LONG-TERM PAVEMENT PERFORMANCE PAVEMENT LOADING USER GUIDE (LTPP PLUG) SOFTWARE MANUAL

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16. Abstract
This software manual supports the use of the LTPP PLUG software. The LTPP PLUG software helps users to select site-specific or default axle loading conditions from its traffic loading library and produces axle load distribution input files for use with the MEPDG or DARWin-ME software. In addition, the software can be used to store, view, and group multiple normalized axle load spectra (NALS) and to develop MEPDG inputs and defaults using agency-provided data.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

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LIST OF ABBREVIATIONS AND ACRONYMS

AADTT	Average Annual Daily Truck Traffic
AASHTO	American Association of State Highway and Transportation Officials
APC	Axle-per-Truck Coefficient
AVC	Automated Vehicle Classification
DOT	Department of Transportation
DOW	Day-of-the-Week
ESAL	Equivalent Single Axle Load
FHWA	Federal Highway Administration
GPS	General Pavement Studies
JPCP	Jointed Plain Concrete Pavement
LTPP	Long Term Pavement Performance
MEPDG	Mechanistic-Empirical Pavement Design Guide
MPO	Metropolitan Planning Organization
NALS	Normalized Axle Load Spectra
NCHRP	National Cooperative Highway Research Program
PLUG	Pavement Loading User Guide
QA	Quality Assurance
QC	Quality Control
RANALS	Representative Annual Normalized Axle Load Spectra
RPPIF	Relative Pavement Performance Impact Factor
SHRP	Strategic Highway Research Program
SPS	Specific Pavement Studies
TPF	Transportation Pooled-Fund (study)
TWRG	Truck Weight Road Group
WIM	Weigh-in-Motion

PURPOSE AND APPLICABILITY

This manual and accompanying software program were developed to aid users in estimating traffic loading inputs for MEPDG applications for sites with insufficient site-specific traffic loading data.

This application is beneficial for developing MEPDG Level 2 or 3 traffic loading inputs for LTPP sites that have site-specific vehicle classification and/or truck volume data but no axle load information (or if the accuracy of the loading information is questionable due to limited data availability or traffic monitoring equipment type). Traffic loading inputs are developed by selecting or computing NALS for each vehicle class and axle type based on available LTPP NALS defaults or site-specific NALS for SPS TPF WIM sites. Once default or surrogate NALS are established for a given LTPP site, the software develops NALS input file for use with the DARWin-ME software (*.alf or *.xml file).

The LTPP PLUG database and software also can be used to develop MEPDG Level 2 and 3 traffic loading inputs and NALS defaults using agency-specific NALS (site-specific and/or defaults) or a combination of agency-specific data and LTPP-based loading defaults. The software includes a data import function for this purpose. The LTPP PLUG data dictionary is provided in appendix B to facilitate the integration of agency-specific axle load distributions and vehicle classification data.

STARTING THE APPLICATION

This application is embedded in a Microsoft Access database file and can run on any computer on which Access is installed. No LTPP PLUG software installation is required.

Start the application by opening the LTPP PLUG database file, LTPP_PLUG.mdb. Based on the user's computer and Microsoft Access security settings, the user may need to ensure that macros/content is enabled in the application. This is accomplished by clicking on the "Options…" frame located on the security warning ribbon and selecting the "Enable this content" radio button.

Microsoft Access Reference Libraries

This application was developed using Microsoft Access 2007. If using this application with different versions of Access, references to some of the Microsoft libraries used in this application could be lost, and these libraries will be marked as "Missing." In these circumstances, the user should add and activate the necessary reference libraries. To accomplish this task, open the VBA code window by pressing Alt+F11 and choose "References" from the Tools menu. This will bring up the form showing all available reference libraries. The user needs to make sure that the three reference libraries shown with the checkmarks in Figure 1 are available and selected.

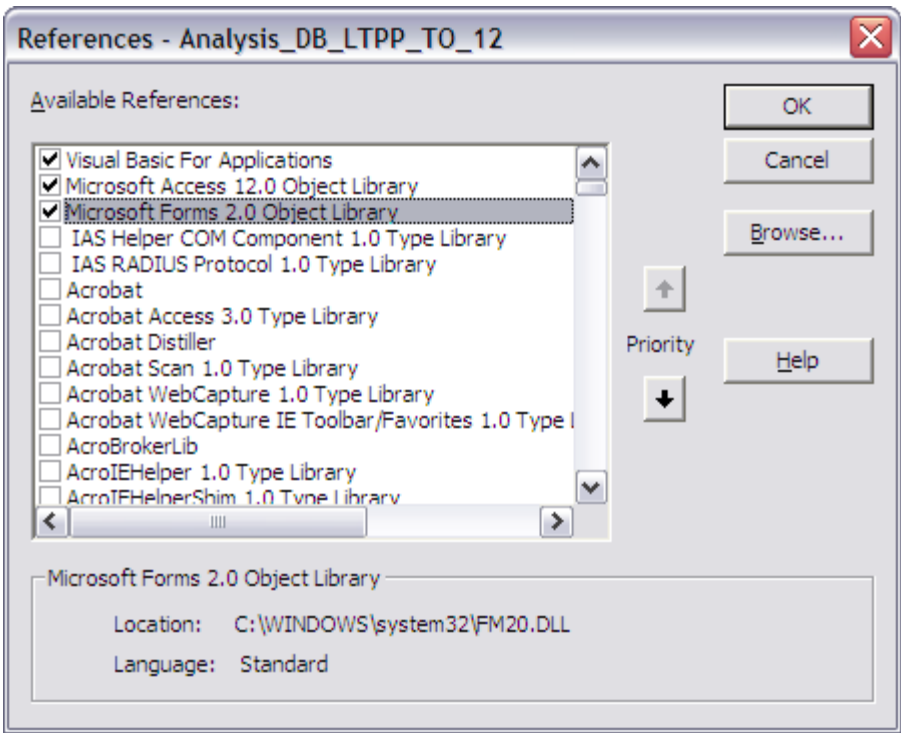

Figure 1. Selection of necessary library references.

FUNCTIONALITY DESCRIPTION

Select Actions from the Main Menu

When the LTPP PLUG database application is started, the user will see the main menu shown in Figure 2.

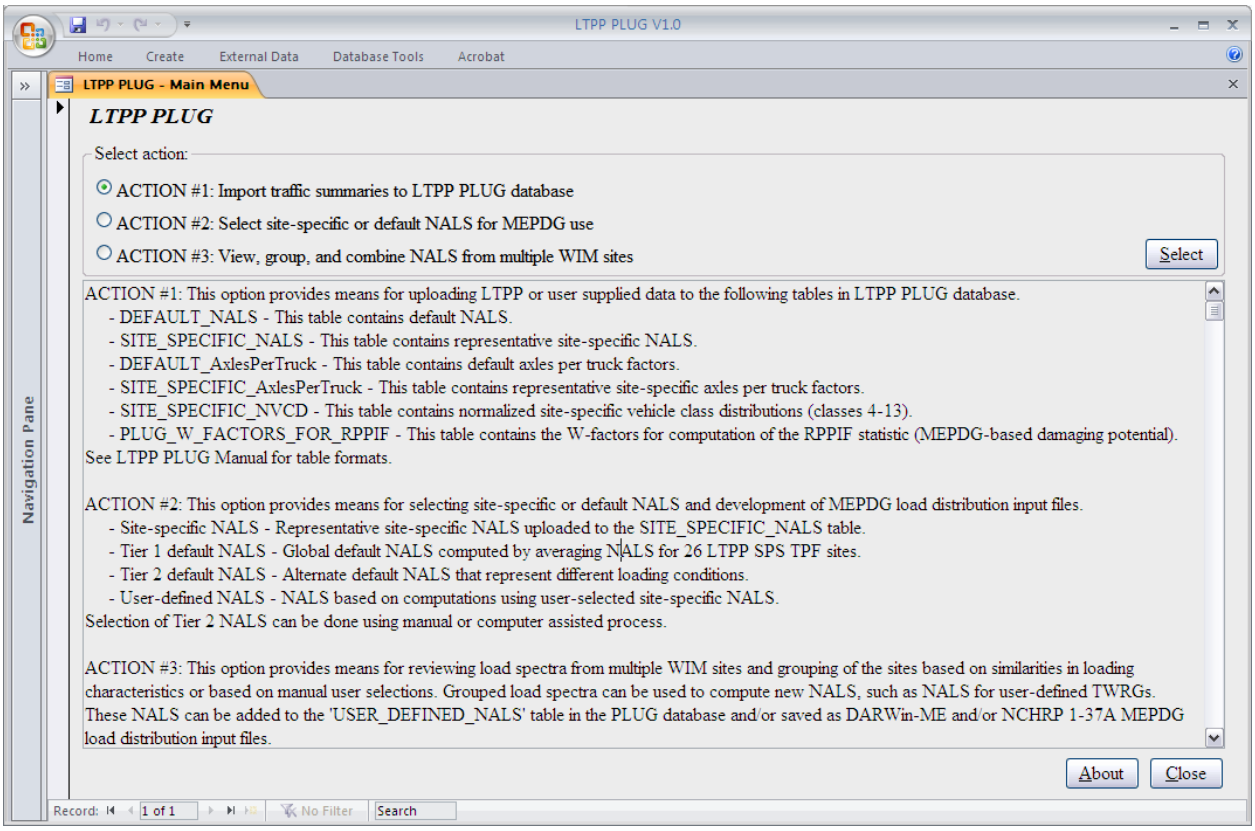

Figure 2. Main menu for selecting different actions.

This menu provides three action options:

- ACTION #1: Import traffic summaries to LTPP PLUG database.
- ACTION #2: Select site-specific or default NALS for MEPDG use.
- ACTION #3: View, group, and combine NALS from multiple WIM sites.

ACTION #1 provides means for uploading LTPP or user-supplied data to the following tables in the LTPP PLUG database:

- DEFAULT_NALS - This table contains default NALS.
- SITE_SPECIFIC_NALS - This table contains representative site-specific NALS.
- DEFAULT_AxlesPerTruck - This table contains default axles per truck factors.
- SITE_SPECIFIC_AxlesPerTruck - This table contains representative site-specific axles per truck factors.
- SITE_SPECIFIC_NVCD - This table contains normalized site-specific vehicle class distributions (classes 4-13).
- PLUG_W_FACTORS_FOR_RPPIF - This table contains the *W*-factors for computation of the RPPIF statistic (MEPDG-based damaging potential).

See appendix B manual for table formats.

ACTION #2 provides means for selecting site-specific or default NALS and development of MEPDG load distribution input files:

- Site-specific NALS - Representative site-specific NALS uploaded to the SITE_SPECIFIC_NALS table.
- Tier 1 default NALS - Global default NALS computed by averaging NALS for 26 LTPP SPS TPF sites.
- Tier 2 default NALS - Alternate default NALS that represent different loading conditions. Tier 2 NALS can be selected using manual or computer-assisted processes.
- User-defined NALS - NALS based on computations using user-selected, site-specific NALS.

ACTION #3 provides means for reviewing load spectra from multiple WIM sites and grouping of the sites based on similarities in loading characteristics or based on manual user selections. Grouped load spectra can be used to compute new NALS, such as NALS for user-defined truck weight road groups (TWRGs). These NALS can be added to the USER_DEFINED_NALS table in the PLUG database and/or saved as DARWin-ME and/or NCHRP 1-37A MEPDG load distribution input files.

To select ACTION #1, ACTION #2, or ACTION #3, click on the radio button next to the action label on the main menu and then click the “Select” button.

Import Traffic Summaries to LTPP PLUG Database

To import traffic summaries to the LTPP PLUG database, select ACTION #1 on the main menu and click on “Select” button (see Figure 2). This action will bring up a data import form, shown in Figure 3.

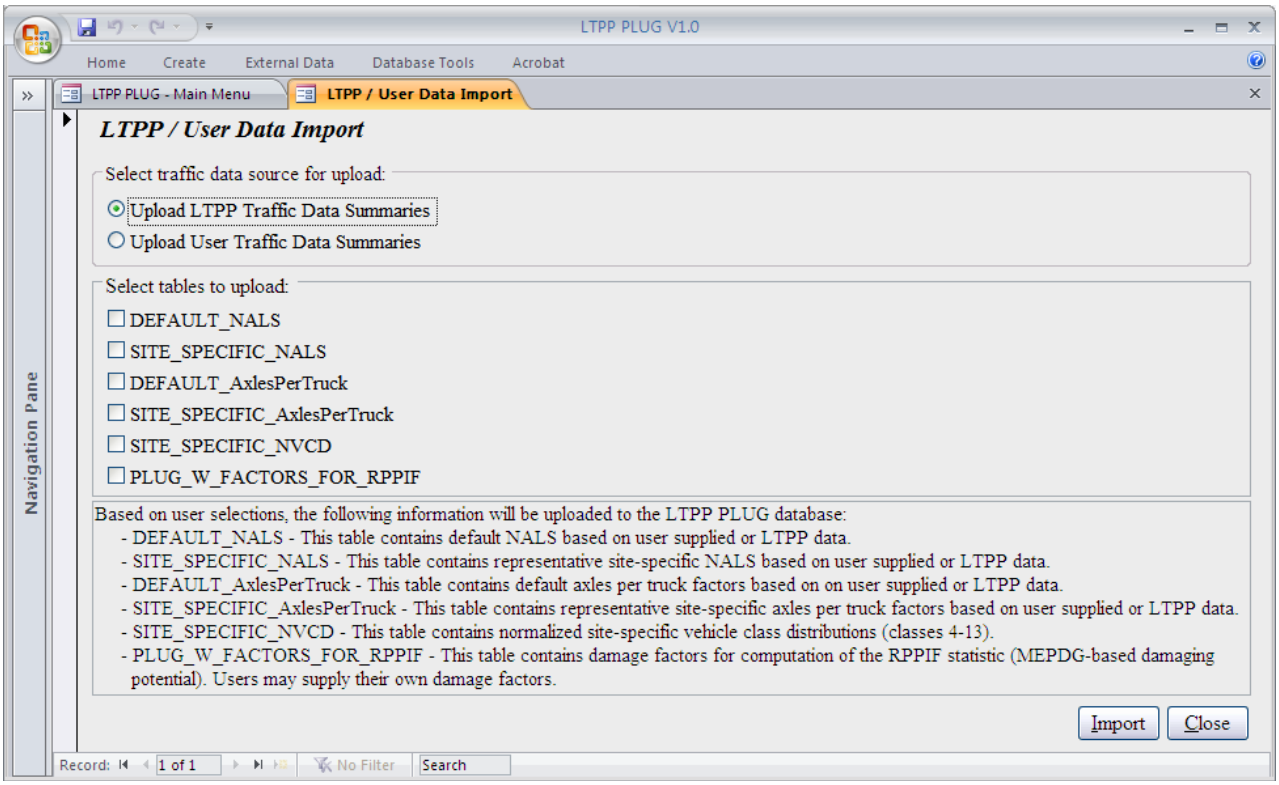

Figure 3. Data import form for importing traffic data summaries.

