Highway Performance Monitoring System Software Guide for Version 8.0

U.S. Department of Transportation
Federal Highway Administration

April 2014

Contents

Chapter 1—Introduction

This document serves as a guide to using HPMS 8.0, the software used for input, analysis and processing of Highway Performance Monitoring System (HPMS) data. It assumes that access to HPMS 8.0 has been granted through the User Profile Access Control System (UPACS). Please contact a FHWA Division Office for information about obtaining a UPACS account.

Please note that although UPACS operates 24 hours a day and seven days a week, maintenance windows impact the HPMS system. The HPMS system is therefore available from 7am to 11pm Monday through Saturday and 1pm through 11pm on Sunday. All times are Eastern Standard Time (EST).

This manual is a companion to the HPMS Field Manual which can be found on the Federal Highway Administration website (http://www.fhwa.dot.gov/policy/ohpi/hpms/fieldmanual/). All data collection and database definitions are contained in the Field Manual as opposed to this Software Guide.

HPMS 8.0 is divided into three distinct areas according levels of review and ownership of the data.

Level 1: The **Submit** (State) area is a staging environment to allow States to prepare data for submittal into the National HPMS Database.

Level 2: The **Review** environment allows FHWA staff to analyze the submitted data to ensure consistency with HPMS requirements.

Level 3: The **National** area is the official interface for public viewing of finalized HPMS data.

Key to Symbols and Text Notices in this Guide

There are three types of text boxes in this guide -

A white box will provide information about a screen.	A shaded box will indicate an instruction to the user.	*Purple italic print in a dashed box will indicate notes or warnings to the user .*

The guide also includes a few symbols to help users jump to important content or actions on the illustrations of application screens.

Star symbols indicate actions that should be taken by the user to complete processes.

Software features within process screens that are of particular interest are highlighted with large red circles or ovals

Chapter 2—HPMS Workflow

The HPMS v.8 workflow is illustrated in the diagram below. Workflow is from left to right beginning with Import* and ending with Submit. For each stage, there is a companion but independent mapping component that is derived from the Create Geometries tool. Frequently the HPMS submission process is iterative, with Validations or Import errors triggering revisions to data items and then new imports. The cyclical nature of the process is depicted with the arrow at the top of the diagram from the Verify stage, but each stage and/or data item required for the submission process could loop back to Import in order to complete the submittal. Note that this diagram is conceptual and does not mimic the menus in the software. As a result, State data types such as routes and sections appear alongside system outputs such as TOPS**.

Import	Samples	Validate	Verify	Submit
• Routes • Sections • Summary • Estimates • Metadata	• Create TOPS • Import Samples	• LRS • Sections • Samples • Coverage	• Sample Adequacy • Expansion Factors • Sample Data Item Check • Reports • Spatial Intersection	• Import Status/Checks • Confirm Mileage • Confirm Validations • Submission Comments

Mapping

Create Geometries: Routes/LRS, Sections, TOPS, Samples, Validations

Review

National

The National HPMS Database Import process consists of two parts, Upload and Insert. The Upload step involves the transmission of data from the user (State) cpu to the FHWA HPMS server. This step is followed by the Insert process whereby data on the HPMS server are incorporated into the National HPMS database.

**TOPS (Table of Potential Samples), is the HPMS sampling frame and is composed of five elements; Functional System, Facility Type, Urban Code, AADT, and Through Lanes. See Chapter 6 of the Field Manual for more information.*

Chapter 3—HPMS Application Layout

Each HPMS 8.0 screen is generally partitioned according to the following layout. The application itself is dynamic such that depending on where you are in the application, options may change. For example, while the Application Menu will provide an option for data import in the Submittal Area, the Review Area Application Menu will provide options to View Review Reports.

HPMS Entry Screen

1   **Database Area**- Displays three buttons to navigate between Submittal (State), Review and National datasets.

2   **Exit**– Exit HPMS application. After selecting Exit, the user is prompted to confirm exit in case this function was hit unintentionally.

3   **Filter**– Users must select the appropriate Year (and State for those with national access) before importing, exporting, viewing or editing data.

4   **Application Menu**– Allows users to select a specific table in the database or perform a specific task in the application. Selecting an item on this menu will typically navigate to a different screen.

5   **Screen Indicator**– Displays the name of the active Application Menu item.

Database Area

Select an Area by clicking Submittal, Review or National. Only one location may be selected at a time.

Submittal- State DOT users and their approved agents have permission to access the Submittal Area of the National HPMS Database. They will have access only to their State based on their UPACS account information. The Submittal Area provides tools and processes to assist State DOTs in preparing the annual HPMS submittal.

Review - Access to the Review Area is granted to State DOTs and FHWA staff to evaluate data quality issues once the data has been submitted by the State.

National – The official record for the annual HPMS data submission. The National Area enables users to view products and data that have been approved for release to the public.

State and Year Filter

1. Click on the Year and State Label

2. Change Year/State Screen is displayed

3. Enter a 4 digit Year in the Text box for Year and use the drop down list to select a State.

4. Click OK to change the Year

5. Changes made will appear in the Year/State Label

The filter area is used to set the application workspace to the data year and State of choice. Follow these steps to change the Year and State parameters: HPMS users normally work with a specific Year and State. The Filter allows a user to select and change the filter. There are some reports and queries that will allow multi-year and multi-state selection. With these exceptions, work within HPMS 8.0 will always relate to the options selected via this filter.

Note: State Users will be restricted to their own State in the Submittal Area.

Application Menu
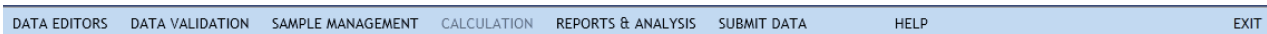
The application menu provides the functionality of the software, from importing to reporting. The Application Menu is located in a light blue bar across the top of the window. Menu items are unique for each Database Area. The menu shown above is for the Submittal Area. The Application Menu is discussed in more detail in Chapter 4.

Map Display & Tabular Grid

During the submittal and review processes users typically will view data via a map display and accompanying tabular grid. The following image illustrates the general layout of the map with an accompanying grid below. Subsequent images provide detail about each component of the map and table portions of the application display.

Screen Layout

Note that data items won't appear in the map window until the Create Geometries process is completed. See Page 19 for guidance.

Map Window

Grid Window

Grid Features

Delete functions

Click top of any column to sort records

Click, hold and drag any header to reposition columns of data.

Invokes Record Editor

A colored globe icon Indicates that there is a spatial relationship to the Route or Section record.

Fields that can be filtered are demarcated with a filter icon.

Navigation and Map Layers

Users may also Pan and Zoom from the mouse controls

Pan: Click on Cardinal Points to pan map.

Toggle On/Off Layers Control

Obtain information about Map Data Layers: Click this button and then click on the desired section.

Toggle On/Off Map Legend

Map Scale

Collapse/ Expand Layer and Scale Tools

Adjust the Opacity of the Navigation Tools: Regardless of position of slider, the Navigation Tools will always illuminate when the cursor is placed on the tool bar.

Zoom: Click on Plus or Minus symbol or slide bar.

Zoom to Full Extent: This may take some time to fully execute.

Collapse/ Expand Zoom and Opacity Tools

Legend

- IRI < 95
- IRI 95 - 170
- IRI >170

Map Legend: The map legend can be turned on or off using the Legend Icon on the Navigation grid, or the X in the Legend's top corner. The Legend can also be moved by clicking with the mouse cursor and dragging to another location on the screen.
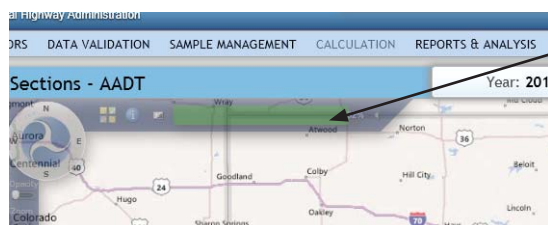
A green status bar will appear when map elements are drawing.

Layers

- Counties — Zoom To
- State — Zoom To
- ✓ Bing Map —
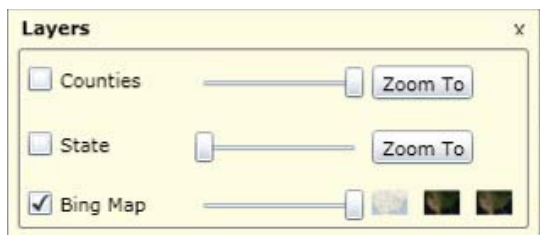
Layers Control: Checking the boxes next to available map layers will turn them on. The Opacity of each layer can be adjusted with the slider bar. Zoom buttons allow a quick zoom to the State or county level.

Use these buttons to select map, aerial or aerial with labels background images.

Applying Filters to Grid

Specific data sets may be examined through the use of the query feature in the grid table. Fields that may be filtered are indicated with a funnel icon in the field header on the data grid. The graphics below illustrate the filter process.

To query data records, click the funnel icon on the field to be filtered.
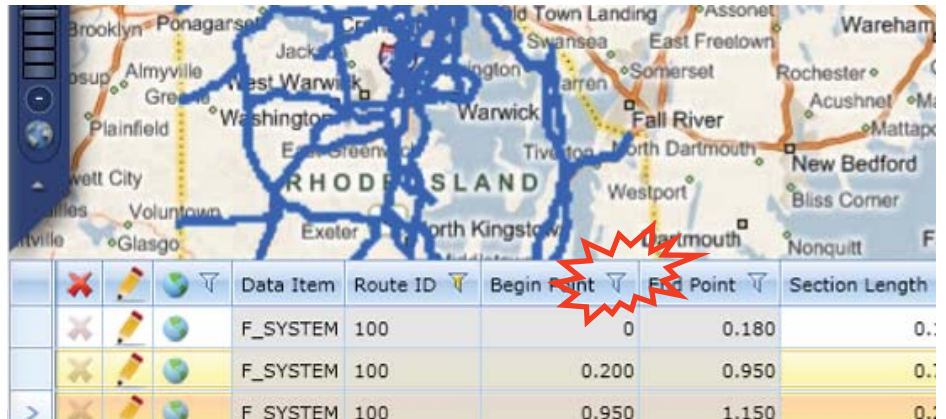
A dialog box will appear after clicking on the funnel icon.

Type in query parameters in the spaces provided being sure to use the drop down menu to select the appropriate filter string— Is equal to, Contains, etc.
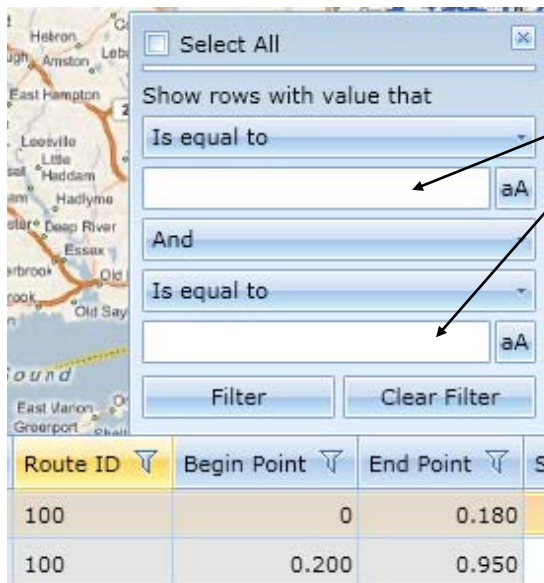
Enter query text here.

Grid Filters Continued

After entering query parameters, click Filter.

The Records Are Displayed in the Grid and the sections are displayed where there is a spatial link.

Deleting and editing data are covered in another section of this manual.

Grid Filters Continued
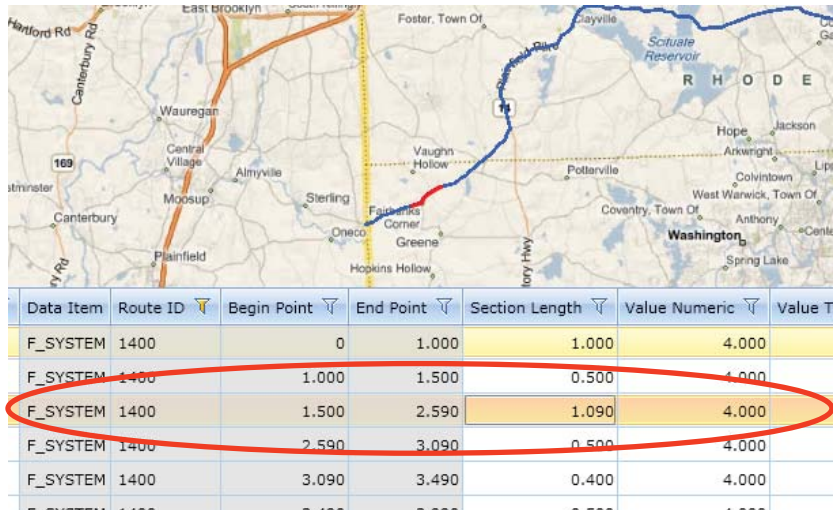
Double click on a record in the grid to highlight the section. If there is a spatial link, the focus will change to that record.

Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value T
F_SYSTEM	1400	0	1.000	1.000	4.000	
F_SYSTEM	1400	1.000	1.500	0.500	4.000	
F_SYSTEM	1400	1.500	2.590	1.090	4.000	
F_SYSTEM	1400	2.590	3.090	0.500	4.000	
F_SYSTEM	1400	3.090	3.490	0.400	4.000	

em	Route ID	Begin Point	End Point	Section Length	Va
EM	1400	0	1.0		
EM	1400	1.000	1.5		
EM	1400	1.500	2.590	1.090	

Zoom To Feature
Zoomed Preview

Right click on a record to provide Zoom options, where Zoom to Feature will display the limits of the feature selected as long as a spatial link has been established.

| Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value Text	Value D
F_SYSTEM	1400	0	1.000	1.000	4.000		
F_SYSTEM	1400	1.000	1.500	0.500	4.000		
F_SYSTEM	1400	1.500	2.590	1.090	4.000		
F_SYSTEM	1400	2.590	3.090	0.500	4.000		
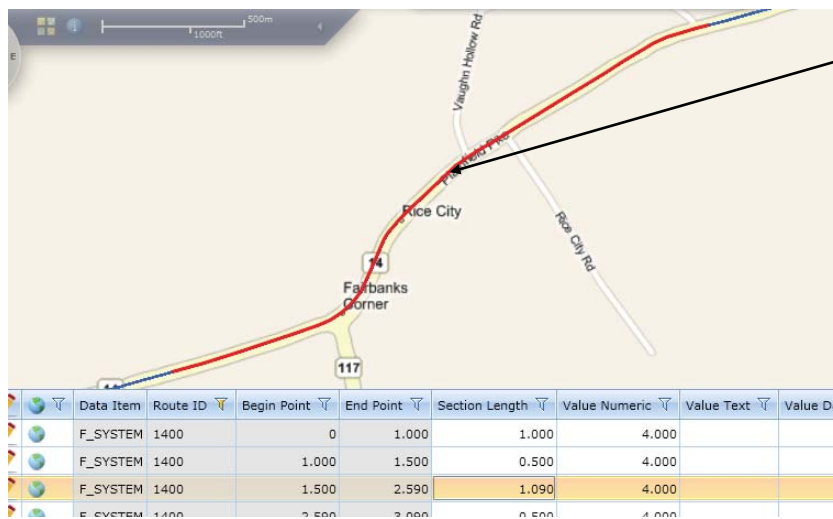
Chapter 4—The Application Menu

| DATA EDITORS | DATA VALIDATION | SAMPLE MANAGEMENT | CALCULATION | REPORTS & ANALYSIS | SUBMIT DATA | HELP | EXIT |

The application menu show above provides key functionality for users during submission of HPMS data. A summary of key process steps functions and their related HPMS v.8 application menu are listed below.

Process Step	Menu
Import	Data Editors
Export	Data Editors
Validate	Data Validation
Create TOPS	Sample Management
Sample Adequacy	Sample Management
Run Geometry	Data Editors/Sections, Data Validation, or Sample Management
Report	Reports & Analysis
Delete (Group of Items or "Batch Delete")	Data Editors
Submit	Submit

The HPMS application menu is intended for use from left to right (from Data Editors to Submittal) but can also be used in a non linear fashion as data may be entered, reviewed, and edited intermixed with other data loads, validation checks and report views. Use the workflow diagram shown in Chapter 2, as a quick reference for submission steps throughout the process. That diagram is show here with User Guide page numbers for each process in parentheses for quick reference.

Import	Samples	Validate	Verify	Submit
• Routes • Sections • Summary • Estimates • Metadata	•Create TOPS •Import Samples	• LRS • Sections • Samples • Coverage	• Sample Adequacy • Expansion Factors • Sample Data Item Check • Reports • Spatial Intersection	• Import Status/Checks • Confirm Mileage • Confirm Validations • Submission Comments

Mapping

Create Geometries: Routes/LRS, Sections, TOPS, Samples, Validations

Data Editors Menu

Software Functions within the Data Editors Menu

The functions listed under the Data Editors heading provide users with access to import, export, modify and view data in preparation of the annual HPMS submittal. As such, a firm understanding of the tools provided within this portion of the software interface is important for all users of the HPMS software application.
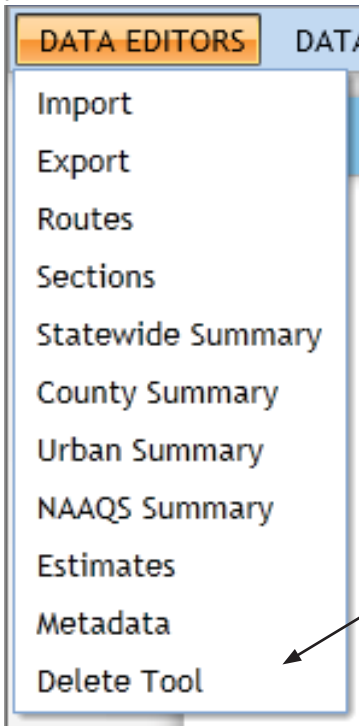
NOTE: Although data may be modified here, it is strongly recommended that any necessary changes be made at the source and not through these reporting tools.

Functionality of the Delete Tool is covered in Chapter 5 - Quick Reference along with the various options users have to delete data that is in the HPMS system.

Importing Data

Overview
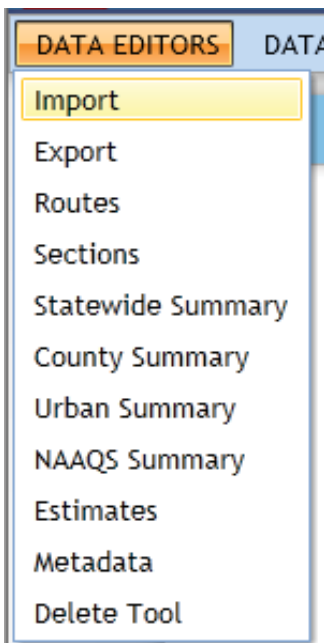
All data are imported through the Application Menu —> Data Editors —>Import. See the following pages for suggested order for importing routes, section data and summary files.

The National HPMS Database is populated through a two part import process which is commenced by the user and completed by the software behind the scenes.

Step 1: The user begins the import process by uploading data. The data are then Validated by the HPMS system. (User must be logged in during this step).

Step 2: Uploaded data are incorporated into necessary tables in the National HPMS Database. This insert process takes place in the background. (User does not need to be logged in during this step).

An import status bar provides a visual queue concerning the success of the import process. Upon completion, a link is enabled, providing users access to a report with documentation about errors encountered in the import.

*Note that some data items may be available for export as spatial and tabular files.*

Steps to Import Data

Step 1—Select Import on the Left Margin

From the Import Log, click Import on the left margin to begin a new import.
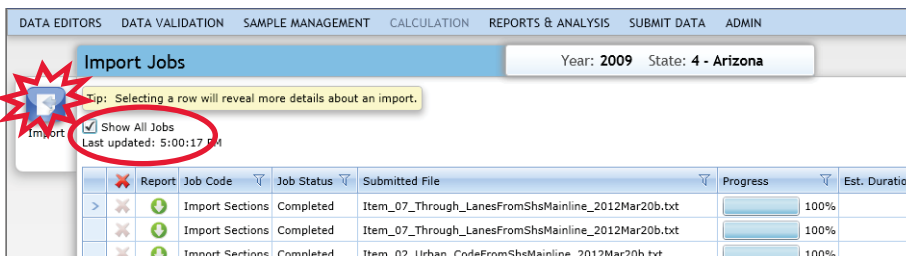
The Import Log automatically shows the most recent imports. To see the full list of imports check the Show All Jobs box.


Step 2—Select the Type of Data Being Imported

On the HPMS Data Import screen, select the data type to import by checking on one of the blue dots above available data types. The dot will turn Green when selected.

Click "Next".

This is an example of a shape file import. Details on formats are listed in the Routes section of this chapter.

IMPORTANT NOTE: The order of import does not matter, but some processes (such as report generation) may produce inaccurate results if they are run before all necessary elements are imported. The suggested import order is Routes, Section Data, Samples and then Summary Files. Note that TOPS must be created for the Sample import process to complete properly. See guidance on TOPS creation on in the Sample Management section of this guide.

Step 3—Browse for Files to Load

On Step 2 of the HPMS Data Import screen, click on the Browse Button to display a browse window for files to import.
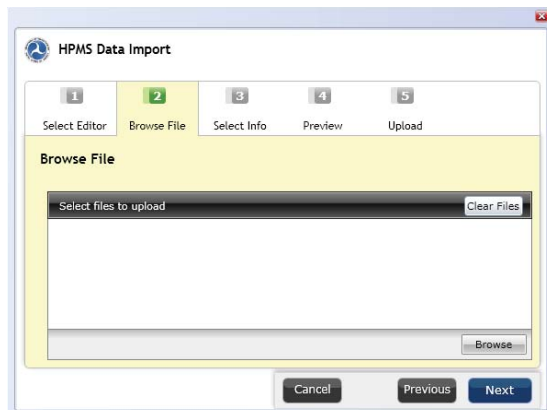
Import Steps Continued

Step 4—Verify File to Import

After selecting that appropriate file from your system, verify that the imported file is correct and click "Next".
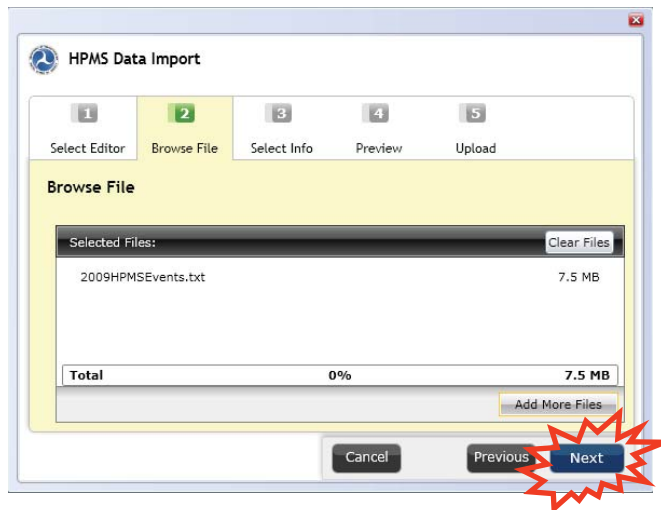
Step 5—Enter Special Information for the Data Type.

Enter the requested information about the imported data on the following screen and click "Next".
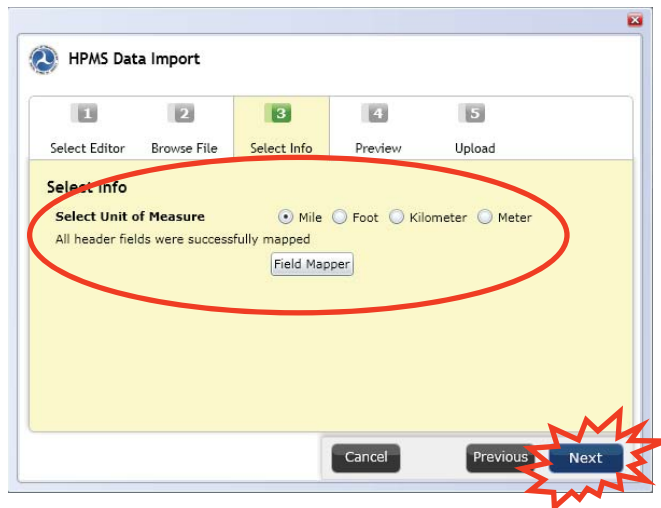
Step 6—Click the Next Button

Review the preview of imported records and click "Next".

The preview feature may not be available for all data types.
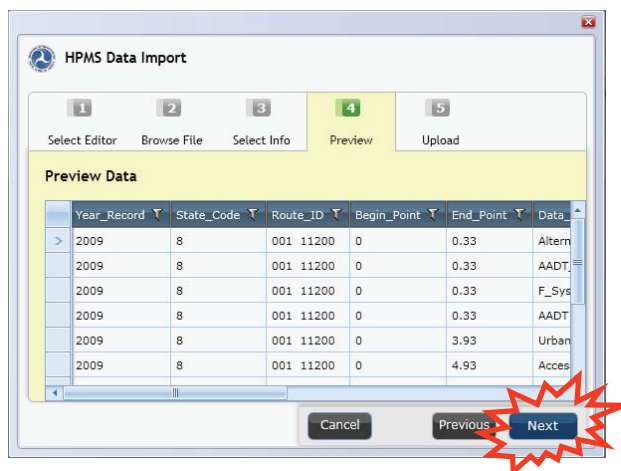
Import Steps Continued

Step 7—After the Upload is Complete, Click the Next Button

When the Upload Progress status bar is complete, click "Next".
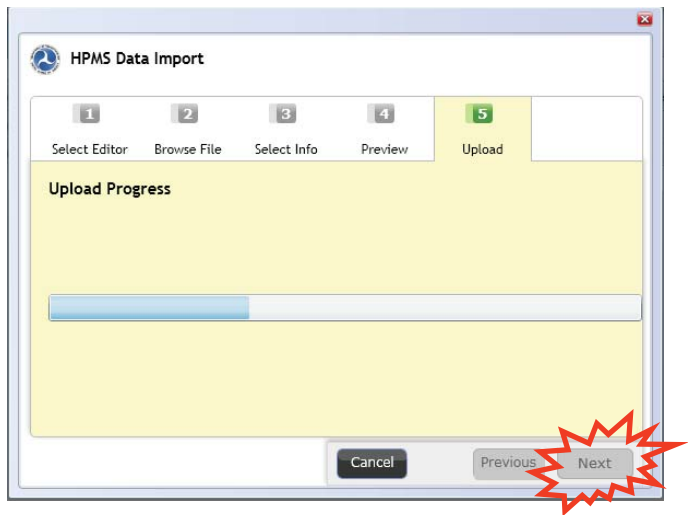
Step 8—Review the Import Jobs Log

After the import is complete, the Import Jobs Log will return, showing the status of insert into the database. This part of the import process takes place in the background. The user may navigate away from this screen or the HPMS Application entirely.

Click on a row in the import table to display information about the import process.

Review the preview of imported records and click "Next".

Import Results Reports

Once the import procedure completes, a log of the results may be viewed and/or downloaded. The Import Jobs Log displays import jobs that have completed successfully with a Job Status as "Completed", Progress as 100% and a Green Arrow Icon in the Report Column.

Select Data Editors > Import from the Submittal Application Menu.
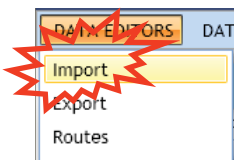
Remember… to import any kind of data, just go to Data Editors —> Import. From here, the user can also review the import logs for any issues.

Import Results—Continued

The Green Arrow Renders Reports

Select the Green Arrow icon to render a report of the import with a link to error feedback on the report process.
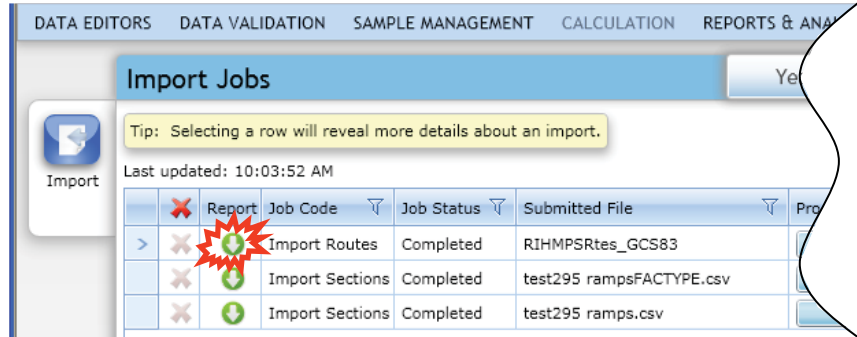
This will display a Report Viewer window. The report will then expand to a summary.

Click "Next".
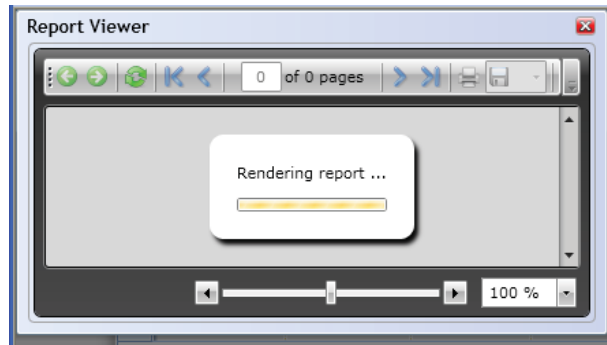
Click "Submittal Results" to show the Error and Warning Messages.

Print and Save options are available.
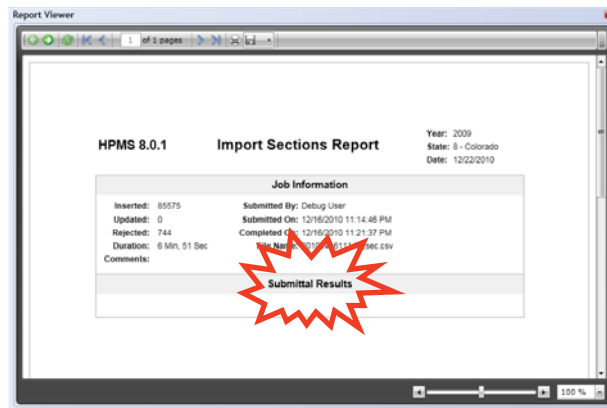
Import Reports Can Be Expanded to Submittal Results

Note: This sample error report is based on fictitious data.
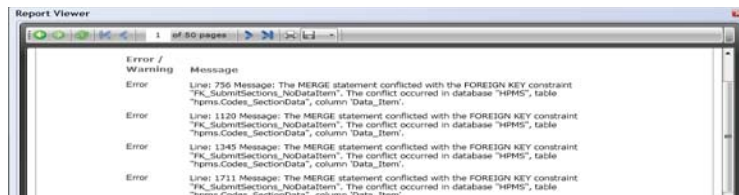
Field Mapping for Import Files

Each imported file may have unique formatting. The order of the columns or the field names may use a different convention.

The field mapper lets the user define (for each type of import—summary, sections, etc.) the fields being imported.

The Import tool requires that files have the exact number of fields required. For section data this is 11 fields. See Chapter 3 of the HPMS Field Manual for details about required fields for HPMS datasets.

Click the Field Mapper Button to Define Other Specific Import Fields
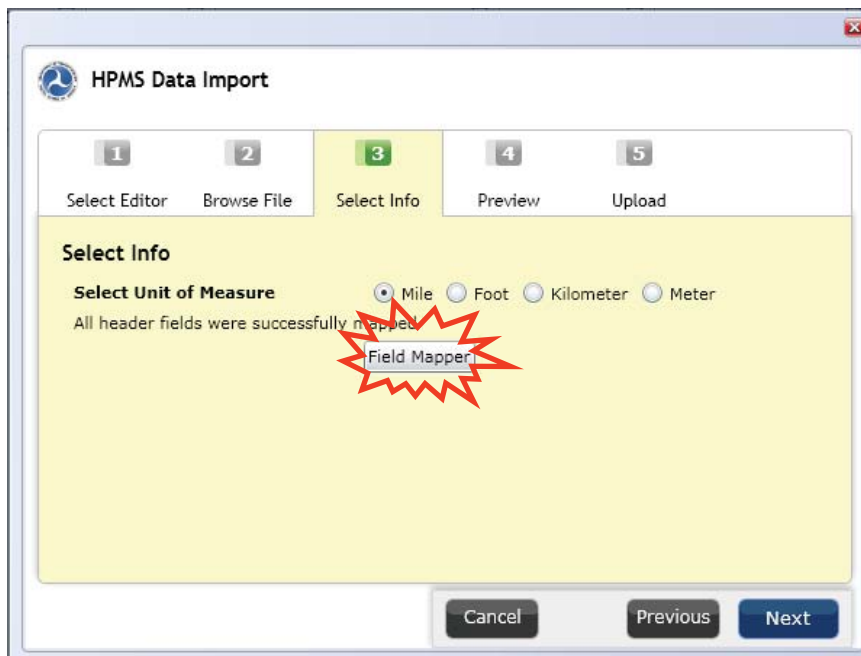
The following are examples of some of the formats for the File Mapper screen for various file types.

