ID – an internal identifier (the unique key in the TrafLoad SITE_DESCRIPTION table).
- Season – name of the month.
- VehicleClass – the FHWA vehicle classification.
- LoadGroup1 – The number of axles in the first load range.
- ... 
- LoadGroup N – The number of axles in the Nth load range (N is 39 for single and tandem axles, and is 31 for tridem and quad axles).

```plaintext
; ; MODULE, WIM ; SITE SPECIFIC OUTPUT ; AXLE GROUP, TandemAxle ;
site_id,site_description,season,vc_id,pavement_type,load_group_1,load_group_2,load_group_3,load_group_4,load_group_5,load_group_6,load_group_7,load_group_8,load_group_9,load_group_10,load_group_11,load_group_12,load_group_13,load_group_14,load_group_15,load_group_16,load_group_17,load_group_18,load_group_19,load_group_20,load_group_21,load_group_22,load_group_23,load_group_24,load_group_25,load_group_26,load_group_27,load_group_28,load_group_29,load_group_30,load_group_31,load_group_32,load_group_33,load_group_34,load_group_35,load_group_36,load_group_37,load_group_38,load_group_39
58,11,"January",4,F,0.0802,0.0000,0.0370,0.0617,0.0370,0.0556,0.0556,0.0617,0.0185,0.0370,0.0432,0.0494,0.0864,0.0432,0.0741,0.0617,0.0370,0.0123,0.0185,0.0185,0.0185,0.0185,0.0741,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000
58,11,"February",4,F,0.0802,0.0000,0.0370,0.0617,0.0370,0.0556,0.0556,0.0617,0.0185,0.0370,0.0432,0.0494,0.0864,0.0432,0.0741,0.0617,0.0370,0.0123,0.0185,0.0185,0.0185,0.0185,0.0741,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000,0.0000
```
### A.5 Axle Groups Per Vehicle

This output file contains the expected number of single, tandem, tridem, and quad axle groups per vehicle for each of the 10 truck and bus classes:

```plaintext
; MODULE, WIM
; LOAD GROUP AGPV OUTPUT
; id, description, vc_id, single_ratio, tandem_ratio, tridem_ratio, quad_ratio
58,"4",1.20,0.80,0.00,0.00
58,"5",2.00,0.00,0.00,0.00
58,"6",1.00,1.00,0.00,0.00
58,"7",2.00,1.00,0.00,0.00
58,"8",2.57,0.59,0.00,0.00
58,"9",1.18,1.91,0.00,0.00
58,"10",1.00,1.00,1.00,0.00
58,"11",5.00,0.00,0.00,0.00
58,"12",4.00,1.00,0.00,0.00
58,"13",1.28,2.77,0.18,0.13
```
TrafLoad Database Documentation

This Appendix documents each table in the TrafLoad Database.
## B.1 Summary of TrafLoad Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>alt_vc_scheme</td>
<td>Stores alternate vehicle classification scheme name/description</td>
</tr>
<tr>
<td>alt_vc_scheme_def</td>
<td>Stores comma-separated lists of user site vehicle classes corresponding to each FHWA class for each ALT_VC_SCHEME record</td>
</tr>
<tr>
<td>grp_dow_factor</td>
<td>Stores Day-of-Week factor group names/descriptions</td>
</tr>
<tr>
<td>grp_seals</td>
<td>Stores seasonal LS factor group names/descriptions</td>
</tr>
<tr>
<td>grp_seasonal</td>
<td>Stores seasonal VC factor group names/descriptions</td>
</tr>
<tr>
<td>grp_tod_factor</td>
<td>Stores Time-of-Day factor group names/descriptions</td>
</tr>
<tr>
<td>grp_ttc</td>
<td>Stores Truck Traffic Classification groups</td>
</tr>
<tr>
<td>grp_twrg</td>
<td>Stores truck weight road group names/descriptions</td>
</tr>
<tr>
<td>hourly_dist_factors_2SM</td>
<td>Stores hourly distribution factors to be used for Level 2B sites (from Table 3.2 in Part 2)</td>
</tr>
<tr>
<td>ls_avg</td>
<td>Stores WIM input data, with one record per lane/direction, vehicle class, and day. Includes – vehicles weighed and calculated ESALs for rigid and flexible pavement. Includes link to ls_count table</td>
</tr>
<tr>
<td>ls_count</td>
<td>Contains a record for each WIM input data file, indicating the begin date for the data</td>
</tr>
<tr>
<td>ls_detail</td>
<td>Stores detailed axle load spectra information for each record in the ls_avg table. Includes link to ls_avg table</td>
</tr>
<tr>
<td>paramtrs</td>