The current version of the PLUG database requires user-supplied data in the Microsoft Access database tables. The database table format is described in appendix B. A blank database with preset table formats is available for download along with the LTPP PLUG software application from the LTPP Customer Support Service Center (e-mail: LTPPinfo@dot.gov, telephone: (202) 493-3035, or fax: (202) 493-3161.).

To import data:

1. Use radio buttons on the top of the form to specify source of traffic data: LTPP or user-supplied data.
2. Use check boxes in the middle of the form to select what data summaries will be uploaded to the LTPP PLUG database:
   - DEFAULT_NALS - This table contains default NALS based on user-supplied or LTPP data.
   - DEFAULT_AxlesPerTruck - This table contains default axles per truck factors based on user-supplied or LTPP data.
   - SITE_SPECIFIC_NALS - This table contains representative site-specific NALS based on user-supplied or LTPP data.
   - SITE_SPECIFIC_AxlesPerTruck - This table contains representative site-specific axles per truck factors based on user-supplied or LTPP data.
   - SITE_SPECIFIC_NVCD - This table contains normalized site-specific vehicle class distributions (Classes 4 through 13) for sites with and without WIM data.

- PLUG_W_FACTORS_FOR_RPPIF - This table contains damage factors for computation of the RPPIF statistic (MEPDG-based damaging potential). Users may supply their own damage factors.

3. Click on the "Import" button at the bottom of the screen to import data.

To close the form, click on the "Close" button at the bottom of the screen.

Select NALS Source for MEPDG Use

To select the source of NALS for MEPDG use, select ACTION #2 on the main menu and click on the "Select" button (see Figure 2). This action will bring up the form shown in Figure 4.

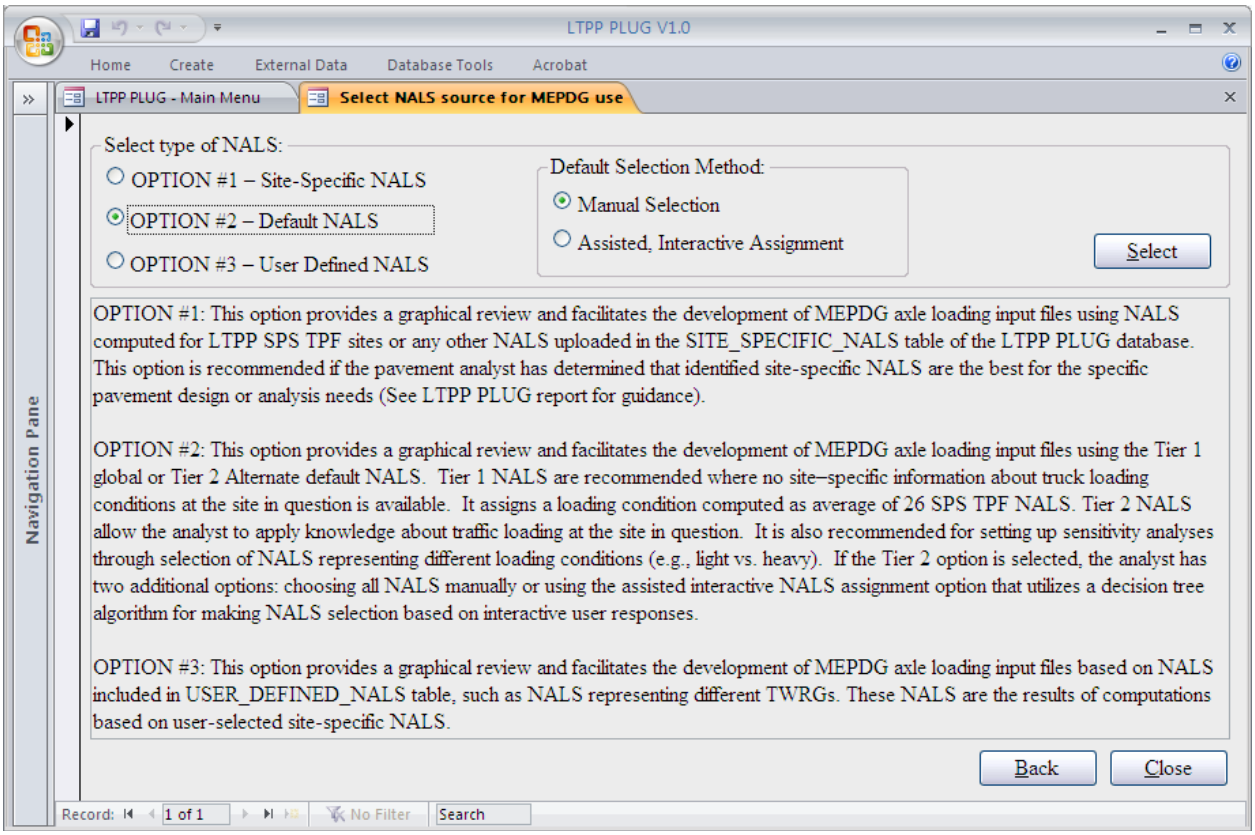

Figure 4. Select NALS source form for selecting loading inputs for MEPDG use.

The LTPP PLUG provides three types of NALS for development of MEPDG axle loading distribution inputs:

- OPTION #1: Site-Specific NALS.
- OPTION #2: Default NALS.
- OPTION #3: User-Defined NALS.

Option #1 provides a graphical review and facilitates the development of MEPDG axle loading input files using NALS computed for LTPP SPS TPF sites or any other NALS uploaded in the SITE_SPECIFIC_NALS table of the LTPP PLUG database. This option is recommended if the

pavement analyst has determined that identified site-specific NALS are the best for the specific pavement design or analysis needs (see the LTPP PLUG report for guidance).

Option #2 provides a graphical review and facilitates the development of MEPDG axle loading input files using the Tier 1 global or Tier 2 adefault NALS based on LTPP data or any other default NALS uploaded by the user to the DEFAULT_NALS table. Tier 1 NALS are recommended where no site-specific information is available regarding truck loading conditions at the site in question. It assigns a loading condition computed as the average of the 26 SPS TPF NALS. Tier 2 NALS allow the analyst to apply knowledge about traffic loading at the site in question. Tier 2 NALS also are recommended for setting up sensitivity analyses through the selection of NALS representing different loading conditions (e.g., light vs. heavy). If the Tier 2 option is selected, the analyst has two additional options: choosing all NALS manually or using the assisted interactive NALS assignment option that utilizes a decision tree algorithm for making NALS selections based on user responses.

Option #3 provides a graphical review and facilitates the development of MEPDG axle loading input files based on NALS included in the USER_DEFINED_NALS table, such as NALS representing different TWRGs. These NALS are the results of computations based on user-selected site-specific NALS.

To select desired the NALS option, click on the appropriate radio button and then click the "Select" button.

Use the "Back" and "Close" buttons at the bottom of the screen to go back to the previous form or to close the form.

Select Site-Specific NALS for MEPDG Use

After selecting the site-specific NALS source from the options shown in Figure 4, the user should click the "Select" button. This action brings up the form shown in Figure 5. This screen lets the analyst view the NALS for each type of axle for each class of truck for a selected site (from the SITE_SPECIFIC_NALS table), to compare site-specific data with the defaults, and to generate site-specific MEPDG axle load distribution files.

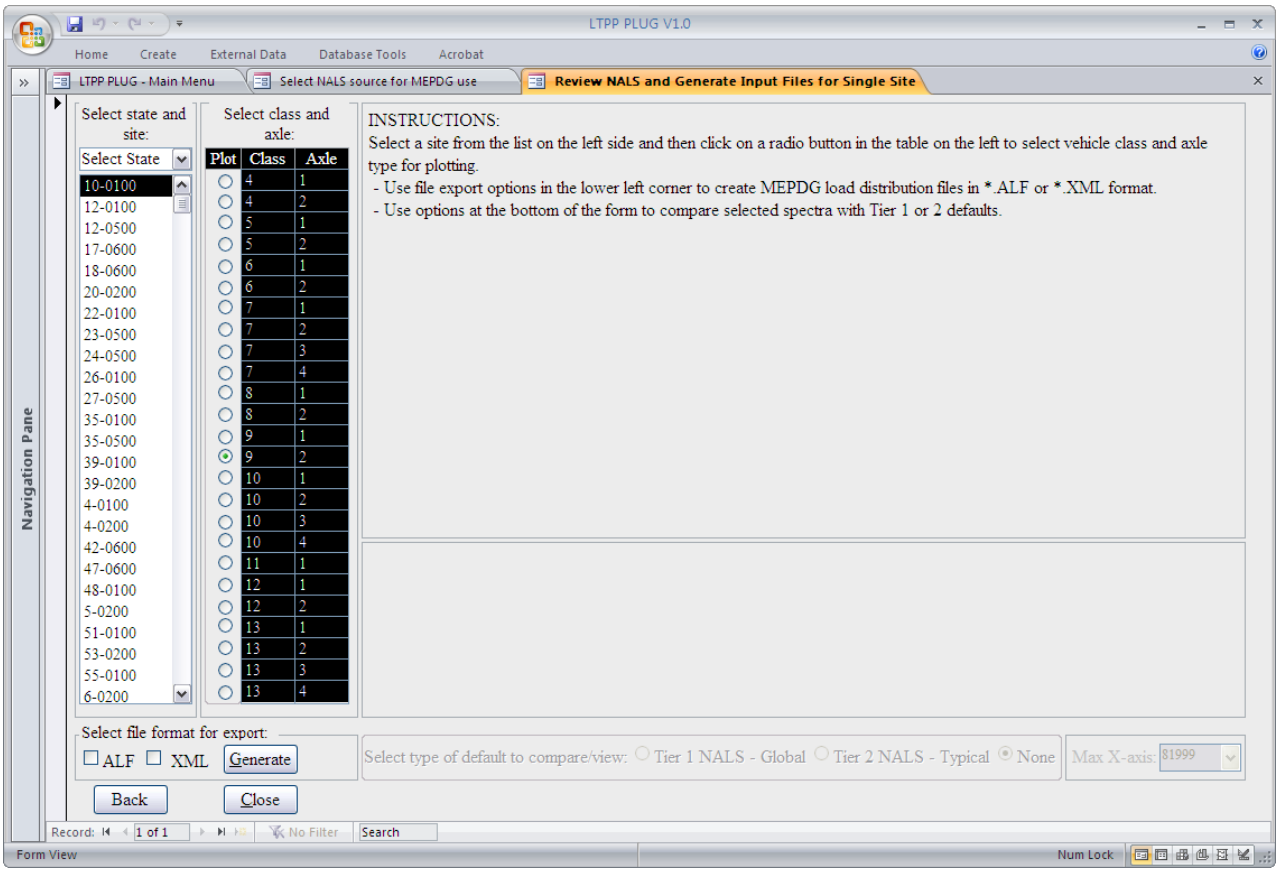

Figure 5. Screen for review and generation of MEPDG input files for site-specific NALS.

A list of the sites for which NALS are available is displayed on the left side of the screen. To select a site, click on it site ID in the list. Use scroll bars to see all available sites. To filter sites for a specific State, use the "Select State" box displayed above the list.

To the right of the site ID list, there is a table showing all available vehicle classes and axle types. Click on a radio button in the "Plot" column to display a NALS plot for the corresponding vehicle class and axle type. One NALS may be selected/displayed at a time.

To generate a MEPDG NALS input file, select the desired file format (*.alf and/or *.xml) and click the "Generate" button. The MEPDG NALS input file(s) will be saved to a user-specified directory.

For the example shown in Figure 6, Class 9 tandem axles have been selected for a non-LTPP site uploaded by the user to the SITE_SPECIFIC_NALS table. This NALS is displayed using a pink line. In addition, for comparison purposes, the user could display either Tier 1 default NALS (national average) or Tier 2 default NALS ("typical" default) for that type of axle and class of truck by selecting the appropriate radio buttons at the bottom of the form. The comparison NALS is displayed in blue. A text description of the NALS is provided in the box below the NALS plot.