Section Import Example

Most file types use the Field Mapper to ensure that import fields are correctly mapped to the HPMS database. Use the drop down options on the right to map fields if necessary. Fields marked with a red asterisk are required.
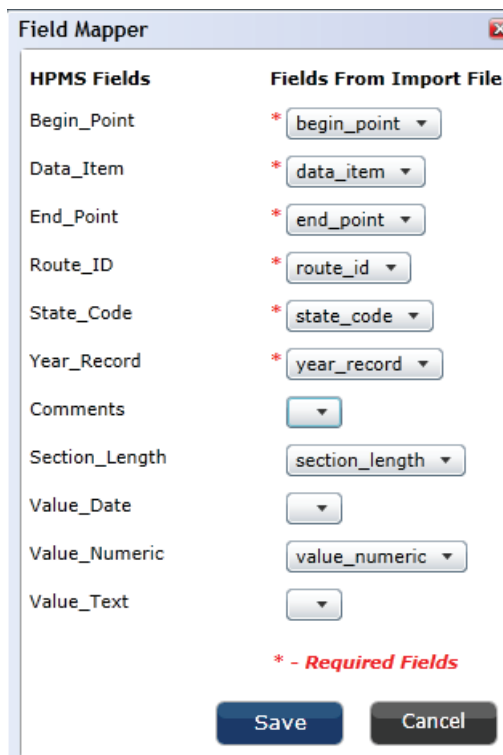
Field Mapping Continued

Field Mapper

HPMS Fields	Fields From Import File
State_Code	* state_code ▼
Urban_Code	* urban_code ▼
Year_Record	* year_record ▼
Local_VMT	local_vmt ▼
State_Portion_Land	state_portion_land ▼
State_Portion_Pop	state_portion_pop ▼

* - Required Fields

[Save]   [Cancel]

Urban Summary Example

*As with the sections files being imported, the Summary, Estimates, and Metadata files also need to have header rows in order to correctly map field names. Be sure to use the pipe (|) delimiter for the import file in order for the HPMS software to recognize your heder row.*

Sample File Example

The field mapper will automatically select fields from the input data that closely match the required fields. Quickly review these fields to ensure that the field mapper has made the right selections.

Field Mapper

HPMS Fields	Fields From Import File
Begin_Point	* begin_point ▼
End_Point	* end_point ▼
Route_ID	* route_id ▼
State_Code	* state_code ▼
Year_Record	* year_record ▼
Comments	▼
Expansion_Factor	▼
Sample_ID	sample_id ▼
Section_Length	section_length ▼

* - Required Fields

[Save]   [Cancel]

Route File Imports

Route imports are a bit different than Section imports. The Import tool is still used in the import process, but menu options are unique to routes during the process.

Step 1 - Select *Routes* **from the Import Dialog**
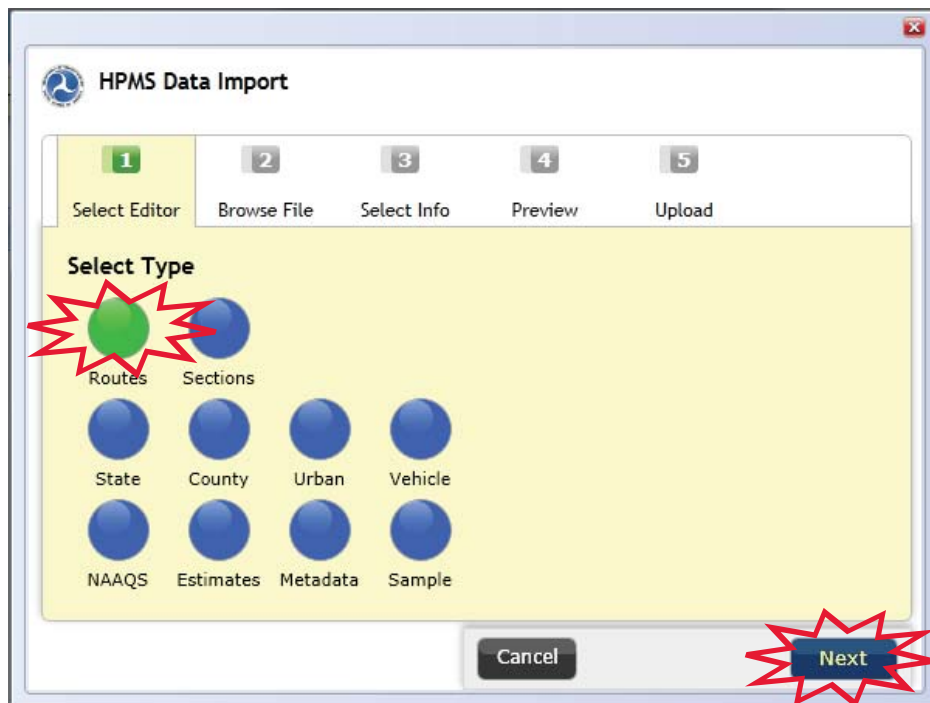
File names in this section are for demonstration purposes only and are not intended to serve as a guide for appropriate file size, naming conventions or other State specific file characteristics.

Step 2 - Select the format used for the route file
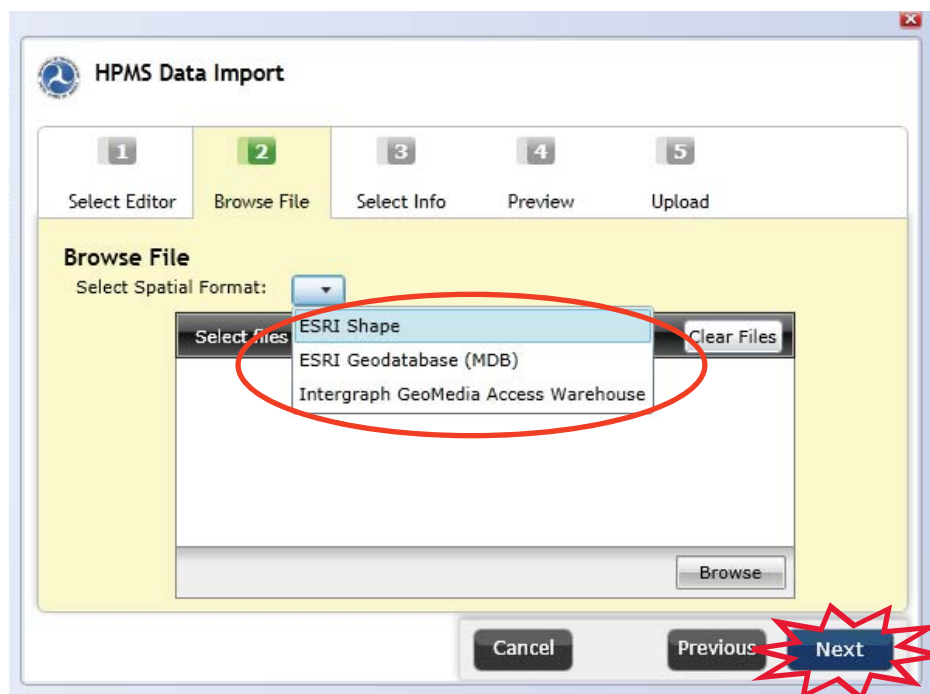
The HPMS v8x Software accepts three types of formats for route files: ESRI Shapefiles, ESRI Geodatabase and Intergraph (as a Geomedia Access Warehouse). Import screens are slightly different for each of these three options.

Screens for each of these formats are shown on the following pages.

After each step, Click Next to move on to the next step of the import process.

Step 2 - Continued - Select files for import via the browse button
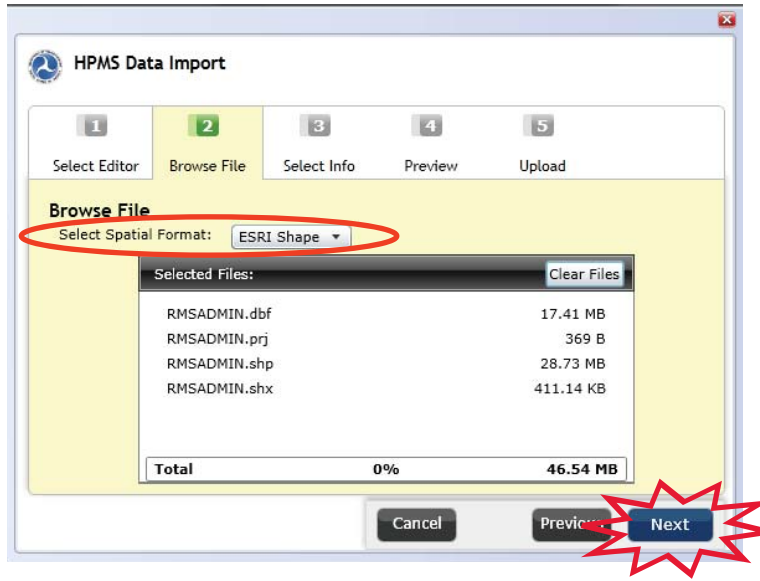
When importing an **ESRI Shapefile**, four component files are required as shown in the example at left.
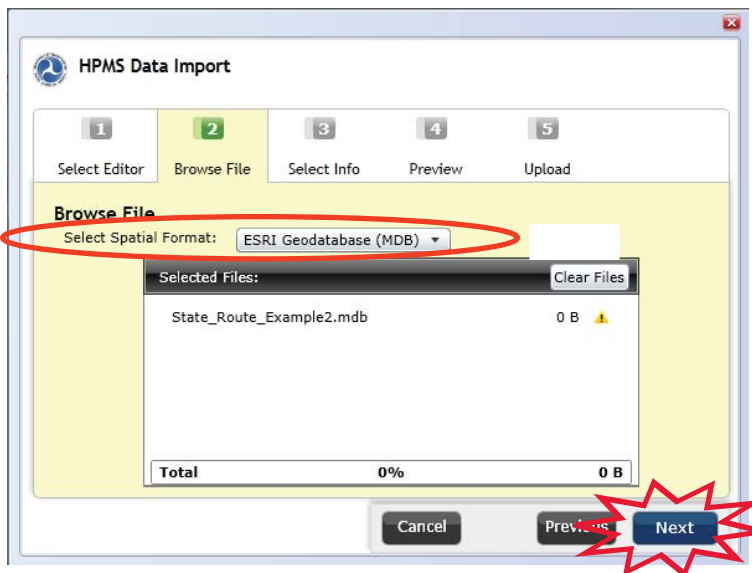
When importing an ESRI **(Personal) Geodatabase**, one file - stored with the Access database .mdb extension - is required as shown in the example at left.
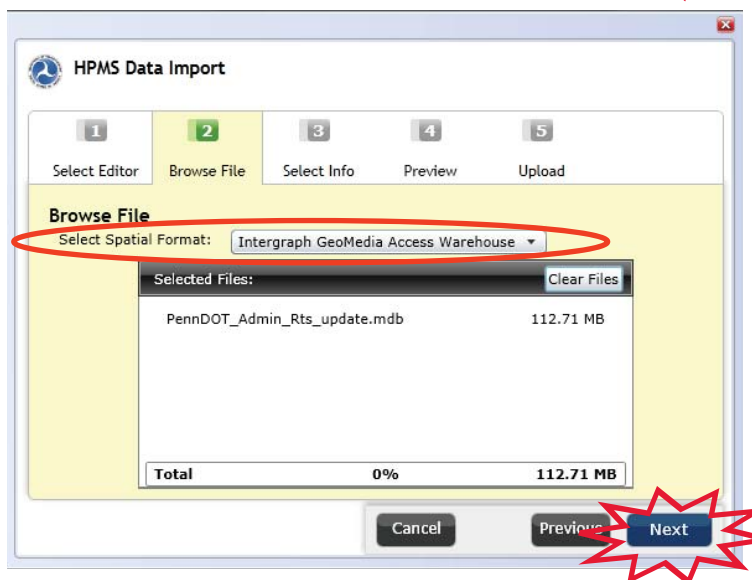
When importing an **Intergraph Geomedia Warehouse**, one file - stored as an Access database - is required as shown in the example at left.

Step 3 - Identify the unit of measure and required fields in the input file

When importing an **ESRI Shapefile**, the Begin and End Point fields will map automatically, use the drop down lists to select the Route ID and the Comments fields. The Comments field is optional.

The unit of measure should match Section data measures, otherwise LRS errors will occur when running Geometries. Note that the HPMS system converts all measures to Miles for analysis and reporting purposes after import.

When importing an ESRI **(Personal) Geodatabase**, all fields must be entered manually. Note that the entries here are CASE SENSITIVE. Again, the Comments field is optional.

*Items typed into these dialogue boxes must EXACTLY match the input file.*

When importing an **Intergraph Geomedia Warehouse**, all fields must be entered manually. Note that the entries here are CASE SENSITIVE. Again, the Comments field is optional.

The Route feature name is the table name from the .MDB file that contains the route features. Please contact HPMS staff at FHWA if you have questions about this component of the import process.

Step 4 - Preview
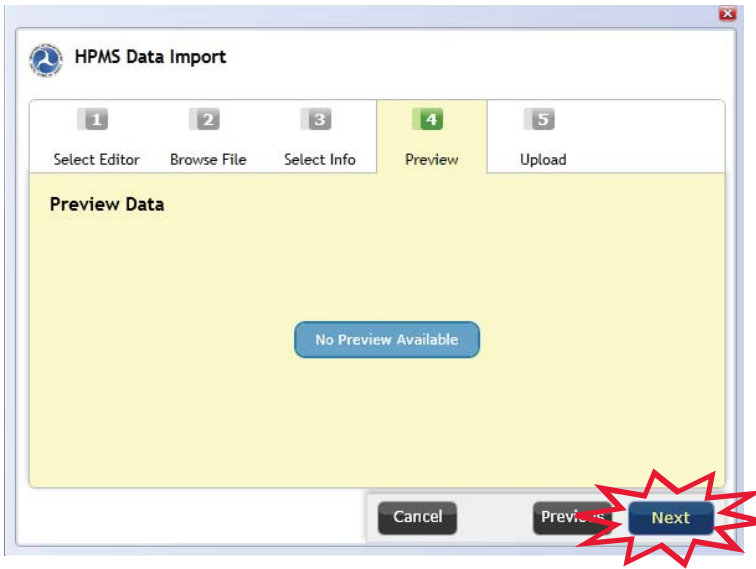
The system does not provide a preview of Route data so just click Next to move on to the next step of the import process.

Step 5 - Upload
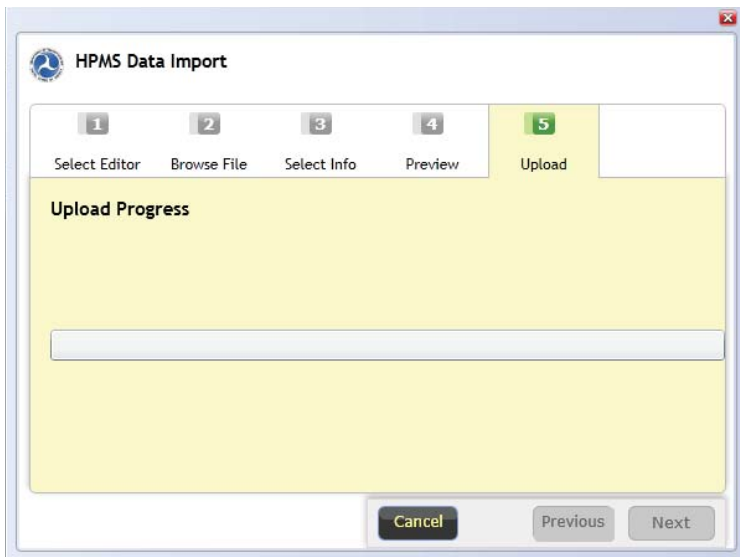
The final step is the Upload process. This may take some time to run. Once the Upload is complete, click Next. Refer to the Import log screen to monitor the import of Route files and review applicable Import Error Reports.

Import Validations can be viewed in Appendix A of this document.

Step 6 - Review Import Report For Route Files
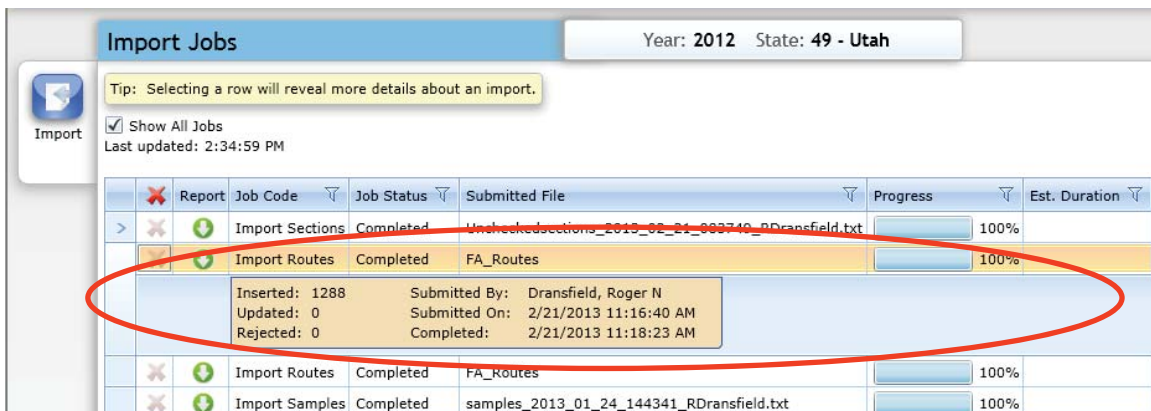
Exporting Data

All data are exported through the Export function from the Application Menu. The HPMS Application allows users to export data and download data into formats that can be ingested into other applications. Spatial data can be downloaded into shapefile or MDB (ESRI Personal Geodatabase or Intergraph Geomedia MDB*). Tabular data can be downloaded into CSV or Excel*.

The Intergraph (spatial files) and Excel (tabular files) export tools are currently in development but are not yet available.

Step 1—Navigate to the Export Screen

Click on "Export" from the Application Menu -> Data Editor Option.
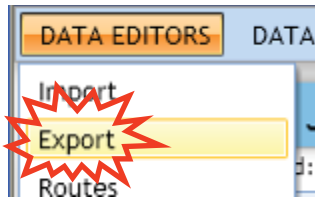
Step 2—Begin the Export Process by Selecting the Export button

The Export Jobs Log will be displayed.

Click Export from the left Margin.
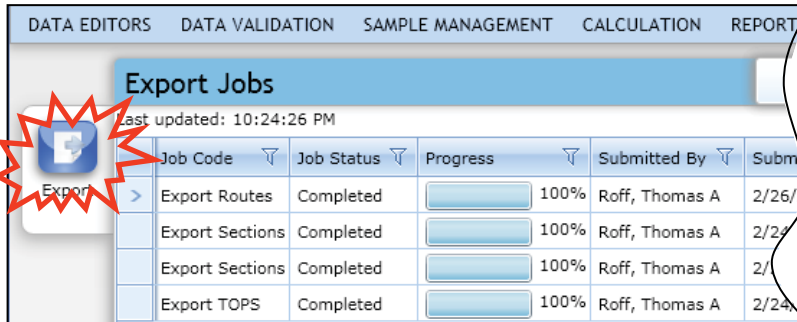
Step 3—Select the Desired Data Set for Export

The HPMS Data Export Screen will be displayed.

Select the Data Type to be exported from the matrix of data items by clicking on one of the blue dots above one of the listed options. The selected data item will turn green. Click Next.

For views of select Export outputs see Appendix C.

Note that some data items are available for export as spatial and tabular files.

Export Continued

Step 3—Select the Desired Data Set for Export

Most of the Export options available from the HPMS Data Export Screen are self evident. There are several options for Sample exports, however. The distinctions between these are displayed below.

Export Type	Key Components of Output
Sample	• Sample ID, • Begin/End Points, • Comments Field, • Expansion Factor Value (populated if Expansion Factors have been run), • Valid/Invalid Flag (populated if Sample Validation has been run)
Sample TOPS	• All fields in Sample export above and, • TOPS Volume Group, • The submitted values for the five TOPS data items (AADT, Through Lanes, Urban Code, Facility Type and Functional System) • And a Yes/No value to identify records where Geometry has been created
Sample Details	• All fields in the Sample TOPS (EXCEPT Geometry), • Values for each of the HPMS Data Items where submitted with sections data or calculated for the Sample extent based on procedures outlined in the HPMS Field Manual
TOPS (Shape)	• Sample ID, • Begin/End Points, • TOPS Volume Group, • Values for each of the HPMS Data Items where submitted with sections data or calculated for the Sample extent based on procedures outlined in the HPMS Field Manual

Export Continued

Step 4—Filter the data

Select the filter icon to the right of any data field to filter that the data by that field.

The State and year filters will already be applied to the data set at this point but other filters can be added as well. **Unless a filter is applied to the Data_Item field for Sections data, the export will include ALL loaded data.** *This may be a very large file.*

Filter text should be entered into the resulting dialog box.
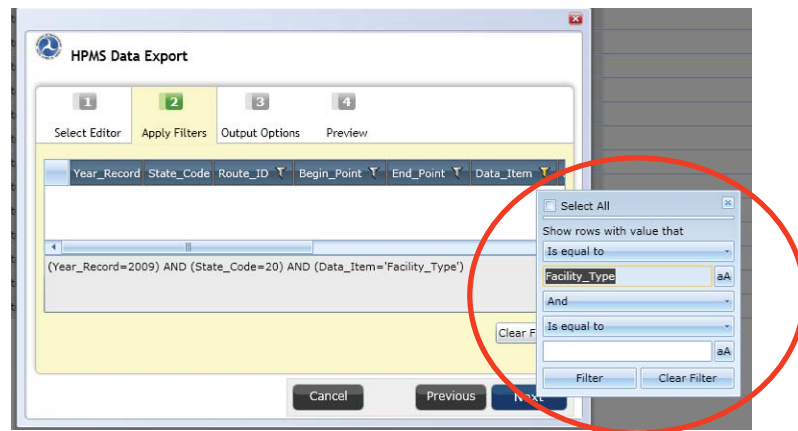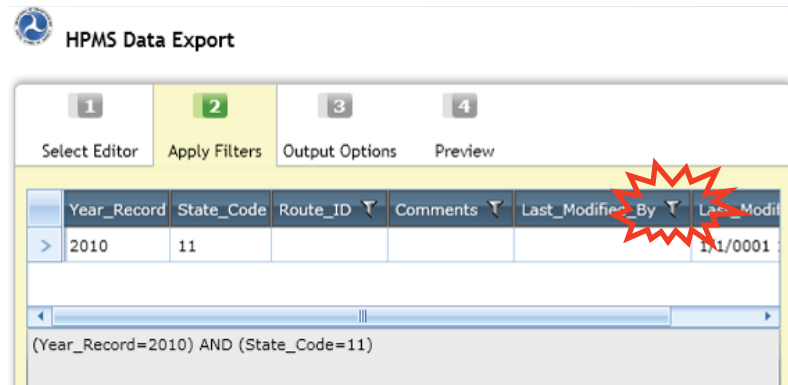
Step 5—Select Data Format for Export

Select a Unit of Measure and format of the Data to be exported and click Next.
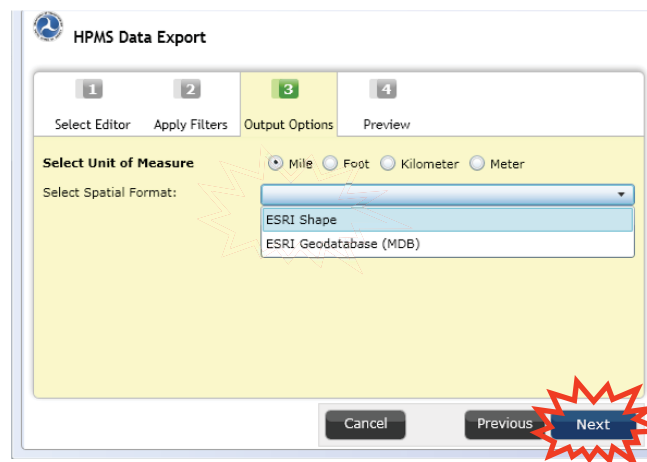
Export Continued

Step 6 - Review Screen/Saving the Data

Review information provided on the Preview Screen and click Finish.

HPMS Data Export

1 Select Editor **2** Apply Filters **3** Output Options **4** Preview

14867 records will be exported.

Cancel   Previous   Finish
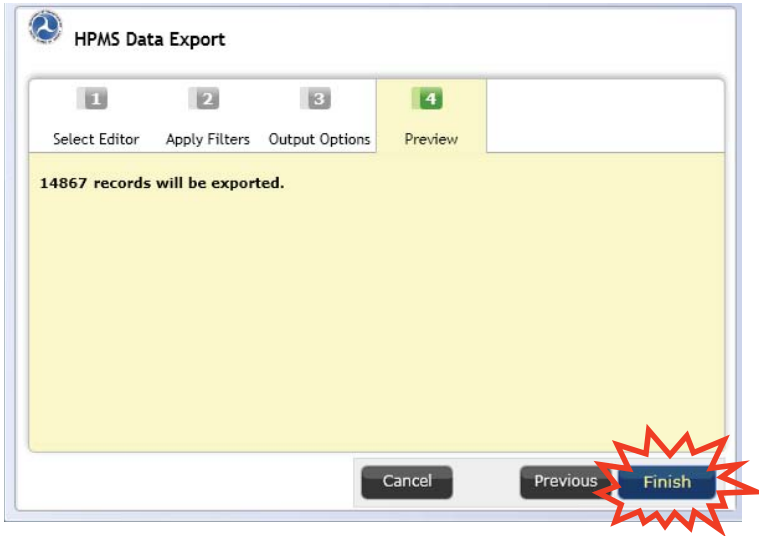
Select the desired location to save the data.

Download Data

Select file to export data   [   ]   Browse

[   ]

Download   Cancel
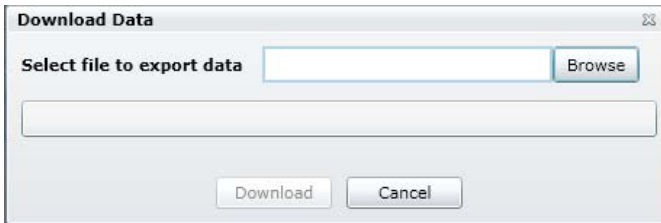
As with the Import tool, data export progress and report errors can be viewed in an Export Log. (The Log can be viewed by selecting Export from the Data Editors Menu on the main HPMS application menu.)

DATA EDITORS   DAT.

Import
Export
Routes
Sections
Statewide Summary
County Summary
Urban Summary
NAAQS Summary
Estimates
Metadata
Delete Tool
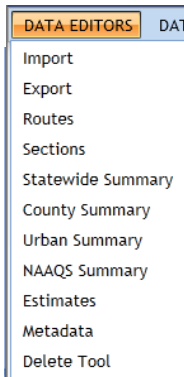
Job Code	Job Status	Progress	Submitted By	Submitted On	Completed On	Download
Export Routes	Files Uploaded	0%	Roff, Thomas A	2/26/2011 10:29:10 PM		
Export Routes	Completed	100%	Roff, Thomas A	2/26/2011 9:37:36 PM	2/26/2011 9:38:01 PM	⬇
Export Sections	Completed	100%	Roff, Thomas A	2/24/2011 11:00:12 PM	2/24/2011 11:00:14 PM	⬇

Example of Export Log view.

Data Viewers—Routes

The Routes menu allows users to view and query Route data.

Select Routes from the Data Editors Menu within the Application Menu to view or query Route data.
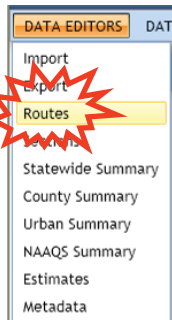
The steps below provide direction on how to examine route information in more detail.

Select a desired Route from the grid window below the map to view a close-up of a specific Route.
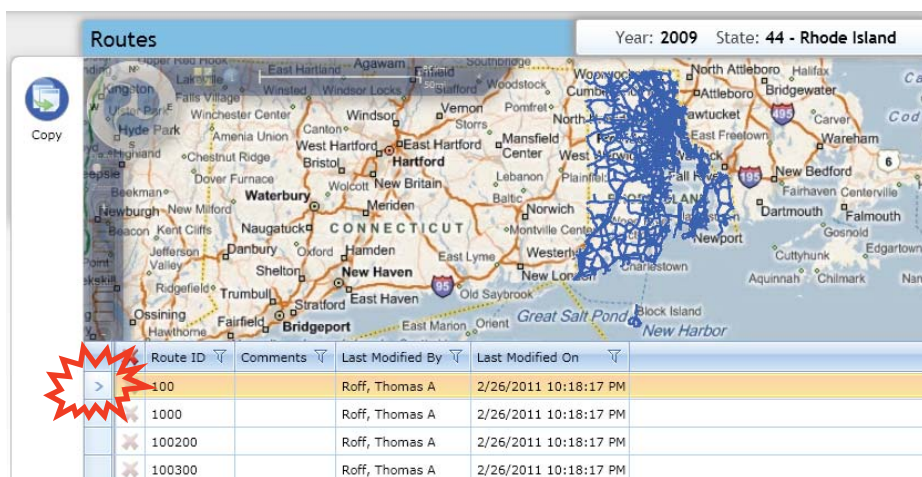
Right click on the highlighted record and select Zoom to Feature.
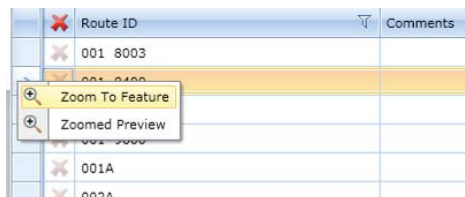
The map display window will be updated to reveal the route selected.
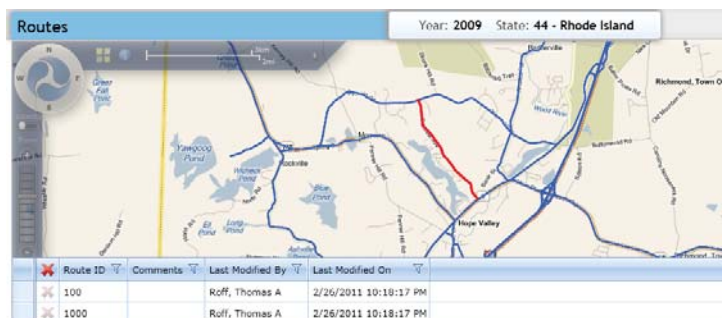
To see a preview of the selected route, select the Zoomed Preview option instead of Zoom to Feature. This is a helpful way to ensure that the route segment selected is the one in question. This is often most useful on crowded urban networks.

The Create Geometries Tool

Before Section data can be viewed in the map window of HPMS software screens, the Create Geometries process must be run. This process creates a spatial file from Section, Sample, TOPS and Validation records. Once geometries are created, users can view data in the map window. The process for creating geometries is described below.

The Create Geometries Tool that appears on the Section, Validation and Sample Management Pages provides access to the Geometry process for all of these data types regardless of what screen the user is viewing. Creating Geometries for the fewest items necessary will enhance processing time.

Click the Create Geometries button to open the Create Geometries dialog. The Last Submitted date and Status columns provide information about the last Geometry creation process that was run for the active submission year and State.

Next, select the type of Geometry to run using the check boxes for TOPS and Sample, Section and/or Validation. Any combination of the three options can be run.

Click the Create Geometries Button to run the process.
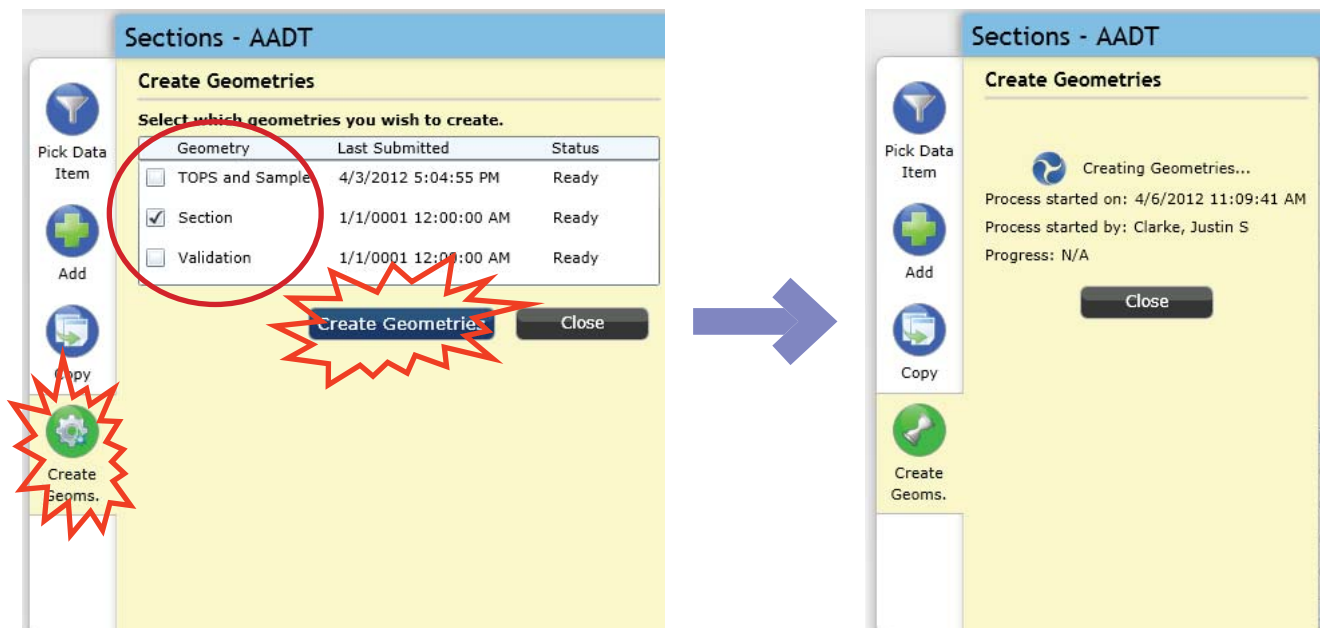
This process runs in the background, so it is OK to close the dialog box and move away from the screen while the process is running. Bear in mind that many files are quite large and the process may take several hours to complete. It is advised that users load several data items and then run geometries at the end of each work session (day/week) rather than after each data item is data loaded. Beginning the Geometry process in off hours (early/late) will also reduce run time.