<td>System parameters table – stores systemwide constants</td>
</tr>
<tr>
<td>segment_description</td>
<td>List of segments (which are groups of sites) – linked to tasks in the task table, with description of their associated run</td>
</tr>
<tr>
<td>segment_layout</td>
<td>List of sites to be processed for a given run – may be multiple records for each record in the segment_description table</td>
</tr>
<tr>
<td>site_2SM_input_data</td>
<td>Stores aggregated daily input data from manual classification counts</td>
</tr>
<tr>
<td>site_description</td>
<td>Master list of all traffic data sites; populated via the Maintain Site Information screen</td>
</tr>
<tr>
<td>site_input_data</td>
<td>Stores vehicle classification input data</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>site_input_hours</td>
<td>Stores which hours of data are included in the site_input_data table</td>
</tr>
<tr>
<td>site_types</td>
<td>List of valid codes for site types – used to determine type of processing</td>
</tr>
<tr>
<td>site_vc_availability</td>
<td>Dates and hours for vehicle classification data</td>
</tr>
<tr>
<td>task</td>
<td>Used for management of requests for processing and output – provides communication mechanism between the UI and the processing routines</td>
</tr>
<tr>
<td>task_2sm_calc_method</td>
<td>Stores user choice of whether standard hourly distribution factors are to be reported for manual count sites</td>
</tr>
<tr>
<td>task_aadt</td>
<td>Stores intermediate results of traffic growth forecast requests</td>
</tr>
<tr>
<td>task_aadt_lane_direct</td>
<td>Stores intermediate results of traffic growth forecast requests</td>
</tr>
<tr>
<td>task_current_ls_datasets</td>
<td>Contains the desired sites and data dates for WIM sites that are marked as current. Loaded at the beginning of LS processing</td>
</tr>
<tr>
<td>task_dar</td>
<td>Contains Day-of-Week adjustment ratios calculated as an intermediate step in LS Processing</td>
</tr>
<tr>
<td>task_dar_addtnl</td>
<td>Contains DOW adjustment ratios for LS datasets not in the task_seasonal_ls_datasets table but that are still needed in LS processing</td>
</tr>
<tr>
<td>task_err</td>
<td>Stores errors generated in processing</td>
</tr>
<tr>
<td>task_hourly_fractions_hdf</td>
<td>Stores intermediate results of vehicle classification data processing</td>
</tr>
<tr>
<td>task_log</td>
<td>Log generated during processing – written to log file on completion of task</td>
</tr>
<tr>
<td>task_madw</td>
<td>Stores intermediate results of vehicle classification data processing</td>
</tr>
<tr>
<td>task_mai</td>
<td>Contains Monthly Adjustment Indices calculated as an intermediate step in LS Processing</td>
</tr>
<tr>
<td>task_mai_addtnl</td>
<td>Contains Monthly Adjustment Indices for LS datasets not in the task_seasonal_ls_datasets table but that are still needed in LS processing</td>
</tr>
<tr>
<td>task_seasonal_ls_datasets</td>
<td>Contains the desired sites and data dates for WIM sites that are marked as current and Seasonal. Loaded at the beginning of LS processing</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>task_seasonal_ls_group</td>
<td>Contains the relationship(s) between seasonal and current LS datasets</td>
</tr>
<tr>
<td>task_seasonal_ls_group_addtnl</td>
<td>Identifies other Seasonal LS Datasets that may not be selected for processing, but for which data are available and are identified as related to datasets that are selected for processing based on seasonal LS Group definitions</td>
</tr>
<tr>
<td>task_site_adt_forecast_input</td>
<td>Used for processing of traffic growth forecast requests</td>
</tr>
<tr>
<td>tod_groups_to_sites</td>
<td>Stores which sites are included in each time-of-day factor group (temporary table used for analysis)</td>
</tr>
<tr>