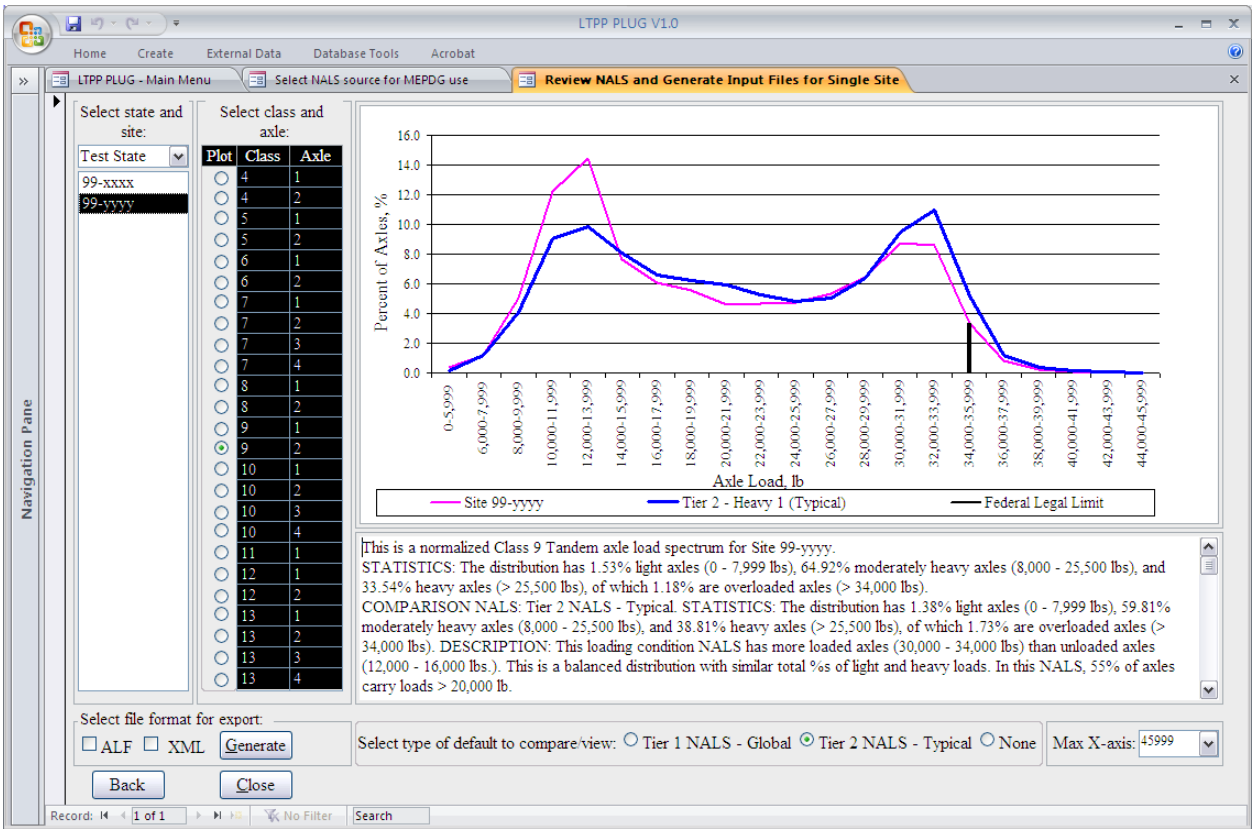

Figure 6. Review of site-specific NALS.

Select Default NALS for MEPDG Use – Manual Selection

If the manual selection option is selected (see Figure 4), the analyst will see a screen such as shown in Figure 7. This screen is designed to allow the analyst to select the default NALS for each type of axle for each class of truck. The same default type can be selected for all vehicle classes and axle types, or different defaults can be assigned to different vehicle classes and axle types.

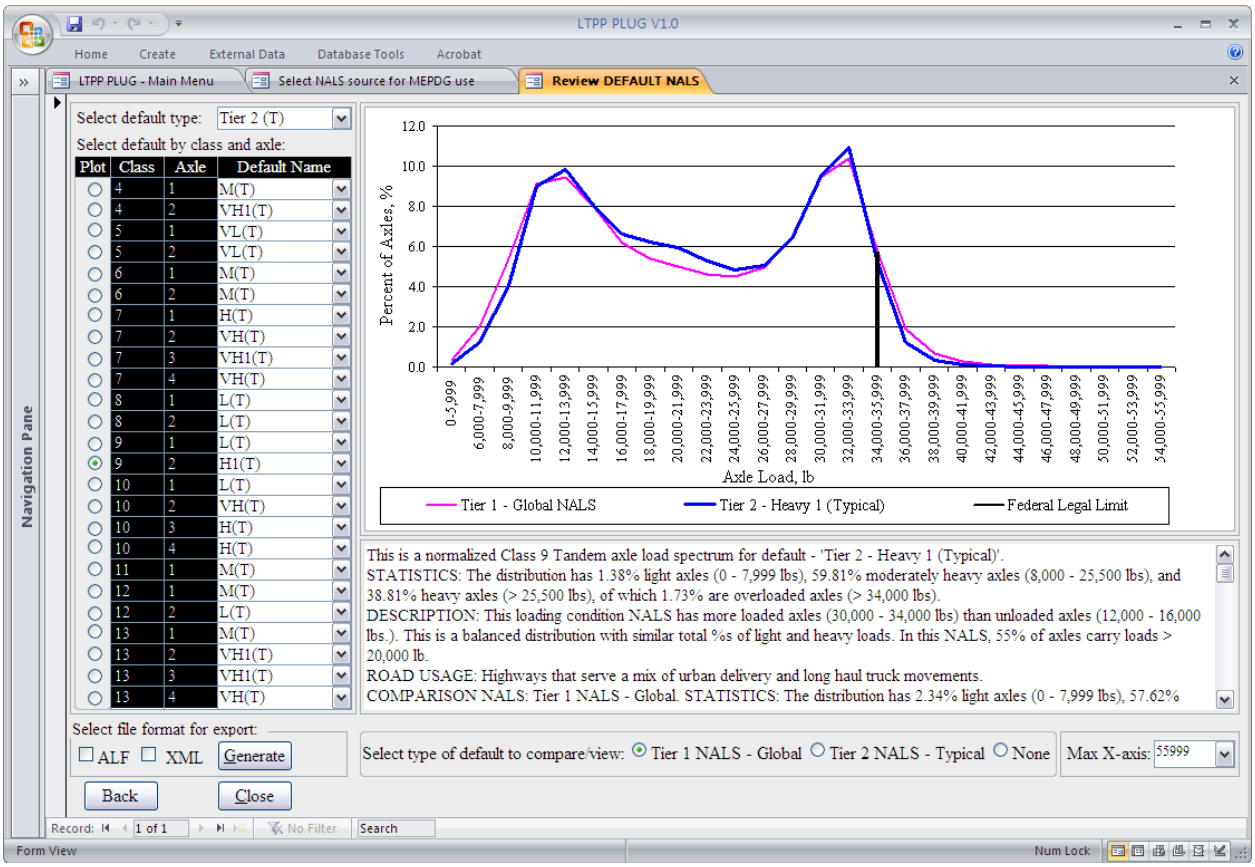

Figure 7. Screen for manual selection and generation of MEPDG input files using default NALS.

To apply the same default selection to all vehicle classes and axle types, choose the desired default type from the “Select default type” box.

To apply a different default to a selected vehicle class and axle type, use the “Select default by class and axle” table shown on the left side of the screen. Identify the row with the desired vehicle class and axle type and use the drop-down box in the “Default Name” column to make a different default selection.

To view NALS for the selected vehicle class and axle type, click on the appropriate “Plot” button. (In Figure 7, Class 9 tandem axles have been selected.)

To compare the selected default with either Tier 1 or Tier 2 default NALS for that type of axle and class of truck, select the appropriate radio buttons at the bottom of the form. These two default options provide means for comparing the manually selected alternative NALS to the default NALS.

A text description of the NALS is provided in the box displayed below the NALS plot.

To generate a MEPDG NALS input file, select the desired file format (*.alf and/or *.xml) and click the “Generate” button. The MEPDG NALS input file(s) will be saved to a user-specified directory.

To compare all of the available, alternative Tier 2 default NALS against the Tier 1 national average defaults, click on the drop-down arrow for the desired class of trucks and type of axle in the “Default Name” column. These manual selections must be done for each class of vehicles and type of axles. The intent of this selection process is to allow the analyst to apply known information about the site loading conditions to select the NALS alternative that best describes these conditions. The analyst should step through each class of trucks and type of axles, comparing the alternative Tier 2 NALS against the Tier 1 default.

For example, the analyst can compare the selected and default NALS to determine which is heavier. In Figure 8, it can be seen that the selected Tier 2 heavy (H2) NALS has a much higher percentage of heavy axles than the Tier 1 NALS. Thus, the Tier 2 heavy (H2) NALS for Class 7 tridem axles will cause the MEPDG software to predict more pavement damage than the Tier 1 global default.

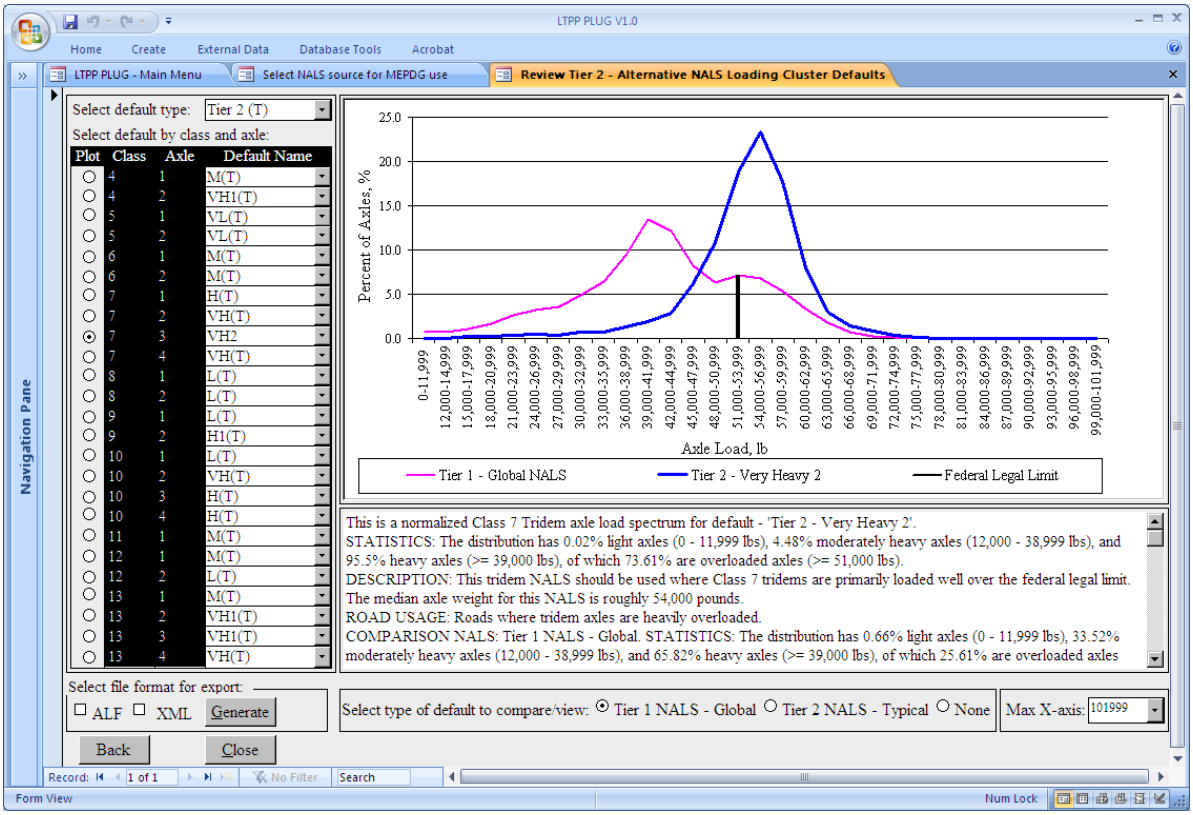

Figure 8. Review of manually selected default NALS.

Select Default NALS for MEPDG Use – Assisted, Interactive NALS Assignment

If the user chooses this option (see Figure 4), the software will display a screen that looks like that shown in Figure 9. At the top of this screen, the user is asked to identify the LTPP test site for which the NALS selection will apply. This could be any LTPP site that has truck volume by class information or any other site with truck volume by class information added to the LTPP PLUG database table SITE_SPECIFIC_NVCD. The site ID is formed by using the numerical State Code ID and Strategic Highway Research Program (SHRP) ID that uniquely identifies an LTPP site. The optional "State Filter" at the top of the form allows the user to narrow the selection to a specific State. If no State name is selected, all sites available in the LTPP traffic database are displayed.

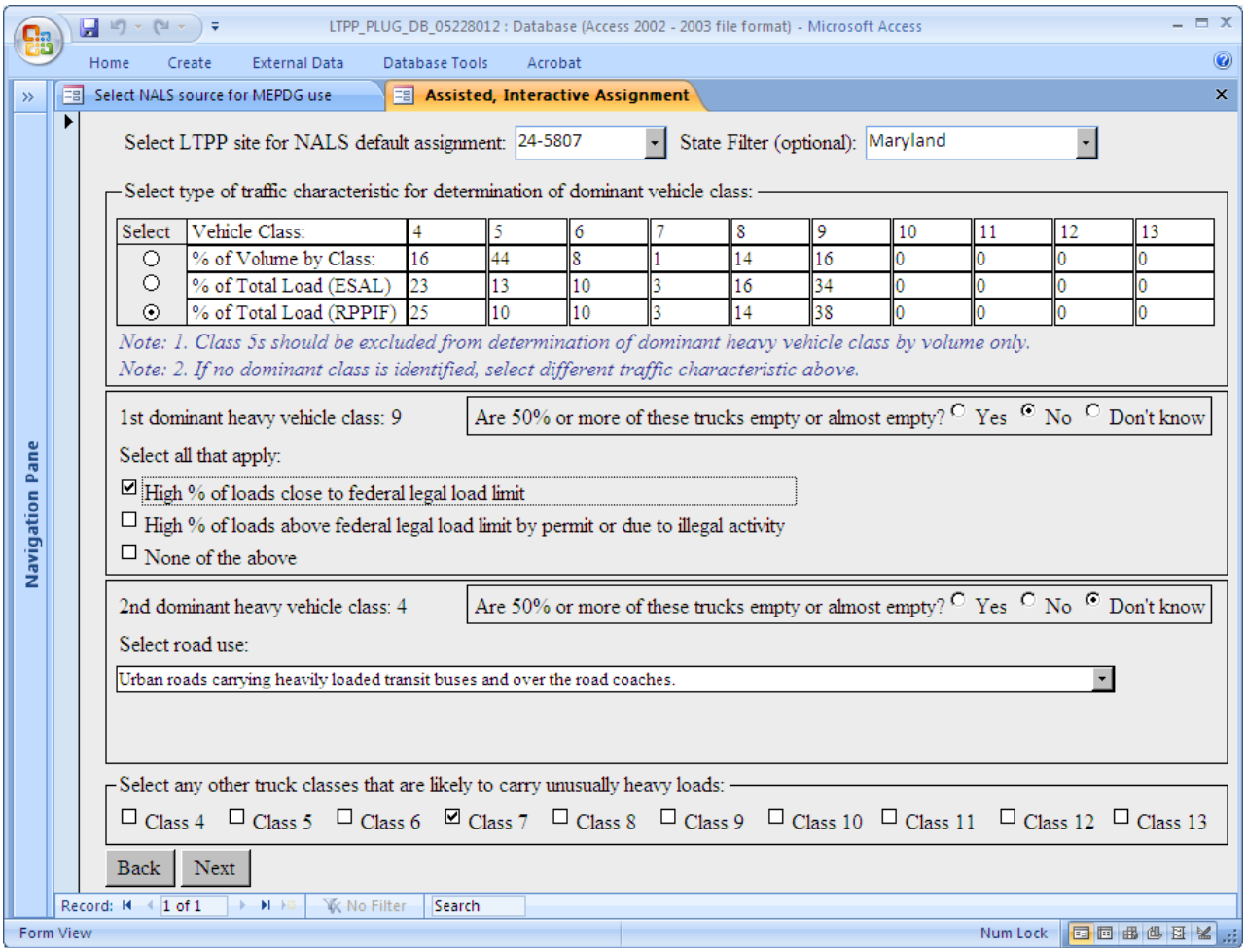

Figure 9. Screen for assisted, interactive assignment of default NALS.