Geometries Continued

When the geometry process is complete, data will appear in the map window. Note also that the globe icon will be colored for records that have geometries.

Use the Filter Tool (with text NO) to find records for which geometries did not create.

There are a number of reasons that geometries might not create but route numbers that don't exist in the LRS or section points that are beyond the bounds of LRS sections are two of the most common.

Click on the filter icon and select Clear Filter to remove the filter.

Click the Create Geometries Button to run the process.

Data Viewers—Sections

Section data can be viewed and queried just as Route Data.

Select Sections from the Data Editors Menu to access section data.
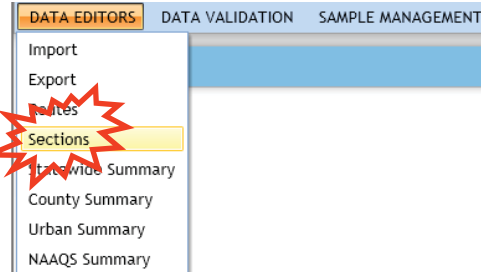
Click on the Filter tool to bring up a list of Section data that can be viewed.
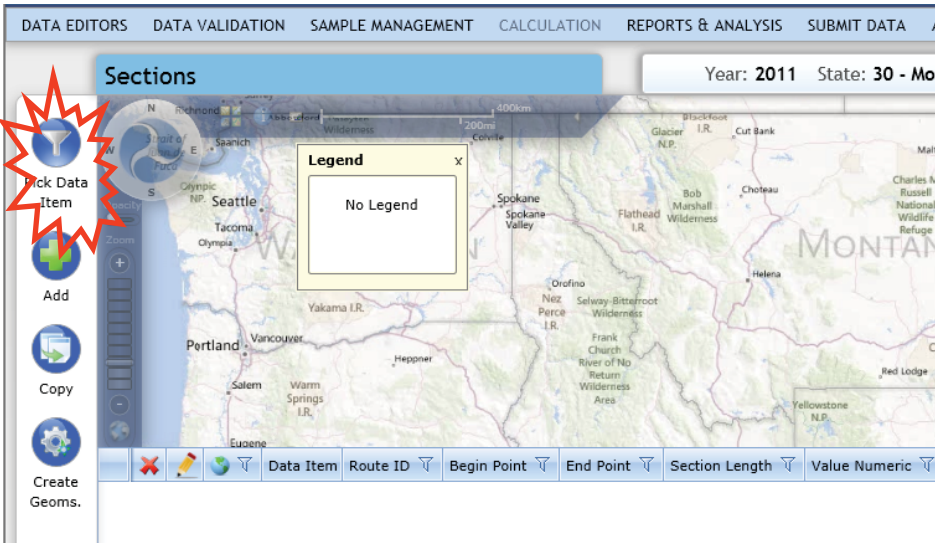
Select an item to view from the list and click Display Selection to generate a map view displaying the section set.

The Filter box can be used to quickly jump to a Section data item by entering the first few characters of the data item.

Items are listed alpha-betically by their HPMS Data Item name.
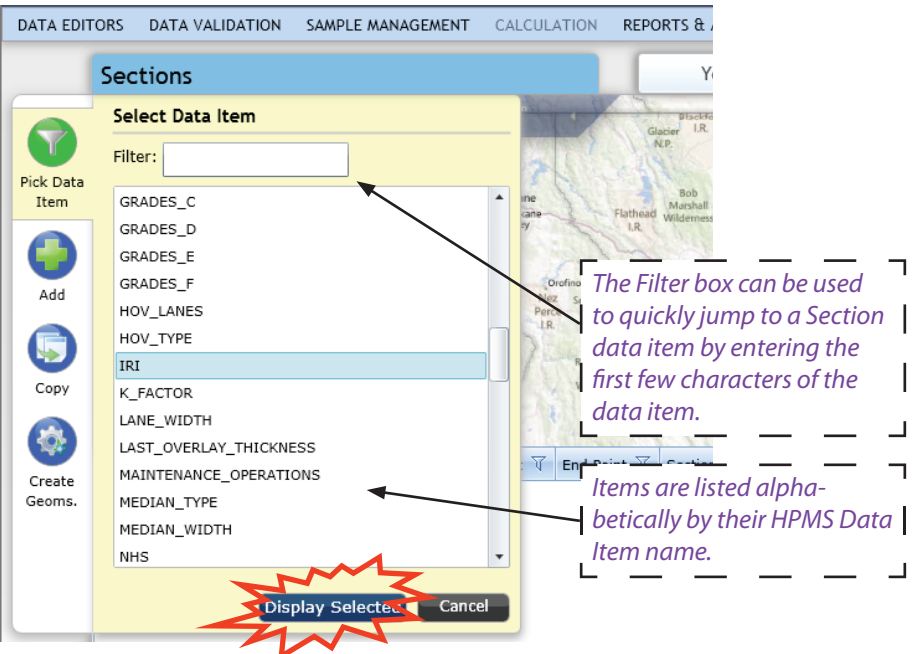
Data Viewers—Sections Continued

Click on the Map tool bar to turn on (or off) the **Legend.**

Click on any of the **filter icons** adjacent to the field headers to filter records within a data item.

To filter for records that have or have not been spatially mapped, use Yes or No in the filter dialog box after clicking on the filter next to the globe icon in the table header.
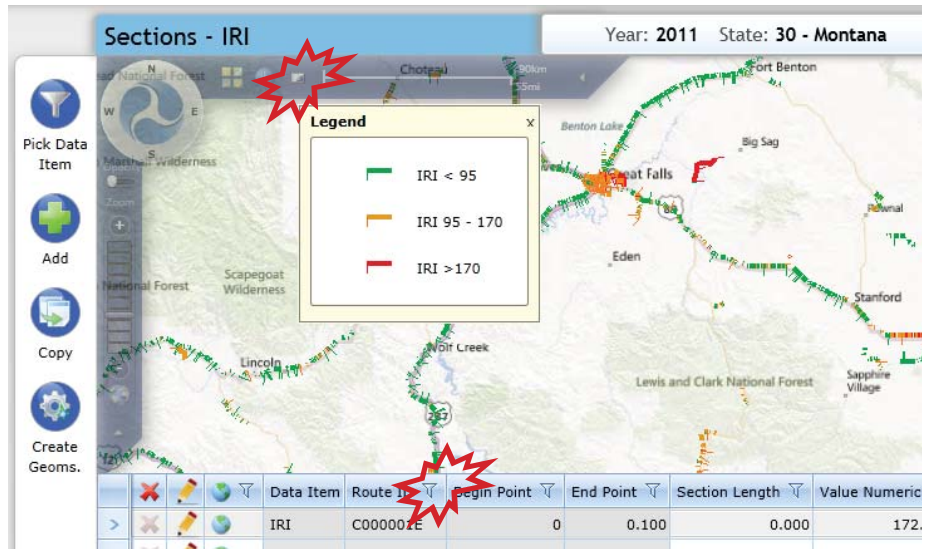
Click on the **Add** tool to manually add records. Select the appropriate data item from the drop down menu before entering any data.
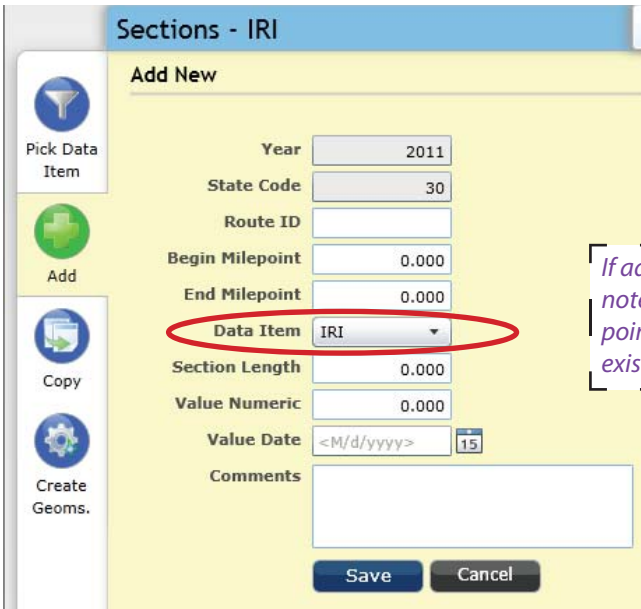
If adding records manually, note that the begin and end points must not overlap existing section data.

Section data can be copied in from a previous year's data set using the **Copy** tool.

Click on the **Copy** tool to copy previous year's data. Be sure to select appropriate year and data item using the drop down radio buttons.
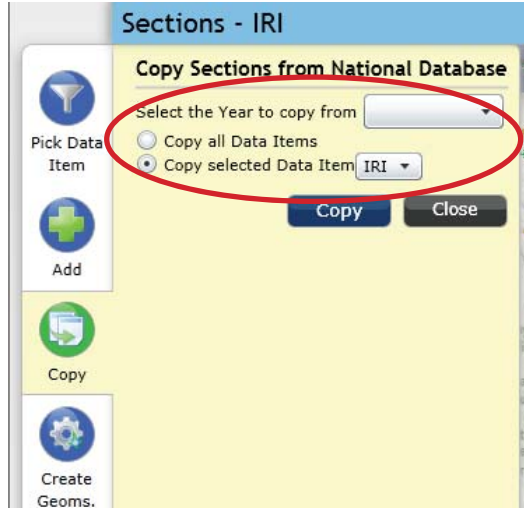
All section data can be copied from a previous year, but this tool is typically used for one Data Item at a time. Note that data is copied from the National HPMS database, so data in Review is not available for Copy.

Summary Features—Statewide Summary

Several Data Summary screens are accessed via the Data Editors Menu options. The first of these, State Summary, provides three tabular views of State data that has been loaded into the HPMS software. Each tab on these screens provides Urban and Rural comparisons. The tabs contain data as follows:

1. Summary— Travel and Demographic Data
2. Pavement Data—Unpaved, Paved mileage for Minor Collector and Local roadways
3. Vehicle Type—Breakdowns of vehicles with data for Interstates, Arterials and Rural roadways

Figures for Travel and Pavement Mileage should be entered in whole numbers (not as a factor of 1,000).

Click the Calculate Total button to complete the Control Total row. The Control Total is a sum of the Minor Collector and Local data in the County Summary file. The Total and Control Total rows must match within one mile.

Use the Edit button to edit and save changes to the data on these screens.

Note that edits to any Summary screen can be partially completed and then finished in another session. This allows users to complete screens as data becomes available and does not require screens to be fully complete for data to be entered into the HPMS system.

Summary Features—County Summary

The County Summary screen provides a tabular view of the County roadways grouped by functional classification with RMC L (Rural Minor Collector and Local) System Length.

To add data to the County Summary table, click the Add button on the left side of the screen. Use the drop down menus to navigate to a data type to begin the edit process.

* *Note that some screen shots in this guide include the Admin menu. This is not available to all users.*

Summary Features—Urban Summary

The Urban Summary screen summarizes DVMT (Daily Vehicle Miles of Travel), the proportion of the State population by Urban Area as well as the proportion of State land for each Urban Area. As with the County Summary Data, Urban records can be edited via the Add tool located on the left of the screen.

Figures for DVMT and Land Area should be entered in whole numbers (not as a factor of 1,000).

Summary Features—NAAQS Summary

Annual review and up-date of NAAQS travel and system length is performed in the NAAQS Summary portion of the Data Editors Menu.
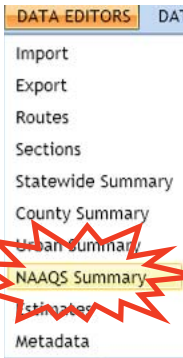
To add new data, select the Add button on the left side of screen.
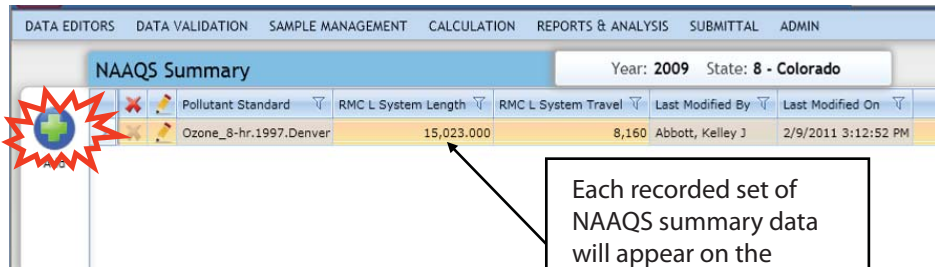
Each recorded set of NAAQS summary data will appear on the summary matrix in the NAAQS Summary screen.

Select a NAAQS area from the Pollution Standard drop down and then enter System Length and System Travel data for the NAAQS area in the blanks below.

Click save to add this data to the National HPMS database.
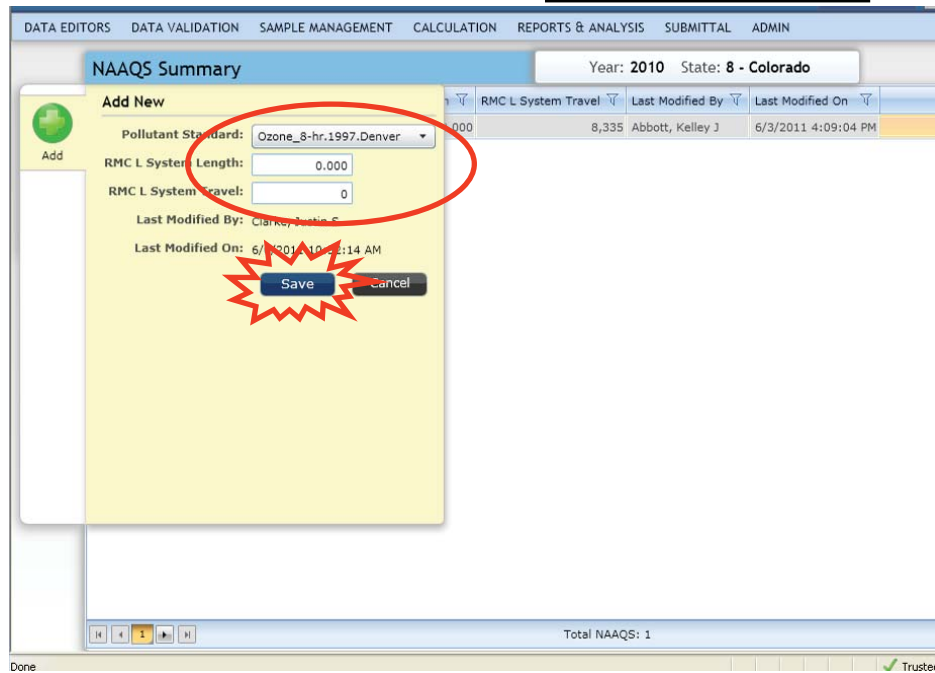
Estimates - Editing and Copying
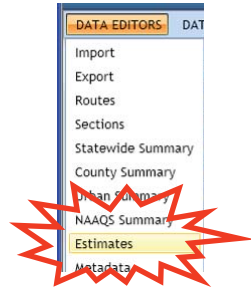
The Estimates screen is a way to quickly verify imported estimate data. Revisions can be made via the Add or Edit tools if necessary. The Add and Edit tools on this screen are useful for minor modifications to estimate data. Large scale data revisions should be made through a new Estimate data import. The Copy tool enables users to create a new year of data

New records can be added to the existing Estimate table using the Add button. Once the tool is active, drop down menus and check boxes provide users with quick access to specific components of the Estimate data set.

Edits can be made to any field in the table by selecting the Edit tool and then making edits on the Estimates table itself.

Quick edits can be made to individual rows by selecting the pencil symbol to the left of each row.

Use the Copy button to copy previous year's data to the current submission year. All data will be copied from the National Database, so data can not be copied from a year that has not been submitted to FHWA (i.e. an incomplete Submission).

The Copy button is also available for Route, Section and Metadata files. To use this feature for those data types, navigate to the Route, Section or Metadata screens from the Data Editors Menu.

Metadata - Import and Edit

The Metadata screen is very similar to the Estimates screen and provides the means to quickly verify imported metadata. As with the Estimates screen, revisions can be made via the Add or Edit tools if necessary.

Data Validation Menu

After successfully completing the Import and Sample (Import/TOPS) processes, the next step in the HPMS submission workflow is Validation. There are four user activated validations that can be run from the Validation screen: LRS, Sections, Samples and Coverage.

Import	Samples	Validate	Verify	Submit
• Routes • Sections • Summary • Estimates • Metadata	• Create TOPS • Import Samples	• LRS • Sections • Samples • Coverage	• Sample Adequacy • Expansion Factors • Sample Data Item Check • Reports • Spatial Intersection	• Import Status/Checks • Confirm Mileage • Confirm Validations • Submission Comments

Mapping

Create Geometries: Routes/LRS, Sections, TOPS, Samples, Validations

The four validation functions are run via tool buttons on the left side of the Validation Screen. The validations operate independently, so they can be run in any order. Each validation should be run and the associated result set reviewed prior to submission. Updates and revisions to submitted data may be necessary to address identified validation errors or warnings.

Each validation run will generate a unique set of warning/ error records, which are visible in the matrix area below the map view.
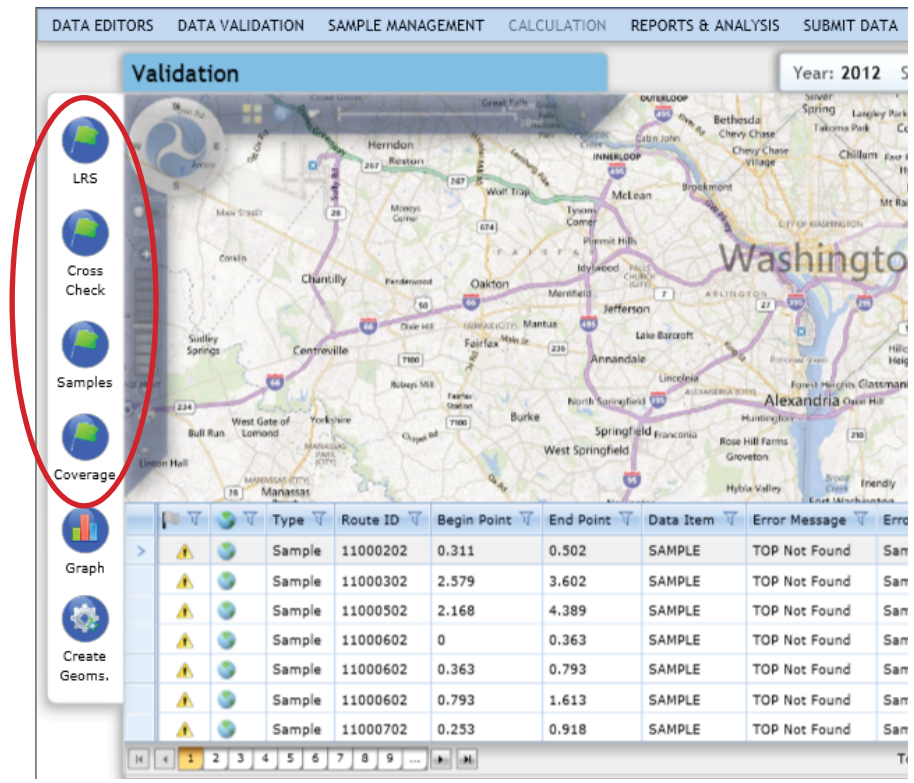
Running Validations

Click on Data Validation in the Application Menu to activate the Validation application window.

Next click on any Validation button to open the associated Validation status window.

Click Validate to run the validation. After the validation has started, click Close.

The LRS Validation pop up box displays the last time a validation was run.
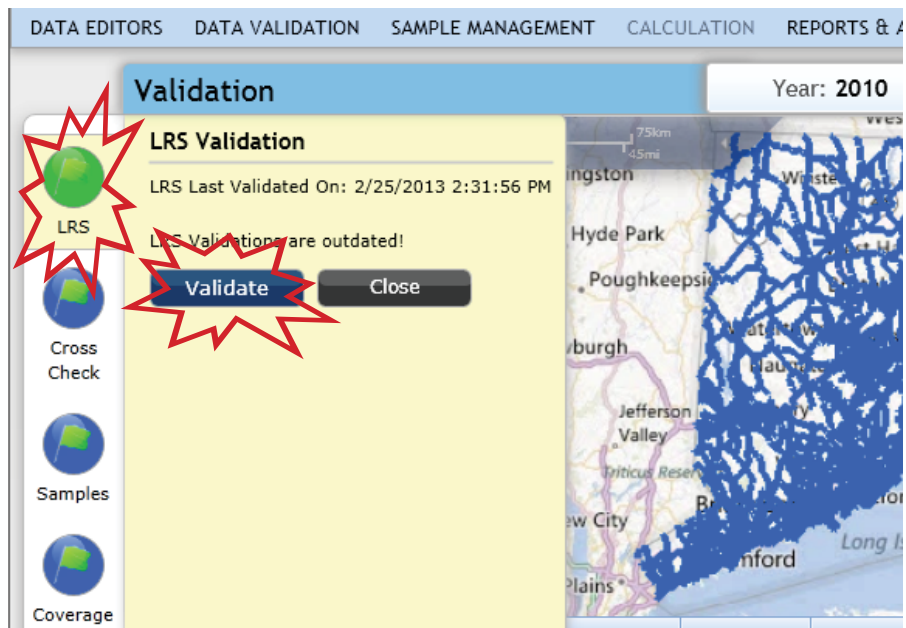
Validations run in the background, so users can close the validation window before the validation run is complete. Users can also exit the system once the process has started, and it will continue to run.
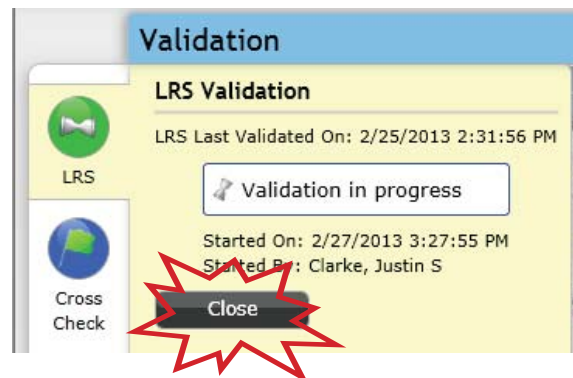
When the hourglass stops spinning, the validation process is complete.
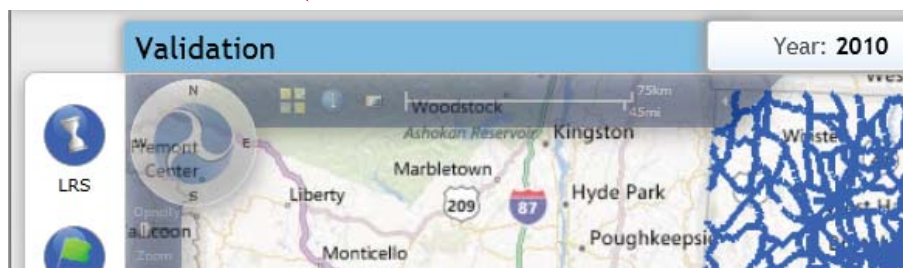
After running Validations, each Validation window will show the most recent run of the associated Validation. If there has been no change to the underlying data since the last run then a message noting that Validations are up to date will appear.
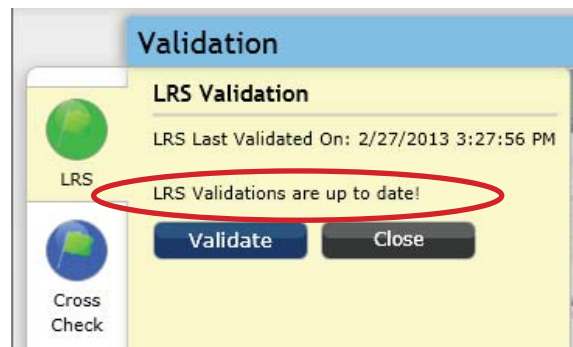
Running Validations Continued

Unlike other Validations which are always run for the whole State, Cross Check Validations can be run at the County level. Use the check boxes in the Cross Check Validation dialog box to select counties to be included in the Cross Check Validation. Select All and Clear can be used to quickly modify the selected list of Counties.
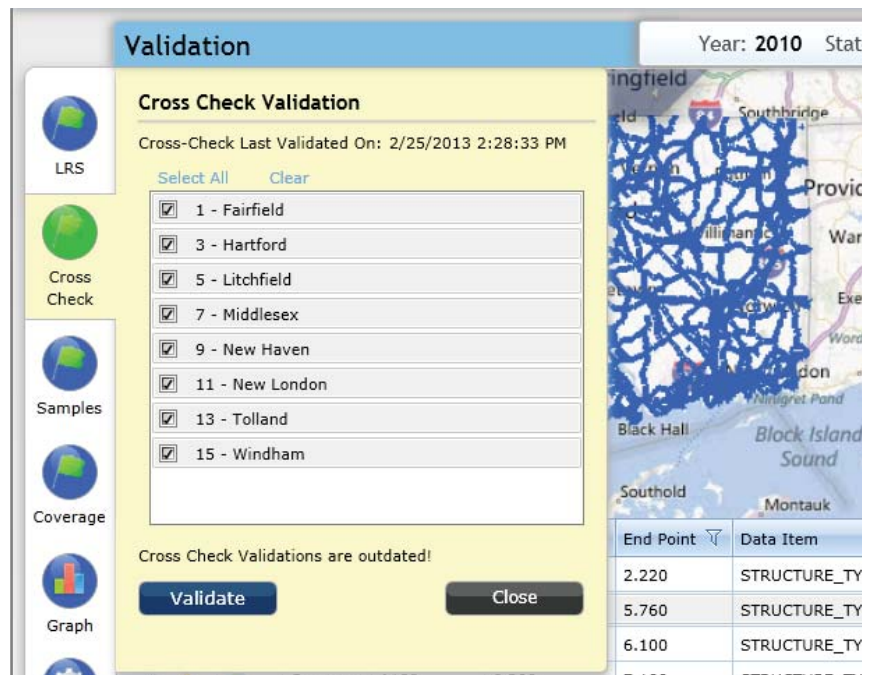
Types of Validations

Each of the four Validation types runs a different process. Some identify errors that needed to be fixed, others produce warnings that flag data for further review. The table below provides more information about each Validation.

Validation	Processes/Data Checks	Output
LRS	• Identify locations where Data Item records to not match LRS extents • Begin/End Points for Data Items exceed Route Begin/End Points • Locations where Data Items reference a Route that does not exist in the LRS file	Errors (Data will not be used by HPMS)
Cross Check	• Comparison of Data Item values against values from other related Data Items • Identify values that are outside of typical data relationship ranges	Warnings (Data will still be used by HPMS but numerous warnings should be addressed in Submission Comments)
Samples	• Verification of the spatial location of Samples per HPMS Field Manual rules • Locations of Sample Begin/End Points are evaluated against TOPS records and the provided LRS • Samples must not cross a TOPS boundary or be located where a valid LRS ID does not exist	Errors (Data will not be used by HPMS - Samples that fail Validation are marked as Invalid)
Coverage	• Logical checks to asses where Sample Data Items should be reported related to other Data Items • Check to ensure that HPMS Data Items are reported to the requirements provided in the Field Manual	Errors (Where data is not properly reported or missing)

Viewing Validation Results

After each Validation process is run, results can be viewed in the matrix at the bottom of the screen.

In the view at right, the Error Message field has been repositioned by clicking and dragging the column to a location adjacent to the Route ID field.

To export a CSV file of Validation records, use the Validation button on the Export screen (in the Data Editors menu).

Validation Results Records

Before Validation results can be viewed on the map within HPMS, their Geometry must be crated. Click the Create Geometries tool and then select Validation from the options listed.

For an understanding of the Create Geometries process see the Geometries guidance in the Data Editors Menu section of this Guide.

Viewing Validation Results Continued

After running the Geometry process for Validations, the Validations will appear in the map window of the Validation screen. By default, all Validation records will be shown.

By default, all counties will be included in the validation. Use the Clear, Select all, or check boxes to refine your validation if desired.

To view one type of Validation use the filter tools to refine the Validation records.

Viewing Validation Results Continued

Left click on a record and select Zoom to Feature to view the highlighted record.

A sample view of highlighted record is at right. The Zoomed Preview option will preview, but not zoom to the selected feature.

The Sample Splitter Tool

For samples that cross TOPS sections, the HPMS software includes a tool that allows users to split samples to create new samples that conform to TOPS breaks. This Sample Splitter tool is described below.

Click on a record in the Sample Validation matrix that has an error message "Sample Crosses Over TOP".

To split the sample, click Split in the resulting dialog box.

A sample split can not be undone, so be sure to use the splitter tool with caution.
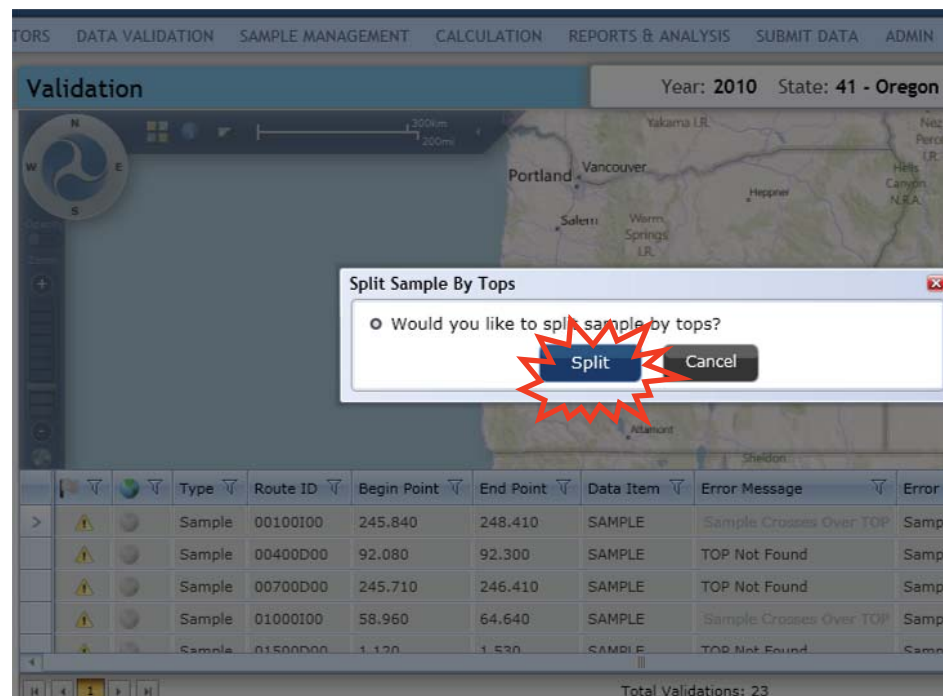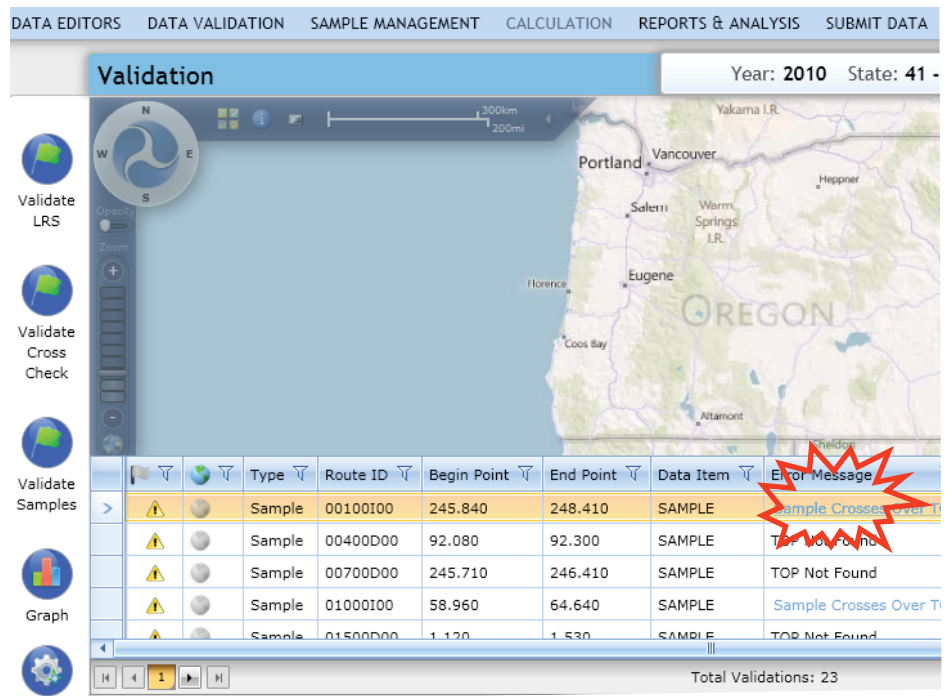
Viewing Validation Rules

The HPMS Validate processes use a number of validation rules when verifying submitted data. The latest list of these validations can be viewed via the application's Admin menu.