<td>tod_groups_to_vc_groups</td>
<td>Stores which time-of-day factor groups include data for each vehicle class group</td>
</tr>
<tr>
<td>Traf_Load_Dummy</td>
<td>Internal system table</td>
</tr>
<tr>
<td>trfl_adt_growth_rate</td>
<td>Stores results of traffic growth forecasts for each site</td>
</tr>
<tr>
<td>trfl_group_dtr</td>
<td>Stores day-of-week traffic ratios for vehicle class groups</td>
</tr>
<tr>
<td>trfl_group_hdf</td>
<td>Stores hourly fractions for vehicle class groups</td>
</tr>
<tr>
<td>trfl_group_mtr</td>
<td>Stores monthly traffic ratios for vehicle class groups</td>
</tr>
<tr>
<td>trfl_site_aadt</td>
<td>Stores AADT by vehicle class for each site by lane and direction</td>
</tr>
<tr>
<td>trfl_site_aadt_no ld</td>
<td>Stores total AADT by vehicle class for each site</td>
</tr>
<tr>
<td>trfl_site_aadw</td>
<td>Stores AADW by vehicle class for each site by lane and direction</td>
</tr>
<tr>
<td>trfl_site_ddf</td>
<td>Stores directional distribution factors by site, direction, and lane</td>
</tr>
<tr>
<td>trfl_site_dtr</td>
<td>Stores day-of-week traffic ratios by site and vehicle class group</td>
</tr>
<tr>
<td>trfl_site_hdf</td>
<td>Stores hourly fractions by site and vehicle class group</td>
</tr>
<tr>
<td>trfl_site_hdf_output</td>
<td>Stores hourly distribution factors by site</td>
</tr>
<tr>
<td>trfl_site_lane_dir_hdf</td>
<td>Stores hourly distribution factors by site, lane, and direction (used for output)</td>
</tr>
<tr>
<td>trfl_site_madt</td>
<td>Stores monthly average daily traffic by vehicle class by site (used for output)</td>
</tr>
<tr>
<td>trfl_site_madw</td>
<td>Stores monthly average day of the week volume by vehicle class by site</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><code>trfl_site_mdf</code></td>
<td>Stores monthly distribution factors by site and vehicle class group</td>
</tr>
<tr>
<td><code>trfl_site_mdwtr</code></td>
<td>Stores monthly/day-of-week traffic ratios by site, direction, and vehicle class group</td>
</tr>
<tr>
<td><code>trfl_site_mtr</code></td>
<td>Stores monthly traffic ratios for vehicle class groups by site</td>
</tr>
<tr>
<td><code>trfl_site_vcgpr_hdf</code></td>
<td>Stores hourly fractions by vehicle class group by site, lane, and direction</td>
</tr>
<tr>
<td><code>trfl_wim_dow_adj_factors</code></td>
<td>Day-of-week adjustment factors used for WIM processing</td>
</tr>
<tr>
<td><code>trfl_wim_final_agpv_ls_distribution</code></td>
<td>Stores axle groups per vehicle by site, axle group, and vehicle class</td>
</tr>
<tr>
<td><code>trfl_wim_final_current_ls_distribution</code></td>
<td>WIM results table – for current LS data sets</td>
</tr>
<tr>
<td><code>trfl_wim_final_state_agpv_ls_distribution</code></td>
<td>Final statewide axle groups per vehicle results when statewide LS processing is done</td>
</tr>
<tr>
<td><code>trfl_wim_final_state_ls_distribution</code></td>
<td>WIM results table – for the State</td>
</tr>
<tr>
<td><code>trfl_wim_final_twrg_agpv_ls_distribution</code></td>
<td>Stores axle groups per vehicle by truck weight road group, axle group, and vehicle class</td>
</tr>
<tr>
<td><code>trfl_wim_final_twrg_ls_distribution</code></td>
<td>WIM results table – for each truck weight road group</td>
</tr>
<tr>
<td><code>trfl_wim_load_ranges</code></td>
<td>Stores upper and lower thresholds for each load range group</td>
</tr>
<tr>
<td><code>vehicle_class</code></td>
<td>Stores definition of vehicle class groups for classification and WIM, including correspondence between vehicle class group and FHWA classes</td>
</tr>
<tr>
<td><code>w_*</code></td>
<td>All tables with a w_ prefix are working tables containing the results of intermediate aggregations and computations. These tables are purged before and after each run</td>
</tr>
</tbody>
</table>