For each of the identified dominant truck classes, the analyst is asked whether 50% or more of these trucks are empty or almost empty. If the user answers "Yes," then the load spectrum best describing this loading condition is selected from the list of available defaults. If the user answers "No," then a list of options with check boxes is displayed to help better define the expected loading condition. The following options are provided:

- High percentage of loads in the dominant class close to the Federal legal weight limit.
- High percentage of loads in the dominant class above the Federal legal weight limit due to permitted loads or illegal activity.
- None of the above.

The first two options provide means to determine a likely shape of a heavy loading distribution that helps identify heavy NALS defaults. One or both of these options could be selected. If the user selects the "None of the above" option, a Tier 2 default "typical" distribution is used for the dominant vehicle class.

If the user has no knowledge of the loading condition and specifies "Don't know" option on the form, a drop-down list appears to provide different road use options for the analyst to select. The number and type of entries in this list depends on the vehicle class. Each default has assigned road use recommendations in the LTPP PLUG database DEFAULT_NALS table. This list could be updated when new default NALS are added to the database or new road uses are identified for the LTPP Tier 2 NALS.

This input screen is designed to accommodate up to two dominant classes. If the analyst wishes to identify additional heavily loaded vehicle classes, this can be done by selecting those additional classes at the bottom of the screen.

When all questions have been answered and appropriate selections made on the form, click the "Next" button at the bottom of the screen. This will bring up a screen similar to the one shown in Figure 7, except unlike the manual selection of Tier 2 NALS, not all vehicle class and axle types are set to the "typical" (default) Tier 2 NALS conditions. Instead, the data entered for the dominant truck classes has been used to select specific Tier 2 NALS defaults. Also, vehicle classes and axle types that are likely to have a significant effect on pavement damage for the selected site will be colored black in the table displaying all available vehicle classes and axle types.

The analyst may now review and change any or all of the cluster assignments for each class of vehicle and type of axle. Thus, even if this NALS selection option is used, the analyst may still manually apply information previously learned about trucking patterns at the test site. This screen also may be used to select other NALS to test the sensitivity of MEPDG outputs to different loading conditions.

Select User-Defined NALS for MEPDG Use

This option facilitates the review of NALS computed using ACTION #3 (View, group, and combine NALS from multiple WIM sites) provided in the LTPP PLUG software. Once user-defined NALS have been added to the LTPP PLUG database by executing ACTION #3, these NALS can be viewed by selecting "user-defined" as the NALS source from the options shown in Figure 4 and clicking the "Select" button on that form. Click the "Select" button to bring up the form shown in Figure 10.

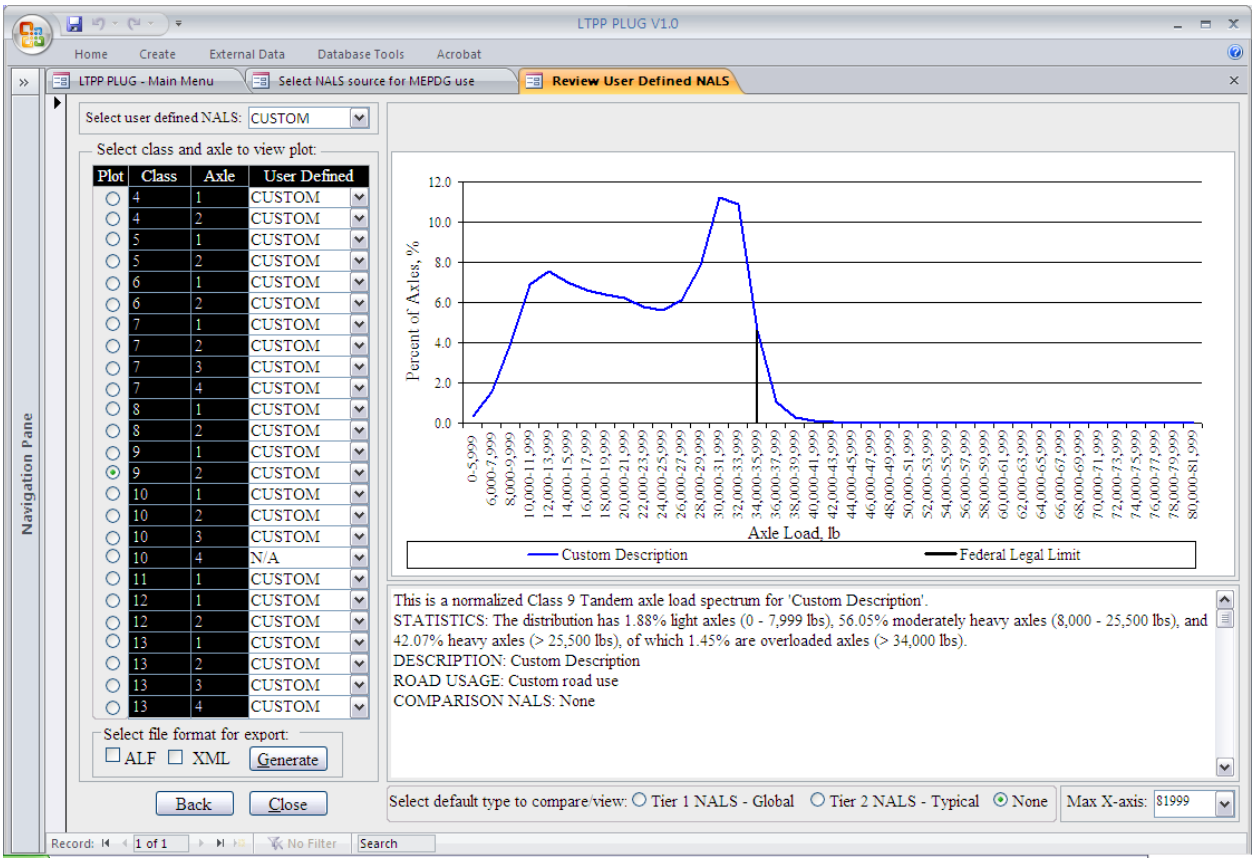

Figure 10. Screen for review of user-defined NALS.

This screen lets the analyst view the NALS for each type of axle for each class of truck for a user-defined NALS, such as NALS computed for TWRGs (from the LTPP PLUG USER_DEFINED_NALS table), to compare user-defined NALS with the defaults, and to generate site-specific MEPDG axle load distribution files. The same user-defined NALS type can be selected for all vehicle classes and axle types, or different user-defined NALS types can be assigned to different vehicle classes and axle types.

To apply the same user-defined NALS type to all vehicle classes and axle types, select the desired user-defined NALS type from the "Select user-defined NALS" box shown in the top left corner of the screen.

To apply a different user-defined NALS type to a selected vehicle class and axle type, use the table shown on the left side of the screen. Identify the row with the desired vehicle class and axle type and click on the appropriate drop-down box in the "User-Defined" column.

To view user-defined NALS for the selected vehicle class and axle type, click on the appropriate "Plot" button on the left of the screen.

To compare the selected user-defined NALS with either Tier 1 or Tier 2 default NALS for that type of axle and class of truck, select the appropriate radio buttons at the bottom of the form.

These two default options provide means for comparing user-defined NALS to the default NALS.

A text description of the NALS is provided in the box displayed below the NALS plot.

To generate a MEPDG NALS input file, select the desired file format (*.alf and/or *.xml) and click the “Generate” button. The MEPDG NALS input file(s) will be saved to a user-specified directory.

Generate MEPDG NALS Input Files

Functionality to generate the MEPDG NALS input file is provided for each “Select NALS for MEPDG Use” option. The button to generate MEPDG NALS input files is located at the bottom left corner of the “Review NALS and Generate Input Files” form presented in Figure 8. MEPDG axle load spectra files are developed automatically by a software routine using two of the file formats supported by DARWin-ME: *.alf and *.xml. Files are saved to a user-specified directory. To execute this function, select the file format and click the “Generate” button. The NALS selection displayed in the table located above the “Generate” button will be used in the development of the MEPDG NALS input file.

View, Group, and Combine NALS from Multiple WIM Sites

To view, group, and combine NALS from multiple WIM sites, select ACTION #3 on the main menu and click the “Select” button (see Figure 2). This action will bring up the data import form shown in Figure 11.

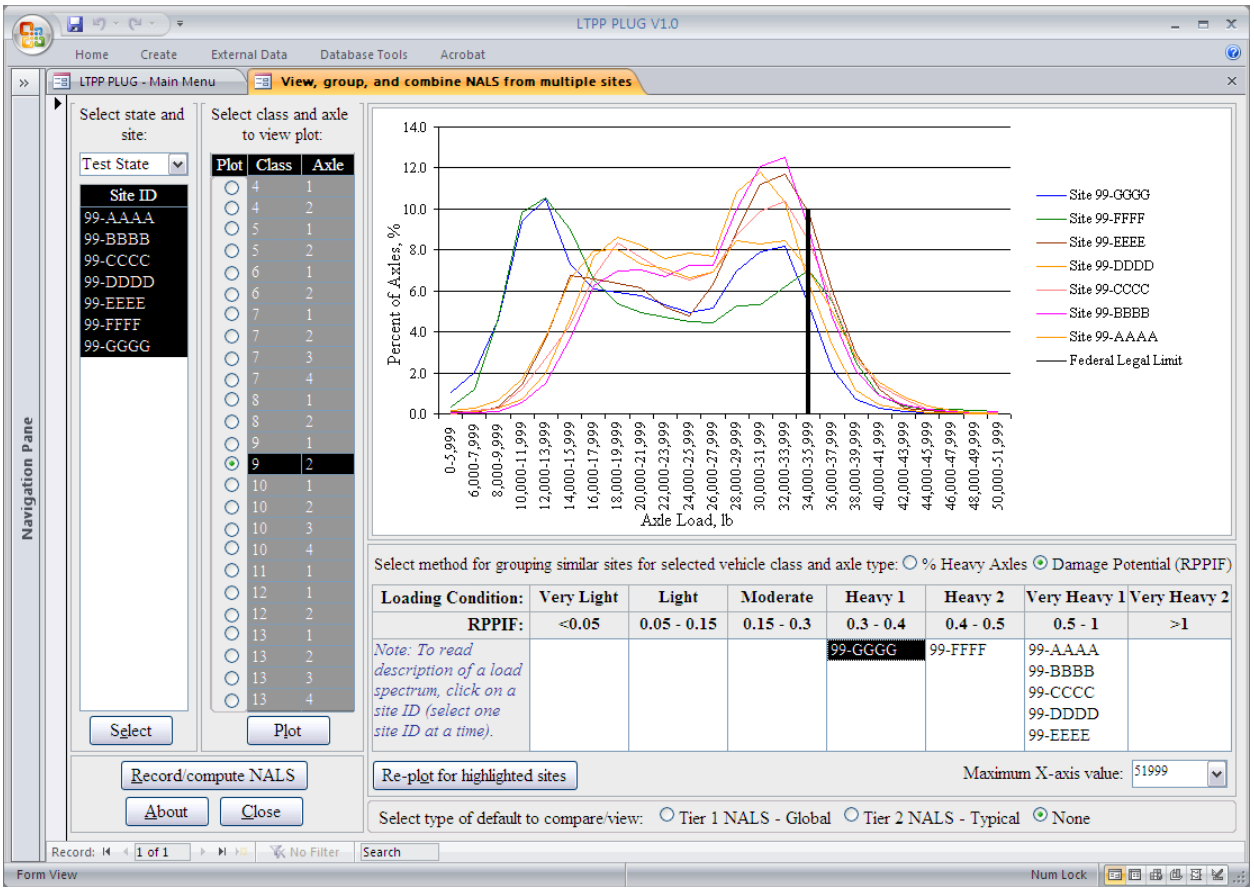

Figure 11. Screen to view, group, and combine NALS from multiple WIM sites.

A list of the sites for which NALS are available is displayed on the left side of the screen. To filter sites for a specific State, use the "Select State" box displayed above site list. To select the sites for comparison and viewing of NALS, click on the site IDs displayed in the list. Hold the Ctrl or Shift key to select multiple sites. Use scroll bars to see all available sites. Click on the "Select" button under the site ID list to apply the selection.

To the right of the site ID list, there is a table showing all available vehicle classes and axle types. Click on a radio button in the "Plot" column to display a NALS plot for the corresponding vehicle class and axle type. One class and axle combination may be selected at a time.
If site selection has been changed, click on "Plot" button at the bottom of the table to refresh the plot for selected class and axle.

The site IDs for the selected sites will be displayed in a table located under the axle load spectra plot. Site IDs will be displayed in different columns depending on the percentages of heavy axles or the damaging potential of the axle load spectrum. Use this information to group sites with similar loading conditions. To change the method for grouping load spectra, use the radio buttons displayed above the table to specify statistical parameter used for grouping: "% of Heavy Loads" or "Damage Potential (RPPIF)."

Vehicle classes and axle types that are likely to have a significant effect on pavement damage for the selected site(s) are colored black; purple indicates that the selected class-axle combination is likely to have significant effect for some but not all of the selected sites. This determination is made based on vehicle class distributions and axle load spectra for the selected sites.

In addition to site-specific load spectra, default load spectra can be displayed using the radio buttons at the bottom of the screen.

To narrow down site selection or plot only few sites at a time, hold the Shift or Ctrl key to highlight site IDs in the table below the load spectra plot and click the "Re-plot for highlighted sites" button.

To record average NALS for sites displayed in the table below the load spectra plot, and to generate MEPDG load distribution files, click the "Record/Compute NALS" button at the bottom of the screen.