Click on the Help menu and then Error Messages to view validation rules used by the HPMS application.
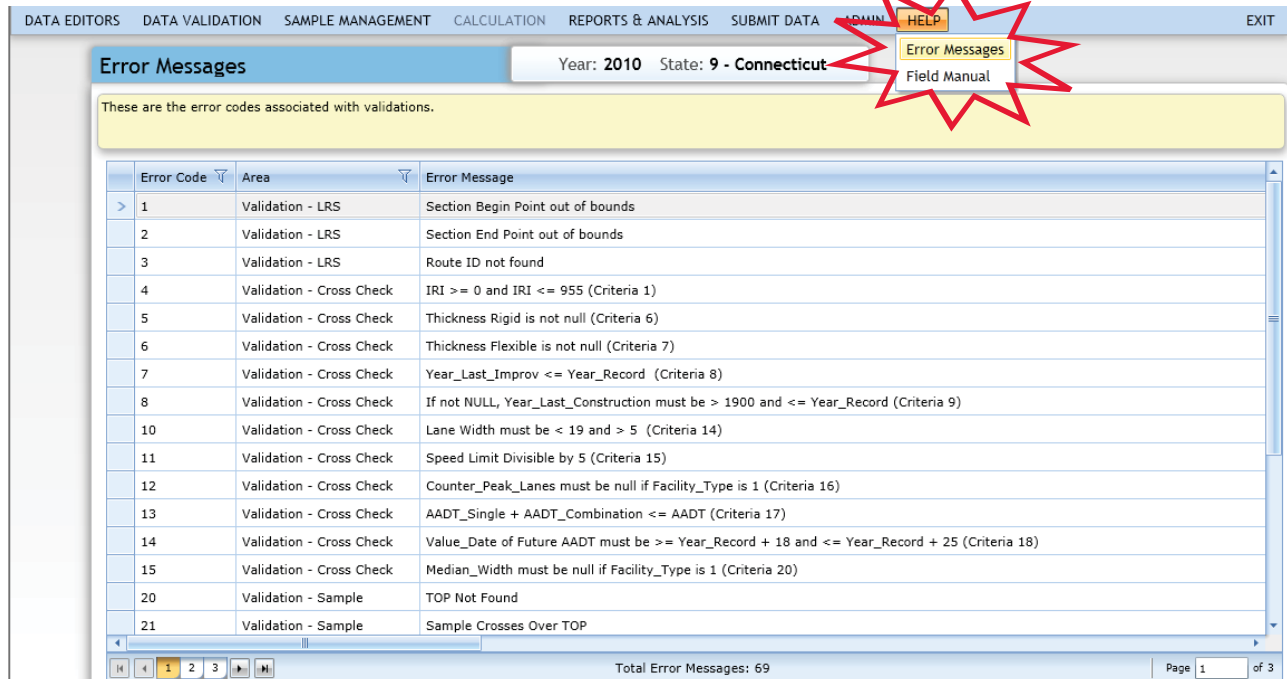
This list is comprised of the user activated Validations (LRS, Cross Check, Sample and Coverage) currently employed in the HPMS Software. Import Validations are run automatically by the HPMS software and can be viewed via reports associated with each Import Job on the Import Screen. More information on validations can be found in Chapter 7 of the HPMS Field Manual (http://www.fhwa.dot.gov/policy/ohpi/hpms/fieldmanual). For a complete list of Validations see Appendix A.

The Validation Graph

A summary graphic depicting the number and type of Validation Warnings/Errors generated for a State data set can be viewed via the Graph button on the left side of the Validation screen.

This graphic is currently in revision in order to accommodate the new Coverage Validations. Future versions of this Guide will provide more information about this tool.
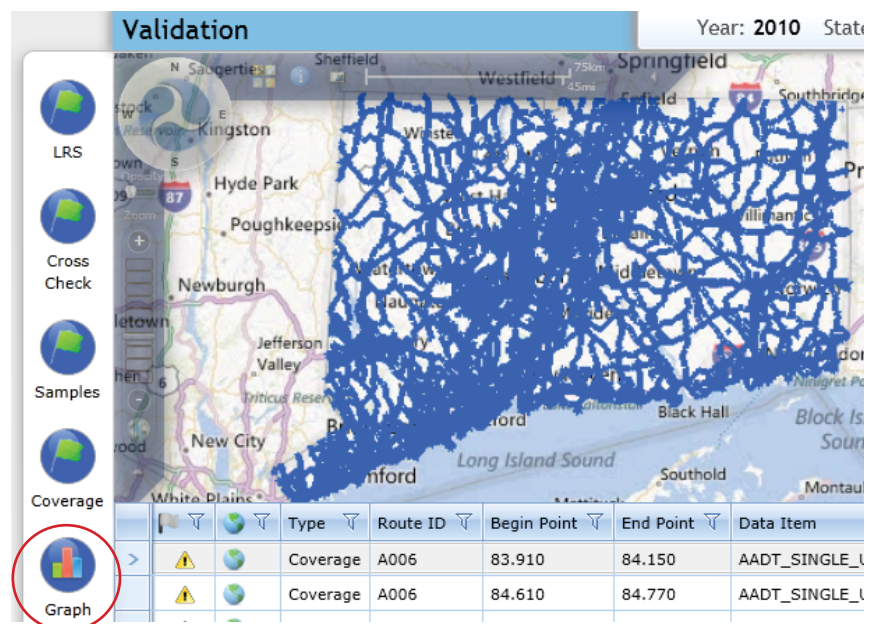
Sample Management Menu

Once Route, Section and Sample data are Imported and Validations have been reviewed, there are several processes that must be completed by States in order to appropriately manage their sample data sets. This review process is performed though the Sample Management Menu and its two components - Sample Management and Sample Data Items. The four tools in the Sample Management area: Add, Create TOPS, Check Adequacy and Expansion Factors, provide users with the means to evaluate and manage sample data. Samples can be reviewed in detail within the Sample Data Items area. The next few pages of this guide discuss the Sample Management Menu in detail. In addition to this guide, it may be helpful to review Chapter 6 of the HPMS Field Manual for details on sample collection and required data elements.

	DATA EDITORS	DATA VALIDATION	SAMPLE MANAGEMENT
	Home		Sample Management
			Sample Data Items
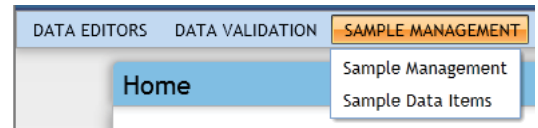
Sample Management tasks fall into the Verify component of the workflow.

Import	Samples	Validate	Verify	Submit
• Routes • Sections • Summary • Estimates • Metadata	• Create TOPS • Import Samples	• LRS • Sections • Samples • Coverage	• Sample Adequacy • Expansion Factors • Sample Data Item Check • Reports • Spatial Intersection	• Import Status/Checks • Confirm Mileage • Confirm Validations • Submission Comments

Mapping

Create Geometries: Routes/LRS, Sections, TOPS, Samples, Validations

A view of the Sample Management Menu Screen with its four tools on the left margin.
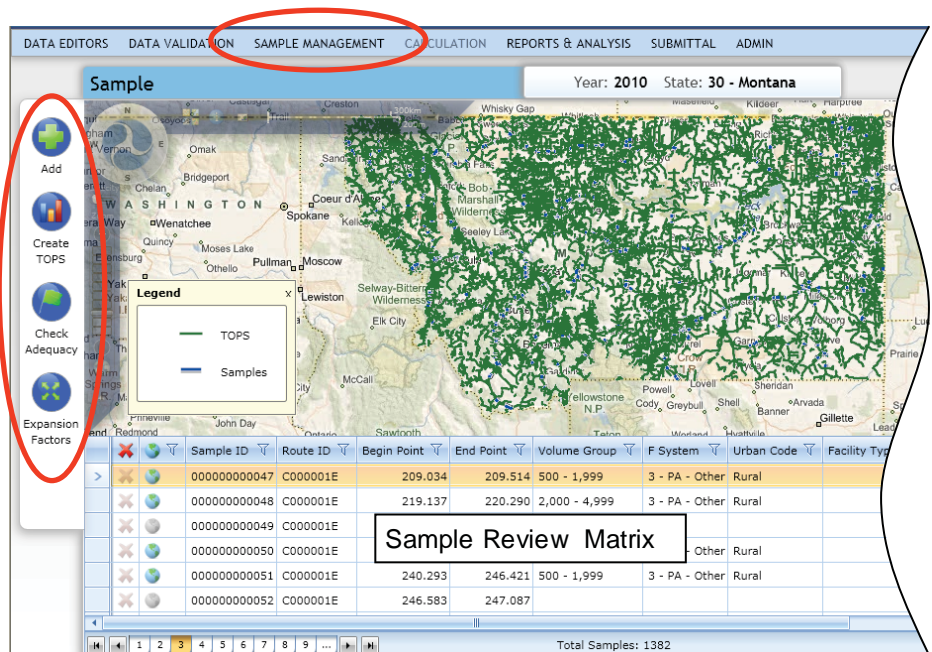
Create TOPS

The Table of Potential Samples, or TOPS is the sampling frame for HPMS and is based on five elements—Functional System, Facility Type, Urban Code, AADT and Through Lanes. State sample submissions are compared to the HPMS TOPS sample frame as part of the HPMS submission process. Typically, States submit their own sample set, but the TOPS sampling frame can serve as a sample set for HPMS submission if States do not have sample data of their own. Regardless of the approach, the HPMS TOPS process must be completed to ensure that the State sample set is consistent with the TOPS and is sufficient for precision targets.

From the Sample Management screen, click Create TOPS to activate the TOPS dialog box.
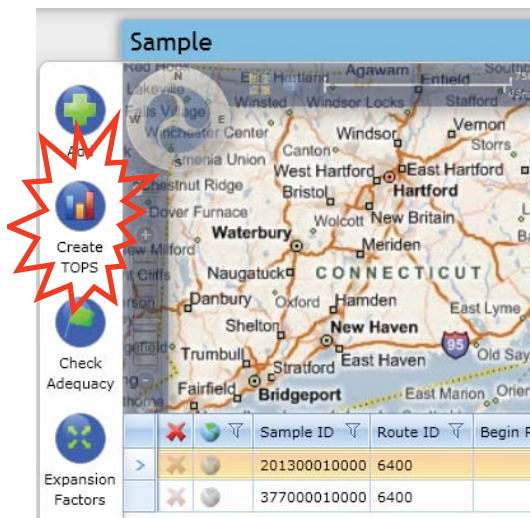
NOTE: The TOPS process runs automatically upon import of sample data. Although this guide describes a linear process for importing files, many States edit, delete and re-import files throughout the import process. It is therefore recommended that TOPS be run manually before examining sample adequacy to ensure that the sample review in the following steps accurately reflects your most recent data and the associated TOPS file.

Click Create TOPS in the resulting screen. The TOPS button will turn into a spinning hour glass icon when the TOPS process is running.

Users can navigate away from this screen once the Create TOPS button has been pushed as this process will continue to run in the background.

There isn't a display of the TOPS run, but the TOPS can be exported for review from the Export Screen.
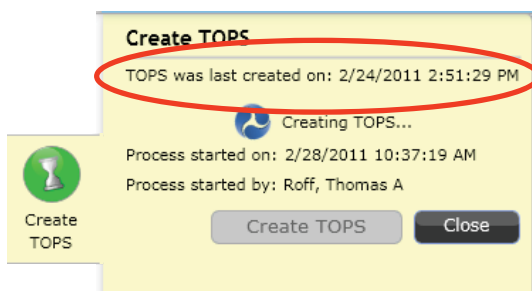
If you can't recall when or if TOPS was last created, the TOPS dialog box displays a record of the last TOPS run just above the Create TOPS button.

Check Adequacy

When samples are imported into the HPMS system, they are compared with the TOPS sample set and HPMS sample guidelines to ensure that samples meet HPMS adequacy requirements. The Check Adequacy tool provides a quick view of the necessary samples for each functional system and volume grouping. Samples are grouped by Urban or Rural Area.

From the Sample Management screen, click Check Adequacy to activate sample adequacy review. Click Close to exit the Check Adequacy screen after reviewing sample counts.
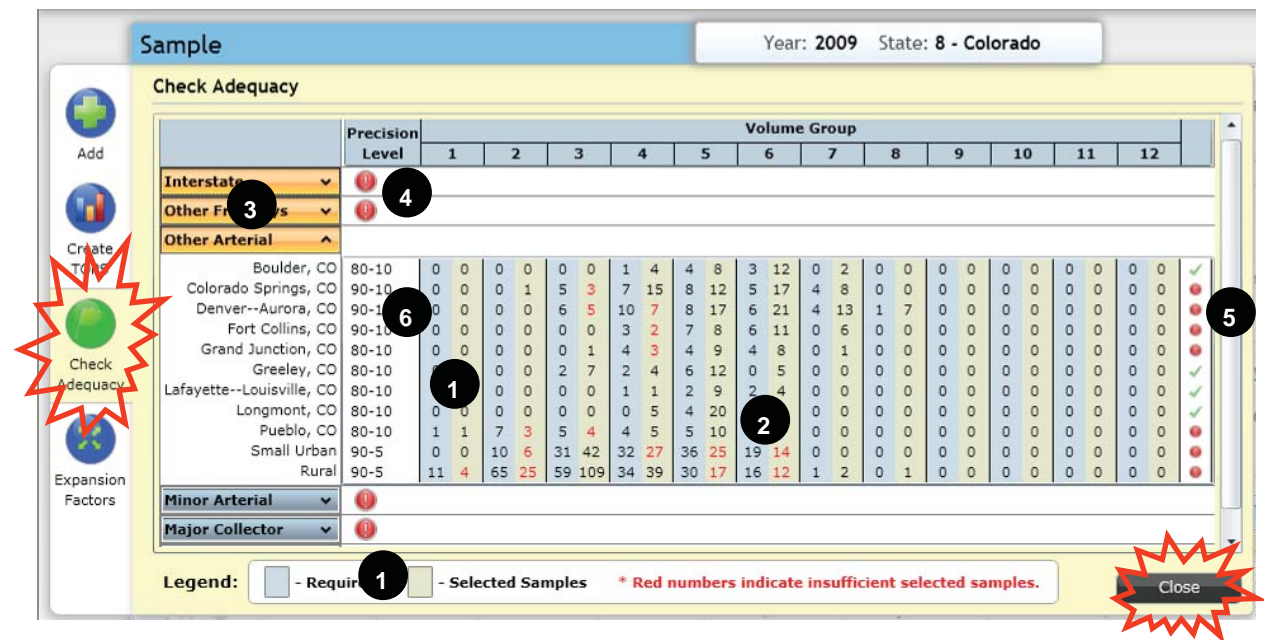
Key Features of the Check Adequacy Window

1 Column shading provides guidance for sample requirements. The blue (left) column for each volume group indicates the number of required samples required while the green (right) column records the number of samples submitted.

2 If the number of imported samples for a volume group is below the HPMS requirements, the count of imported samples will appear in red text.

3 Samples are grouped by functional system. Click the down arrow to the right of each functional classification to view a sample set. Click the arrow again to collapse the set and view another set.

4 Red exclamation points indicate functional systems with inadequate sample sets. Green checks indicate that adequacy requirements have been met.

5 Green checks in the right margin indicate areas (urban or rural) with adequate samples. Red dots indicate areas that don't have adequate samples in at least one volume group.

6 Sample requirements are based on specific precision levels for each functional system and are scaled for rural to large urbanized areas. See the HPMS Field Manual, Chapter 6 for more detail on precision levels.

Important Note: The Sample Adequacy Tool reflects VALID Samples only. Those Samples that don't fall within TOPS sections are excluded from this analysis and will appear in the Validation Summary Report.

Adding Samples

If the Sample Adequacy review indicates that samples need to be added to meet HPMS sample requirements, the Add tool can be used to select samples from an available sample set based on the TOPS generated in previous steps.

From the Sample Management screen, click Add to activate the Add Sample dialog box.

Drop down menus for Volume Group, Functional System and Urban Code enable users to select the appropriate groupings for added samples.

Adding Samples Continued

After using the drop down menus to select a Volume Group, Functional System and Urban Code, users have two options for selecting samples to meet HPMS requirements. For either approach, added samples will be given a system generated Sample ID.

A Add Samples - Manual Select Option

Click on the Add check boxes on the left side of the Add Sample Window to manually add sample records to the selected Volume Group, Functional System and Urban Code. Samples that can be added to the sample set appear in the Add Sample window with an unchecked box in the Add column.

B Add Samples - Random Select Option

Click on the **Random Select** button to add a random selection of sample records to the selected Volume Group, Functional System and Urban Code to match the necessary HPMS sampling requirements.

A running count of existing versus required samples is kept at the bottom of the Add Sample Table.

Click on the Add check boxes on the left side of the Add Sample Window to manually add sample records to the selected Volume Group, Functional System and Urban Code. Samples that can be added to the sample set appear in the Add Sample window with an unchecked box in the Add column.

Expansion Factors

The final step in sample adequacy review is examination of the sample expansion factors. Section 6.5 of the HPMS Field Manual provides guidance and background on sample adequacy requirements.

Select the Expansion Factors button from the Sample Management screen to view sample expansion factors for the imported and/or TOPS sample set. Click the Calculate button to generate an updated list of expansion factors for your data.

As with several other processes, the Expansion Factor window displays a record of the most recent process run.

Sample Data Item Area

The Sample Data Item Area contains two tools to help with the review of Samples - the Sample Data Items Matrix and the Missing Data Items Breakdown Summary. Use these tools to identify Samples that are missing data, generate maps for field review of Samples and to summarize the set of data items covered by the submitted Sample set. The images below illustrate the features of the default screen in this area of the software.
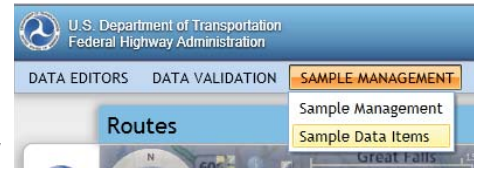
The Overall Summary lists the total number of samples imported into the software and identifies those samples that are missing data.

Records can be sorted or filtered on any Header column.
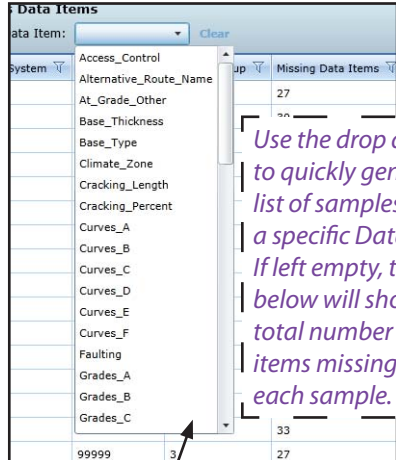
Use the drop down list to quickly generate a list of samples missing a specific Data Item. If left empty, the screen below will show the total number of data items missing from each sample.

Sample Data Items   Year: **2010**   State: **20 - Kansas**

Overall Summary: Total Samples: 1878   Samples With No Missing Data Items: 0   Samples with Missing Data Items: 1878

Samples Data Items

Filter by Samples with Missing Data Item: [▼] Clear

Sample ID	Route ID	Begin Point	End Point	F System	Urban Code	Volume Group	Missing Data Items	
201300010000	001K0022400-EB	0	1.039	5	99999	2	27	🔍
377000010000	001U0005400-EB	6.034	6.161	3	99998	4	30	🔍
117400010000	001U0005400-EB	7.666	9.046	3	99999	4	32	🔍
114100010000	001U0005400-EB	19.110	22.182	3	99999	3	29	🔍
548000010000	001U0005900-NB	3.896	10.134	4	99999	2	26	🔍
548500010000	001U0005900-NB	12.406	12.555	4	99999	2	29	🔍
549000010000	001U0005900-NB	15.134	20.020	4	99999	2	25	🔍
202300020000	002K0003100-NB	1.003	3.011	5	99999	1	26	🔍
278300020000	002K0003100-NB	3.964	8.174	5	99999	1	30	🔍
126300020000	002K0003100-NB	20.275	20.682	5	99999	3	31	🔍
119300020000	002K0003100-NB	41.628	44.128	4	99999	2	29	🔍
850200020000	002R0001100X0	3.080	7.110	5	99999	1	50	🔍
850400020000	002R0116000X0	0	0.970	5	99999	2	49	🔍
550000020000	002U0005900-NB	0.154	3.041	4	99999	2	27	🔍
117600020000	002U0005900-NB	21.468	21.752	3	99999	4	33	🔍
238500020000	002U0016900-NB	19.897	27.447	3	99999	3	27	🔍

|◀ ◀ 1 2 3 4 5 6 7 8 9 ... ▶ ▶| Total: 1878   Page 1 of 76

Show Summary

Sample Data Item Area Continued

To view more information about an individual record in a **Sample Detail** report, click on the magnifying glass on the right side of that record's row in the table.

The Sample Detail report consists of three components - the Sample Details summary, Map tab and Data Item (detail) tab. Shown below are the Sample Details summary and Map tab. The Data Items tab is shown on the next page. Note that the Map is automatically zoomed to the selected sample.

Items that are not complete will appear in red text in the Sample Details screens.

*The tab (with Detail summary) can be printed. Note that the print will be **Landscape**.*

Sample Data Item Area Continued

The Data Items tab, as shown below, provides a list of all Data Items that are required by HPMS and identifies those that are missing from the sample file. Note that the list of Data Items is the same for each Sample. The data provided on that Sample, however, defines the appropriate set of required Data Items based on the HPMS Field Manual requirements and associated Coverage Validations. For example, a Sample with a rigid pavement type will be required to have Faulting values reported on that Sample.

Items that are not complete will appear in red text in the Sample Details screens (but only after the Coverage Validations have been run, see Page 39).

Sample Data Item Area Continued

Click on the Show Summary tool to view a full listing of the number of Samples reported for each of the Data Items that are part of the annual HPMS Sample submission.

Reports & Analysis

There are three options for users in the Reports & Analysis menu: Reports, Spatial Intersector and Sample Drill. The Reports and Spatial Intersector tools are described in this Guide. The Sample Drill function will be described in a future version of this Guide.

The Reports function enables users to generate summaries of submitted HPMS data while the Spatial Intersector tool can be used to create queries of multiple data items for analysis. There are a number of reports available either in static form or through interactive dialogs. The text below describes available reports in the Submit Module. Each report can be downloaded or printed for further analysis.
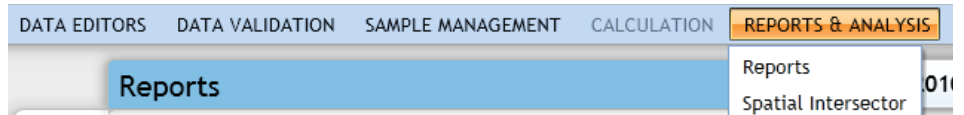
Available Report Types

Here is an overview of the HPMS reports available in the Submit Module. More detail is available in Appendix B.

Overview: Lists the submitted data items (Sections, Routes, Summaries) by number of records submitted. A detailed list of records submitted for each Data Item is available via the Interactive Reports tool.

Validation Summary: Summary of the number of occurrences of errors associated with uploaded data. This report is also available via the Interactive Reports tool where users can generate sub-reports by error type.

Extent and Travel (also on the NHS, Interstate, Extent and Travel Changes and Changes Summary): This group of reports produces a table of miles, lane miles and travel by Functional System. The base report (Extent and Travel) also groups records by Urban Area. The Changes report compares the current submittal with data from the previous year, the Summary report groups data by Urban and Rural classifications, the Interstate report lists mileage and travel for all reported Interstates and the NHS version reports mileage only for routes that are part of the NHS (National Highway System).

Several reports, including the Extent and Travel Report selected at right, incorporate summary data. Be sure to have summary data imported before running any of the Extent and Travel reports.

Ownership: A listing of mileage for each of the Ownership categories in the Field Manual - grouped by Functional System.

Consistency: This report compares the total mileage for several key Data Items with the HPMS Control Total (F_System, Facility_Type and Urban_Code) for upper level systems. Data is reported by Functional System for Section data only.

IRI on the NHS (and Federal Aid Highways): These two reports present IRI (International Roughness Index) Data grouped by Functional System and Good, Fair and Poor Rating for the respective subset of a State's roadway network.

Generating Reports

Select Reports from the Reports & Analysis Menu.
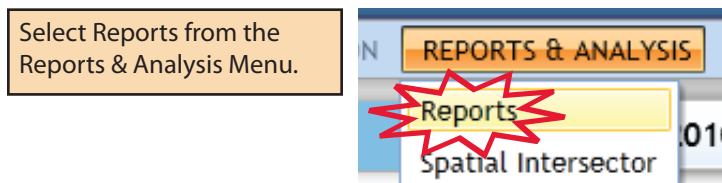
Generating Reports Continued

Software Generated Static Reports

There are two types of reports in the HPMS software, Static and Interactive. Both Static and Interactive reports are generated from the Reports & Analysis Menu. The features of the Report screen are described in the image below.

The list of available static reports varies depending on the HPMS software module: Submit, Review and National. The list here is for Submit. More reports are available in the Review and National Modules. See Appendix for more detail.

After reports are run, they are stored in the HPMS system for future use. Date and time data is updated each time a report is run. Reports that have already been run can be downloaded and previewed without going through the Create process.

1 **Static Report Interface** - Users can run, preview and download reports from this area.

2 **Interactive Report Link** – Clicking this link will take users to a screen where two interactive reports can be generated. These reports are described in the following pages.

3 **Available Reports** – The image above depicts the reports available from the Submit module. Four additional reports, the National Extent and Travel Report and three standard tables from the FHWA Highway Statistics series - HM-20, HM-60 and VM-2 are available in the Review and National modules.

4 **Report Selection Buttons -** Reports are created, canceled, downloaded and previewed via check boxes to the right of the screen. To run a report, check the box in the row that corresponds to the desired report.   Processing status will appear in the middle columns of the screen.   After the report is created, it can be viewed or downloaded via corresponding check boxes in the adjacent columns.

5 **Action Buttons** – After selecting reports to run or download via the check boxes in the Static Report Interface, users must click one of these buttons to complete the request. If necessary, reports can be canceled once the processing request has been made.

General Note on Report Output where Two Years of Data is Reported: Many Reports in the HPMS system (submittal year 2011 and higher) provide year to year comparisons of submitted HPMS data. In the Submit and Review Modules, data for the previous year is taken from the National module for comparison.

Generating Reports Continued

Generating Interactive Reports

As the name suggests, interactive reports allow users to define the components of the report (to an extent). The two interactive reports in the HPMS software are for Overview and Validations. The Overview report lists the number of records that were submitted for each Data Item. The Validations report lists the detailed records for each validation error or warning from the Validations processes. Validations must first be run before this report will be populated.

To create interactive reports for viewing or printing, select Interactive Reports from the Reports Screen.
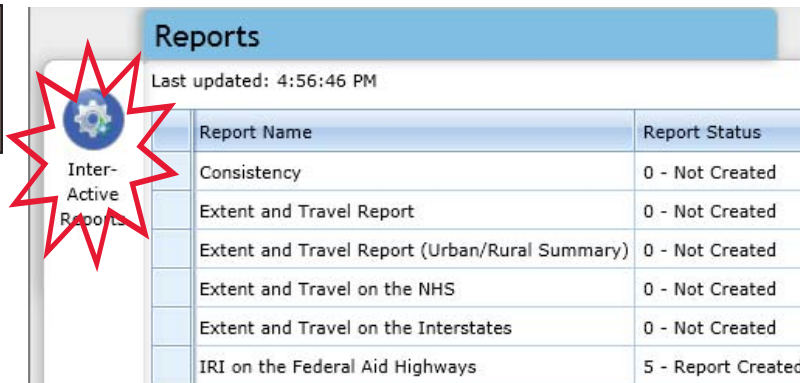
Two interactive report options will be displayed. Select the Overview or Validations buttons to generate the associated report.
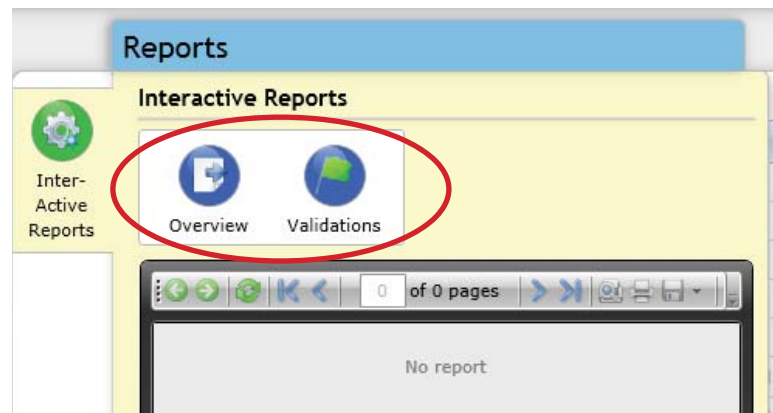
The Overview report is provided both in Interactive and Static formats. The Static version provides a summary of the data submitted by data type (e.g., Sections, Summary, Routes, etc.) while the Interactive version provides details for each HPMS Data Item (e.g. number of records for Functional System, number of records for Facility Type, etc.).

The Validation report is also provided in Interactive and Static formats. The Interactive version allows users to get the records that are affected by each Validation as opposed to the Static version which provides the just the sum of all records for each Validation.

Features of the Interactive Report Screen
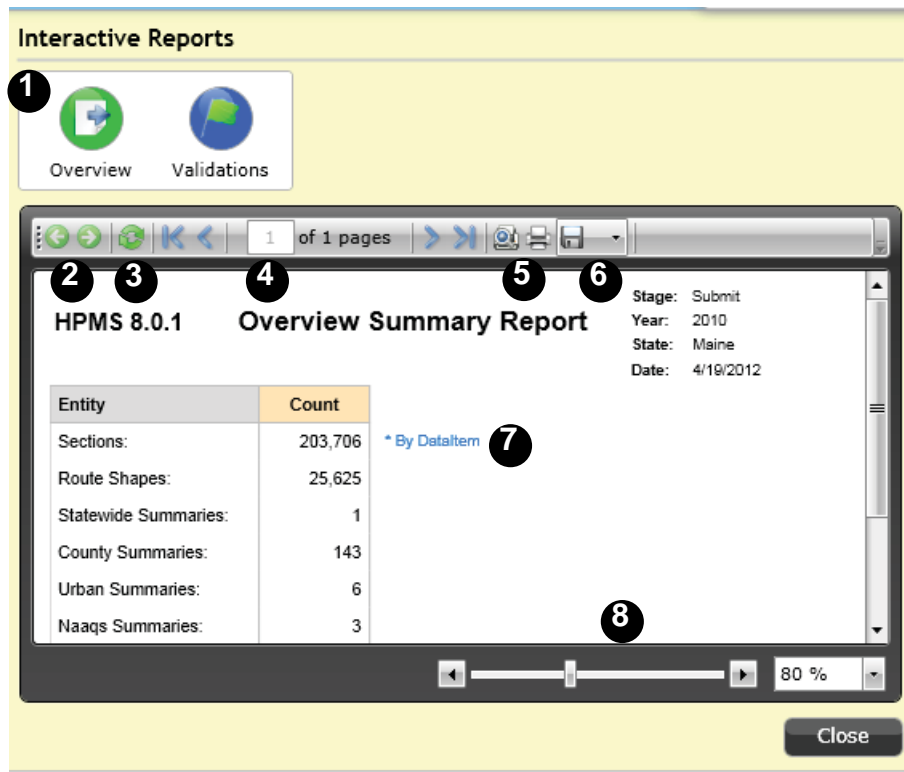
1 Select one of the available report types to generate a report in the report window below.

2 These back and forward buttons are used when navigating between reports and sub reports. For example, clicking the back button will take the user back to the full report if a link to a sub report has been clicked.

3 This button can be used to refresh the report currently selected.

4 Users can enter a page number or use the forward and back arrows to navigate through pages within the reports.

5 The Print Preview and Print buttons can be used to print directly from the report view screen.

6 Reports can be saved into several formats for further review and analysis.
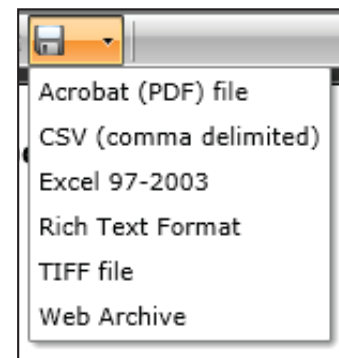
7 Text in the report window may have links to other reports or sub reports. Click these links to generate related reports.

8 Use the slider bar or preset zoom levels to enlarge or shrink reports for better reading or format review.

Spatial Intersector Tool

The Spatial Intersector tool in the Reports & Analysis menu provides users with the ability to query submitted data and combine various data items for tailored analysis. Output from the Intersector tool is in the form of a (zipped) pipe delimited .csv file.