Compute and Record User-Defined NALS for Groups of Sites

This function facilitates the development of user-defined NALS by vehicle class and axle type. This is accomplished by grouping sites with similar loading conditions, or based on manual selection of site IDs, and computing average NALS for each group of sites. Groupings are done for the sites selected by the user on the "View, group, and combine NALS from multiple WIM sites" screen (see Figure 11). Click on the "Record/Compute NALS" button on that form to bring up a form displaying the selected sites, as shown in Figure 12.

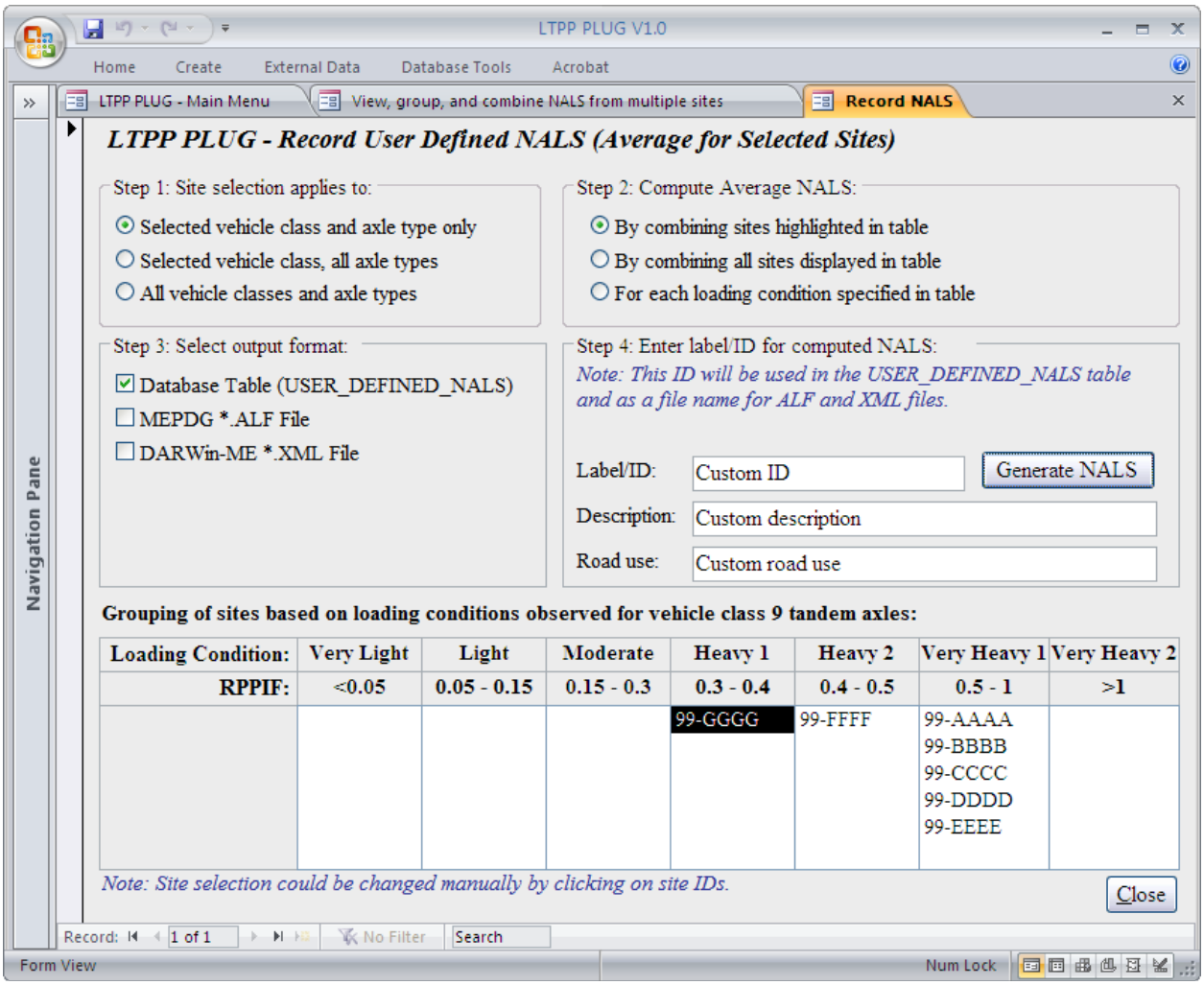

Figure 12. Screen to compute and record user-defined NALS.

This form shows instructions for four steps and a table at the bottom of the form populated with the site IDs selected on the previous screen. The site IDs are placed in different columns of the table based on axle loading conditions observed for the selected vehicle class and axle type.

The LTPP PLUG provides multiple options for computation of average NALS for the selected group of sites. Step 1 on the form asks the user to select whether site selection for computation of average NALS should apply to:

- Selected vehicle class and axle type only.
- Selected vehicle class, all axle types.
- All vehicle classes and axle types.

It is recommended that the loading conditions observed for the dominant vehicle class are used as the basis for grouping of sites, at least to develop alternative NALS for that vehicle class. For the light vehicle classes and axle types that do not contribute much to the total loading, all sites may be combined to compute an average NALS. In some circumstances, where several heavy vehicle types are well represented on the road or loading conditions observed for different

vehicle classes are different (for example, for a road with moderate Class 9 trucks and very heavy Class 7 trucks), it is recommended that NALS alternatives are computed based on grouping of sites for individual vehicle classes and axle types.

Step 2 provides the following options to group the sites for computation of the average NALS for each group:

- By combining NALS for the sites highlighted in the table.
- By combining NALS for all the sites displayed in the table.
- For each loading condition specified in the table header.

To change the selection of sites for grouping, highlight site IDs in the table by clicking on them. Use Shift or Ctrl key to select multiple sites.

Step 3 asks the user to select output format using the following options:

- Database table (USER_DEFINED_NALS).
- MEPDG *.alf file.
- DARWin-ME *.xml file.

In step 4, the user is asked to provide several characteristics for the average NALS being computed based on user selection, including:

- Label that will be used in the LTPP PLUG database USER_DEFINED_NALS table or in *.alf and *.xml file names to identify computed NALS.
- Description of the computed NALS (what loading condition or group of roads this NALS represents).
- Recommended road use (for what roads this new NALS is recommended).

Once steps 1 through 4 have been completed, click on the “Generate NALS” button to compute and save the new user-defined NALS. If NALS have been written to the USER_DEFINED_NALS table of the LTPP PLUG database, use Option #3 of the “Select NALS Source for MEPDG Use” form (see Figure 4) to view the computed NALS.
Click the “Close” button to close the form.

LTPP PLUG DATABASE DATA DICTIONARY

This document provides a data dictionary containing field names and descriptions for the tables included in the LTPP PLUG database. This information could be used to help with understanding of the data in the database tables and to facilitate uploading of the additional information (LTPP updates or State-specific information) to the database tables.

Listed below are brief descriptions of the tables present in the database:

- ALF_DEFAULT_ALS and ALF_Gen_Axle_Group – These tables are used internally by the LTPP PLUG software to generate *.alf files. Tables 21 and 22 contain the field names and descriptions.
- DEFAULT_AxlesPerTruck – This table contains default axle-per-truck coefficients (APC) based on all applicable SPS TPF data. Table 3 contains the field names and descriptions.
- DEFAULT_NALS – This table contains LTPP Tier 1 or Tier 2 NALS defaults developed based on SPS TPF data or user-defined defaults. Table 4 contains the field names and descriptions.
- LTPP_CODES – This table, imported from the LTPP LTAS database, contains numeric codes and names for all the States and Provinces in the United States and Canada. Table 5 contains the field names and descriptions.
- PLUG_LEF_FOR_ESAL – This table contains load equivalency factors by axle type and is used for % of Total Load (ESAL) computations. Table 6 contains the field names and descriptions.
- PLUG_W_FACTORS_FOR_RPPIF – This table contains *W*-factors by axle type and is used for % of Total Load (RPPIF) computations. Table 7 contains the field names and descriptions.
- SITE_SPECIFIC_AxlesPerTruck – This table contains APCs for each site. Table 8 contains the field names and descriptions.
- SITE_SPECIFIC_NALS – This table contains representative annual NALS for each SPS TPF or user-supplied site. Table 9 contains the field names and descriptions.
- SITE_SPECIFIC_NVCD – This table contains the normalized vehicle class distribution for the most recent year for all SPS and GPS sites or user-supplied sites. Table 10 contains the field names and descriptions.
- USER_DEFINED_NALS – This table contains user-defined NALS based on the computation performed under Action 3 of the LTPP PLUG software (multiple sites selection and computation of NALS). Table 11 contains the field names and descriptions.
- XMLGen_AxleLoadDistribution, XMLGen_AxleLoadMain_Template, and XMLGen_DEFAULT_NALS_By_Loading_Cluster – These tables are used internally by the LTPP PLUG software to generate DARWin-ME *.xml files. Tables 32 through 34 contain the field names and descriptions.

Table 1. Field names and descriptions for ALF_DEFAULT_ALS.

Field Name	Data Type	Description
Month	NUMBER(2,0)	Code specifying the month in text format (January- December).
Veh_Class	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
Sum_Axles	NUMBER(3,0)	A constant value of 100 populated in each record for ALF file generation.
Axle_Group	NUMBER(1,0)	Type of axle for which these percentages of axles apply.

Table 2. Field names and descriptions for ALF_Gen_Axle_Group.

Field Name	Data Type	Description
Veh_Class	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
Axle_Group	NUMBER(1,0)	Type of axle for which these percentages of axles apply.

Table 3. Field names and descriptions for DEFAULT_AxlesPerTruck.

Field Name	Data Type	Description
classNumber	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
numberAxle	NUMBER(1,0)	Type of axle for which the values in the field “truckAxleConfig” apply.
truckAxleConfig	NUMBER(2,2)	Number of this type of axle for a vehicle in this class.

Table 4. Field names and descriptions for DEFAULT_NALS.

Field Name	Data Type	Description
VEH_CLASS	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
AXLE_GROUP	NUMBER(1,0)	Type of axle for which these percentages of axles apply.
NALS_CLUSTERS	VARCHAR2(255)	Text field containing the name of the default or NALS cluster name.
MEPDG_LG01	NUMBER(3,14)	Percent of axles whose weight falls in the bin 0-2999 pounds for single axles; 0-5999 pounds for tandem axles; 0-11999 pounds for tridem and quad axles.
MEPDG_LG02	NUMBER(3,14)	Percent of axles whose weight falls in the bin 3000-3999 pounds for single axles; 6000-7999 pounds for tandem axles; 12000-14999 pounds for tridem and quad axles.
MEPDG_LG03	NUMBER(3,14)	Percent of axles whose weight falls in the bin 4000-4999 pounds for single axles; 8000-9999 pounds for tandem axles; 15000-17999 pounds for tridem and quad axles.
MEPDG_LG04	NUMBER(3,14)	Percent of axles whose weight falls in the bin 5000-5999 pounds for single axles; 10000-11999 pounds for tandem axles; 18000-20999 pounds for tridem and quad axles.
MEPDG_LG05	NUMBER(3,14)	Percent of axles whose weight falls in the bin 6000-6999 pounds for single axles; 12000-13999 pounds for tandem axles; 21000-23999 pounds for tridem and quad axles.
MEPDG_LG06	NUMBER(3,14)	Percent of axles whose weight falls in the bin 7000-7999 pounds for single axles; 14000-15999 pounds for tandem axles; 24000-26999 pounds for tridem and quad axles.
MEPDG_LG07	NUMBER(3,14)	Percent of axles whose weight falls in the bin 8000-8999 pounds for single axles; 16000-17999 pounds for tandem axles; 27000-29999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG08	NUMBER(3,14)	Percent of axles whose weight falls in the bin 9000-9999 pounds for single axles; 18000-19999 pounds for tandem axles; 30000-32999 pounds for tridem and quad axles.
MEPDG_LG09	NUMBER(3,14)	Percent of axles whose weight falls in the bin 10000-10999 pounds for single axles; 20000-21999 pounds for tandem axles; 33000-35999 pounds for tridem and quad axles.
MEPDG_LG10	NUMBER(3,14)	Percent of axles whose weight falls in the bin 11000-11999 pounds for single axles; 22000-23999 pounds for tandem axles; 36000-38999 pounds for tridem and quad axles.
MEPDG_LG11	NUMBER(3,14)	Percent of axles whose weight falls in the bin 12000-12999 pounds for single axles; 24000-25999 pounds for tandem axles; 39000-41999 pounds for tridem and quad axles.
MEPDG_LG12	NUMBER(3,14)	Percent of axles whose weight falls in the bin 13000-13999 pounds for single axles; 26000-27999 pounds for tandem axles; 42000-44999 pounds for tridem and quad axles.
MEPDG_LG13	NUMBER(3,14)	Percent of axles whose weight falls in the bin 14000-14999 pounds for single axles; 28000-29999 pounds for tandem axles; 45000-47999 pounds for tridem and quad axles.
MEPDG_LG14	NUMBER(3,14)	Percent of axles whose weight falls in the bin 15000-15999 pounds for single axles; 30000-31999 pounds for tandem axles; 48000-50999 pounds for tridem and quad axles.
MEPDG_LG15	NUMBER(3,14)	Percent of axles whose weight falls in the bin 16000-16999 pounds for single axles; 32000-33999 pounds for tandem axles; 51000-53999 pounds for tridem and quad axles.
MEPDG_LG16	NUMBER(3,14)	Percent of axles whose weight falls in the bin 17000-17999 pounds for single axles; 34000-35999 pounds for tandem axles; 54000-56999 pounds for tridem and quad axles.
MEPDG_LG17	NUMBER(3,14)	Percent of axles whose weight falls in the bin 18000-18999 pounds for single axles; 36000-37999 pounds for tandem axles; 57000-59999 pounds for tridem and quad axles.
MEPDG_LG18	NUMBER(3,14)	Percent of axles whose weight falls in the bin 19000-19999 pounds for single axles; 38000-39999 pounds for tandem axles; 60000-62999 pounds for tridem and quad axles.
MEPDG_LG19	NUMBER(3,14)	Percent of axles whose weight falls in the bin 20000-20999 pounds for single axles; 40000-41999 pounds for tandem axles; 63000-65999 pounds for tridem and quad axles.
MEPDG_LG20	NUMBER(3,14)	Percent of axles whose weight falls in the bin 21000-21999 pounds for single axles; 42000-43999 pounds for tandem axles; 66000-68999 pounds for tridem and quad axles.
MEPDG_LG21	NUMBER(3,14)	Percent of axles whose weight falls in the bin 22000-22999 pounds for single axles; 44000-45999 pounds for tandem axles; 69000-71999 pounds for tridem and quad axles.
MEPDG_LG22	NUMBER(3,14)	Percent of axles whose weight falls in the bin 23000-23999 pounds for single axles; 46000-47999 pounds for tandem axles; 72000-74999 pounds for tridem and quad axles.
MEPDG_LG23	NUMBER(3,14)	Percent of axles whose weight falls in the bin 24000-24999 pounds for single axles; 48000-49999 pounds for tandem axles; 75000-77999 pounds for tridem and quad axles.
MEPDG_LG24	NUMBER(3,14)	Percent of axles whose weight falls in the bin 25000-25999 pounds for single axles; 50000-51999 pounds for tandem axles; 78000-80999 pounds for tridem and quad axles.
MEPDG_LG25	NUMBER(3,14)	Percent of axles whose weight falls in the bin 26000-26999 pounds for single axles; 52000-53999 pounds for tandem axles; 81000-83999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG26	NUMBER(3,14)	Percent of axles whose weight falls in the bin 27000-27999 pounds for single axles; 54000-55999 pounds for tandem axles; 84000-86999 pounds for tridem and quad axles.
MEPDG_LG27	NUMBER(3,14)	Percent of axles whose weight falls in the bin 28000-28999 pounds for single axles; 56000-57999 pounds for tandem axles; 87000-89999 pounds for tridem and quad axles.
MEPDG_LG28	NUMBER(3,14)	Percent of axles whose weight falls in the bin 29000-29999 pounds for single axles; 58000-59999 pounds for tandem axles; 90000-92999 pounds for tridem and quad axles.
MEPDG_LG29	NUMBER(3,14)	Percent of axles whose weight falls in the bin 30000-30999 pounds for single axles; 60000-61999 pounds for tandem axles; 93000-95999 pounds for tridem and quad axles.
MEPDG_LG30	NUMBER(3,14)	Percent of axles whose weight falls in the bin 31000-31999 pounds for single axles; 62000-63999 pounds for tandem axles; 96000-98999 pounds for tridem and quad axles.
MEPDG_LG31	NUMBER(3,14)	Percent of axles whose weight falls in the bin 32000-32999 pounds for single axles; 64000-65999 pounds for tandem axles; 99000-101999 pounds for tridem and quad axles.
MEPDG_LG32	NUMBER(3,14)	Percent of axles whose weight falls in the bin 33000-33999 pounds for single axles; 66000-67999 pounds for tandem axles.
MEPDG_LG33	NUMBER(3,14)	Percent of axles whose weight falls in the bin 34000-34999 pounds for single axles; 68000-69999 pounds for tandem axles.
MEPDG_LG34	NUMBER(3,14)	Percent of axles whose weight falls in the bin 35000-35999 pounds for single axles; 70000-71999 pounds for tandem axles.
MEPDG_LG35	NUMBER(3,14)	Percent of axles whose weight falls in the bin 36000-36999 pounds for single axles; 72000-73999 pounds for tandem axles.
MEPDG_LG36	NUMBER(3,14)	Percent of axles whose weight falls in the bin 37000-37999 pounds for single axles; 74000-75999 pounds for tandem axles.
MEPDG_LG37	NUMBER(3,14)	Percent of axles whose weight falls in the bin 38000-38999 pounds for single axles; 76000-77999 pounds for tandem axles.
MEPDG_LG38	NUMBER(3,14)	Percent of axles whose weight falls in the bin 39000-39999 pounds for single axles; 78000-79999 pounds for tandem axles.
MEPDG_LG39	NUMBER(3,14)	Percent of axles whose weight falls in the bin 40000-40999 pounds for single axles; 80000-81999 pounds for tandem axles.
Description	VARCHAR2(255)	Text description for NALS_CLUSTERS field.
Recommended_Road_Usage	VARCHAR2(255)	Text description indicating the recommended road usage for the selected cluster.

Table 5. Field names and descriptions for LTPP_CODES.

Field Name	Data Type	Description
CODETYPE	VARCHAR2(40)	Name assigned to a set of codes for a field in another table.
CODE	NUMBER(2,0)	Unique text value whose meaning is defined in CODES.DETAIL.
DETAIL	VARCHAR2(200)	Textual description defining the meaning of the code.
ADDL_CODE	VARCHAR2(2)	Additional code needed to uniquely define the meaning of a code. For example, both State and county code are needed to uniquely identify a county.
ADDL_CODETYPE	VARCHAR2(20)	Codetype of the code entered in the ADDL_CODE field.

Table 6. Field names and descriptions for PLUG_LEF_FOR_ESAL.

Field Name	Data Type	Description
PAVEMENT_TYPE	VARCHAR2(255)	Code indicating pavement type.
AXLE_TYPE	NUMBER(1,0)	Type of axle for which these values apply.
AX_01	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 0.5 times WEIGHT_BIN_SIZE.
AX_02	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 1.5 times WEIGHT_BIN_SIZE.
AX_03	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 3.5 times WEIGHT_BIN_SIZE.
AX_04	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 4.5 times WEIGHT_BIN_SIZE.
AX_05	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 5.5 times WEIGHT_BIN_SIZE.
AX_06	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 6.5 times WEIGHT_BIN_SIZE.
AX_07	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 7.5 times WEIGHT_BIN_SIZE.
AX_08	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 8.5 times WEIGHT_BIN_SIZE.
AX_09	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 9.5 times WEIGHT_BIN_SIZE.
AX_10	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 10.5 times WEIGHT_BIN_SIZE.
AX_11	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 11.5 times WEIGHT_BIN_SIZE.
AX_12	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 12.5 times WEIGHT_BIN_SIZE.
AX_13	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 13.5 times WEIGHT_BIN_SIZE.
AX_14	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 14.5 times WEIGHT_BIN_SIZE.
AX_15	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 15.5 times WEIGHT_BIN_SIZE.
AX_16	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 16.5 times WEIGHT_BIN_SIZE.
AX_17	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 17.5 times WEIGHT_BIN_SIZE.
AX_18	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 18.5 times WEIGHT_BIN_SIZE.
AX_19	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 19.5 times WEIGHT_BIN_SIZE.
AX_20	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 20.5 times WEIGHT_BIN_SIZE.
AX_21	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 21.5 times WEIGHT_BIN_SIZE.
AX_22	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 22.5 times WEIGHT_BIN_SIZE.
AX_23	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 23.5 times WEIGHT_BIN_SIZE.
AX_24	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 24.5 times WEIGHT_BIN_SIZE.
AX_25	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 25.5 times

Field Name	Data Type	Description
		WEIGHT_BIN_SIZE
AX_26	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 26.5 times WEIGHT_BIN_SIZE.
AX_27	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 27.5 times WEIGHT_BIN_SIZE.
AX_28	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 28.5 times WEIGHT_BIN_SIZE.
AX_29	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 29.5 times WEIGHT_BIN_SIZE.
AX_30	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 30.5 times WEIGHT_BIN_SIZE.
AX_31	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 31.5 times WEIGHT_BIN_SIZE.
AX_32	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 32.5 times WEIGHT_BIN_SIZE.
AX_33	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 33.5 times WEIGHT_BIN_SIZE.
AX_34	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 34.5 times WEIGHT_BIN_SIZE.
AX_35	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 35.5 times WEIGHT_BIN_SIZE.
AX_36	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 36.5 times WEIGHT_BIN_SIZE.
AX_37	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 37.5 times WEIGHT_BIN_SIZE.
AX_38	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 38.5 times WEIGHT_BIN_SIZE.
AX_39	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 39.5 times WEIGHT_BIN_SIZE.
AX_40	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 40.5 times WEIGHT_BIN_SIZE.
AX_41	NUMBER(2,20)	LEF for axles in bin with mid-point weight equal to 41.5 times WEIGHT_BIN_SIZE.
WEIGHT_BIN_SIZE	NUMBER(4,0)	Value of the increment for a bin for the axle type as loaded. 1,000 for singles; 2,000 for tandems; 3,000 for tridems; 3,000 or 4,000 for quads, depending on the software version used to load the data.

Table 7. Field names and descriptions for PLUG_W_FACTORS_FOR_RPPIF.

Field Name	Data Type	Description
Axle_Type	NUMBER(1, 0)	Type of axle for which these W-factors apply.
AX_CT_01	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 0-999 pounds for single axles; 0-1999 pounds for tandem axles; 0-2999 pounds for tridem and quad axles.
AX_CT_02	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 1000-1999 pounds for single axles; 2000-3999 pounds for tandem axles; 3000-5999 pounds for tridem and quad axles.

Field Name	Data Type	Description
AX_CT_03	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 2000-2999 pounds for single axles; 4000-5999 pounds for tandem axles; 6000-8999 pounds for tridem and quad axles.
AX_CT_04	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 3000-3999 pounds for single axles; 6000-7999 pounds for tandem axles; 9000-11999 pounds for tridem and quad axles.
AX_CT_05	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 4000-4999 pounds for single axles; 8000-9999 pounds for tandem axles; 12000-14999 pounds for tridem and quad axles.
AX_CT_06	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 5000-5999 pounds for single axles; 10000-11999 pounds for tandem axles; 15000-17999 pounds for tridem and quad axles.
AX_CT_07	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 6000-6999 pounds for single axles; 12000-13999 pounds for tandem axles; 18000-20999 pounds for tridem and quad axles.
AX_CT_08	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 7000-7999 pounds for single axles; 14000-15999 pounds for tandem axles; 21000-23999 pounds for tridem and quad axles.
AX_CT_09	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 8000-8999 pounds for single axles; 16000-17999 pounds for tandem axles; 24000-26999 pounds for tridem and quad axles.
AX_CT_10	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 9000-9999 pounds for single axles; 18000-19999 pounds for tandem axles; 27000-29999 pounds for tridem and quad axles.
AX_CT_11	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 10000-10999 pounds for single axles; 20000-21999 pounds for tandem axles; 30000-32999 pounds for tridem and quad axles.
AX_CT_12	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 11000-11999 pounds for single axles; 22000-23999 pounds for tandem axles; 33000-35999 pounds for tridem and quad axles.
AX_CT_13	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 12000-12999 pounds for single axles; 24000-25999 pounds for tandem axles; 36000-38999 pounds for tridem and quad axles.
AX_CT_14	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 13000-13999 pounds for single axles; 26000-27999 pounds for tandem axles; 39000-41999 pounds for tridem and quad axles.
AX_CT_15	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 14000-14999 pounds for single axles; 28000-29999 pounds for tandem axles; 42000-44999 pounds for tridem and quad axles.

Field Name	Data Type	Description
AX_CT_16	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 15000-15999 pounds for single axles; 30000-31999 pounds for tandem axles; 45000-47999 pounds for tridem and quad axles.
AX_CT_17	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 16000-16999 pounds for single axles; 32000-33999 pounds for tandem axles; 48000-50999 pounds for tridem and quad axles.
AX_CT_18	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 17000-17999 pounds for single axles; 34000-35999 pounds for tandem axles; 51000-53999 pounds for tridem and quad axles.
AX_CT_19	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 18000-18999 pounds for single axles; 36000-37999 pounds for tandem axles; 54000-56999 pounds for tridem and quad axles.
AX_CT_20	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 19000-19999 pounds for single axles; 38000-39999 pounds for tandem axles; 57000-59999 pounds for tridem and quad axles.
AX_CT_21	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 20000-20999 pounds for single axles; 40000-41999 pounds for tandem axles; 60000-62999 pounds for tridem and quad axles.
AX_CT_22	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 21000-21999 pounds for single axles; 42000-43999 pounds for tandem axles; 63000-65999 pounds for tridem and quad axles.
AX_CT_23	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 22000-22999 pounds for single axles; 44000-45999 pounds for tandem axles; 66000-68999 pounds for tridem and quad axles.
AX_CT_24	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 23000-23999 pounds for single axles; 46000-47999 pounds for tandem axles; 69000-71999 pounds for tridem and quad axles.
AX_CT_25	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 24000-24999 pounds for single axles; 48000-49999 pounds for tandem axles; 72000-74999 pounds for tridem and quad axles.
AX_CT_26	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 25000-25999 pounds for single axles; 50000-51999 pounds for tandem axles; 75000-77999 pounds for tridem and quad axles.
AX_CT_27	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 26000-26999 pounds for single axles; 52000-53999 pounds for tandem axles; 78000-80999 pounds for tridem and quad axles.
AX_CT_28	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 27000-27999 pounds for single axles; 54000-55999 pounds for tandem axles; 81000-83999 pounds for tridem and quad axles.

Field Name	Data Type	Description
AX_CT_29	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 28000-28999 pounds for single axles; 56000-57999 pounds for tandem axles; 84000-86999 pounds for tridem and quad axles.
AX_CT_30	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 29000-29999 pounds for single axles; 58000-59999 pounds for tandem axles; 87000-89999 pounds for tridem and quad axles.
AX_CT_31	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 30000-30999 pounds for single axles; 60000-61999 pounds for tandem axles; 90000-92999 pounds for tridem and quad axles.
AX_CT_32	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 31000-31999 pounds for single axles; 62000-63999 pounds for tandem axles; 93000-95999 pounds for tridem and quad axles.
AX_CT_33	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 32000-32999 pounds for single axles; 64000-65999 pounds for tandem axles; 96000-98999 pounds for tridem and quad axles.
AX_CT_34	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 33000-33999 pounds for single axles; 66000-67999 pounds for tandem axles; 99000-101999 pounds for tridem and quad axles.
AX_CT_35	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 34000-34999 pounds for single axles; 68000-69999 pounds for tandem axles; 102000-104999 pounds for tridem and quad axles.
AX_CT_36	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 35000-35999 pounds for single axles; 70000-71999 pounds for tandem axles; 105000-107999 pounds for tridem and quad axles.
AX_CT_37	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 36000-36999 pounds for single axles; 72000-73999 pounds for tandem axles; 108000-110999 pounds for tridem and quad axles.
AX_CT_38	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 37000-37999 pounds for single axles; 74000-75999 pounds for tandem axles; 111000-113999 pounds for tridem and quad axles.
AX_CT_39	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 38000-38999 pounds for single axles; 76000-77999 pounds for tandem axles; 114000-116999 pounds for tridem and quad axles.
AX_CT_40	NUMBER(2,20)	W-factors for axles whose weight falls in the lowest bin 39000-39999 pounds for single axles; 78000-79999 pounds for tandem axles; 117000-119999 pounds for tridem and quad axles.