Select Spatial Intersector from the Reports & Analysis menu to begin using the tool.
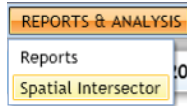
Click on the Create Query button to launch the Inter-sector dialog box.
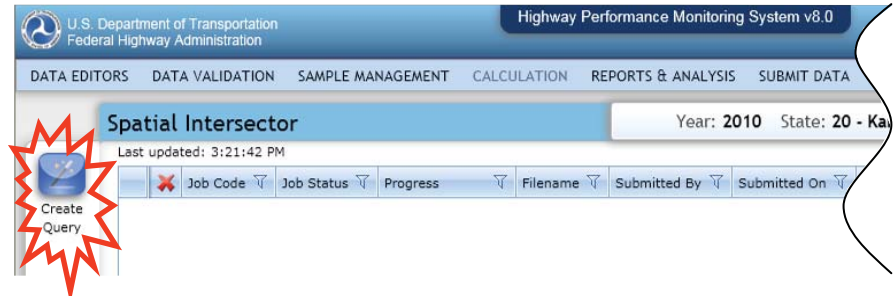
Features of the Spatial Intersector Dialog Box
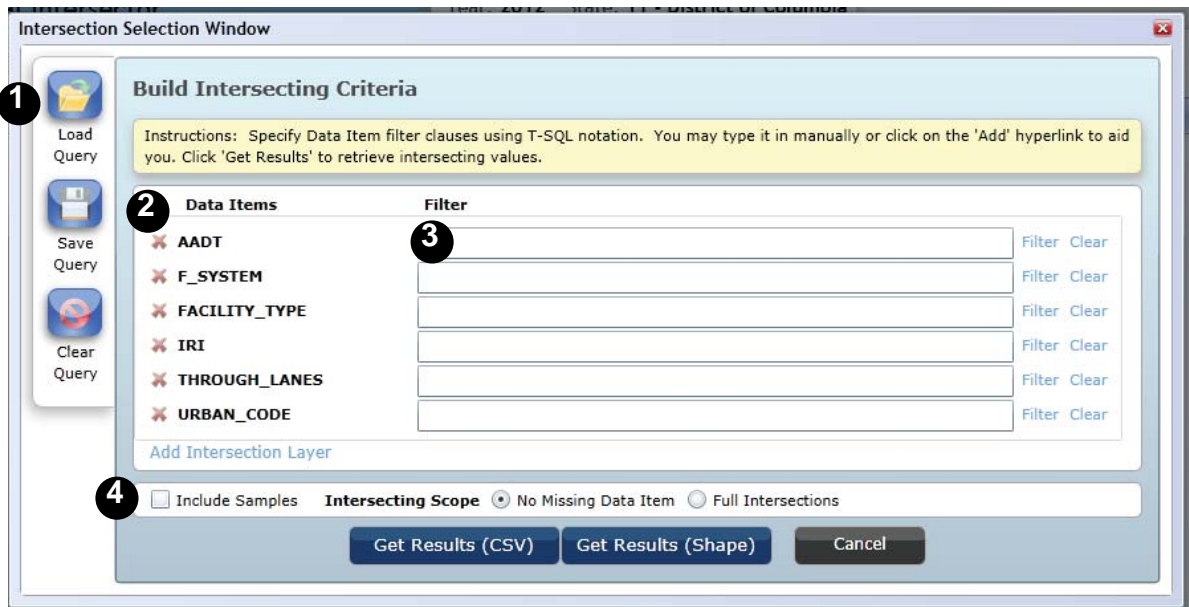
1 Existing SQL queries can be loaded into the application, and can be saved once generated. Use the Clear Query button to clear an existing query or refresh the query screen.

2 Use the 'X' marks next to the default list of data items to remove them from the query.

3 Add query text for data items in the boxes to the right of data items. The Intersector Query tool uses T-SQL notation.

4 Click here to include a field identifying which records were included in the submitted Sample set. Designation is via a boolean value (1/0). In addition, for those records that are Samples, the associated Expansion Factor will be included.

Spatial Intersector Tool Continued
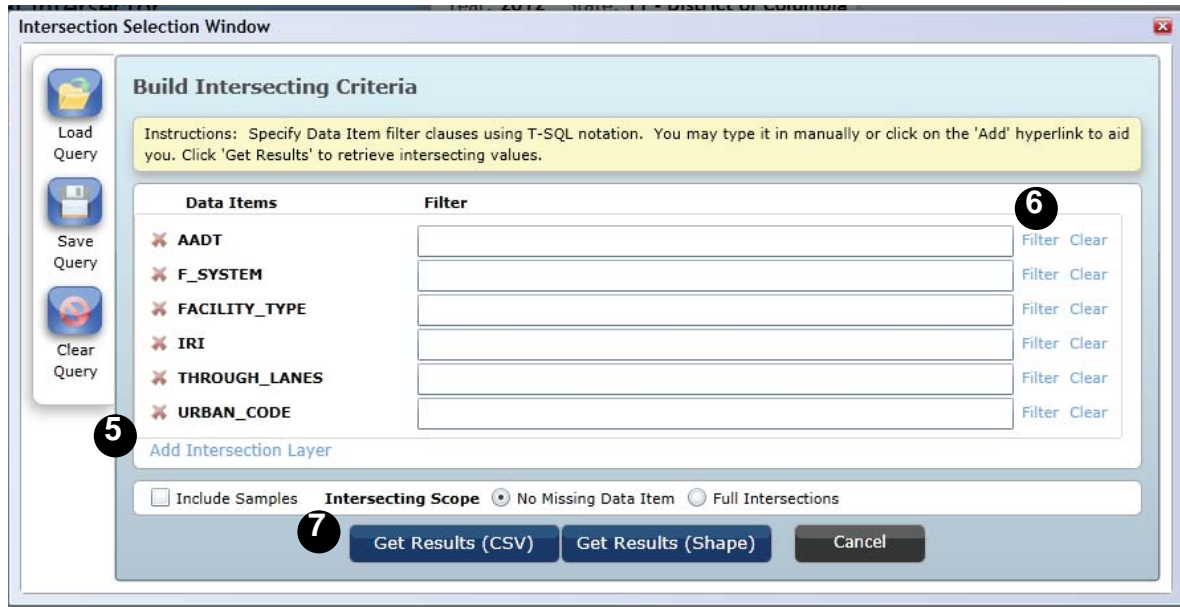
⑤ Data items can be added to the query by clicking on the Add Intersection Layer link. In the resulting dialog box, select data items by clicking in the boxes to the left of the data items and click OK.
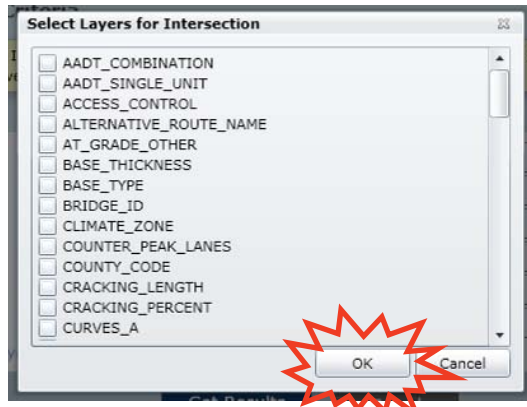
There is no limit within the application on the number of layers that can be intersected at the same time. However, it is advised that users keep the number of layers to a minimum in order to ensure reasonable processing times.

⑥ Users can quickly add text to the Intersection dialog box by clicking on the Filter link. The resulting dialog box provides a drop down menu and check boxes for data items unique to each data item.
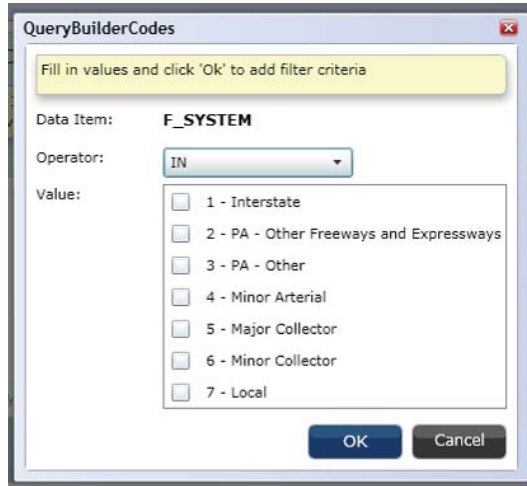
Clicking 'Clear' in the Intersector Dialog will clear an existing filter string.

⑦ Click either the CSV or Shape Results button to generate the corresponding output file. Note that Geometries must be run in order to obtain a Shape output.

Spatial Intersector Tool Continued

Specifying the Intersection Type

The intersector tool includes options to allow users to specify the type of intersection to run on the Data Items included in the Spatial query. The three "Intersecting Scope" options are described below and are available via the radio buttons on the bottom of the Intersection Criteria window.
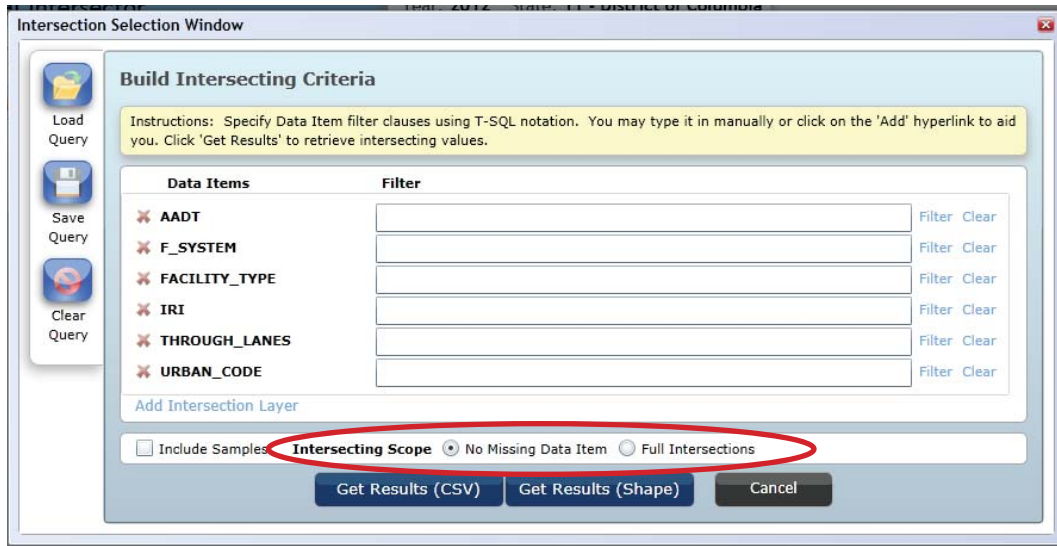
No Missing Data Item – This includes all of the sections that were selected as part of the intersection (this is the previous format for the tool). If there is data missing on a given piece of roadway for one of the included items then all data items will be left out of the result set for that section of road.

Full Intersection – All road sections will be included. If there is a gap in one data item but not another, null values will be filled in for the data section that has the gap.

Illustrative Diagram

In the example intersection with sample sections for two data items, shaded areas contain data, those without shading do not contain data. Note also that new section breaks are created when input section data contains different break points.

Data ⟶ | 2 | No Data |

No Data

Input Data Items

| 2 | 4 | 2 | No Data | Facility Type
| 20000 | No Data | 7500 | 5000 | AADT

Example Output Results

| No Data | No Data | No Missing Data Item
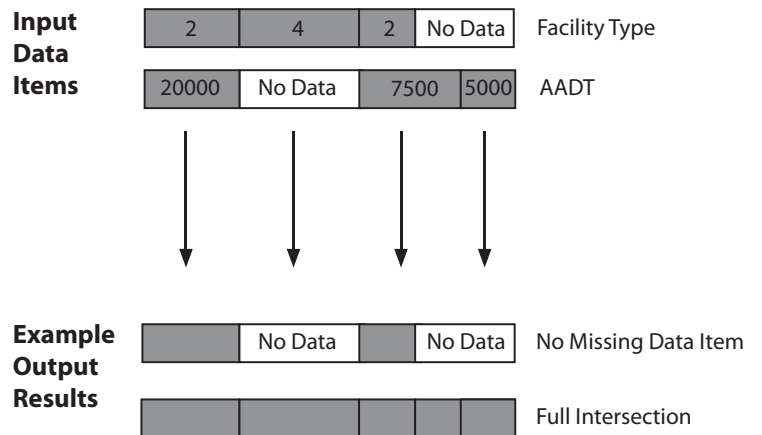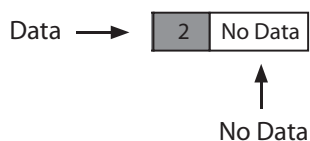
Full Intersection

Spatial Intersector Tool Continued

After clicking on the Get Results button, the query will run and generate a log record on the main Spatial Intersector screen. As with the Import and Export logs, Intersection log entries can be cleaned by selecting the red 'X' to the left of the record. All queries can be deleted by selecting the 'X' in the header bar of the query log.

Click the green arrow under Download to download the data in a zipped, pipe delimited .csv file.
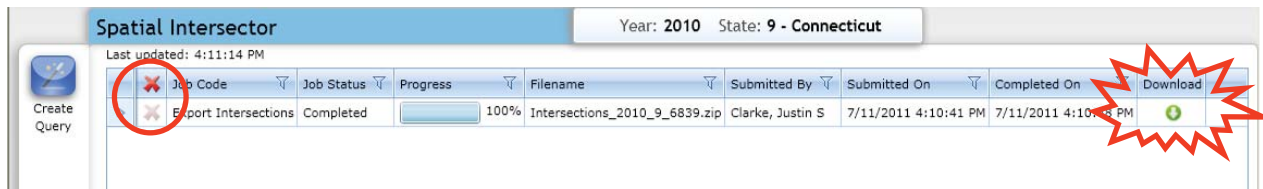
An example of an intersection created with the No Missing Data Item option of Urban Code and F_System is show below. The Intersector tool will generate a file with one record for each section. Note that because this option is an intersection and not a union, records will only be created for areas where all of the selected items are present.

Year_Record	State_Code	Route_ID	Begin_Point	End_Point	F_SYSTEM	URBAN_CODE
2010	9	E084 009	0	0.26	1	22096
2010	9	E084 018	0	0.19	1	22096
2010	9	E084 029	0.62	0.63	1	22096
2010	9	E084 240	0	0.12	1	22096
2010	9	E084 013	0	0.15	1	22096
2010	9	E084 021	0	0.27	1	22096
2010	9	E084 801	0	0.4	1	22096
2010	9	E084 236	0	0.06	1	22096
2010	9	E084 243	0	0.88	1	22096
2010	9	E084 010	0	0.13	1	22096
2010	9	E084 019	0	0.2	1	22096
2010	9	E084 031	0.22	0.57	1	22096
2010	9	E084 241	0	0.26	1	22096
2010	9	E084 014	0	0.13	1	22096

Submittal

The last stage in the annual HPMS submittal process is the review and verification of submitted files via the Submit Data screen. The components of the screen are described below.

Select the Submit Data function on the application menu to open the submittal review screen.
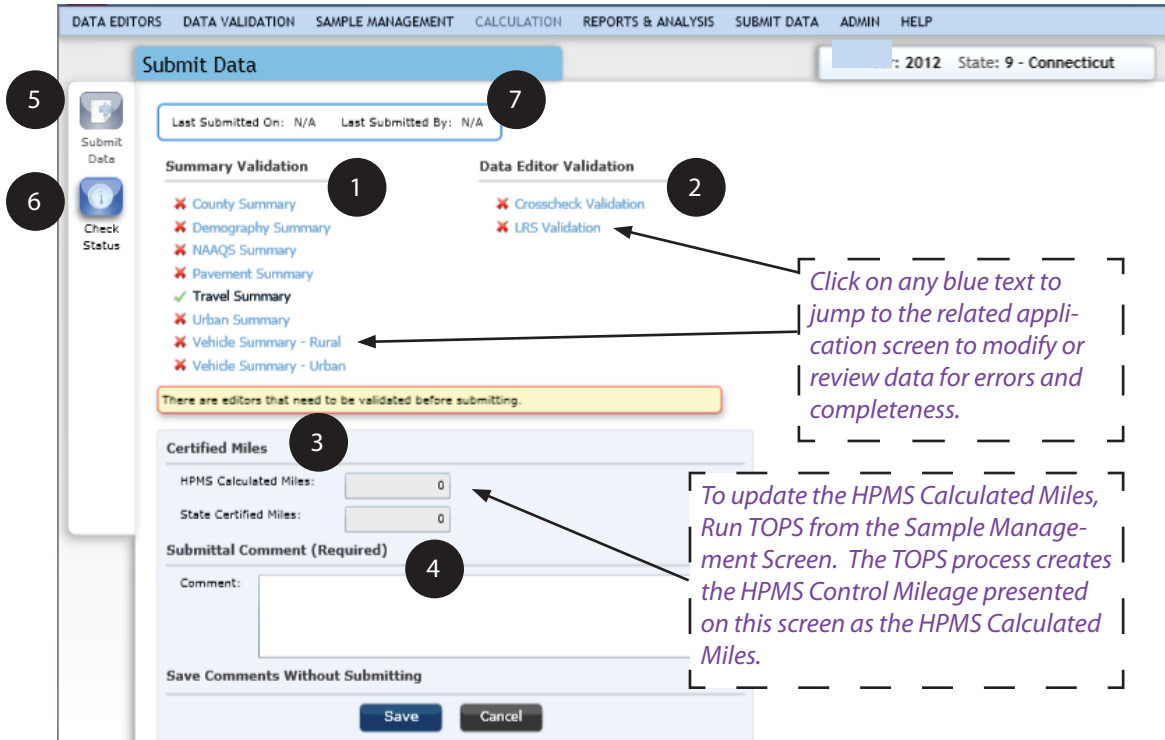
Click on any blue text to jump to the related application screen to modify or review data for errors and completeness.

To update the HPMS Calculated Miles, Run TOPS from the Sample Management Screen. The TOPS process creates the HPMS Control Mileage presented on this screen as the HPMS Calculated Miles.

1 Summary Validation: data that is ready for submittal will appear with a green check. Items needing further attention will be marked with a red 'X'.

2 Data Editor Validation: LRS and Cross Check Validation results are displayed in this list. Green checks indicate that validation is successful, an exclamation mark/warning sign indicates that there are active warnings but that validation is free of errors, a red 'X' indicates that validation has not run or has errors needing attention.

3 Certified Miles: The HPMS Calculated Mileage should equal the number of miles for the State Certified Mileage submitted separately to FHWA. FHWA staff will enter the State Certified Mileage on this screen based on the Certified Mileage submission from the States. **In order to submit successfully, these two numbers must match within one mile.**

4 Submittal Comment: Comments are required but can be emailed separately. Comments should address items that are irregular, or major changes from the previous year's submittal. If emailing comments, write "Comments sent to staff via e-mail." in the comment box on this screen.

5 Submit Data Button: When all validations are free from red 'X' marks, the certified mileage has been entered and comments added, the Submit Data button will be activated (it will turn blue). Click the button to submit your data and e-mail FHWA staff any comments.

6 After submitting data, click the Check Status button to view submission progress.

7 For Reference, record of the most recent submission is logged in this box at the top of the Submission Screen.

Submittal Continued

Click the Submit Data button. Several windows will subsequently open. These boxes will confirm that the submission should continue and provide opportunity to monitor the submission status.

To activate the Submit Data button, HPMS submissions must meet all of the following conditions on the Submit Data Screen:

1. All validations either have a green check or caution sign. Red 'X' marks will prevent activation of the Submit Data button.

2. Certified Mileage must match HPMS calculated mileage within one mile.

3. Comments must be entered. Enter as much detail about the constraints and deficiencies of the associated submission as possible. Comments can be pasted from a text or word processing file.

See Appendix B - The Extent and Travel Report - for details on how the HPMS Calculated Miles figure is derived.

Read and Click through the Submit Process dialog boxes.

Each submission updates the data in the HPMS Review Module. Be sure to let FHWA HPMS staff know each time a submission is run.

The Submit Process runs in the background so users don't need to be logged in once the complete process has started. Details of the process can be viewed using the button on the right of this screen.

Submittal Continued

The Submit Process Dialog shows the status of submission throughout the process.

While the Submission process is running, the HPMS system is locked for the associated State and Year. No other actions or processes can be run while the Submission is running. Users can manipulate data for the same State but a different year, however.

Submit Process is Running

Submit Process is Running.

The HPMS system will now verify your data and move it to the Review module.
This process may take several hours depending on system activity levels.

NOTE: HPMS functionalities will be unavailable until the verification process is complete.
Processing will continue in the background. Users may log off of the system.

Step	Name	Started	Completed
1	Deleting Review Data	2/25/2013 2:52:23 PM	Not Yet
2	Running LRS and Cross Validation	Not Yet	Not Yet
3	Running Coverage Validation	Not Yet	Not Yet
4	Creating TOPS	Not Yet	Not Yet
5	Breaking TOPS	Not Yet	Not Yet
6	Running Sample Validation	Not Yet	Not Yet
7	Calculating Expansion Factors	Not Yet	Not Yet
8	Creating Full Intersections	Not Yet	Not Yet
9	Creating Section Geometries	Not Yet	Not Yet
10	Creating TOPS and Sample Geometries	Not Yet	Not Yet
11	Creating Validation Results Geometries	Not Yet	Not Yet
12	Submitting Routes	Not Yet	Not Yet
13	Submitting Sections	Not Yet	Not Yet

Close this Window   Refresh and View Verification Process Detail

When the Submit process is complete, users will get a notice dialog when logging into the HPMS system.

Submit Process is Completed

Submit Process is Completed. Thank You !

Close this Window   Refresh and View Verification Process Detail

The example at right displays a full set of completed steps in the Submit process.

Submit Process is Completed

Submit Process is Completed. Thank You !

Step	Name	Started	Completed
6	Running Sample Validation	2/25/2013 3:02:32 PM	2/25/2013 3:02:34 PM
7	Calculating Expansion Factors	2/25/2013 3:02:34 PM	2/25/2013 3:02:36 PM
8	Creating Full Intersections	2/25/2013 3:02:36 PM	2/25/2013 3:05:00 PM
9	Creating Section Geometries	2/25/2013 3:05:00 PM	2/25/2013 3:12:37 PM
10	Creating TOPS and Sample Geometries	2/25/2013 3:12:37 PM	2/25/2013 3:13:16 PM
11	Creating Validation Results Geometries	2/25/2013 3:13:16 PM	2/25/2013 3:14:51 PM
12	Submitting Routes	2/25/2013 3:14:51 PM	2/25/2013 3:14:56 PM
13	Submitting Sections	2/25/2013 3:14:56 PM	2/25/2013 3:16:10 PM
14	Submitting Samples and TOPs	2/25/2013 3:16:10 PM	2/25/2013 3:16:20 PM
15	Submitting Summaries and Validations	2/25/2013 3:16:20 PM	2/25/2013 3:16:40 PM
16	Submitting Full Intersections	2/25/2013 3:16:40 PM	2/25/2013 3:17:09 PM
17	Spooling Report Jobs	2/25/2013 3:17:09 PM	NA

Close this Window   Refresh and View Verification Process Detail

Submittal Continued

After a submission is complete, the Submit Data button will be grayed out, and the State will be locked from resubmitting. To remove the lock (for a re-submittal) contact FHWA HPMS staff.

Chapter 5—Quick Reference

Deleting Data

For various reasons, users may want to delete data that has been uploaded into the HPMS system. This can be done for entire data sets, for data with particular attributes or piecemeal for individual records. In addition, the import and export logs can be cleaned by deleting the record of import and export jobs without affecting associated data.

Deleting Entire Data Sets

The Delete Tool is the most efficient option for deleting data sets that have been uploaded into the HPMS system. Currently this tool is available via the Admin menu. The tool enables users to delete entire data sets with a few clicks.

After selecting the tool from the Data Editors menu, the Delete screen will appear. Check the box next to one or more data elements and click Delete.

To deselect an item from the list after checking it, Click on the item's check box again or use the Clear option on the top of the list to clear all items.

DATA EDITORS   DATA VALIDATION   SAMPLE MANAGEMENT   CALCULATION   REPORTS & A

Delete   Year: **2010**

Select the group(s) you would like to delete

Select All   Clear

- Routes
- Sections
- Samples
- State Summary
- County Summary
- Urban Summary
- NAAQS Summary
- Estimate Data
- Metadata
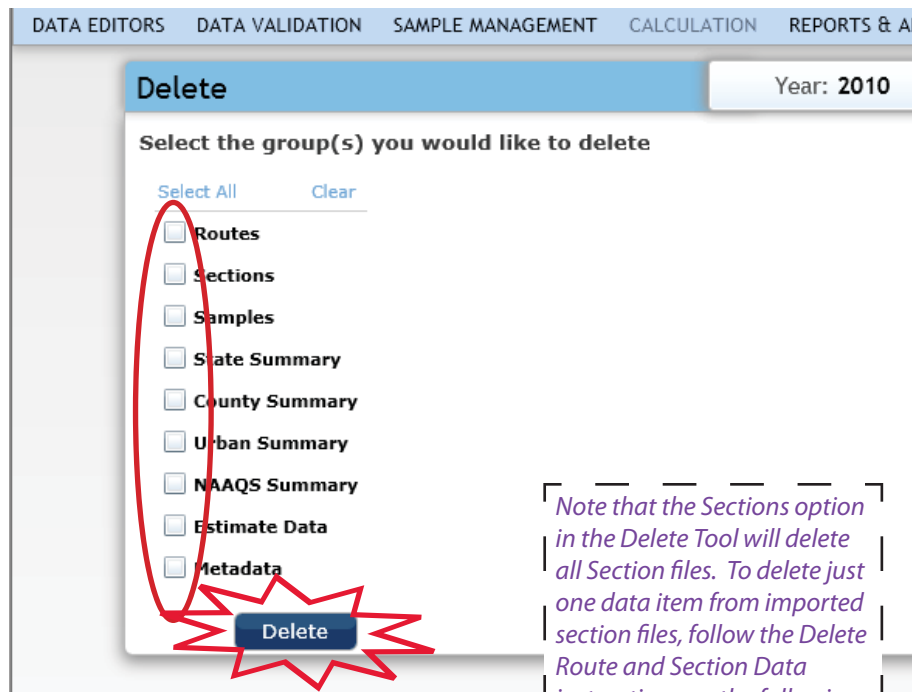
Delete

Note that the Sections option in the Delete Tool will delete all Section files. To delete just one data item from imported section files, follow the Delete Route and Section Data instructions on the following pages.

The application will prompt the user with a confirmation before deleting any files. Deleting files should be done with caution as files can not be restored once deleted. Also, note that several related processes and reports may be affected by a deletion.

Delete Confirmation

This operation will delete all data from the following editors:

Sections
Tops
Validation_Results
Control_Length
Travel_Report
Ownership_Report
Consistency_Report
IRILengthTravel_Report
TravelByNHS_Report
TravelByRouteNumber_Report

Are you sure you want to continue?

Yes   No
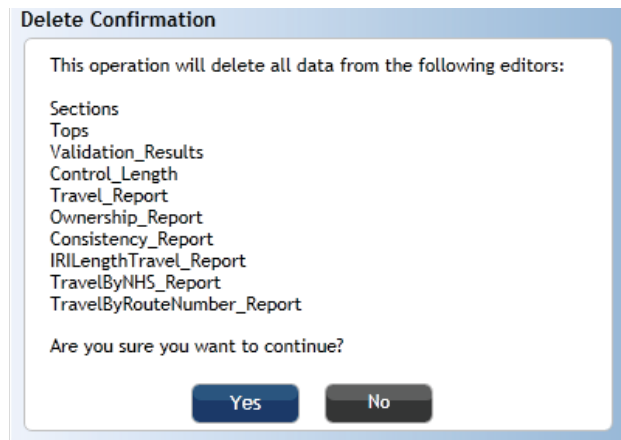
Deleting Route and Section Data

Route and Section data can also be deleted from the HPMS system via the respective route and section screens on the Data Editors tab of the Application Menu. This approach to delete records is more interactive than the Delete Tool and provides the user with more control on the number of records deleted.

Deleting Routes

Delete All Routes

First, open the Routes view by clicking on Route in the Data Editors menu.

Next, Click on the 'X' at the top of the Routes Matrix to remove all routes from the HPMS system.

All records will be deleted if the 'X' at the top of the column is selected—regardless of any selected records in the Routes Matrix.

Delete Individual Routes

Click on the 'X' to the left of a record in the Routes Matrix to remove individual route records from the HPMS system.

Deleting Routes Continued

Delete A Subset of Routes With a Filter

Click on the filter Icon at the top of a column in the Routes Matrix.

	Route ID		Comments		Last Modified By		Last Modified On	
✖	I089-NR007B				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR007A				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR006B				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR006A				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR005B				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
> ✖	I089-NR005A				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR004D				Beauregard, Rachel K		6/23/2011 4:24:06 PM	

1 2 3 4 5 6 7 8 9 ... ▶ ▶| Total Routes: 1196

Enter filter parameters in the filter dialog box and click the Filter button.

☐ Select All

Show rows with value that

Contains

I089   aA

And

Is equal to

    aA

Filter   Clear Filter

Use the drop down list above the filter parameters entry box to select the appropriate qualifier for your filter.

After the filter has run, the entire filtered record set can be deleted by clicking on the red 'X' above the data in the Routes Matrix.

	Route ID		Comments		Last Modified By		Last Modified On	
✖	I089-NR012A				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR011F				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR011C				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR011A				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR010H				Beauregard, Rachel K		6/23/2011 4:24:06 PM	
✖	I089-NR010C				Beauregard, Rachel K		6/23/2011 4:24:06 PM	

1 2 3 4 ▶ ▶| Total Routes: 100

You can quickly gauge the success of the filter by noting the number of pages of records for your route data. In this example, the records list was reduced from nine+ pages to four.

For all of the interactive delete options, the user will be prompted to confirm the deletion of data before any delete is completed.

Delete Confirmation

Sections record with the following key-fields will be deleted:

Year Record: 2009
State Code: 16
Route ID: 007015000018
Begin Point: 0
End Point: 0.018
Data Item: F_SYSTEM

Are you sure you want to delete this r

Yes   No

Delete Confirmation

16795 records will be deleted.

Are you sure you want to continue?

Yes   No

Deleting Section Data

Deleting section data is done through a procedure very much like that for route data. The major distinction between the two processes, is that Section data must first be selected through the 'Select Data Item' filter in the Sections screen (accessible via the Data Editors menu).
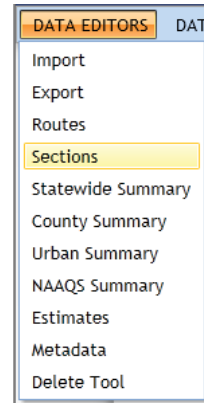
Click on the Pick Data Item button in the Sections screen to select an item from submitted Section data.
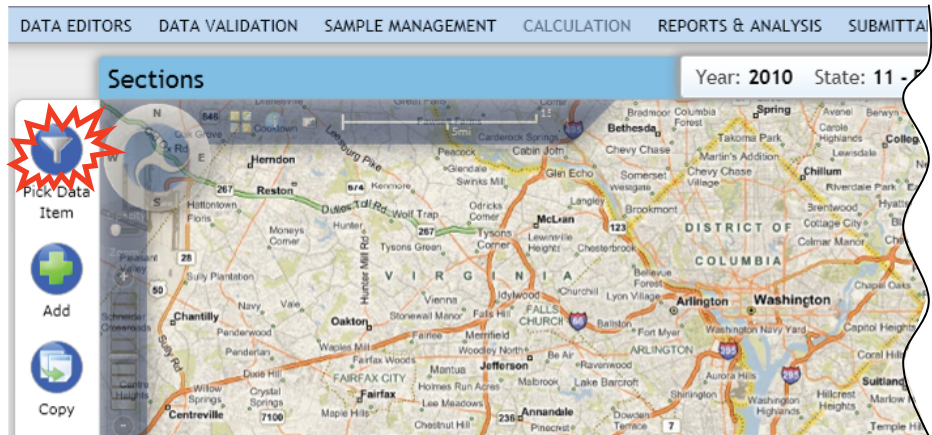
Select the desired Section data set from the Select Data Item window and click Display Selected. Use the Filter box to quickly navigate to your desired Section data item.
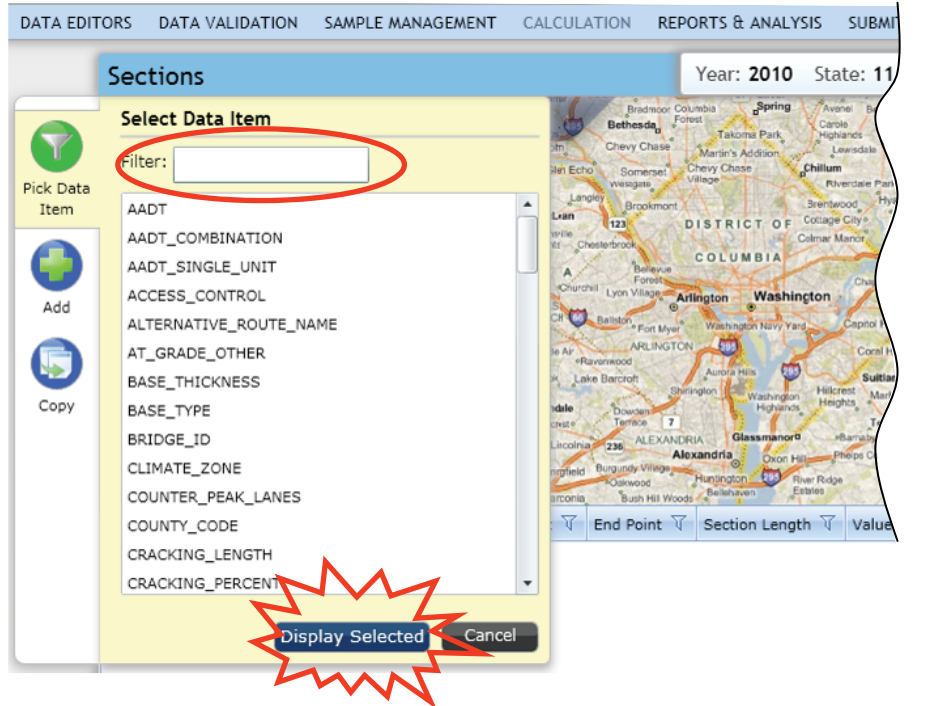
Deleting Section Data—Continued

Section Data can be deleted just as Route data - entirely for each section, in a subset grouping based on a filter, or record by record.

Delete One Data Item

To delete an entire Section data set, click on the 'X' on the top of the Section Matrix.

Delete Individual Section Items

To delete one row/record of data, click on the 'X' to the left of a given row in the table from the appropriate Sections Data Item screen.

Deleting Section Data - Continued

Delete A Subset of Records With a Filter

Click on the filter Icon at the top of a column in the Sections Matrix.

Enter filter parameters in the filter dialog box and click the Filter button.

The funnel icon will be shaded when there is a filter applied to a data field.

After the filter has run, the entire filtered record set can be deleted by clicking on the red 'X' above the data in the Routes Matrix.