Table 8. Field names and descriptions for SITE_SPECIFIC_AxlesPerTruck.

Field Name	Data Type	Description
STATE_CODE	NUMBER(2,0)	Numerical code for State or Province. U.S. codes are consistent with Federal Information Processing Standards.
SHRP_ID	VARCHAR2(255)	Test section identification number assigned by LTPP program. Must be combined with STATE_CODE to be unique.
classNumber	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
numberAxle	NUMBER(1,0)	Type of axle for which the values in the field “truckAxleConfig” apply.
truckAxleConfig	NUMBER(1,2)	Number of this type of axle for a vehicle in this class.

Table 9. Field names and descriptions for SITE_SPECIFIC_NALS.

Field Name	Data Type	Description
STATE_CODE	NUMBER(2,0)	Numerical code for State or Province. U.S. codes are consistent with Federal Information Processing Standards.
SHRP_ID	VARCHAR2(255)	Test section identification number assigned by LTPP program. Must be combined with STATE_CODE to be unique.
VEH_CLASS	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
AXLE_GROUP	NUMBER(1,0)	Type of axle for which these percentages of axles apply.
MEPDG_LG01	NUMBER(3,14)	Percent of axles whose weight falls in the bin 0-2999 pounds for single axles; 0-5999 pounds for tandem axles; 0-11999 pounds for tridem and quad axles.
MEPDG_LG02	NUMBER(3,14)	Percent of axles whose weight falls in the bin 3000-3999 pounds for single axles; 6000-7999 pounds for tandem axles; 12000-14999 pounds for tridem and quad axles.
MEPDG_LG03	NUMBER(3,14)	Percent of axles whose weight falls in the bin 4000-4999 pounds for single axles; 8000-9999 pounds for tandem axles; 15000-17999 pounds for tridem and quad axles.
MEPDG_LG04	NUMBER(3,14)	Percent of axles whose weight falls in the bin 5000-5999 pounds for single axles; 10000-11999 pounds for tandem axles; 18000-20999 pounds for tridem and quad axles.
MEPDG_LG05	NUMBER(3,14)	Percent of axles whose weight falls in the bin 6000-6999 pounds for single axles; 12000-13999 pounds for tandem axles; 21000-23999 pounds for tridem and quad axles.
MEPDG_LG06	NUMBER(3,14)	Percent of axles whose weight falls in the bin 7000-7999 pounds for single axles; 14000-15999 pounds for tandem axles; 24000-26999 pounds for tridem and quad axles.
MEPDG_LG07	NUMBER(3,14)	Percent of axles whose weight falls in the bin 8000-8999 pounds for single axles; 16000-17999 pounds for tandem axles; 27000-29999 pounds for tridem and quad axles.
MEPDG_LG08	NUMBER(3,14)	Percent of axles whose weight falls in the bin 9000-9999 pounds for single axles; 18000-19999 pounds for tandem axles; 30000-32999 pounds for tridem and quad axles.
MEPDG_LG09	NUMBER(3,14)	Percent of axles whose weight falls in the bin 10000-10999 pounds for single axles; 20000-21999 pounds for tandem axles; 33000-35999 pounds for tridem and quad axles.
MEPDG_LG10	NUMBER(3,14)	Percent of axles whose weight falls in the bin 11000-11999 pounds for single axles; 22000-23999 pounds for tandem axles; 36000-38999 pounds for tridem and quad axles.
MEPDG_LG11	NUMBER(3,14)	Percent of axles whose weight falls in the bin 12000-12999 pounds for single axles; 24000-25999 pounds for tandem axles; 39000-41999 pounds for tridem

Field Name	Data Type	Description
		and quad axles.
MEPDG_LG12	NUMBER(3,14)	Percent of axles whose weight falls in the bin 13000-13999 pounds for single axles; 26000-27999 pounds for tandem axles; 42000-44999 pounds for tridem and quad axles.
MEPDG_LG13	NUMBER(3,14)	Percent of axles whose weight falls in the bin 14000-14999 pounds for single axles; 28000-29999 pounds for tandem axles; 45000-47999 pounds for tridem and quad axles.
MEPDG_LG14	NUMBER(3,14)	Percent of axles whose weight falls in the bin 15000-15999 pounds for single axles; 30000-31999 pounds for tandem axles; 48000-50999 pounds for tridem and quad axles.
MEPDG_LG15	NUMBER(3,14)	Percent of axles whose weight falls in the bin 16000-16999 pounds for single axles; 32000-33999 pounds for tandem axles; 51000-53999 pounds for tridem and quad axles.
MEPDG_LG16	NUMBER(3,14)	Percent of axles whose weight falls in the bin 17000-17999 pounds for single axles; 34000-35999 pounds for tandem axles; 54000-56999 pounds for tridem and quad axles.
MEPDG_LG17	NUMBER(3,14)	Percent of axles whose weight falls in the bin 18000-18999 pounds for single axles; 36000-37999 pounds for tandem axles; 57000-59999 pounds for tridem and quad axles.
MEPDG_LG18	NUMBER(3,14)	Percent of axles whose weight falls in the bin 19000-19999 pounds for single axles; 38000-39999 pounds for tandem axles; 60000-62999 pounds for tridem and quad axles.
MEPDG_LG19	NUMBER(3,14)	Percent of axles whose weight falls in the bin 20000-20999 pounds for single axles; 40000-41999 pounds for tandem axles; 63000-65999 pounds for tridem and quad axles.
MEPDG_LG20	NUMBER(3,14)	Percent of axles whose weight falls in the bin 21000-21999 pounds for single axles; 42000-43999 pounds for tandem axles; 66000-68999 pounds for tridem and quad axles.
MEPDG_LG21	NUMBER(3,14)	Percent of axles whose weight falls in the bin 22000-22999 pounds for single axles; 44000-45999 pounds for tandem axles; 69000-71999 pounds for tridem and quad axles.
MEPDG_LG22	NUMBER(3,14)	Percent of axles whose weight falls in the bin 23000-23999 pounds for single axles; 46000-47999 pounds for tandem axles; 72000-74999 pounds for tridem and quad axles.
MEPDG_LG23	NUMBER(3,14)	Percent of axles whose weight falls in the bin 24000-24999 pounds for single axles; 48000-49999 pounds for tandem axles; 75000-77999 pounds for tridem and quad axles.
MEPDG_LG24	NUMBER(3,14)	Percent of axles whose weight falls in the bin 25000-25999 pounds for single axles; 50000-51999 pounds for tandem axles; 78000-80999 pounds for tridem and quad axles.
MEPDG_LG25	NUMBER(3,14)	Percent of axles whose weight falls in the bin 26000-26999 pounds for single axles; 52000-53999 pounds for tandem axles; 81000-83999 pounds for tridem and quad axles.
MEPDG_LG26	NUMBER(3,14)	Percent of axles whose weight falls in the bin 27000-27999 pounds for single axles; 54000-55999 pounds for tandem axles; 84000-86999 pounds for tridem and quad axles.
MEPDG_LG27	NUMBER(3,14)	Percent of axles whose weight falls in the bin 28000-28999 pounds for single axles; 56000-57999 pounds for tandem axles; 87000-89999 pounds for tridem and quad axles.
MEPDG_LG28	NUMBER(3,14)	Percent of axles whose weight falls in the bin 29000-29999 pounds for single axles; 58000-59999 pounds for tandem axles; 90000-92999 pounds for tridem and quad axles.
MEPDG_LG29	NUMBER(3,14)	Percent of axles whose weight falls in the bin 30000-30999 pounds for single

Field Name	Data Type	Description
		axles; 60000-61999 pounds for tandem axles; 93000-95999 pounds for tridem and quad axles.
MEPDG_LG30	NUMBER(3,14)	Percent of axles whose weight falls in the bin 31000-31999 pounds for single axles; 62000-63999 pounds for tandem axles; 96000-98999 pounds for tridem and quad axles.
MEPDG_LG31	NUMBER(3,14)	Percent of axles whose weight falls in the bin 32000-32999 pounds for single axles; 64000-65999 pounds for tandem axles; 99000-101999 pounds for tridem and quad axles.
MEPDG_LG32	NUMBER(3,14)	Percent of axles whose weight falls in the bin 33000-33999 pounds for single axles; 66000-67999 pounds for tandem axles.
MEPDG_LG33	NUMBER(3,14)	Percent of axles whose weight falls in the bin 34000-34999 pounds for single axles; 68000-69999 pounds for tandem axles.
MEPDG_LG34	NUMBER(3,14)	Percent of axles whose weight falls in the bin 35000-35999 pounds for single axles; 70000-71999 pounds for tandem axles.
MEPDG_LG35	NUMBER(3,14)	Percent of axles whose weight falls in the bin 36000-36999 pounds for single axles; 72000-73999 pounds for tandem axles.
MEPDG_LG36	NUMBER(3,14)	Percent of axles whose weight falls in the bin 37000-37999 pounds for single axles; 74000-75999 pounds for tandem axles.
MEPDG_LG37	NUMBER(3,14)	Percent of axles whose weight falls in the bin 38000-38999 pounds for single axles; 76000-77999 pounds for tandem axles.
MEPDG_LG38	NUMBER(3,14)	Percent of axles whose weight falls in the bin 39000-39999 pounds for single axles; 78000-79999 pounds for tandem axles.
MEPDG_LG39	NUMBER(3,14)	Percent of axles whose weight falls in the bin 40000-40999 pounds for single axles; 80000-81999 pounds for tandem axles.

Table 10. Field names and descriptions for SITE_SPECIFIC_NVCD.

Field Name	Data Type	Description
STATE_CODE	NUMBER(2,0)	Numerical code for State or Province. U.S. codes are consistent with Federal Information Processing Standards.
SHRP_ID	VARCHAR2(255)	Test section identification number assigned by LTPP program. Must be combined with STATE_CODE to be unique.
YEAR	NUMBER(4,0)	Year for which values apply.
VEHICLE_CLASS	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
Pct_Trucks_Class	NUMBER(3,2)	The percentage of the truck population represented by this class.

Table 11. Field names and descriptions for USER_DEFINED_NALS.

Field Name	Data Type	Description
VEH_CLASS	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
AXLE_GROUP	NUMBER(1,0)	Type of axle for which these percentages of axles apply.
NALS_CLUSTERS	VARCHAR2(255)	Text field indicating the type of NALS cluster.
MEPDG_LG01	NUMBER(3,14)	Percent of axles whose weight falls in the bin 0-2999 pounds for single axles; 0-5999 pounds for tandem axles; 0-11999 pounds for tridem and quad axles.
MEPDG_LG02	NUMBER(3,14)	Percent of axles whose weight falls in the bin 3000-3999 pounds for single axles; 6000-7999 pounds for tandem axles; 12000-14999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG03	NUMBER(3,14)	Percent of axles whose weight falls in the bin 4000-4999 pounds for single axles; 8000-9999 pounds for tandem axles; 15000-17999 pounds for tridem and quad axles.
MEPDG_LG04	NUMBER(3,14)	Percent of axles whose weight falls in the bin 5000-5999 pounds for single axles; 10000-11999 pounds for tandem axles; 18000-20999 pounds for tridem and quad axles.
MEPDG_LG05	NUMBER(3,14)	Percent of axles whose weight falls in the bin 6000-6999 pounds for single axles; 12000-13999 pounds for tandem axles; 21000-23999 pounds for tridem and quad axles.
MEPDG_LG06	NUMBER(3,14)	Percent of axles whose weight falls in the bin 7000-7999 pounds for single axles; 14000-15999 pounds for tandem axles; 24000-26999 pounds for tridem and quad axles.
MEPDG_LG07	NUMBER(3,14)	Percent of axles whose weight falls in the bin 8000-8999 pounds for single axles; 16000-17999 pounds for tandem axles; 27000-29999 pounds for tridem and quad axles.
MEPDG_LG08	NUMBER(3,14)	Percent of axles whose weight falls in the bin 9000-9999 pounds for single axles; 18000-19999 pounds for tandem axles; 30000-32999 pounds for tridem and quad axles.
MEPDG_LG09	NUMBER(3,14)	Percent of axles whose weight falls in the bin 10000-10999 pounds for single axles; 20000-21999 pounds for tandem axles; 33000-35999 pounds for tridem and quad axles.
MEPDG_LG10	NUMBER(3,14)	Percent of axles whose weight falls in the bin 11000-11999 pounds for single axles; 22000-23999 pounds for tandem axles; 36000-38999 pounds for tridem and quad axles.
MEPDG_LG11	NUMBER(3,14)	Percent of axles whose weight falls in the bin 12000-12999 pounds for single axles; 24000-25999 pounds for tandem axles; 39000-41999 pounds for tridem and quad axles.
MEPDG_LG12	NUMBER(3,14)	Percent of axles whose weight falls in the bin 13000-13999 pounds for single axles; 26000-27999 pounds for tandem axles; 42000-44999 pounds for tridem and quad axles.
MEPDG_LG13	NUMBER(3,14)	Percent of axles whose weight falls in the bin 14000-14999 pounds for single axles; 28000-29999 pounds for tandem axles; 45000-47999 pounds for tridem and quad axles.
MEPDG_LG14	NUMBER(3,14)	Percent of axles whose weight falls in the bin 15000-15999 pounds for single axles; 30000-31999 pounds for tandem axles; 48000-50999 pounds for tridem and quad axles.
MEPDG_LG15	NUMBER(3,14)	Percent of axles whose weight falls in the bin 16000-16999 pounds for single axles; 32000-33999 pounds for tandem axles; 51000-53999 pounds for tridem and quad axles.
MEPDG_LG16	NUMBER(3,14)	Percent of axles whose weight falls in the bin 17000-17999 pounds for single axles; 34000-35999 pounds for tandem axles; 54000-56999 pounds for tridem and quad axles.
MEPDG_LG17	NUMBER(3,14)	Percent of axles whose weight falls in the bin 18000-18999 pounds for single axles; 36000-37999 pounds for tandem axles; 57000-59999 pounds for tridem and quad axles.
MEPDG_LG18	NUMBER(3,14)	Percent of axles whose weight falls in the bin 19000-19999 pounds for single axles; 38000-39999 pounds for tandem axles; 60000-62999 pounds for tridem and quad axles.
MEPDG_LG19	NUMBER(3,14)	Percent of axles whose weight falls in the bin 20000-20999 pounds for single axles; 40000-41999 pounds for tandem axles; 63000-65999 pounds for tridem and quad axles.
MEPDG_LG20	NUMBER(3,14)	Percent of axles whose weight falls in the bin 21000-21999 pounds for single axles; 42000-43999 pounds for tandem axles; 66000-68999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG21	NUMBER(3,14)	Percent of axles whose weight falls in the bin 22000-22999 pounds for single axles; 44000-45999 pounds for tandem axles; 69000-71999 pounds for tridem and quad axles.
MEPDG_LG22	NUMBER(3,14)	Percent of axles whose weight falls in the bin 23000-23999 pounds for single axles; 46000-47999 pounds for tandem axles; 72000-74999 pounds for tridem and quad axles.
MEPDG_LG23	NUMBER(3,14)	Percent of axles whose weight falls in the bin 24000-24999 pounds for single axles; 48000-49999 pounds for tandem axles; 75000-77999 pounds for tridem and quad axles.
MEPDG_LG24	NUMBER(3,14)	Percent of axles whose weight falls in the bin 25000-25999 pounds for single axles; 50000-51999 pounds for tandem axles; 78000-80999 pounds for tridem and quad axles.
MEPDG_LG25	NUMBER(3,14)	Percent of axles whose weight falls in the bin 26000-26999 pounds for single axles; 52000-53999 pounds for tandem axles; 81000-83999 pounds for tridem and quad axles.
MEPDG_LG26	NUMBER(3,14)	Percent of axles whose weight falls in the bin 27000-27999 pounds for single axles; 54000-55999 pounds for tandem axles; 84000-86999 pounds for tridem and quad axles.
MEPDG_LG27	NUMBER(3,14)	Percent of axles whose weight falls in the bin 28000-28999 pounds for single axles; 56000-57999 pounds for tandem axles; 87000-89999 pounds for tridem and quad axles.
MEPDG_LG28	NUMBER(3,14)	Percent of axles whose weight falls in the bin 29000-29999 pounds for single axles; 58000-59999 pounds for tandem axles; 90000-92999 pounds for tridem and quad axles.
MEPDG_LG29	NUMBER(3,14)	Percent of axles whose weight falls in the bin 30000-30999 pounds for single axles; 60000-61999 pounds for tandem axles; 93000-95999 pounds for tridem and quad axles.
MEPDG_LG30	NUMBER(3,14)	Percent of axles whose weight falls in the bin 31000-31999 pounds for single axles; 62000-63999 pounds for tandem axles; 96000-98999 pounds for tridem and quad axles.
MEPDG_LG31	NUMBER(3,14)	Percent of axles whose weight falls in the bin 32000-32999 pounds for single axles; 64000-65999 pounds for tandem axles; 99000-101999 pounds for tridem and quad axles.
MEPDG_LG32	NUMBER(3,14)	Percent of axles whose weight falls in the bin 33000-33999 pounds for single axles; 66000-67999 pounds for tandem axles.
MEPDG_LG33	NUMBER(3,14)	Percent of axles whose weight falls in the bin 34000-34999 pounds for single axles; 68000-69999 pounds for tandem axles.
MEPDG_LG34	NUMBER(3,14)	Percent of axles whose weight falls in the bin 35000-35999 pounds for single axles; 70000-71999 pounds for tandem axles.
MEPDG_LG35	NUMBER(3,14)	Percent of axles whose weight falls in the bin 36000-36999 pounds for single axles; 72000-73999 pounds for tandem axles.
MEPDG_LG36	NUMBER(3,14)	Percent of axles whose weight falls in the bin 37000-37999 pounds for single axles; 74000-75999 pounds for tandem axles.
MEPDG_LG37	NUMBER(3,14)	Percent of axles whose weight falls in the bin 38000-38999 pounds for single axles; 76000-77999 pounds for tandem axles.
MEPDG_LG38	NUMBER(3,14)	Percent of axles whose weight falls in the bin 39000-39999 pounds for single axles; 78000-79999 pounds for tandem axles.
MEPDG_LG39	NUMBER(3,14)	Percent of axles whose weight falls in the bin 40000-40999 pounds for single axles; 80000-81999 pounds for tandem axles.
Description	VARCHAR2(255)	User-defined description for the NALS.
Cluster_Description	VARCHAR2(255)	Text description for NALS_CLUSTERS field.
Recommended_Road_Usage	VARCHAR2(255)	Text description indicating the recommended road usage for the selected cluster.

Table 12. Field names and descriptions for XMLGen_AxleLoadDistribution.

Field Name	Data Type	Description
classNumber	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
numberAxle	NUMBER(1,0)	Type of axle (1-4) for which these values apply.
month	NUMBER(2,0)	Code specifying the month in numeric format (1-12).
axleLoad	NUMBER(2,0)	Code specifying load bins in DARWin-ME (1-39)
percentTrucksPerLoad	NUMBER(3,14)	Percent of axles whose weight falls in the specified DARWin-ME load bin.

Table 13. Field names and descriptions for XMLGen_AxleLoadMain_Template.

Field Name	Data Type	Description
classNumber	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
numberAxle	NUMBER(1,0)	Type of axle (1-4) for which these values apply.
month	NUMBER(2,0)	Code specifying the month in numeric format (1-12).
axleLoad	NUMBER(2,0)	Code specifying load bins in DARWin-ME (1-39)

Table 14. Field names and descriptions for XMLGen_DEFAULT_NALS_By_Loading_Cluster.

Field Name	Data Type	Description
VEH_CLASS	NUMBER(2,0)	Code indicating the 13-bin classification into which trucks have been grouped.
AXLE_GROUP	NUMBER(1,0)	Type of axle for which these percentages of axles apply.
MEPDG_LG01	NUMBER(3,14)	Percent of axles whose weight falls in the bin 0-2999 pounds for single axles; 0-5999 pounds for tandem axles; 0-11999 pounds for tridem and quad axles.
MEPDG_LG02	NUMBER(3,14)	Percent of axles whose weight falls in the bin 3000-3999 pounds for single axles; 6000-7999 pounds for tandem axles; 12000-14999 pounds for tridem and quad axles.
MEPDG_LG03	NUMBER(3,14)	Percent of axles whose weight falls in the bin 4000-4999 pounds for single axles; 8000-9999 pounds for tandem axles; 15000-17999 pounds for tridem and quad axles.
MEPDG_LG04	NUMBER(3,14)	Percent of axles whose weight falls in the bin 5000-5999 pounds for single axles; 10000-11999 pounds for tandem axles; 18000-20999 pounds for tridem and quad axles.
MEPDG_LG05	NUMBER(3,14)	Percent of axles whose weight falls in the bin 6000-6999 pounds for single axles; 12000-13999 pounds for tandem axles; 21000-23999 pounds for tridem and quad axles.
MEPDG_LG06	NUMBER(3,14)	Percent of axles whose weight falls in the bin 7000-7999 pounds for single axles; 14000-15999 pounds for tandem axles; 24000-26999 pounds for tridem and quad axles.
MEPDG_LG07	NUMBER(3,14)	Percent of axles whose weight falls in the bin 8000-8999 pounds for single axles; 16000-17999 pounds for tandem axles; 27000-29999 pounds for tridem and quad axles.
MEPDG_LG08	NUMBER(3,14)	Percent of axles whose weight falls in the bin 9000-9999 pounds for single axles; 18000-19999 pounds for tandem axles; 30000-32999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG09	NUMBER(3,14)	Percent of axles whose weight falls in the bin 10000-10999 pounds for single axles; 20000-21999 pounds for tandem axles; 33000-35999 pounds for tridem and quad axles.
MEPDG_LG10	NUMBER(3,14)	Percent of axles whose weight falls in the bin 11000-11999 pounds for single axles; 22000-23999 pounds for tandem axles; 36000-38999 pounds for tridem and quad axles.
MEPDG_LG11	NUMBER(3,14)	Percent of axles whose weight falls in the bin 12000-12999 pounds for single axles; 24000-25999 pounds for tandem axles; 39000-41999 pounds for tridem and quad axles.
MEPDG_LG12	NUMBER(3,14)	Percent of axles whose weight falls in the bin 13000-13999 pounds for single axles; 26000-27999 pounds for tandem axles; 42000-44999 pounds for tridem and quad axles.
MEPDG_LG13	NUMBER(3,14)	Percent of axles whose weight falls in the bin 14000-14999 pounds for single axles; 28000-29999 pounds for tandem axles; 45000-47999 pounds for tridem and quad axles.
MEPDG_LG14	NUMBER(3,14)	Percent of axles whose weight falls in the bin 15000-15999 pounds for single axles; 30000-31999 pounds for tandem axles; 48000-50999 pounds for tridem and quad axles.
MEPDG_LG15	NUMBER(3,14)	Percent of axles whose weight falls in the bin 16000-16999 pounds for single axles; 32000-33999 pounds for tandem axles; 51000-53999 pounds for tridem and quad axles.
MEPDG_LG16	NUMBER(3,14)	Percent of axles whose weight falls in the bin 17000-17999 pounds for single axles; 34000-35999 pounds for tandem axles; 54000-56999 pounds for tridem and quad axles.
MEPDG_LG17	NUMBER(3,14)	Percent of axles whose weight falls in the bin 18000-18999 pounds for single axles; 36000-37999 pounds for tandem axles; 57000-59999 pounds for tridem and quad axles.
MEPDG_LG18	NUMBER(3,14)	Percent of axles whose weight falls in the bin 19000-19999 pounds for single axles; 38000-39999 pounds for tandem axles; 60000-62999 pounds for tridem and quad axles.
MEPDG_LG19	NUMBER(3,14)	Percent of axles whose weight falls in the bin 20000-20999 pounds for single axles; 40000-41999 pounds for tandem axles; 63000-65999 pounds for tridem and quad axles.
MEPDG_LG20	NUMBER(3,14)	Percent of axles whose weight falls in the bin 21000-21999 pounds for single axles; 42000-43999 pounds for tandem axles; 66000-68999 pounds for tridem and quad axles.
MEPDG_LG21	NUMBER(3,14)	Percent of axles whose weight falls in the bin 22000-22999 pounds for single axles; 44000-45999 pounds for tandem axles; 69000-71999 pounds for tridem and quad axles.
MEPDG_LG22	NUMBER(3,14)	Percent of axles whose weight falls in the bin 23000-23999 pounds for single axles; 46000-47999 pounds for tandem axles; 72000-74999 pounds for tridem and quad axles.
MEPDG_LG23	NUMBER(3,14)	Percent of axles whose weight falls in the bin 24000-24999 pounds for single axles; 48000-49999 pounds for tandem axles; 75000-77999 pounds for tridem and quad axles.
MEPDG_LG24	NUMBER(3,14)	Percent of axles whose weight falls in the bin 25000-25999 pounds for single axles; 50000-51999 pounds for tandem axles; 78000-80999 pounds for tridem and quad axles.
MEPDG_LG25	NUMBER(3,14)	Percent of axles whose weight falls in the bin 26000-26999 pounds for single axles; 52000-53999 pounds for tandem axles; 81000-83999 pounds for tridem and quad axles.
MEPDG_LG26	NUMBER(3,14)	Percent of axles whose weight falls in the bin 27000-27999 pounds for single axles; 54000-55999 pounds for tandem axles; 84000-86999 pounds for tridem and quad axles.

Field Name	Data Type	Description
MEPDG_LG27	NUMBER(3,14)	Percent of axles whose weight falls in the bin 28000-28999 pounds for single axles; 56000-57999 pounds for tandem axles; 87000-89999 pounds for tridem and quad axles.
MEPDG_LG28	NUMBER(3,14)	Percent of axles whose weight falls in the bin 29000-29999 pounds for single axles; 58000-59999 pounds for tandem axles; 90000-92999 pounds for tridem and quad axles.
MEPDG_LG29	NUMBER(3,14)	Percent of axles whose weight falls in the bin 30000-30999 pounds for single axles; 60000-61999 pounds for tandem axles; 93000-95999 pounds for tridem and quad axles.
MEPDG_LG30	NUMBER(3,14)	Percent of axles whose weight falls in the bin 31000-31999 pounds for single axles; 62000-63999 pounds for tandem axles; 96000-98999 pounds for tridem and quad axles.
MEPDG_LG31	NUMBER(3,14)	Percent of axles whose weight falls in the bin 32000-32999 pounds for single axles; 64000-65999 pounds for tandem axles; 99000-101999 pounds for tridem and quad axles.
MEPDG_LG32	NUMBER(3,14)	Percent of axles whose weight falls in the bin 33000-33999 pounds for single axles; 66000-67999 pounds for tandem axles.
MEPDG_LG33	NUMBER(3,14)	Percent of axles whose weight falls in the bin 34000-34999 pounds for single axles; 68000-69999 pounds for tandem axles.
MEPDG_LG34	NUMBER(3,14)	Percent of axles whose weight falls in the bin 35000-35999 pounds for single axles; 70000-71999 pounds for tandem axles.
MEPDG_LG35	NUMBER(3,14)	Percent of axles whose weight falls in the bin 36000-36999 pounds for single axles; 72000-73999 pounds for tandem axles.
MEPDG_LG36	NUMBER(3,14)	Percent of axles whose weight falls in the bin 37000-37999 pounds for single axles; 74000-75999 pounds for tandem axles.
MEPDG_LG37	NUMBER(3,14)	Percent of axles whose weight falls in the bin 38000-38999 pounds for single axles; 76000-77999 pounds for tandem axles.
MEPDG_LG38	NUMBER(3,14)	Percent of axles whose weight falls in the bin 39000-39999 pounds for single axles; 78000-79999 pounds for tandem axles.
MEPDG_LG39	NUMBER(3,14)	Percent of axles whose weight falls in the bin 40000-40999 pounds for single axles; 80000-81999 pounds for tandem axles.

REFERENCES

1. *MEPDG Traffic Loading Defaults Derived from LTPP Transportation Pooled Fund Study*. In review.