Deleting Import or Export Jobs

A record of import and export jobs is kept in the HPMS application to help users keep track of files that have been loaded into or extracted from the system.   The log record is visible from the Import or Export screens of the Data Editors tab on the Application Menu. The logs can be managed through deleting records individually or collectively. Use procedures depicted below to delete Import/Export log files.
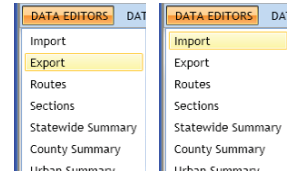
Delete All Log Records

Click on the 'X' at the top of the jobs log table to remove all jobs from the log.
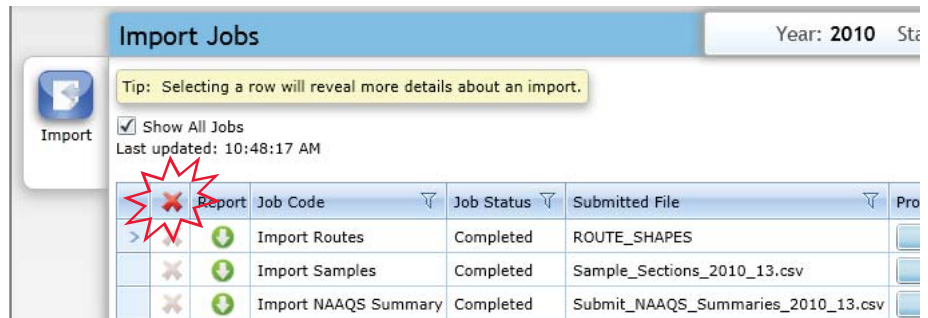
Delete Individual Import /Export Logs Records

Click on the 'X' next to a job in the jobs log to remove that job from the log.
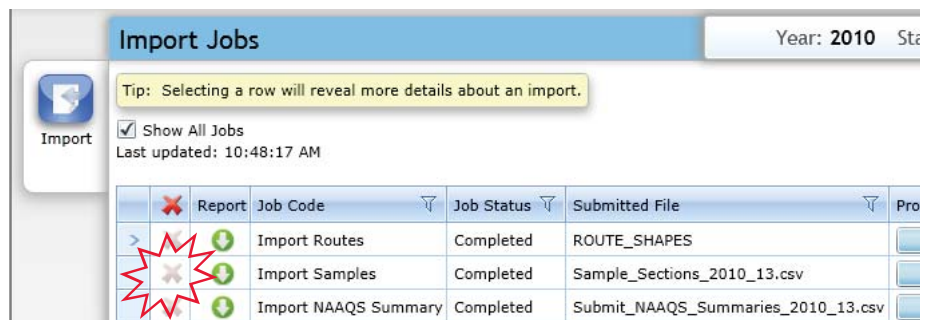
Warning message dialog boxes like the one shown at right appear once a delete process has been initiated. They help to ensure that erroneous mouse clicks don't remove job logs inadvertently.
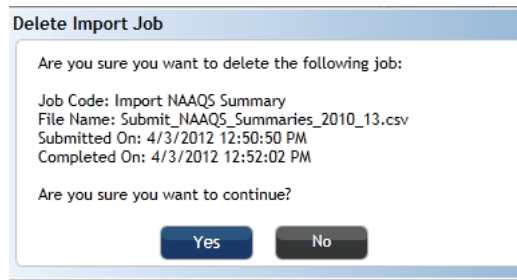
Import and Export Log delete processes can not be undone.

Exiting the System

Closing the HPMS browser window will disconnect the user from the HPMS application. If a connection to the UPACS system is still desired, e.g. when switching between Test and Production versions of the application, use the Exit command on the right side of the main application menu. Users will be prompted to confirm their exit before leaving the application.
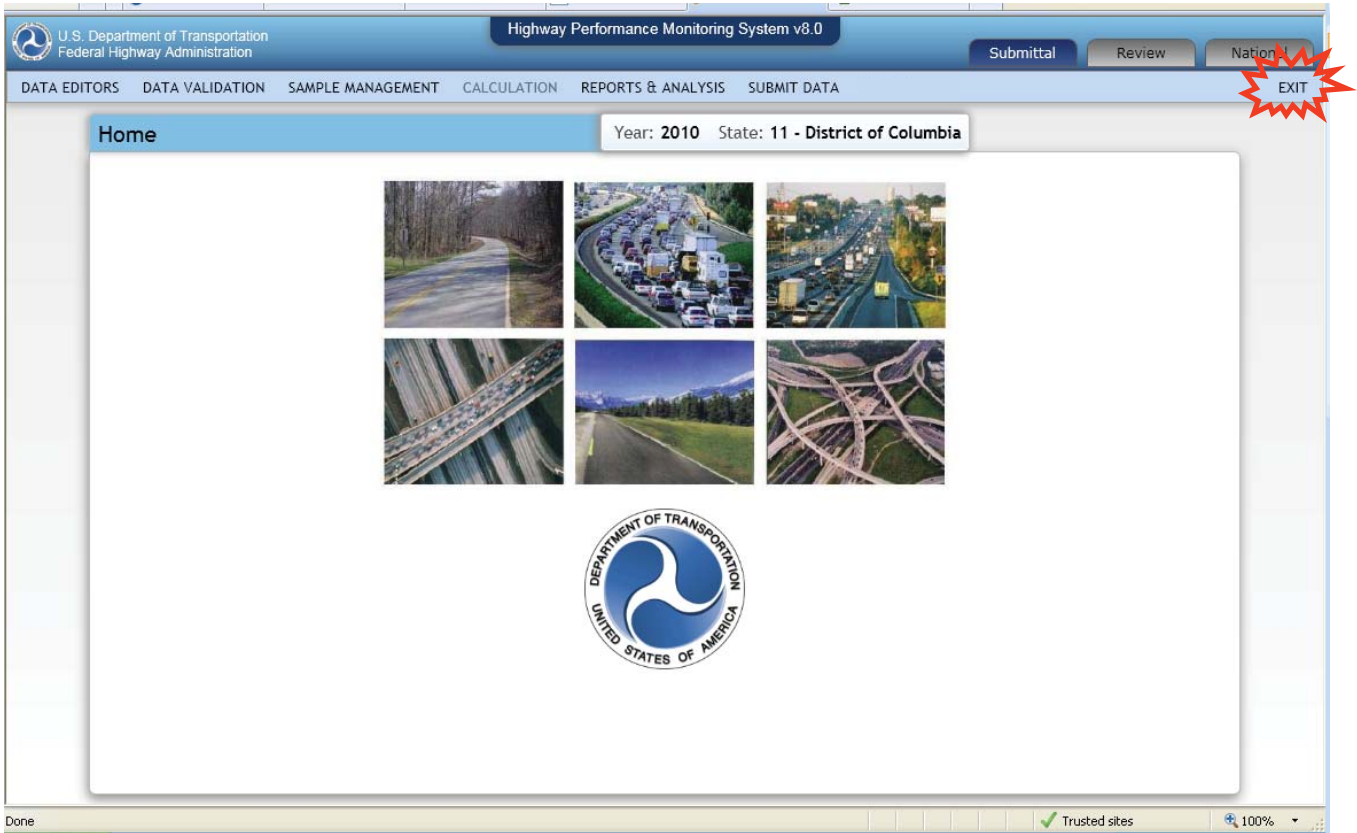
The Help Menu

The HPMS Help Menu contains links to valuable reference documents. Currently, there are two options in this Menu, links to the HPMS Field Manual the Error Messages Screen. Ultimately this Menu will include a link to this Software Guide and other technical documents about HPMS processes, and methodology.

Accessing the HPMS Field Manual

The Help Menu Continued

Viewing Error Messages

As discussed in the Validations section of this document, the list of current software validations is available via the Help menu.   Any updates to this list will be posted periodically with notice to users as appropriate.

Please see Appendix A for the complete list of Validations currently used in the software.

The Job Monitor

The Job Monitor provides users with a view of activity in the HPMS v8 software. Jobs are listed sequentially according to their submission time with the oldest jobs at the top of the list. Jobs are processed according to a number of queues, however, so job completion may appear to be out of order. See below for a list of the job queues currently employe by the HPMS software.

The Job Monitor is accessible via the Admin Menu.

Use the red X to cancel jobs from this screen. Note that users can only cancel jobs that they have issued.

HPMS Software Queues

1. **Import Routes and Geometry**
   (Routes, Urban Area Geometry*)
2. **Other Imports**
   (Import Sections, Summaries, Estimates, Metadata)
3. **Sample and TOPS Processes**
   (Import Samples, Create TOPS, Expansion Factor Creation)
4. **Validations**
   (LRS Validation, Cross Check Validation, Sample Validation, Coverage Validation,
5. **Geometry Creation**
   (Sections, TOPS/Samples, Validations)
6. **Copy and Delete**
   (Copy Section Data from National, Copy Routes from National, Delete Data)
7. **Submit**
   Submit Data, (Archive Data - FHWA Use)
8. **Export Geometry**
   (Routes, Section Geometry, TOPS/Samples Geometry, Validation Geometry, Urban Area Geometry)
9. **Tabular Data Exports**
   (Sections, Samples/Sample Details, Summaries, Estimates, Metadata, Validations, Urban Areas)
10. **FHWA Extraction and Query Processes**
11. **Reports**
   (All Reports)
12. **Calculations**
   (Calculations are currrently not activated)

The 12 Queues operate independently, not in sequential order. Numbers listed here do not indicate hierarchy and are for reference purposes only.

*Urban Area Geometry will be fully accomodate in HPMS software in 2015.

HPMS v8 User Guide Appendices

Appendix A - Validations

Route Import Validations (Errors)

Message	Type	Description
Wrong Type of Geometry	Error - Data Rejected	Only Line files are accepted in HPMS
Illegal Route (Parts Not Connected)	Error - Data Rejected	Aggregated geometry in GeoMedia format that is not perfectly connected is not accepted
Illegal Route (Wrong BP or EP)	Error - Data Rejected	Geometry in GeoMedia format that is missing either the Begin Point or the End Point is not accepted
Route is Empty	Error - Data Rejected	All records in the submitted file must have a Route ID
Duplicate Route ID	Error - Data Rejected	Each record must have a unique Route ID
Invalid M at Part X, Point Y	Error - Data Rejected	The M (measurement) value is missing, too big or too small (measures with this error are typically VERY small or large with values to many exponential factors)
M Not in Order in Part X, Point Y	Error - Data Rejected	M values are not in order at the specified location
M Order in Part X Changes	Error - Data Rejected	Measurements should follow the same sequential order in each part
Route X has a zero-area Ring at Part X	Error - Data Rejected	Typically this occurs when a false area is created by a Route that overlaps itself. These overlaps are often at a VERY small scale.

Route Import Validations (Warnings)

Message	Type	Description
Self -Intersect at Part	Warning	Within a Route Part, a loop may be created, possibly due to digitizing errors.
Route X Has a Non-Zero Ring at Part Y	Warning	An interchange or cul-de-sac may occur on a route leading to an area that has a positive area.
Duplicate Points removed	Warning	Points that exactly overlap each other are removed
Point Order in a Part is Reversed	Warning	If a measurement order is not ascending, but consistently in a descending order, points will be reversed - Measures are not affected.
OGC Invalid	Warning	Geometry is invalid in terms of Open Geospatial Consortium definitions. The FHWA HPMS SQL Server is using OGC format to save geometry. When a route is OGC invalid, HPMS uses the native database function to make it valid in order to save it. When the HPMS system makes this record valid, its measurements will be modified. Please check for OGC Invalid issues before submission if possible. Many OGC validation errors are due to overlaps at the intersection of Route Parts.
Parts are reordered	Warning	When a route has more than one part and M is not in ascending order from part to part, parts will be reordered.

Users should review any record that gets flagged with one or more of the Route Import validation rules above. Special attention should be paid to records where the imported Route has been modified during import. The modification of these routes may impact the dynamic segmentation of data during the Geometry process and lead to LRS Validation errors.

Appendix A - Validations

Import Validations

Data Item #	Data Item Name	Validation
1	F_System	(1,2,3,4,5,6,7)
2	Urban_Code	Valid Five Digit Code from Census
3	Facility_Type	(1,2,4,5,6,7)
4	Structure_Type	(1,2,3)
5	Access_Control	(1,2,3)
6	Ownership	(1,2,3,4,11,12,21,25,26,27,31,32,40,50,60,62,63, 64,66,67,68,69,70,72,73,74,80)
7	Through_Lanes	> 0
8	HOV_Type	(1,2,3)
9	HOV_Lanes	> 0
10	Peak_Lanes	> 0
11	Counter_Peak_Lanes	> 0
12	Turn_Lanes_R	(1,2,3,4,5,6)
13	Turn_Lanes_L	(1,2,3,4,5,6)
14	Speed_Limit	> 0
15	Toll_Charged	(1,2,3)
16	Toll_Type	(1,2)
17	Route_Number	> 0
18	Route_Signing	(1,2,3,4,5,6,7,8,9,10)
19	Route_Qualifier	(1,2,3,4,5,6,7,8,9,10)
20	Alternative_Route_Name	
21	AADT	> 0
22	AADT_Single_Unit	>= 0
23	Pct_Peak_Single	>= 0 and <= 100
24	AADT_Combination	>= 0
25	Pct_Peak_Combination	>= 0 and <= 100
26	K_Factor	>0
27	Dir_Factor	> 0 and <= 100
28	Future_AADT	> 0
29	Signal_Type	(1,2,3,4,5)
30	Pct_Green_Time	> 0 and <= 100
31	Number_Signals	>= 0
32	Stop_Signs	>= 0
33	At_Grade_Other	>= 0
34	Lane_Width	>5 and <31
35	Median_Type	(1,2,3,4,5,6,7)
36	Median_Width	>0 and <100
37	Shoulder_Type	(1,2,3,4,5,6,7)
38	Shoulder_Width_R	> 0

Appendix A: Validations Continued

Import Validations Continued

Data Item #	Data Item Name	Validation
39	Shoulder_Width_L	> 0
40	Peak_Parking	(1,2,3)
41	Widening_Obsticle	(X) or (A,B,C,D,E,F,G)
42	Widening_Potential	>= 0 and <=9
43	Curves_A-F	> 0
44	Terrain_Type	(1,2,3)
45	Grades A-F	> 0
46	Pct_Pass_Sight	>=0 and <= 100
47	IRI	> 0
47	IRI	Value_Date<=Year Record
48	PSR	>0.0 and <=5.0
49	Surface_Type	(1,2,3,4,5,6,7,8,9,10,11)
50	Rutting	>=0
51	Faulting	>=0
52	Cracking_Percent	>= 0 and <= 100
53	Cracking_Length	>= 0
54	Year_Last_Improv	>= 1753 and <= Year Record
55	Year_Last_Construction	>= 1753 and <= Year Record
56	Last_Overlay_Thickness	> 0
57	Thickness_Rigid	>0
58	Thickness_Flexible	> 0
59	Base_Type	(1,2,3,5,6,7,8)
60	Base_Thickness	> 0
61	Climate_Zone	(1,2,3,4)
62	Soil_Type	(1,2)
63	County_Code	Valid Three Digit FIPS Code
64	NHS	(1,2,3,4,5,6,7,8,9)
65	STRAHNET_Type	(1,2)
66	Truck	(1,2)
67	Future_Facility	1
68	Maintenance_Operations	(1,2,3,4,11,12,21,25,26,27,31,32,40,50,60,62,63, 64,66,67,68,69,70,72,73,74,80)
69	Capacity	>0
N/A	All Data Items	Begin Point (BP) Must be < End Point (EP)

Appendix A: Validations Continued

Coverage Validations

	Data Item	Must Exist Where
1	F_System	Facility_Type in (1,2,4)
2	Urban_Code	(F_System in (1,2,3,4,5,6) or NHS)and Facility_Type (1,2,4)
3	Facility_Type	F_System in (1,2,3,4,5) or (F_System =6 and Urban_Code <> 99999)or NHS
4	Structure_Type	
5	Access_Control	(F_System in (1,2,3) or Sample or NHS) AND Facility_Type IN (1,2)
6	Ownership	Facility Type in (1,2) AND (F_System in (1,2,3,4,5) or (F_System = 6 and Urban Code <99999) or NHS)
7	Through_Lanes	Facility Type in (1,2,4) AND (F_System in (1,2,3,4,5) or (F_System = 6 and Urban Code <99999) or NHS)
8	HOV_Type	HOV Lanes is not Null
9	HOV_Lanes	HOV Type is not Null
10	Peak_Lanes	Sample
11	Counter_Peak_Lanes	Sample and Facility_Type = 2 AND (Urban_Code < 99999 OR Through_Lanes>=4)
12	Turn_Lanes_R	Sample and Urban_Code < 99999 and Access_Control >1
13	Turn_Lanes_L	Sample and Urban_Code < 99999 and Access_Control >1
14	Speed_Limit	Sample
15	Toll_Charged	Toll_Type is not Null
16	Toll_Type	Toll_Charged is not Null
17	Route_Number	(F_System in (1,2,3,4) or NHS) and Facility_Type (1,2) AND Route_Signing in (2,3,4,5,6,7,8,9)
18	Route_Signing	(F_System in (1,2,3,4) or NHS) and Facility_Type (1,2)
19	Route_Qualifier	(F_System in (1,2,3,4, or NHS) and Facility_Type (1,2)
20	Alternative_Route_Name	
21	AADT	Facility Type in (1,2,4) AND (F_System in (1,2,3,4,5) or (F_System = 6 and Urban Code <99999) or NHS)
22	AADT_Single_Unit	(F_System in (1) or NHS) and Facility_Type (1,2) or Sample
23	Pct_Peak_Single	Sample
24	AADT_Combination	(F_System in (1) or NHS) and Facility_Type (1,2) or Sample
25	Pct_Peak_Combination	Sample
26	K_Factor	Sample
27	Dir_Factor	Sample
28	Future_AADT	Sample
29	Signal_Type	Sample AND Urban Code <> 99999 and Access_Control >1
30	Pct_Green_Time	Sample and Number_Signals >=1 AND Urban Code <99999
31	Number_Signals	(Sample Where Pct_Green_Time is not Null) or (Sample and Signal_Type IN (1,2,3,4))
32	Stop_Signs	Sample
33	At_Grade_Other	Sample
34	Lane_Width	Sample
35	Median_Type	Sample
36	Median_Width	Sample and Median_Type in (2,3,4,5,6,7)
37	Shoulder_Type	Sample

Appendix A: Validations Continued
Coverage Validations Continued

	Data Item	Must Exist Where
38	Shoulder_Width_R	Sample and Shoulder_Type in (2,3,4,5,6)
39	Shoulder_Width_L	Sample and Shoulder_Type in (2,3,4,5,6) and Median_Type in (2,3,4,5,6,7)
40	Peak_Parking	Sample and Urban_Code < 99999
41	Widening_Obsticle	Sample
42	Widening_Potential	Sample
43	Curves A-F	Curves BP/EP on F_System in (1,2,3) or F_System = 4 and Urban_Code = 99999 and Surface_Type > 1 Must Align with Sample BP/EP
44	Terrain_Type	Sample and Urban_Code = 99999
45	Grades A-F	Grades BP/EP on F_System in (1,2,3) or F_System = 4 and Urban_Code = 99999 and Surface_Type > 1 Must Align with Sample BP/EP
46	Pct_Pass_Sight	Sample and Urban_Code = 99999 and Through_Lanes =2
47	IRI	Facility_Type (1,2) and (F_System in (1,2,3) or NHS or (Sample and F_System = 4 and Urban_Code = 99999))
48	PSR	IRI is NULL and Sample and ((F_System in (4,5,6) and Urban_Code < 99999 and Facility_Type in (1,2,3)) or (F_System in (5) and Facility_Type in (1,2,3) and Urban_Code = 99999)))
49	Surface_Type	Sample
50	Rutting	Surface Type in (2,6,7,8) and Sample
51	Faulting	Surface_Type in (3,4,9,10) and Sample
52	Cracking_Percent	Surface_Type in (2,3,4,5,6,7,8,9,10) and Sample
53	Cracking_Length	Surface Type in (2,6,7,8) and Sample
54	Year_Last_Improv	(Surface_Type in (2,3,4,5,6,7,8,9,10) and Sample) OR (Year_Last_Construction < Year Record - 20)
55	Year_Last_Construction	Surface_Type in (2,3,4,5,6,7,8,9,10) and Sample
56	Last_Overlay_Thickness	Sample and Year_Last_Improv exists
57	Thickness_Rigid	Surface_Type (3,4,5,7,8,9,10) and Sample
58	Thickness_Flexible	Surface_Type (2,6,7,8) and Sample
59	Base_Type	Sample and Surface_Type >1
60	Base_Thickness	Surface_Type >1 and Sample
61	Climate_Zone	
62	Soil_Type	
63	County_Code	Facility Type in (1,2) AND (F_System in (1,2,3,4,5) or (F_System = 6 and Urban Code <99999) or NHS)
64	NHS	(F_System = 1 AND Facility_Type <4) OR Future Facility =1
65	STRAHNET_Type	
66	Truck	
67	Future_Facility	
68	Maintenance_Operations	Toll Charged and Facility_Type (1,2) and (F_System in (1,2,3,4,5) or NHS or (F_System =6 and Urban_Code < 99999))
69	Capacity	
72	Sum of Curves	Length Must Equal to the Sample Length on (Sample and (F_System (1,2,3) or (F_System = 4 and Urban_Code = 99999)))
73	Sum of Grades	Length Must Equal to the Sample Length on (Sample and (F_System (1,2,3) or (F_System = 4 and Urban_Code = 99999)))

Appendix A: Validations Continued

Cross, LRS and Sample Validations

Type	Data Item (and Value)	Validation
Cross	AADT Combination	AADT_Combination < AADT/2.5
Cross	AADT_Single_Unit	AADT_Single_Unit < AADT/2.5
Cross	Counter Peak Lanes	NULL if FACILITY_TYPE is 1
Cross	Cracking_Percent	Cracking Percent should be <50
Cross	DIR_Factor	DIR_Factor must be 100 where Facility_Type = 1
Cross	DIR_Factor	DIR_Factor must be < 81 AND > 50 where Facility_Type = 2
Cross	Faulting	<=1
Cross	Future AADT	Year_Record + 25 >= Value_Date >= Year_Record + 18
Cross	Future_AADT	AADT < FAADT < 3*AADT
Cross	IRI	Where (NHS = (1,2,3,4,5,6,7,8,9), Value_Date = Year Record), Where (NHS is Null, Value_Date Must not be less than (Year Record -2)
Cross	IRI	>= 30 and <= 400
Cross	K_Factor	K_Factor must be > 4.5 and <20
Cross	Lane Width	> 5 and <19
Cross	Median Type in (2,3,4,5,6,7)	Median Width > 0
Cross	Median Width	NULL if (FACILITY_TYPE is 1 or 4) or Median_Type Code <2
Cross	PCT_Peak_Combination	AADT*PCT_Peak_Combination/100 < =AADT_Combination
Cross	PCT_Peak_Single	AADT*PCT_Peak_Single/100 < =AADT_Single_Unit
Cross	Rutting	Rutting should be < 1
Cross	Should_Width_R	Warning if Shoulder_Width_R < 2
Cross	Single Unit / Combination	SU AADT + CU AADT < AADT
Cross	Speed Limit	Divisible by 5
Cross	Surface Type in (7,8)	Neither Flexible or Rigid is Null
Cross	Surface_Type in (2,6)	Thickness Rigid is Null
Cross	Surface_Type in (3,4,5,9,10)	Thickness Flexible is Null
Cross	Widening_Obstacle	Widening_Obstacle must contain A-G where Widening_Potential <9
Cross	Year_Last_Construction	<= Year_Record or NULL
LRS	Route ID Not Found	Route Must Exist where (F_System in (1,2,3,4,5) or(F_System =6 and Urban_Code <> 99999) or NHS)
LRS/Cross	Section Begin_Point/End_Point Out of Bounds	BP/EP Must be Within Route Measurement Bounds within Error of 0.05 mile where (F_System in (1,2,3,4,5) or(F_System =6 and Urban_Code <> 99999) or NHS)
Sample	Sample Crosses Over TOPS	The extent of a given Sample Panel Section extends beyond the extent of the associated TOPS section. Samples should match the length of TOPS sections or be shorter, but can not be longer.
Sample	Sample on Ramp and lower functional systems is Invalid	Only allow Sample where Facility_Type IN 1,2,3 and (F_System = 1-5 or F_System = 6 and Urban Code <99999)
Sample	TOPS Not Found	No TOPS record was created for a given section of the network. One or more of the five TOPS data items is likely missing from this section.

Note: Cross, LRS and Sample validations indicate valid values. A user will receive an error message if submitted data falls outside of this prescribed range. E.g. a value for IRI of 980.

Appendix B: Report Types

Software Generated Static Reports

There are two types of reports in the HPMS software, Static and Interactive. Both Static and Interactive reports are generated from the Reports & Analysis Menu. This Appendix provides detail on both report types, with images and documentation for reference.

The two Interactive Reports in the HPMS 8.x software are Overview and Validations. Although both of these reports are also available via the Static Reports tool, the Interactive versions contain internal links to sub-reports and a slightly different interface. These reports are always generated on the fly and are not stored in a jobs log as with the Static reports.

Link to Interactive Report Interface

These Static Reports are available in Submit, Review and National Modules.

These Static Reports are available in Review and National Modules only.

Overview Summary Report (Interactive)

The Overview Summary Report provides a view of the records uploaded into the HPMS system for each of the Data Menu items. The Interactive version (shown below) contains a link to a count detail for each Section Data Item.

Click the "By Data Item" link to jump to a sub report with a count of records uploaded for each of the HPMS data items.

Appendix B: Report Types Continued

Validation Summary Report (Interactive)

The Validation Summary Report is the second of two reports available in both static and interactive formats. The report lists validation errors with uploaded data, grouped by validation category (LRS, Cross Check or Sample) and error type. These validation errors are the same as those displayed on the validation screens in the Data Validation menu. Links in the Records column of the Interactive version can be used to view a detailed validation report by topic area. See the Help Menu for a list of the Validations that appear in this report.

Click the linked record count in the Records column to jump to a report listing each record (Route ID, etc) with a specified error.

Extent and Travel Report

This report is represents the output of three similar but distinct spatial intersections of submitted Section and Summary data.

Collectively, the following data elements are included in this report: F_System, Facility_Type, Urban_Code, Through_Lanes and AADT. Note that totals from the lower functional systems (Minor Collectors and Locals) are derived from a mix of Summary and Section data. The output of this report is a useful tool in the review of submitted length, lane length and travel data. There are several versions of this report. The formulas are similar for each version, although the universe of data (e.g. Total Mileage vs. National Highway System Mileage) is unique.

The example to the right depicts the components of the 'Miles' portion of the report as described below. Note that the illustration is truncated and only shows a few of the urban/rural classifications for the selected State. Subsequent pages depict the various iterations of the Extent and Travel Report in the HPMS V. 8.x software.

For each column of the report table: Miles, Through Lanes and Vehicle Miles, several HPMS Data Items are intersected within the HPMS system. Data in this report includes records where Facility Type is equal to 1 or 2. Sections coded as Ramps, Non-Mainline and Non-Inventory Direction (codes 4-6) are excluded. (Note, use of Facility Type 3 has been discontinued).

Miles
- Establishes the length ("HPMS Calculated Miles") which should be compared to the Certified Mileage. The comparison of these two mileage figures can be viewed on the Submit Data screen.
- For records with Functional System equal to 1 through 5, length is calculated by running a spatial intersection of F_System, Facility_Type, and Urban_Code for Facility_Type, and then summing the difference of (End_Point - Begin_Point) and grouping by F_System.
- Where Functional System is equal to 6-Minor Collector and 7-Local, the table represents the combination of County Summary and Section data. Mileage for Urban Minor Collectors (F_System =6 and Urban Code < 99999) is summed as described above for Functional Systems 1 through 5. The mileage for Rural Minor Collector (F_System = 6 and Urban_Code = 99999) and all Local roadways (F_System = 7) is a sum of the length for those Functional Systems as reported in the County Summary table.

Lane Miles
- For records with Functional System equal to 1 through 5, length is calculated by running a spatial intersection of F_System, Facility_Type, and Urban_Code for Facility_Type, and then summing: ((End Point – Begin Point)*Through Lanes), for each reported HPMS Section, and grouping by Functional System.
- As with the Miles calculations, figures for Functional System equal to 6-Minor Collector and 7-Local are a combination of County Summary and Section data. Lane Miles for Urban Minor Collectors is summed as described above for Functional Systems 1 through 5. The mileage for Rural Minor Collector and all Local roadways is the sum of system length in the County Summary Table multiplied by two (so the total may not agree with lane miles in State records).

Vehicle Miles (VMT)
- This column represents the total Daily Vehicle Miles Traveled (DVMT) for each of the seven roadway functional classes. The DVMT is defined as the Annualized Average Daily Travel (AADT) * Segment Length
- DVMT is calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code, and AADT for Facility_Type and then summing the (End_Point – Begin_Point)*AADT and Grouping by F_System.
- For Functional System equal to 6- Minor Collector and 7-Local, the report represents the State Summary travel figures for Local and Minor Collector roadway types. Where Urban Area data is reported for Rural Minor Collector and Local roadways, the travel figures are taken from the Urban Summary table.

Appendix B: Report Types Continued

Extent and Travel Report Continued

HPMS 8.0.1   **Extent and Travel Report**

Stage: Review
Year: 2010
State: 41 - Oregon
Date: 12/20/2011

All Areas	Miles
1 - Interstate	729.810
2 - PA - Other Freeways and Expressways	58.870
3 - PA - Other	3,583.470
4 - Minor Arterial	3,498.480
5 - Major Collector	10,278.170
6 - Minor Collector	7,413.250
7 - Local	33,588.830
Total	59,150.880

6868 - Bend, OR	Miles
1 - Interstate	0.000
2 - PA - Other Freeways and Expressways	0.000
3 - PA - Other	27.620
4 - Minor Arterial	57.490
5 - Major Collector	52.460
6 - Minor Collector	0.000
7 - Local	303.350
Total	440.920

99998 - Small Urban	Miles
1 - Interstate	55.420
2 - PA - Other Freeways and Expressways	0.000
3 - PA - Other	293.440
4 - Minor Arterial	293.550
5 - Major Collector	631.590
6 - Minor Collector	0.000
7 - Local	2,399.060
Total	3,673.060

99999 - Rural	Miles
1 - Interstate	553.070
2 - PA - Other Freeways and Expressways	0.000
3 - PA - Other	2,817.850
4 - Minor Arterial	2,366.880
5 - Major Collector	8,385.050
6 - Minor Collector	7,413.250
7 - Local	24,716.130
Total	46,252.230

Sum section lengths:
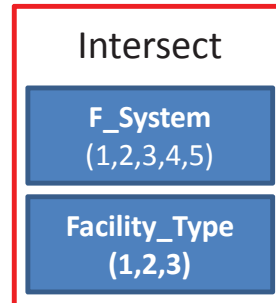
Intersect

F_System (1,2,3,4,5)

Facility_Type (1,2,3)

+

Sum section lengths:

Intersect

F_System (6)

Facility_Type (1,2,3)

Urban_Code (<99999)

+

Sum mileage:

County Summary (All Locals and Rural Minor Collectors)
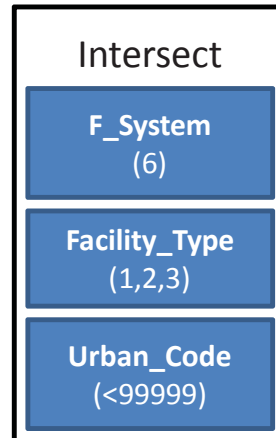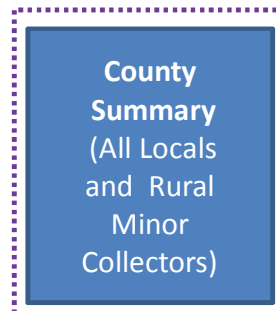
Appendix B: Report Types Continued

Extent and Travel Report Continued

The image below depicts the first page of the Extent and Travel Report for 2010/Review showing columns for Miles Lane Miles and Vehicle Miles. The format of this report is the same as what appears in the Submit module. Note that the report provides a two year comparison for Miles, Lane Miles and Vehicle Miles. Data is grouped for the entire State and then broken out by urban/rural designation. The active year in the HPMS application will always be compared with the previous year's data from the National database. If data was not submitted for a prior year, then no comparison will be available.

HPMS 8.0.1	**Extent and Travel Report** Urbanized Area Summary						**Stage:** Review **Year:** 2010 **State:** 8 - Colorado **Date:** 05/04/2012		
	Miles			Lane Miles			Vehicle Miles		
	2010	2009	% Change	2010	2009	% Change	2010	2009	% Change
All Areas									
1 - Interstate	952.71	952.67	0.00%	4,119.46	4,119.61	0.00%	31,885,353.40	31,632,446.00	0.80%
2 - PA - Other Freeways and Expressways	313.97	313.99	-0.01%	1,320.78	1,320.86	-0.01%	12,367,712.00	11,787,952.30	4.92%
3 - PA - Other	3,512.59	3,511.44	0.03%	9,764.33	9,757.23	0.07%	35,829,191.36	34,986,927.02	2.41%
4 - Minor Arterial	5,412.06	5,410.51	0.03%	11,909.30	11,897.79	0.10%	21,246,105.40	21,481,448.08	-1.10%
5 - Major Collector	7,298.34	7,301.40	-0.04%	14,900.18	14,904.82	-0.03%	12,397,178.36	12,110,711.58	2.37%
6 - Minor Collector	8,972.03	8,967.82	0.05%	17,944.07	17,935.64	0.05%	2,016,000.00	1,994,000.00	1.10%
7 - Local	61,891.12	61,801.18	0.15%	123,782.24	123,602.36	0.15%	12,861,000.00	12,665,000.00	1.55%
Total	**88,352.8**	**88,259.0**	**0.11%**	**183,740.4**	**183,538.3**	**0.11%**	**128,602,540.5**	**126,658,485.0**	**1.53%**
9298 - Boulder, CO									
1 - Interstate	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
2 - PA - Other Freeways and Expressways	15.10	15.10	0.03%	60.73	60.74	-0.01%	664,454.30	594,789.90	11.71%
3 - PA - Other	27.71	27.71	-0.01%	101.88	101.89	0.00%	567,831.80	546,341.90	3.93%
4 - Minor Arterial	37.72	37.72	0.00%	96.88	96.88	0.00%	451,979.70	445,475.50	1.46%
5 - Major Collector	38.90	38.96	-0.18%	78.50	78.64	-0.18%	168,871.20	171,037.90	-1.27%
6 - Minor Collector	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
7 - Local	302.21	301.45	0.25%	604.41	602.89	0.25%	206,000.00	195,000.00	5.64%
Total	**421.6**	**420.9**	**0.16%**	**942.4**	**941.0**	**0.15%**	**2,059,137.0**	**1,952,645.2**	**5.45%**
18856 - Colorado Springs, CO									
1 - Interstate	35.44	35.46	-0.06%	165.90	166.02	-0.07%	2,752,012.00	2,469,633.60	11.43%
2 - PA - Other Freeways and Expressways	47.34	47.34	0.00%	212.96	212.97	0.00%	1,678,818.00	1,519,265.40	10.50%
3 - PA - Other	173.83	173.81	0.01%	637.50	637.74	-0.04%	3,177,733.80	3,224,567.90	-1.45%
4 - Minor Arterial	273.81	273.81	0.00%	693.02	693.04	0.00%	1,863,602.80	1,887,434.80	-1.26%
5 - Major Collector	148.35	148.14	0.14%	315.19	314.77	0.13%	498,507.98	492,713.42	1.18%
6 - Minor Collector	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
7 - Local	1,850.54	1,844.68	0.32%	3,701.08	3,689.36	0.32%	1,108,000.00	1,066,000.00	3.94%
Total	**2,529.3**	**2,523.2**	**0.24%**	**5,725.6**	**5,713.9**	**0.21%**	**11,078,674.6**	**10,659,615.1**	**3.93%**

Appendix B: Report Types Continued

Extent and Travel Report (Urban/Rural Summary)

This version of the Extent and Travel Report provides a grouping of data by urban designation: Small Urban, Urban and Rural as well as a two year comparison much like the Extent and Travel Changes report.

HPMS 8.0.1	**Extent and Travel Report** **Statewide Summary**							**Stage:** Submit **Year:** 2011 **State:** 40 - Oklahoma **Date:** 05/01/2012		
	Miles			**Lane Miles**			**Vehicle Miles**			
	2011	**2010**	**% Change**	**2011**	**2010**	**% Change**	**2011**	**2010**	**% Change**	
All Areas										
1 - Interstate	932.65	932.65	0.00%	3,955.54	3,939.48	0.41%	27,309,365.00	27,472,188.00	-0.59%	
2 - PA - Other Freeways and Expressways	188.13	185.64	1.34%	881.06	861.24	2.30%	7,709,204.10	7,730,404.10	-0.27%	
3 - PA - Other	3,388.02	3,388.31	-0.01%	10,675.37	10,658.39	0.16%	29,331,456.71	29,727,049.27	-1.33%	
4 - Minor Arterial	4,843.84	4,844.42	-0.01%	11,302.62	11,295.08	0.07%	23,271,951.01	23,460,721.02	-0.80%	
5 - Major Collector	22,318.05	22,315.71	0.01%	45,139.00	45,129.54	0.02%	18,977,562.02	19,072,370.03	-0.50%	
6 - Minor Collector	2,990.71	2,989.52	0.04%	5,981.42	5,979.04	0.04%	495,984.00	496,000.00	0.00%	
7 - Local	78,145.40	78,216.76	-0.09%	156,290.80	156,433.52	-0.09%	22,894,474.00	22,852,000.00	0.19%	
Total	**112,806.8**	**112,873.0**	**-0.06%**	**234,225.8**	**234,296.3**	**-0.03%**	**129,989,996.8**	**130,810,732.4**	**-0.63%**	
99998 - Small Urban										
1 - Interstate	80.07	80.07	0.00%	320.28	320.28	0.00%	1,863,071.00	1,863,071.00	0.00%	
2 - PA - Other Freeways and Expressways	43.57	43.57	0.00%	174.28	174.28	0.00%	770,576.00	855,127.00	-9.89%	
3 - PA - Other	547.74	547.76	0.00%	1,878.44	1,878.36	0.00%	5,333,445.10	5,381,479.00	-0.89%	
4 - Minor Arterial	1,051.17	1,062.78	-1.09%	2,323.74	2,346.98	-0.99%	3,733,219.41	3,770,851.36	-1.00%	
5 - Major Collector	485.21	488.40	-0.65%	993.58	1,000.34	-0.68%	989,184.94	994,627.32	-0.55%	
6 - Minor Collector	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	
7 - Local	4,939.42	4,890.80	0.99%	9,878.84	9,781.60	0.99%	3,886,922.00	3,841,000.00	1.20%	
Total	**7,147.2**	**7,113.4**	**0.48%**	**15,569.2**	**15,501.8**	**0.43%**	**16,576,418.5**	**16,706,155.7**	**-0.78%**	
99999 - Rural										
1 - Interstate	683.52	683.52	0.00%	2,748.94	2,735.14	0.50%	14,014,257.00	14,089,911.00	-0.54%	
2 - PA - Other Freeways and Expressways	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	
3 - PA - Other	2,328.22	2,326.04	0.09%	6,903.78	6,881.12	0.33%	13,604,656.70	13,902,264.60	-2.14%	
4 - Minor Arterial	2,702.91	2,703.28	-0.01%	5,986.24	5,979.72	0.11%	7,935,195.40	8,129,163.10	-2.39%	
5 - Major Collector	21,262.45	21,259.04	0.02%	42,852.36	42,839.10	0.03%	15,453,769.74	15,532,752.24	-0.51%	
6 - Minor Collector	2,990.71	2,989.52	0.04%	5,981.42	5,979.04	0.04%	495,984.00	496,000.00	0.00%	
7 - Local	66,704.09	66,822.49	-0.18%	133,408.18	133,644.98	-0.18%	7,509,662.00	7,501,000.00	0.12%	
Total	**96,671.9**	**96,783.9**	**-0.12%**	**197,880.9**	**198,059.1**	**-0.09%**	**59,013,524.8**	**59,651,090.9**	**-1.07%**	
All Urbanized										
1 - Interstate	169.06	169.06	0.00%	886.32	884.06	0.26%	11,432,037.00	11,519,206.00	-0.76%	
2 - PA - Other Freeways and Expressways	144.56	142.07	1.75%	706.78	686.96	2.89%	6,938,628.10	6,875,277.10	0.92%	
3 - PA - Other	512.06	514.51	-0.48%	1,893.15	1,898.91	-0.30%	10,393,354.91	10,443,305.67	-0.48%	
4 - Minor Arterial	1,089.76	1,078.36	1.06%	2,992.64	2,968.38	0.82%	11,603,536.20	11,560,706.56	0.37%	
5 - Major Collector	570.39	568.27	0.37%	1,293.06	1,290.10	0.23%	2,534,607.34	2,544,990.47	-0.41%	
6 - Minor Collector	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	
7 - Local	6,501.89	6,503.47	-0.02%	13,003.78	13,006.94	-0.02%	11,497,890.00	11,510,000.00	-0.11%	
Total	**8,987.7**	**8,975.7**	**0.13%**	**20,775.7**	**20,735.4**	**0.19%**	**54,400,053.6**	**54,453,485.8**	**-0.10%**	
All Urban										
1 - Interstate	249.13	249.13	0.00%	1,206.60	1,204.34	0.19%	13,295,108.00	13,382,277.00	-0.65%	
2 - PA - Other Freeways and Expressways	188.13	185.64	1.34%	881.06	861.24	2.30%	7,709,204.10	7,730,404.10	-0.27%	
3 - PA - Other	1,059.80	1,062.27	-0.23%	3,771.59	3,777.27	-0.15%	15,726,800.01	15,824,784.67	-0.62%	
4 - Minor Arterial	2,140.93	2,141.14	-0.01%	5,316.38	5,315.36	0.02%	15,336,755.61	15,331,557.92	0.03%	
5 - Major Collector	1,055.60	1,056.67	-0.10%	2,286.64	2,290.44	-0.17%	3,523,792.28	3,539,617.79	-0.45%	
6 - Minor Collector	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	
7 - Local	11,441.31	11,394.27	0.41%	22,882.62	22,788.54	0.41%	15,384,812.00	15,351,000.00	0.22%	
Total	**16,134.9**	**16,089.1**	**0.28%**	**36,344.9**	**36,237.2**	**0.30%**	**70,976,472.0**	**71,159,641.5**	**-0.26%**	

Interstate Extent and Travel by Route Number

This table shows the Interstate Mileage, Lane-Mileage and DVMT for the Interstate System grouped by Route Number. The Totals should agree with the Interstate rows on the Extent and Travel Report.

Miles
- Length is calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code and Route_Number for Facility_Type equal to 1-One-Way or 2-Two-Way and F_System = 1.
- The Length is determined by summing the End_Point – Begin_Point and Grouping by Route_Number.

Lane Miles
- Lane-Length is calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code, Through_Lanes and Route_Number for Facility_Type equal to 1-One-Way or 2-Two-Way and F_System = 1.
- The Lane-Length is determined by summing the (End_Point – Begin_Point)* Through_Lanes and grouping by Route_Number.

Vehicle Miles (DVMT)
- Length is calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code, and Route_Number for Facility_Type equal to 1-One-Way or 2-Two-Way and F_System = 1.
- The total DVMT is determined by summing the (End_Point – Begin_Point)* AADT and Grouping by Route_Number.

HPMS 8.0.1	Interstate Extent and Travel by Route Number		Stage: Submit Year: 2011 State: 12 - Florida Date: 03/28/2012

Route Number	Miles	Lane Miles	Vehicle Miles
4	131.90	804.39	13,630,400.04
10	362.06	1,489.16	8,984,849.20
75	470.76	2,476.04	25,212,699.46
95	382.01	2,310.26	33,707,622.40
110	6.34	34.55	218,764.50
175	1.29	5.53	24,834.60
195	4.42	25.13	470,901.55
275	60.29	332.15	5,732,930.10
295	60.86	307.38	4,639,817.92
375	1.22	5.50	28,934.10
395	1.29	5.17	168,292.00
595	12.86	83.86	1,995,458.00
Total	**1,495.30**	**7,879.10**	**94,815,503.86**

Appendix B: Report Types Continued

Extent and Travel on the NHS

This table is similar to the other Extent and Travel Reports but adds the National Highway System (NHS) as a filter for included roadways.   The resulting table is grouped by Functional System and NHS code. **Note that totals for Mileage, Lane Miles and DVMT are listed on the last page of the report.**

Miles
- Included roadways are calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code and NHS for Facility_Type equal to 1-One-Way or 2-Two-Way.
- The Length is determined by summing the (End_Point – Begin_Point) and Grouping by F_System.

Lane Miles
- Lane-Length is calculated by running a spatial intersection of F_System, Facility_Type, Urban_Code, Through_ Lanes and NHS for Facility_Type equal to 1-One-Way or 2-Two-Way.
- The Lane-Length is determined by summing the (End_Point – Begin_Point)* Through_Lanes and Grouping by F_System.

Vehicle Miles
- Length is calculated by running a spatial intersection as described above for Miles.
- The total DVMT is determined by summing the (End_Point – Begin_Point)* AADT and Grouping by F_System.

HPMS 8.0.1	Extent and Travel on the NHS		Stage:	Review
			Year:	2011
			State:	37 - North Carolina
			Date:	10/09/2012

NHS: 1 - Non Connector NHS

F System	Miles	Lane Miles	Vehicle Miles
1 - Interstate	1,172.50	5,599.40	58,169,504.60
2 - PA - Other Freeways and Expressways	397.94	1,681.30	13,358,831.60
3 - PA - Other	2,064.16	7,326.15	31,128,067.03
4 - Minor Arterial	175.84	519.66	1,578,617.10
5 - Major Collector	90.68	195.32	473,362.44
6 - Minor Collector	0.00	0.00	0.00
7 - Local	7.74	28.96	62,778.50
Sub-Totals	**3,908.85**	**15,350.79**	**104,771,161.27**

NHS: 9 - Ferry Terminal

F System	Miles	Lane Miles	Vehicle Miles
1 - Interstate	0.00	0.00	0.00
2 - PA - Other Freeways and Expressways	0.00	0.00	0.00
3 - PA - Other	31.99	91.13	566,343.40
4 - Minor Arterial	3.78	8.12	21,136.30
5 - Major Collector	98.74	197.49	392,441.79
6 - Minor Collector	0.00	0.00	0.00
7 - Local	0.00	0.00	0.00
Sub-Totals	**134.51**	**296.74**	**979,921.49**

Total Miles	Total Lane Miles	Total Vehicle Miles
4,082.04	**15,768.41**	**106,271,197.76**

The NHS ETR is multiple pages long. This example is truncated to show the Miles, Lane Miles and Vehicle Miles totals and therefore depicts data for just two of nine NHS codes.

Appendix B: Report Types Continued

Consistency

The output for this report is a comparison of key full extent Data Items. The Control Length column should agree with the State's Certified Miles for upper level Functional Systems. The Miles of AADT, Lanes and Ownership indicate the number of miles that are covered by each respective data item. **This report is a key reference for review of State HPMS submittals.** Once complete, a submittal should yield equal values across each row. Note that the report only includes Section lengths so most miles reported on lower Functional Systems in Summary tables are not represented. As a result, mileage for lower Functional Systems typically only represents those roadways where data is coded for NHS or related purposes.   The intersections that support this report will omit data where it is missing on any of the intersected data items, so if AADT is not reported for the full extent of a Functional System, the Length for AADT will be short on the corresponding Functional System when compared with the length on the same Functional System for other Data Items in the report. Finally, this report only represents system length for select Data Items, it does not reflect the coded numeric values on those Sections.

Length calculations for all data items are the same. After each intersection described below is performed, the Length is determined by summing (End_Point - Begin_Point) and grouping by F_System.

Length of AADT (Miles)
 * Length is calculated after running a spatial intersection of F_System, Facility_Type, Urban_Code and AADT for Facility_Type equal to 1-One-Way, 2-Two-Way, or 3-Couplet.

Length of Through Lanes (Miles)
 * Length is calculated after running a spatial intersection of F_System, Facility_Type, Urban_Code and Through_ Lanes for Facility_Type equal to 1-One-Way, 2-Two-Way, or 3-Couplet.

Length of Ownership (Miles)
 * Length is calculated after running a spatial intersection of F_System, Facility_Type, Urban_Code and Ownership for Facility_Type equal to 1-One-Way, 2-Two-Way, or 3-Couplet.

Length Control (Miles)
 * This is the same calculation that is used for the Extent and Travel Report for Functional Systems 1-5.
 * Length is derived from a spatial intersection of F_System, Facility_Type, and Urban_Code for Facility_Type equal to 1-One-Way, 2-Two-Way, or 3-Couplet.

HPMS 8.0.1 — **Consistency Report** — Stage: Submit, Year: 2010, State: 37 - North Carolina

F System	Length AADT (Miles)	Length Through Lanes (Miles)	Length Ownership (Miles)	Length Control (Miles)
1 - Interstate	1,171.400	1,171.996	1,171.996	1,171.996
2 - PA - Other Freeways and Expressways	480.742	480.742	480.742	480.742
3 - PA - Other	3,685.628	3,685.748	3,685.748	3,685.748
4 - Minor Arterial	5,846.634	5,846.634	5,846.634	5,846.634
5 - Major Collector	10,757.502	10,757.518	10,757.518	10,757.518
6 - Minor Collector	6,568.288	6,569.285	6,569.285	6,569.285
7 - Local	43.055	43.055	43.055	43.055

Length figures for Rural Minor Collectors and Local roadways reported in the County Summary file are not included in this report.

Appendix B: Report Types Continued

Ownership

Ownership totals are shown by Functional System for each ownership category coded in the State submittal, as well as the total sum for submitted data statewide. The "All" sub-table reflects the State Total. Subsequent sub-tables reflect individual ownership categories. The length of this report varies greatly depending on the number of Ownership categories reported in a State submittal. The example shown here depicts just two of the many Ownership categories available for coding per the HPMS Field Manual.

HPMS 8.0.1	Ownership Report	Stage: Review Year: 2010 State: 9 - Connecticut Date: 03/20/2012

All	Miles
1 - Interstate	346.170
2 - PA - Other Freeways and Expressways	278.870
3 - PA - Other	807.310
4 - Minor Arterial	1,916.340
5 - Major Collector	2,769.240
6 - Minor Collector	432.970
7 - Local	14,839.820
Total	**21,390.720**

State Highway Agency	Miles
1 - Interstate	346.170
2 - PA - Other Freeways and Expressways	278.870
3 - PA - Other	758.160
4 - Minor Arterial	1,166.510
5 - Major Collector	1,122.780
6 - Minor Collector	22.450
7 - Local	24.150
Total	**3,719.090**

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Appendix B: Report Types Continued

IRI on NHS

There are two reports that deal specifically with IRI (International Roughness Index) data. The first of these reports depicts the Mileage and DVMT for the National Highway System grouped by Functional System and aggregated by reported IRI values where IRI is less than 95 (Good), greater than 94 but less than 171 (Fair) and greater than 170 (Poor). The totals in this report should be consistent with the Extent and Travel on the NHS report.

Length - in Miles
- Length includes all control sections that have a FACILITY_TYPE of 1 or 2 and are covered by IRI and NHS
- Length is determined from (End_Point - Begin Point) and summed where;
- IRI is less than 95 (as Good), IRI ranges from 95 to 170 (as Fair) and IRI is greater than 170 (as Poor), and group by F_SYSTEM

Travel - in Vehicle Miles
- For all control sections that have a FACILITY_TYPE of 1 or 2 and are covered by IRI and any NHS,
- Sum VMT of those with an IRI less than 95 (as Good), with an IRI from 95 to 170 (as Fair) and those with an IRI great than 170 (as Poor), and group by F_SYSTEM

HPMS 8.0.1	IRI on NHS		Stage: Review Year: 2010 State: 20 - Kansas Date: 05/07/2012	
Length - In Miles				
F System	< 95	95 - 170	> 170	Total
1 - Interstate	679.0	191.4	2.1	872.5
2 - PA - Other Freeways and Expressways	121.8	34.6	0.9	157.2
3 - PA - Other	2,320.1	395.1	20.3	2,735.4
4 - Minor Arterial	4.3	4.3	3.4	12.0
5 - Major Collector	0.0	0.1	1.9	2.0
6 - Minor Collector	0.0	0.0	0.0	0.0
7 - Local	0.0	0.0	0.0	0.0
Sub-Totals	3,125.1 (82.7%)	625.5 (16.6%)	28.6 (0.8%)	3,779.1
Travel - In Vehicle Miles				
F System	< 95	95 - 170	> 170	Total
1 - Interstate	12,312,973.1	6,244,270.0	60,042.5	18,617,285.6
2 - PA - Other Freeways and Expressways	3,388,118.5	889,040.8	8,495.9	4,285,655.2
3 - PA - Other	9,973,551.5	2,062,665.0	143,778.0	12,179,994.6
4 - Minor Arterial	11,554.3	15,361.2	33,246.4	60,161.9
5 - Major Collector	0.0	60.0	4,938.3	4,998.3
6 - Minor Collector	0.0	0.0	0.0	0.0
7 - Local	0.0	0.0	0.0	0.0
Sub-Totals	25,686,197.3 (73.1%)	9,211,397.1 (26.2%)	250,501.1 (0.7%)	35,148,095.4

Appendix B: Report Types Continued

IRI on Federal Aid Highways

As with the IRI on NHS report, this report provides length and travel information in two tables with records grouped by Functional System and IRI rating. Here the Functional System value of 1-3 replaces the NHS component of the data input/intersection.

Length
- For all sections that have a FACILITY_TYPE of 1, 2 or 3 and a F_SYSTEM of 1, 2 or 3, and are covered by IRI,
- Sum the length of sections as (End_Point - Begin_Point) and group by Functional System.
- Group records within Functional System by IRI value; IRI less than 95 (as Good), IRI from 95 to 170 (as Fair) and IRI greater than 170 (as Poor)

Travel/Vehicle Miles
- For all sections that have a FACILITY_TYPE of 1, 2 or 3 and a F_SYSTEM of 1, 2 or 3, and are covered by IRI,
- Sum DVMT (Length*AADT) of those with an IRI less than 95 (as Good), with an IRI from 95 to 170 (as Fair) and those with an IRI great than 170 (as Poor), and group by F_SYSTEM

HPMS 8.0.1 **IRI on Federal Aid Highways**

Stage: Review
Year: 2010
State: 20 - Kansas
Date: 05/07/2012

Length- In Miles				
F System	**< 95**	**95 - 170**	**> 170**	**Total**
1 - Interstate	679.0	191.4	2.1	872.5
2 - PA - Other Freeways and Expressways	136.6	47.8	2.8	187.2
3 - PA - Other	2,868.9	809.2	187.8	3,865.9
Sub-Totals	**3,684.5 (74.8%)**	**1,048.5 (21.3%)**	**192.7 (3.9%)**	**4,925.6**

Travel - In Vehicle Miles				
F System	**< 95**	**95 - 170**	**> 170**	**Total**
1 - Interstate	12,312,973.1	6,244,270.0	60,042.5	18,617,285.6
2 - PA - Other Freeways and Expressways	3,685,841.2	1,128,131.9	22,079.8	4,836,053.0
3 - PA - Other	12,540,350.5	7,034,219.0	2,348,286.7	21,922,856.2
Sub-Totals	**28,539,164.7 (62.9%)**	**14,406,621.0 (31.7%)**	**2,430,409.1 (5.4%)**	**45,376,194.8**

Appendix B: Report Types Continued

National Level Reports Overview

With the exception of the National Extent and Travel Report, National reports match the format and content of the annual FHWA Highway Statistics Series. The HM-20, HM-60 and VM-2 reports are also available online at this address: *http://www.fhwa.dot.gov/policyinformation/statistics.cfm.*   Brief descriptions of these reports are below. Sample exports of the reports appear on the following pages.

HM-20 - State Length by Functional System (Rural and Urban)
- The section lengths of Function Systems 1-5 are sum of all sections that have a Facility Type of 1-3
- The section length of Function System 6 are sum of all sections that have a Facility Type of 1-3 and an Urban Code less than 99999 (using length entered in the County Summary table)
- The length of Functional System 6 where Urban Code = 99999 and all Function System 7 is what is entered in the County Summary table

HM-60 - Estimated State Lane Miles by Functional System (Rural and Urban)
- The section lane-lengths of Function Systems 1-5 are the sum of all sections that have a Facility Type of 1-3 multiplied by Through Lanes
- The section lane-length of Function System 6 are sum of all sections that have a Facility Type of 1-3 and an Urban Code less than 99999 multiplied by Through Lanes using the length entered in the County Summary table multiplied by 2 (Through Lanes is assumed as 2)
- The section lane-length of Function System 7 is what entered in County Summary table multiplied by 2 (Through Lanes is assumed as 2)

VM-2 - State Vehicle Miles of Travel by Functional System (Rural and Urban)
- The vehicle-lengths of Function Systems 1-5 are sum of all sections that have a facility of 1-3 multiplied by AADT
- The vehicle-length of Function System 6 are sum of all sections that have a Facility Type of 1-3 and an urban code less than 99999 multiplied by AADT
- Rural Minor Collector VMT is from State Summary
- The vehicle-length of Function System 7 are sum of Local VMT in the Urban Summary table
- Small Urban VMT is from State Summary
- Rural Local VMT is from State Summary
- Multiply 365 to above results to represent Annual Vehicle Miles

National Extent and Travel Report (National ETR)
- This report displays the HPMS calculated mileage, lane mileage and travel totals for each State. These total figures match each State's respective ETR totals and are calculated in the same manner as the State level ETR report.
- Figures are presented for two years with a percent change column.

Appendix B: Report Types Continued

National Level Reports: HM-20

HPMS 8.0.1

Public Road Length (HM-20)
Miles by Functional System

Stage: Review
Year: 2011
Date: 02/01/2013

State	RURAL Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	URBAN Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	Total
Alabama	536.77	74.07	2,102.00	4,042.45	12,462.18	6,697.78	50,501.55	76,417	369.01	55.45	1,093.86	2,061.46	3,010.83	0.70	18,662.78	25,254	101,671
Alaska	1,005.41	0.00	816.78	426.67	1,629.48	1,031.85	9,076.89	13,987	78.53	0.00	122.95	209.07	0.00	620.46	1,656.57	2,688	16,675
Arizona	980.48	25.22	1,267.12	1,328.11	4,412.66	2,031.80	31,548.26	41,594	187.63	178.39	1,434.83	1,788.34	1,650.92	2.05	18,255.82	23,498	65,092
Arkansas	441.46	134.34	2,066.22	2,993.84	12,527.11	6,973.33	61,932.62	87,069	214.09	86.76	688.70	1,325.84	1,403.10	59.34	9,235.25	13,013	100,082
California	1,278.67	0.00	3,528.14	6,674.73	12,807.53	8,130.75	49,457.62	81,877	1,173.99	1,538.99	6,549.99	10,755.88	11,360.53	0.00	58,944.76	90,324	172,202
Colorado	684.55	40.60	2,310.91	3,721.00	5,502.13	8,962.86	47,661.35	68,883		12.48	1,182.85	1,664.86	1,793.57	0.00	14,309.38	19,531	88,415
Connecticut	43.28	39.14	126.61	256.70	940.62	398.93	4,446.64	6,252	302.89	239.74	680.70	1,661.08	1,830.82	36.31	10,441.73	15,193	21,445
Delaware	0.00	0.00	160.78	114.57	451.61	223.55	2,410.34	3,361	0.37	0.37	176.68	192.69	368.38	0.00	2,188.01	2,997	6,358
District of Columbia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	12.77	16.85	104.11	164.13	156.45	0.00	1,046.34	1,501	1,501
Florida	748.45	180.58	2,674.06	2,408.14	4,176.80	3,295.91	26,803.70	40,288	66.37		3,614.87	4,112.05	7,050.03	0.00	65,381.04	81,471	121,759
Georgia	716.31	0.00	2,674.01	5,206.65	12,816.72	4,645.62		83,548	531.62	147.37	1,924.16	4,331.13	2,766.70	0.00	30,297.04	39,998	123,546
Hawaii	6.35	0.00	107.17	293.78	319.76	122.38		2,050	48.55	33.65	232.98	121.68	386.31	0.00	1,532.13	2,355	4,405
Idaho	521.58	0.00	1,742.18	1,392.61	5,786.77	4,014.64	29,541.91	43,000		0.00	455.89	651.62	703.82	0.00	3,651.61	5,553	48,553
Illinois	1,356.23	0.00	2,353.68	4,670.78	13,751.60	3,361.39		98,226	16.01	98.94	3,140.10	4,512.01	4,813.6	0.27	27,882.15	41,273	139,498
Indiana	712.28	0.00	1,588.56	2,070.67	10,204.22	9,016.79	6,578.37	70,171	.22	169.73	1,860.80	3,002.83	3,226.1	2.60	18,176.03	26,895	97,066
Iowa	628.41	0.00	3,456.81	3,911.40	14,385.25	16,159.15	4,444.67	102,986		0.00	824.93	1,551.77	1,072.2	2.60	7,796.04	11,401	114,387
Kansas	656.02	0.00	3,075.31	4,280.52	22,898.82	9,230.00		127,532	217.88	186.72	801.27	1,362.78	1,462.55	0.27	8,949.18	12,980	140,513
Kentucky	596.78	587.00	1,865.02	1,848.11	9,489.12		46,246.53	66,588	.94	66.71	847.32	934.27	1,106.33	0.00	9,473.50	12,632	79,220
Louisiana	532.80	8.40	1,018.75	1,759.99	4,99?.99	3,153.10		44,466		51.64	1,085.05	1,742.95	1,892.92	0.00	12,031.62	17,169	61,635
Maine	299.15	0.00	787.63	1,016.8	3,21?	2,179.72	12,305.?	19,867	18.71	18.71	142.64	232.77	531.8	0.00	2,011.06	3,007	22,874
Maryland	183.57	0.00	444.88	840.4	1,55?	1,770.20	9,529.47	14,323	297.36	305.75	1,086.48	1,434.45	1,753.65	0.00	13,120.45	17,998	32,321
Massachusetts	91.36	19.98	146.31	389.41	?.62	775.34	5,411.49	7,988	325.49	329.02	1,845.56	747.85	2,907.84	0.00	19,005.98	28,315	36,303
Michigan	608.92	376.33	2,195.88	5,011.35	16,700.56	4,294		86,596				3,488.60	3,488.60	0.00	23,942.65	35,490	122,086
Minnesota	629.51	8.40	3,585.94	6,605.90	12,017.69			117,885	284.40	157.86	670.01	2,309.3	2,309.3	12.55	14,810.54	20,817	138,702
Mississippi	501.69	0.65	1,925.13	3,667.76	11,8?	2,298.79	3,885.94	64,107		70.48	995.?	958.0	1,432.4	0.00	7,354.54	11,011	75,119
Missouri	723.62	966.86	2,159.26	3,993.73	16,44?	6,496.36		107,827	482.61	464.70	1,0?.03	990.27	2,363.70	0.0?	17,454.81	23,839	131,667
Montana	1,129.38	0.00	2,623.39	2,978.5?	?.65	8,816.72	49,103.47	71,698	62.85	0.00	.075	245.26	329.82	0.00	2,353.21	3,182	74,880
Nebraska	417.50	350.66	2,362.00	4,153.01	11,508.08	8,785.17	87,170	87,170	172.?	91.70	4?.31	775.21	486.55	0.00	4,605.65	6,430	93,600
Nevada	449.21	0.26	1,514.99	767.5?	2,525.81		1,362.46	28,622	171.3?	69.06	340.?	825.29	3.46	308.02	5,819.85	8,217	36,839
New Hampshire	149.25	21.47	336.09	462.5?	?.75	1,146.72	7,938.62	11,147	4?	52.19	219.90	497.07	503.1?	0.00	3,581.00	4,929	16,076
New Jersey	65.00	0.00	253.92	2.99	424.50			7,296	?	403.63	1.7?	483.76	2,756.5	0.00	23,202.51	31,917	39,213
New Mexico	847.59	0.00	1,857.99	1,0?.82	3,?.10	3,137.61	48,?.03	60,480	152.32	0.00	693.79	640.41	1,432.4	0.00	4,924.33	7,904	68,384
New York	846.80	128.68	1,410.37	3,745.?	5,768.49	9,592.76	44,663.?	66,157	?.57	812.07	2,834.68	5,665.64	5,403.79	0.00	32,862.10	48,435	114,592
North Carolina	541.26	3.20	1,864.30	2,654.71	11,5?.26	6,544.80	30,5?.65	70,197	82.34	472.53	1,848.84	3,227.14	2,778.29	0.03	26,713.36	35,673	105,869
North Dakota	519.23	0.00	2,934.93	2,515.25	11,586.54	6,615.11	48.5?.05	84,932	51.75	0.00	166.28	320.46	314.76	0.00	1,065.94	1,919	86,851
Ohio	723.27	0.00	1,972.88	2,657.23	11,361.88	54,878.84		78,209	416.99	155.26	2,425.70	3,912.72	4,675.47	0.00	32,689.91	45,038	123,247
Oklahoma	683.52	0.00	2,328.22	2,702.91	21,262.45	2,990.71	6?.60	96,673	249.13	188.13	1,059.80	2,140.93	1,055.60	0.00	11,441.31	16,135	112,808
Oregon	553.07	0.00	2,793.74	2,362.00	8,386.87	7,414.13	41?.70	46,237	?.57	57.22	761.20	1,133.23	1,897.7	0.00	8,885.28	12,911	59,148
Pennsylvania	1,119.70	327.85	1,580.02	4,541.49	7,243.04	7,258.60	51,5?.73	73,620	1,?.57	524.85	2,832.28	3,959.15	5,343.34	0.00	32,755.38	46,151	119,771
Rhode Island	21.47	0.00	47.91	65.85	144.86	126.52	8?.81	1,225	19.58	87.84	360.93	355.85	615.48	0.00	3,789.96	5,260	6,485
South Carolina	580.50	0.00	1,289.43	3,287.50	10,477.99	2,153.39	31,8?.03	49,623	?.09	82.29	1,054.87	1,518.35	2,454.39	0.00	10,993.94	16,374	65,997
South Dakota	602.37	0.00	2,531.92	3,342.03	12,445.81	6,284.32	44,28?	79,492	78?.?	11.11	141.76	385.20	279.39	0.00	2,073.58	2,968	82,459
Tennessee	687.50	0.00	1,894.70	3,188.36	11,361.88	5,132.13	18,5?.05	69,975	?.?	155.26	1,544.22	2,489.42	2,333.20	0.00	18,578.25	25,517	95,492
Texas	2,049.51	0.00	7,435.65	10,158.04	34,879.56	17,657.55	1,?.492	213,725	1,?.?	1,511.96	5,832.56	8,332.07	12,600.32	0.00	69,720.76	99,185	312,911
Utah	723.95	0.00	1,031.79	1,429.76	3,368.49	3,893.93	24,015.03	46,237	212.94	19.71	395.75	876.57	898.91	28.81	8,739.08	12,911	45,635
Vermont	279.95	0.00	319.47	728.29	2,007.79	886.39	8,602.60	12,824	40.33	17.62	102.99	152.34	215.52	0.00	936.60	1,465	14,290
Virginia	656.63	2.45	1,408.47	3,409.47	9,428.69	2,450.48	33,035.05	50,391		259.03	1,360.14	2,312.57	2,520.25	0.00	17,155.41	24,070	74,461
Washington	467.33	722.92	1,257.38	1,911.33	8,430.41	6,453.10	40,816.93	60,059	296.93	380.29	1,351.81	2,682.38	2,431.84	0.00	16,540.15	23,683	83,743
West Virginia	368.04	0.00	1,083.70	1,339.47	5,651.76	2,216.59	22,615.16	33,275	186.55	10.30	335.01	743.95	733.64	0.00	3,361.42	5,371	38,646
Wisconsin	477.75	213.56	2,961.85	4,819.13	12,276.14	8,621.56	63,167.21	92,537	264.73	348.73	1,878.85	2,521.13	2,507.15	0.00	14,960.22	22,481	115,018
Wyoming	812.42	0.00	1,992.00	1,252.76	2,746.11	6,926.37	11,738.74	25,468	101.13	2.88	220.16	195.52	474.23	9.20	1,781.48	2,785	28,253
US Total:	30,256	4,224	91,266	135,665	420,136	263,053	2,037,783	2,982,383	16,704	11,495	65,012	107,263	114,456	3,304	777,142	1,095,376	4,077,759
Grand Total:	30,256	4,224	91,266	135,665	420,136	263,053	2,037,783	2,982,383	16,704	11,495	65,012	107,263	114,456	3,304	777,142	1,095,376	4,077,759

Appendix B: Report Types Continued

National Level Reports: HM-60

HPMS 8.0.1

Functional System Lane-Length (HM-60)
Lane-Miles

Stage: Review
Year: 2011
Date: 11/27/2012

State	RURAL Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	URBAN Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	Total
Alabama	2,241.65	340.20	6,312.28	8,561.52	25,046.37	13,395.56	101,003.10	156,901	1,853.10	263.42	4,042.15	5,224.12	6,295.65	1.41	37,325.55	55,005	211,906
Alaska	2,063.81	0.00	1,652.47	860.98	3,253.86	2,063.69	18,153.79	28,049	305.12	0.00	451.84	484.00	0.00	1,230.96	3,313.14	5,785	33,834
Arizona	4,030.21	90.10	3,502.11	2,875.48	9,037.81	4,063.59	63,096.52	86,696	1,416.22	6,428.02	5,620.00	3,688.95	4.10	36,511.64	54,787	141,483
Arkansas	1,765.84	533.83	5,319.07	6,246.89	25,035.31	13,946.66	123,865.24	176,713	991.05	373.21	2,289.29	3,087.41	2,843.06	115.88	18,470.50	28,170	204,883
California	5,846.18	0.00	9,514.53	13,711.78	25,071.89	16,261.49	98,915.25	169,321	8,842.60	8,572.84	24,655.76	29,143.44	23,513.48	0.00	117,889.52	212,618	381,939
Colorado	2,784.97	162.58	5,260.31	7,567.36	11,012.31	17,9	140,036	1,317.31	981.83	4,416.15	4,295.68	3,883.11	0.00	28,618.77	43,889	183,925
Connecticut	213.36	155.91	265.01	519.30	1,883.32	797.86	8,3	12,728	1,653.42	1,813.30	3,758.01	3,806.81	72.62	20,883.46	32,969	45,697
Delaware	0.00	0.00	578.06	266.46	905.79	447.1	4,820	7,018	539.22	680.45	4,416.48	764.48	0.00	4,376.02	6,751	13,769
District of Columbia	0.00	0.00	0.00	0.00	0.00	0.00	0	81.88	75.33	426.06	434.93	309.43	0.00	2,092.67	3,420	3,420
Florida	3,440.65	715.08	7,523.49	5,063.71	8,426.56	6,591.82	57,39	85,369	2,756.74	15,835.65	13,836.44	16,710.13	0.00	130,762.07	184,339	269,708
Georgia	3,501.09	0.00	8,534.24	10,968.10	25,695.23	14,977.26	109,291.24	172,967	700.29	6,923.87	10,894.72	6,0	0.00	60,594.08	88,591	261,558
Hawaii	25.40	0.00	220.16	594.34	639.97	244.76	4,125	152.34	757.26	363.69	8,45	6,0	3,064.25	5,489	9,615
Idaho	2,085.14	0.00	4,019.48	2,875.45	11,631.25	8,029.2	59,083.82	87,724	0.00	1,240.20	1,388.68	1,4.38	0.00	7,303.22	11,761	99,485
Illinois	5,481.08	0.00	5,301.25	9,457.90	27,537.63	6,722.71	145,463.76	199,964	413.88	10,457.65	11,815.42	10,4.80	6,79	55,764.30	93,239	293,203
Indiana	2,869.10	0.00	4,413.01	4,355.40	20,708.02	18,033.5	135,124	143,536	669.53	5,899.12	6,967.75	2,235.1	34	36,352.06	58,965	202,501
Iowa	2,514.05	0.00	8,943.26	7,907.	2,805.10	32,318.30	128,889.33	209,378	77.	2,276.64	3,804.65	2,859.59	5.20	15,592.07	25,219	234,596
Kansas	2,647.67	0.00	7,140.25	8,6.33	4,009.62	18,460.0	257,527	734.54	2,804.70	3,535.68	3,083.35	0.00	17,898.36	29,106	286,632
Kentucky	2,744.16	2,175.70	5,004.65	3,7.57	1,94.39	18,978.25	92,4	137,179	1,02.61	264.40	3,050.24	2,229.65	2,2	18,947.00	27,952	165,130
Louisiana	2,201.08	0.00	3,299.52	3,9.	977.03	6,306.20	66,12.6	91,835	1,651.28	239.94	4,511.44	4,228.74	0.00	24,063.23	38,674	130,509
Maine	1,275.46	0.00	1,632.79	2,063.	6,430.46	4,	40,493	71.08	377.84	562.74	1,073.88	4,022.12	6,391	46,883
Maryland	899.34	0.00	1,508.94	1,7	26.92	3,540.3	19,0.94	29,855	1,877.40	1,399.85	794.70	3,7	6	26,240.89	41,028	70,883
Massachusetts	417.50	76.56	324.49	79,7.9	98.05	1,550.6	10,822	16,288	794.70	1,339.63	4,628.84	7,8.67	0.00	38,011.95	60,418	76,707
Michigan	2,588.39	1,511.63	4,691.76	10,275.37	3,35.29	8,588.2	114,8.8	175,908	375.65	1,475.06	11,927.40	7,3	0.00	47,885.31	80,822	256,730
Minnesota	2,531.35	23.02	8,999.21	13,283.31	84.16	24,035.37	29,68	239,005	712.50	356.50	6,706.02	4,950.41	2,539	29,621.07	45,872	284,877
Mississippi	1,939.72	2.60	6,540.81	7,5.	777.02	4,597.58	82,771.88	132,208	229.99	182.95	2,287.48	2,968.98	0.00	14,709.08	24,285	156,492
Missouri	2,897.37	3,856.29	5,164.27	8,022.45	32,927.36	12,992.77	75	219,940	1,988.51	356.50	4,779.68	4,938.00	0.14	34,909.62	52,899	272,839
Montana	4,516.75	0.00	5,614.57	6,0.	23,170.21	17,633.4	98,200.3	146,035	25.37	0.00	533.68	6	0.00	4,706.41	6,764	152,799
Nebraska	1,735.24	1,399.68	4,880.40	8,363.37	23,040.03	17,570.3	119,18.6	176,177	324.60	396.54	542.10	1,847.79	0.00	9,211.29	14,188	190,364
Nevada	1,845.62	1.32	3,467.73	1,612.87	101.45	5,051.63	58,706	649.69	334.80	701.67	3,138.23	5	11,639.70	20,020	78,726
New Hampshire	622.00	85.88	689.50	5,986.24	42,852.36	2,293.44	15,877.23	22,689	375.65	233.54	1,074.98	1,012.29	0	7,161.99	10,390	33,080
New Jersey	353.92	0.00	689.04	655	1,937.95	849.0	15,049	2,180.93	5,740.59	7,725.42	5,613.03	0	46,405.02	70,173	85,222
New Mexico	3,429.23	0.00	5,732.65	4,035.99	17.71	6,2752	52.5	124,914	728.80	0.00	2,666.37	1,579.34	3,089.6	9,848.67	17,913	142,827
New York	3,464.29	538.11	3,284.64	7,741.14	11,583.17	19,185.5	4,32.4	135,124	4,410.10	3,801.20	8,584.44	13,662.89	11,311.15	0	65,724.20	107,494	242,618
North Carolina	2,271.41	11.73	6,180.17	5,944.80	16,234.03	13,089.61	101,136.37	144,868	1,993.53	6,513.91	8,190.47	5,872.64	0	53,426.72	79,329	224,197
North Dakota	2,076.92	0.00	6,735.63	5,030.12	23,170.21	23	0.00	171,764	219.84	0.00	542.10	701.67	6	2,131.88	4,232	175,996
Ohio	3,300.09	0.00	5,948.11	5,473.63	23,018.04	13,230.22	10,751.9	160,728	2,038.75	7,935.94	10,768.64	11,047.19	0	65,379.82	101,951	262,678
Oklahoma	2,748.94	0.00	6,903.78	5,986.24	24,845.46	12,568.65	8,57.0	197,883	206.60	881.06	3,771.59	5,316.38	2,286.64	0	22,882.62	36,345	234,228
Oregon	2,259.27	0.00	6,312.24	4,858.26	16,794.31	14,828.2	40	94,502	866.81	249.98	2,411.80	2,640.44	3,840.12	0.00	17,770.56	27,780	122,281
Pennsylvania	4,529.79	1,319.93	3,711.11	9,367.74	14,556.46	14,517.20	103,099.47	151,102	2,149.99	8,402.21	8,721.35	10,805.60	0.00	65,510.76	98,881	249,982
Rhode Island	85.89	0.00	107.82	136.84	297.70	253.0	669	2,518	351.79	959.76	3,955.25	4,076.10	1,226.48	0.00	7,579.93	11,154	13,672
South Carolina	2,375.92	0.00	3,859.96	7,265.80	21,057.08	4,306.7	12	162,535	322.32	566.86	5,423.40	6,465.85	585.94	0.00	4,147.16	36,945	139,480
South Dakota	2,413.13	0.00	5,891.64	6,747.68	24,845.46	12,568.65	66,070.11	161,037	347.4	41.74	5,798.67	1,000.34	0.00	37,156.50	6,690	167,727
Tennessee	2,811.82	0.00	6,003.61	6,898.19	10,328.18	21,032.49	97,112.10	144,186	2,314.58	23,225.02	25,985.13	2,640.44	0.00	37,156.50	57,671	201,857
Texas	8,358.49	0.00	22,827.26	22,727.12	70,479.59	35,315.11	283,089.83	442,797	693.39	7,655.41	23,225.02	28,283.97	4,947.92	0.00	231,499	674,296
Utah	2,918.57	0.00	2,458.73	7,555.09	6,779.80	7,787.85	48,030.06	70,968	81.02	1,516.14	2,513.47	1,959.89	57.62	17,478.16	24,932	95,901
Vermont	1,119.79	0.00	724.07	1,470.42	4,024.78	1,772.79	17,205.21	26,317	161.32	239.68	308.81	432.29	0.00	1,873.20	3,065	29,382
Virginia	2,727.58	1.83	5,409.43	19,175.12	9,175.12	4,900.96	66,070.11	105,840	2,673.43	5,423.40	6,465.85	5,538.98	0.00	34,310.83	55,537	161,377
Washington	2,086.29	1,836.82	2,568.08	3,861.01	16,865.68	12,906.20	81,633.86	121,758	1,912.94	4,614.33	5,807.18	4,922.99	0.00	33,080.30	51,796	173,554
West Virginia	1,543.38	0.00	2,795.65	2,699.56	11,307.94	4,433.18	45,230.32	68,010	822.60	1,034.86	1,543.42	1,469.48	0.00	6,722.83	11,630	79,640
Wisconsin	1,986.66	852.38	7,385.23	9,713.00	24,565.82	17,243.13	126,334.41	188,081	1,228.74	1,482.00	5,808.88	5,935.68	5,186.01	0.00	29,920.44	49,562	237,642
Wyoming	3,249.68	0.00	4,133.59	2,541.78	5,504.09	13,852.74	23,477.49	52,759	404.52	11.52	721.61	474.67	966.38	1.840	3,562.96	6,160	58,919
US Total:	123,835	15,691	239,980	282,613	843,317	526,107	4,075,567	6,107,110	92,714	53,852	230,352	277,272	244,712	7,358	1,554,283	2,460,543	8,567,652
Grand Total:	123,835	15,691	239,980	282,613	843,317	526,107	4,075,567	6,107,110	92,714	53,852	230,352	277,272	244,712	7,358	1,554,283	2,460,543	8,567,652

Appendix B: Report Types Continued

National Level Reports: VM-2

HPMS 8.0.1

Functional System Travel (VM-2) Vehicle-Miles

Stage: Review
Year: 2011
Date: 12/05/2012

State	RURAL Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	RURAL Total	URBAN Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	URBAN Total	Total
Alabama	15,658,344	969,807	16,424,317	12,790,836	14,297,174	4,548,104	18,483,870	83,172,454	20,417,924	1,870,710	21,185,898	17,454,491	10,205,902	714	23,539,503	94,675,142	177,847,596
Alaska	2,382,915	0	767,159	408,710	819,900	415,000	1,160,000	5,953,683	1,804,388	0	2,050,559	1,267,942		721,234	786,000	6,630,123	12,583,807
Arizona	19,178,554	254,636	9,230,136	4,794,145	7,915,361	1,268,508	4,424,943	47,066,284	20,292,162	20,944,069	33,458,636	20,944,069	8,433,929	1,329	16,562,765	116,152,754	163,219,039
Arkansas	12,118,586	1,423,363	10,542,252	7,733,245	10,990,893	1,993,164	5,696,080	50,497,584	11,130,680	2,505,660	9,940,206	8,569,181	3,504,898	93,669	4,040,177	39,784,470	90,282,053
California	46,413,641	0	43,086,004	24,956,149	26,139,550	7,117,109	6,439,018	154,151,471	185,588,629	146,802,099	162,435,546	132,725,205	50,516,161	0	46,640,905	724,708,544	878,860,015
Colorado	11,771,971	860,483	10,353,281	6,457,364	5,163,283	2,036,000	4,071,000	40,713,382	12,397,653	12,397,653	24,369,552	13,792,879	6,939,015	0	8,698,000	86,975,012	127,688,394
Connecticut	1,915,379	898,187	1,326,572	1,397,732	2,573,834	431,060	2,166,838	10,709,601	26,114,155	10,157,860	10,157,860	14,012,033	7,093,132	63,879	6,800,006	74,762,308	85,471,909
Delaware	0	0	3,871,438	923,163	1,663,372	295,141	1,494,205	7,949,319	1,344,046	1,344,046	5,086,202	2,651,021	1,987,301	0	2,257,301	16,785,401	24,734,719
District of Columbia	0	0	0	0	0	0	0	0	1,164,499	984,615	2,770,037	1,974,462	789,366	0	2,092,680	9,775,658	9,775,658
Florida	25,868,964	5,157,144	21,107,750	11,041,851	10,160,134	4,467,166	5,920,000	95,375,955	32,156,106	32,156,106	104,491,598	73,434,361	51,328,682	0	99,673,398	430,254,059	525,630,014
Georgia	26,277,744	0	17,333,625	17,028,098	15,620,246	4,095,766	3,907,185	99,077,577	8,178,976	8,178,976	33,906,037	41,572,504	13,141,324	0	49,542,908	198,055,307	297,132,884
Hawaii	300,699	0	1,316,758	1,707,331	777,627	106,816	2,360,997	6,570,225	1,449,993	2,505,660	5,204,986	1,976,322	2,550,548	0	5,019,162	21,008,897	27,579,121
Idaho	6,022,705	0	5,957,379	2,456,995	4,362,280	670,000	5,920,000	25,389,360	2,520,784	6,079,368	6,079,368	4,240,708	2,181,297	0	2,251,000	18,272,556	43,661,916
Illinois	24,392,649	0	10,491,918	12,622,630	13,466,235	1,120,231	9,439,950	72,343,734	60,628,494	3,031,177	56,489,956	42,133,582	22,140,027	0	25,544,359	210,489,189	282,832,923
Indiana	20,143,408	0	12,590,817	9,737,983	17,755,255	5,158,718	13,489,119	78,875,517	3,528,695	3,528,695	29,098,043	22,749,150	13,478,350	67	35,329,676	130,673,061	209,548,578
Iowa	13,305,424	0	15,655,319	6,982,409	9,518,176	2,374,700	4,275,000	52,110,328	5,789,081	0	9,824,701	8,871,512	2,515,837	0	5,221,000	33,572,717	85,683,044
Kansas	8,764,403	0	12,358,516	6,156,176	7,635,094	706,176	4,331,482	40,268,751	4,881,475	4,881,475	9,924,722	7,670,542	3,214,445	0	6,310,811	41,981,241	82,249,992
Kentucky	20,118,606	5,597,517	14,198,757	7,690,148	2,547,909	6,811,000	9,430,000	76,400,725	2,280,678	2,280,678	16,948,276	8,781,985	4,861,025	0	5,816,000	55,274,109	131,674,834
Louisiana	14,629,836	0	7,612,917	9,359,053	15,620,246	4,005,776	4,275,000	54,995,753	2,233,021	2,233,021	21,763,857	16,282,826	7,464,769	0	4,657,359	52,436,332	127,432,086
Maine	6,047,232	0	5,077,425	4,643,943	3,071,040	2,284,000	3,376,000	28,230,639	404,842	404,842	1,976,798	2,488,458	9,468,955	0	1,156,000	10,805,605	39,036,244
Maryland	9,622,448	0	9,325,639	8,865,608	1,789,269	3,376,000	8,610,664	38,611,119	16,094,899	16,094,899	27,710,390	17,061,995	9,468,955	0	8,226,000	115,417,426	154,028,785
Massachusetts	3,513,210	698,112	1,288,657	1,540,000	426,434	2,594,000	1,804,679	11,159,041	15,481,174	15,481,174	29,860,226	29,954,827	7,428,626	0	20,399,701	138,955,240	150,114,281
Michigan	14,508,672	6,828,105	11,429,518	18,009,223	22,145,997	2,594,000	12,594,000	82,124,878	42,222,207	15,247,207	82,124,878	12,601,831	12,594,000	0	18,696,491	177,475,861	259,600,739
Minnesota	11,286,278	97,841	19,962,298	13,553,632	12,638,566	3,669,177	7,101,237	67,353,215	22,533,421	12,892,042	12,892,042	23,311,808	7,283,599	11,580	12,267,028	87,947,382	155,300,597
Mississippi	10,332,168	2,568	15,398,093	9,296,287	402,294	1,245,746	15,600,000	63,185,383	1,333,987	1,333,987	6,481,583	6,481,583	4,239	0	8,300,506	43,254,951	106,440,334
Missouri	16,337,050	10,144,746	12,656,572	9,656,098	5,115,435	1,776,518	25,000,000	79,471,419	34,234,330	13,082,106	22,345,037	15,108,488	8,081,272	75	21,140,000	108,992,207	188,463,626
Montana	6,710,450	0	6,258,441	6,156,176	3,105,736	1,200,368	3,349,000	23,886,347	989,210	0	2,698,183	1,516,281	908,372	0	1,945,311	8,057,758	31,944,104
Nebraska	7,137,669	2,915,780	6,158,386	6,298,926	4,193,209	653,000	8,000,000	30,344,970	2,474,982	2,474,982	29,443,660	10,175,449	5,421,292	0	3,002,000	21,965,491	52,310,462
Nevada	5,201,156	8,448	4,191,377	9,359,900	653,900	577,000	1,000,124	13,379,669	9,417,726	4,693,901	12,207,414	12,207,414	5,658,566	0	12,784,466	52,892,429	66,272,098
New Hampshire	3,433,303	856,474	2,892,359	2,611,017	2,888,348	1,539,361	1,000,426	15,291,807	2,590,712	2,590,712	3,453,878	4,846,252	2,424,245	0	1,955,587	19,556,220	34,848,027
New Jersey	4,138,405	0	4,966,473	2,138,081	1,200,637	794,736	5,704,000	17,255,330	30,669,472	30,669,472	30,354,703	30,354,703	3,723,903	809	30,154,000	183,001,577	200,256,907
New Mexico	11,988,290	0	8,622,154	10,905,995	3,576,120	1,383,000	12,464,000	39,973,673	7,232,613	10,997,441	10,997,441	4,138,774	4,138,774	0	4,371,000	29,978,713	69,952,386
New York	16,852,338	1,758,650	8,705,143	12,290,000	11,302,100	25,683,000	12,267,000	89,875,421	41,631,451	46,369,261	50,120,696	47,802,961	20,569,167	144	40,350,000	260,057,914	349,933,335
North Carolina	16,561,757	79,313	21,036,750	14,461,808	21,840,110	9,362,739	12,890,000	110,319,191	15,371,687	15,371,687	35,285,192	32,710,409	14,848,010	144	34,141,783	173,988,643	284,307,834
North Dakota	4,420,427	0	6,137,990	2,177,470	2,898,404	495,987	2,890,000	18,531,290	1,184,728	1,184,728	1,934,169	1,590,423	681,871	0	1,093,000	6,484,191	25,015,480
Ohio	24,698,871	0	17,952,412	11,796,472	23,901,490	5,526,869	15,704,000	99,580,114	13,112,566	15,111,837	34,058,287	35,696,808	25,833,140	0	35,243,000	207,241,662	306,821,776
Oklahoma	13,931,426	0	13,746,078	7,900,248	15,516,994	495,987	9,837,000	59,100,567	35,952,483	7,701,702	15,897,541	15,331,909	21,430,414	0	15,384,812	70,936,632	130,037,198
Oregon	11,318,816	5,157,073	11,987,820	5,639,563	5,524,506	1,631,576	5,000,000	40,181,281	4,773,313	3,616,947	13,057,229	13,057,229	2,179,490	0	5,907,481	51,252,685	91,433,966
Pennsylvania	28,874,642	5,157,073	11,452,828	18,855,961	12,124,894	5,741,200	15,483,000	97,667,282	35,952,483	17,026,004	44,817,440	34,524,577	21,430,414	0	20,373,737	174,124,988	271,792,271
Rhode Island	1,091,465	0	363,812	355,937	437,985	98,120	408,884	2,408,184	4,773,313	3,268,572	5,556,049	2,682,434	2,179,490	5,754	779,708	19,239,565	21,647,749
South Carolina	20,442,020	0	9,446,629	13,553,632	13,393,471	762,197	6,514,296	64,112,244	35,952,483	2,226,133	19,861,686	15,249,497	9,466,162	0	5,865,718	69,395,097	133,507,341
South Dakota	5,587,047	0	4,666,228	2,932,777	2,885,305	404,876	2,670,000	17,745,703	100,790	100,790	1,531,167	2,196,109	671,234	0	702,337	6,917,442	24,663,145
Tennessee	23,699,290	0	15,027,590	13,666,802	8,754,642	7,500,044	8,674,496	77,273,824	32,192,282	5,519,234	29,443,660	22,606,611	8,137,659	0	18,665,370	116,564,816	193,838,641
Texas	42,598,693	0	56,199,795	33,099,908	37,903,657	7,108,076	15,109,705	192,019,452	88,476,536	88,476,536	101,642,684	79,131,308	52,726,176	0	26,427,154	458,500,798	650,520,250
Utah	8,484,773	0	4,475,922	4,175,143	2,360,742	625,770	2,970,291	21,278,743	16,949,711	785,676	8,262,580	9,957,020	4,180,563	0	10,420,020	50,561,329	71,840,072
Vermont	3,429,775	0	1,947,277	2,552,017	588,906	2,725,048	14,473,911	14,473,911	1,030,672	172,357	1,178,071	963,529	613,914	5,754	1,131,811	5,090,579	19,564,491
Virginia	25,074,672	0	17,500,426	14,175,143	13,647,478	1,493,309	9,258,408	81,149,436	9,301,230	9,301,230	35,487,467	28,612,680	11,318,189	0	15,129,584	140,697,117	221,846,554
Washington	12,531,482	5,019,138	6,025,552	5,867,475	10,689,158	3,185,413	3,260,514	46,578,732	29,787,946	14,471,243	20,714,447	24,051,739	8,391,892	0	12,043,927	109,461,194	156,039,926
West Virginia	7,414,537	0	6,929,242	4,349,670	7,451,880	1,049,000	2,844,000	40,038,328	7,365,726	209,965	5,419,802	5,629,070	1,808,879	0	1,482,000	21,915,442	61,953,770
Wisconsin	14,251,508	4,527,575	18,941,268	14,423,308	16,079,340	3,699,127	4,617,047	76,539,173	14,262,550	12,443,464	23,363,422	12,360,897	5,721,973	0	4,354,900	72,507,208	149,046,381
Wyoming	6,579,280	0	4,467,502	1,566,839	1,628,170	1,915,000	1,677,000	17,833,791	1,350,829	29,312	2,075,986	1,013,329	1,098,299	8,962	1,918,000	7,494,718	25,328,508
US Total:	667,362,978	53,254,961	559,462,567	409,472,055	477,967,696	146,016,859	355,058,982	2,668,596,098	1,306,039,463	608,181,442	1,243,328,478	1,009,047,947	480,001,206	9,805,781	746,595,442	5,402,999,759	8,071,595,857
Grand Total:	667,362,978	53,254,961	559,462,567	409,472,055	477,967,696	146,016,859	355,058,982	2,668,596,098	1,306,039,463	608,181,442	1,243,328,478	1,009,047,947	480,001,206	9,805,781	746,595,442	5,402,999,759	8,071,595,857

Appendix B: Report Types Continued

National Level Reports: National ETR

HPMS 8.0.1

Extent and Travel Report
Nationwide Summary

Stage:	Review
Year:	2011
Date:	12/04/2012

	Miles			Lane Miles			Vehicle Miles		
	2011	2010	% Change	2011	2010	% Change	2011	2010	% Change
1 - Alabama	228,596	228,340	0.11%	478,818	476,726	0.44%	450,370,333	443,637,945	1.52%
2 - Alaska	36,037	35,190	2.41%	73,452	71,837	2.25%	31,797,736	33,397,902	-4.79%
4 - Arizona	153,681	151,683	1.32%	337,752	333,086	1.40%	442,590,832	445,657,205	-0.69%
5 - Arkansas	213,177	213,093	0.04%	437,937	437,463	0.11%	220,348,577	223,895,174	-1.58%
6 - California	434,524	434,370	0.04%	976,099	980,958	-0.50%	2,480,368,842	2,494,487,597	-0.57%
8 - Colorado	196,361	196,136	0.11%	411,728	411,147	0.14%	342,351,800	345,479,197	-0.91%
9 - Connecticut	58,084	57,956	0.22%	124,364	124,121	0.20%	245,706,127	246,524,428	-0.33%
10 - Delaware	15,712	15,665	0.30%	34,290	34,161	0.38%	66,254,839	65,929,169	0.49%
11 - District of Columbia	4,502	4,509	-0.17%	10,261	10,238	0.22%	29,326,973	29,513,636	-0.63%
12 - Florida	324,989	324,916	0.02%	723,7??	722,728	0.14%	1,4??,5??,0??	1,511,949,247	-2.01%
13 - Georgia	287,090	285,657	0.50%	611,7??	607,765	0.65%	7??,321,075	817,527,548	-3.08%
15 - Hawaii	11,166	11,134		24,748	24,684	0.14%	7?,167,1?	75,507,737	0.87%
16 - Idaho	102,658	?03,363		210,7??	212,051	-0.62%	105,596,388	104,580,705	0.97%
17 - Illinois	320,270	?20,358	-0.03%	679,646	679,254	0.06%	776,15?,035	795,990,792	-2.49%
18 - Indiana	221,027	220,852	0.08%	463,9?6	457,200		5??,??	544,984,006	0.88%
19 - Iowa	240,175	?40,156	0.01%	494,4??	494,144	-0.05%	2??,?38,805	205,882,461	-0.46%
20 - Kansas	294,006	?94,284	-0.09%	602,371	602,722	-0.06%	206,?31,??	205,837,077	0.31%
21 - Kentucky	171,072	?1,?24	0.09%	358,2?3	357,761	0.13%	3??,?23,778	318,540,156	0.03%
22 - Louisiana	140,43?	?88,990		299,692	294,909	1.62%	3??,??	321,270,653	1.88%
23 - Maine	48,754	48,732	0.04%	100,1??	100,695	-0.53%	88,87?,09?	90,856,199	-2.18%
24 - Maryland	82,640	?0,489		182,795	178,288	2.53%	423,474,99?	422,163,540	0.31%
25 - Massachusetts	100,921	100,760		213,832	213,451	0.18%	4??,???	435,471,555	0.85%
26 - Michigan	279,661	279,921	-1.09%	594,2?3	594,434	-0.03%	696,677,33?	714,464,048	-2.49%
27 - Minnesota	298,220	296,959	0.42%	615,62?	613,133	0.41%	398,548,577	398,106,261	0.11%
28 - Mississippi	161,248	161,192	0.0?%	337,2?0	337,622	-0.10%	256,135,618	263,229,424	-2.69%
29 - Missouri	287,173	285,641	0.54%	598,576	596,690	0.32%	485,919,458	498,250,335	-2.47%
30 - Montana	152,942	152,760	0.12%	312,3?2	311,873	0.16%	71,945,966	68,955,091	4.34%
31 - Nebraska	193,629	193,734	-0.05%	394,917	395,108	-0.05%	126,586,415	129,325,886	-2.12%
32 - Nevada	81,896	78,155	4.79%	177,472	169,974	4.41%	185,436,625	168,795,464	9.86%
33 - New Hampshire	37,082	37,104	-0.06%	76,550	76,584	-0.04%	89,252,274	91,654,953	-2.62%

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Appendix B: Report Types Continued

National Level Reports: National ETR (Page 2)

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Extent and Travel Report
Nationwide Summary

Stage: Review
Year: 2011
Date: 12/04/2012

	Miles			Lane Miles			Vehicle Miles		
	2011	2010	% Change	2011	2010	% Change	2011	2010	% Change
34 - New Jersey	110,342	110,352	-0.01%	240,618	240,633	-0.01%	583,515,392	582,629,096	0.15%
35 - New Mexico	144,673	144,664	0.01%	303,568	303,153	0.14%	169,883,484	168,469,445	0.84%
36 - New York	277,619	277,575		592,730	592,887	-0.03%	959,924,584	988,576,191	-2.90%
37 - North Carolina	0	246,873	-100.00%	0	526,625	-100.00%	0	731,913,169	-100.00%
38 - North Dakota	175,621	175,603	0.01%	35?,22?	356,179	0.01%	56,515,151	51,582,765	9.56%
39 - Ohio	291,533	291,391	0.05%	62?,307	626,616	0.11%	820,885,?14	820,133,224	0.09%
40 - Oklahoma	241,751	241,835		504,801	504,830	-0.01%	331,011,?28	332,781,106	-0.53%
41 - Oregon	131,208	131,200		27?,3??	272,222	0.04%	234,120,617	236,689,573	-1.09%
42 - Pennsylvania	285,693	285,426	0.09%	598,845	598,334	0.09%	71?,?09,?29	726,718,678	-1.24%
44 - Rhode Island	18,229	18,247		3?,499	38,5?		??,?34,?63	65,634,691	-4.72%
45 - South Carolina	148,369	148,420		31?,??	315,95?	-0.02%	?36,409,779	338,878,408	-0.73%
46 - South Dakota	167,886	167,855	0.02%	342,143	342,0?	0.03%	5?,24?,?33	55,446,456	1.44%
47 - Tennessee	216,502	216,650	1.81%	46?,3?1	453,162	1.81%	1,?5?,242,098	501,107,839	0.63%
48 - Texas	725,007	720,435		1,58?,???	1,569,1?	0.70%	1,75?,544,?97	1,734,310,484	1.45%
49 - Utah	102,44?	101,487	0.94%	21?,???	214,719	0.94%	194,241,?73	196,584,065	-1.19%
50 - Vermont	30,045	30,338	0.96%	61,828	62,160	-0.53%	44,219,?61	44,774,737	-1.24%
51 - Virginia	172,993	172,593		378,291	377,749	0.14%	58?,3??,?25	593,507,661	-1.54%
53 - Washington	191,169	191,155	0.01%	39?,905	398,702	0.05%	421,541,?45	422,999,215	-0.34%
54 - West Virginia	82,662	82,617	0.05%	17?,??9	170,745	0.10%	125,822,982	127,533,811	-1.34%
55 - Wisconsin	252,517	252,377	0.06%	524,847	524,447	0.08%	370,599,969	401,428,916	-7.68%
56 - Wyoming	59,291	0		123,999	0		58,151,734	0	
66 - Guam	0	0	0.00%	0	0	0.00%	0	0	0.00%
69 - Northern Marianas	0	0	0.00%	0	0	0.00%	0	0	0.00%
72 - Puerto Rico	0	0	0.00%	0	0	0.00%	0	0	0.00%
Grand Total	**9,003,280**	**9,166,120**	**-1.78%**	**19,067,728**	**19,409,728**	**-1.76%**	**20,801,527,431**	**21,633,564,918**	**-3.85%**

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