

# Highway Performance Monitoring System Software Guide for Version 8.0



U.S. Department of Transportation  
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## Chapter 1—Introduction

This document serves as a guide to using HPMS 8.0. 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.

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 Quick Start 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 for quality issues.

Level 3: The **National** area is the official database for reports releasable to the public.

### 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.



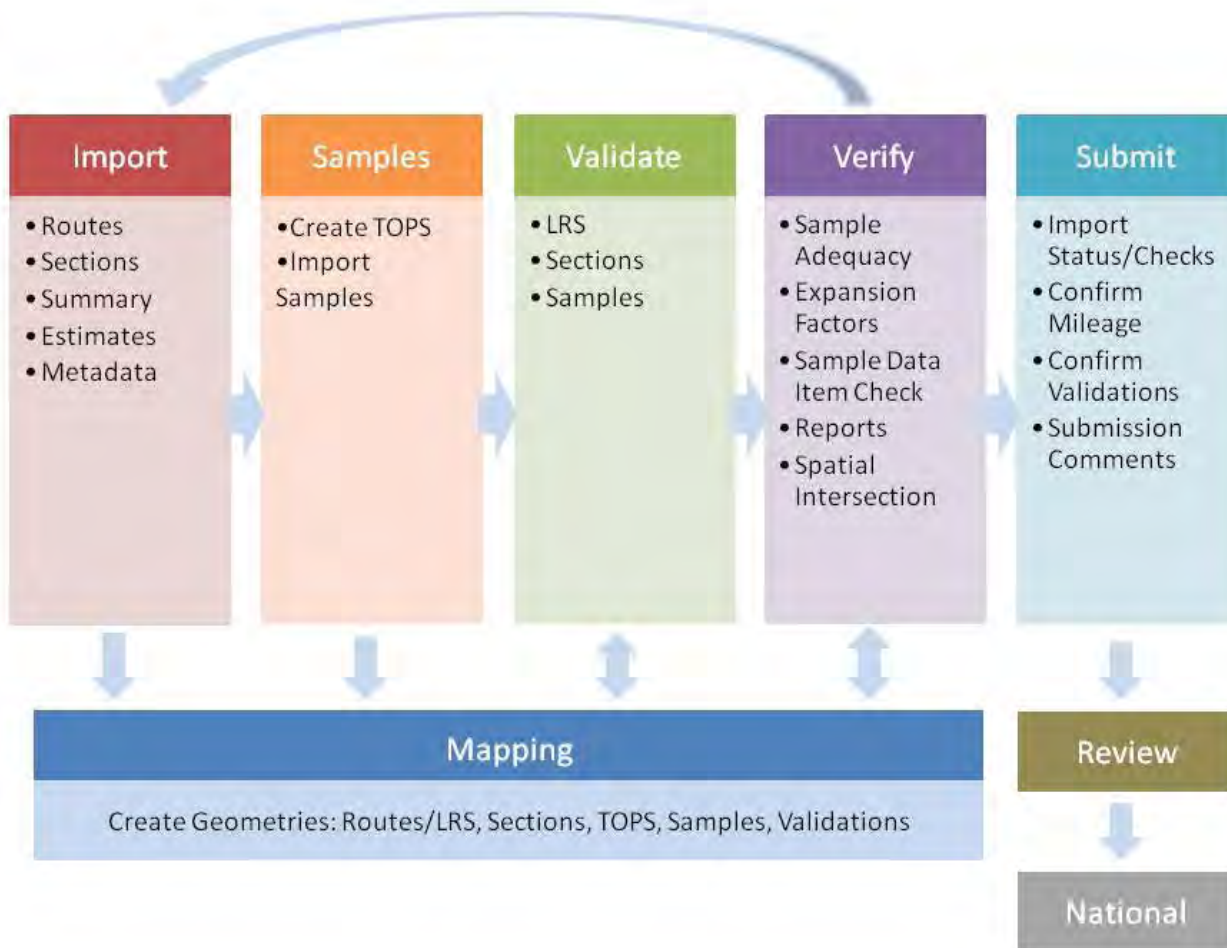
Star symbols indicate actions that should be taken by the user to complete processes.



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\*\*.



\* 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

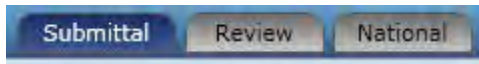
Each HPMS 8.0 screen is generally partitioned according to the following layout. The application itself is dynamic such that depending on where you are in the application, options may change. For example, while the Application Menu will provide an option for data import in the Submittal Area, the Review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

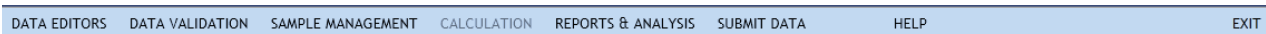


1. Click on the Year and State Label
2. Change Year/State Screen is displayed
3. Enter a 4 digit Year in the Textbox for Year and use the dropdown list to select a State.
4. Click OK to change the Year
5. Changes made will appear in the Year/State Label

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, HPMS 8.0 will always require the 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.

			Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value Text	Value Date	Comme
			F_SYSTEM	100	0	0.180	0.190	3.000			
			F_SYSTEM	100	0.200	0.950	0.750	3.000			
			F_SYSTEM	100	0.950	1.150	0.200	3.000			
			F_SYSTEM	100	1.150	1.760	0.610	3.000			
			F_SYSTEM	100	1.760	1.960	0.200	3.000			
			F_SYSTEM	100	1.960	2.240	0.280	3.000			

### Grid Features

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

Delete functions

Click top of any column to sort records

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.

			Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value Text	Value Date	Comme
			F_SYSTEM	100	0	0.180	0.190	3.000			
			F_SYSTEM	100	0.200	0.950	0.750	3.000			
			F_SYSTEM	100	0.950	1.150	0.200	3.000			
			F_SYSTEM	100	1.150	1.760	0.610	3.000			
			F_SYSTEM	100	1.760	1.960	0.200	3.000			
			F_SYSTEM	100	1.960	2.240	0.280	3.000			

Navigation and Map Layers

**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 toolbar.

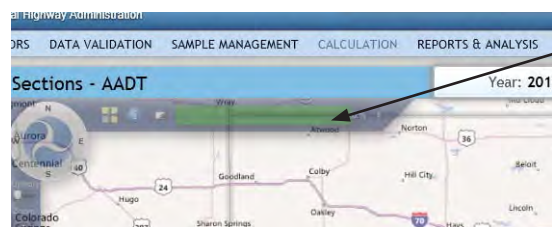
**Zoom:** Click on Plus or Minus symbol or slide bar.

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

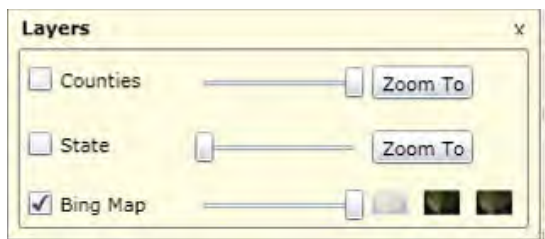
**Collapse/Expand Zoom and Opacity Tools**

**Map Legend:** The map legend can be turned on or off using the Legend Icon on the Navigation grid, or the X in the toolbar top corner. The Legend can also be moved using the mouse cursor.

*Users may also Pan and Zoom from the mouse controls*



*A green status bar will appear when map elements are drawing.*



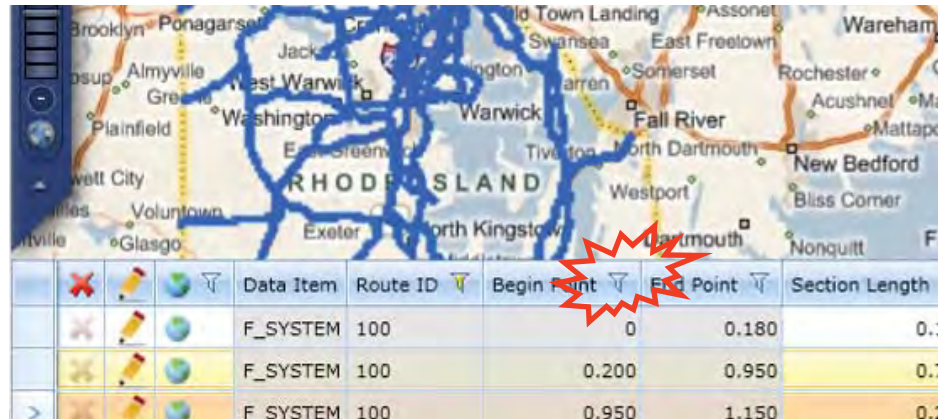
**Layers Control:** Checking the boxes next to available map layers will turn them on. The Opacity of each layer can be adjusted with the slider bar. Zoom buttons allow a quick zoom to the State or county level.

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

## Applying Filters to Grid

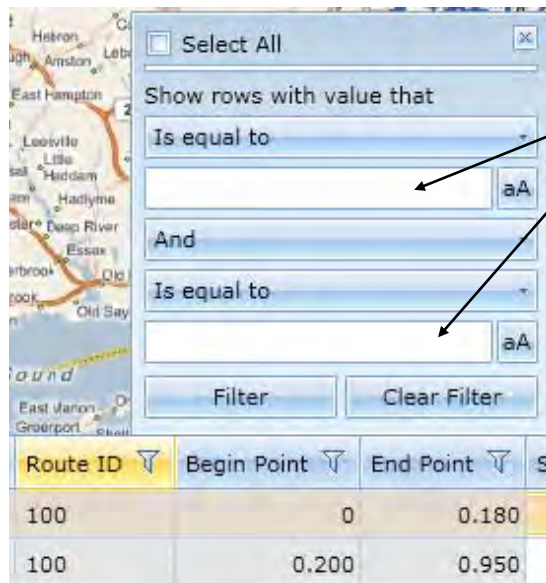
Specific data sets may be examined through the use of the query feature in the grid table. Fields that may be filtered are indicated with a funnel icon in the field header on the data grid. The graphics below illustrate the filter process.

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.

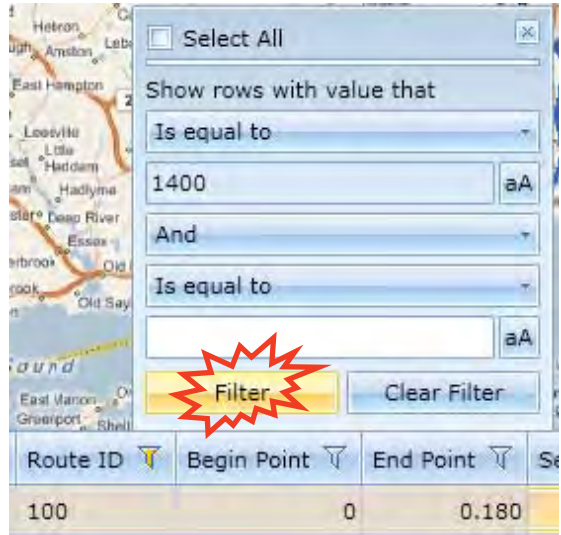
Type in query parameters in the spaces provided being sure to use the drop down menu to select the appropriate filter string— Is equal to, Contains, etc.



Enter query text here.

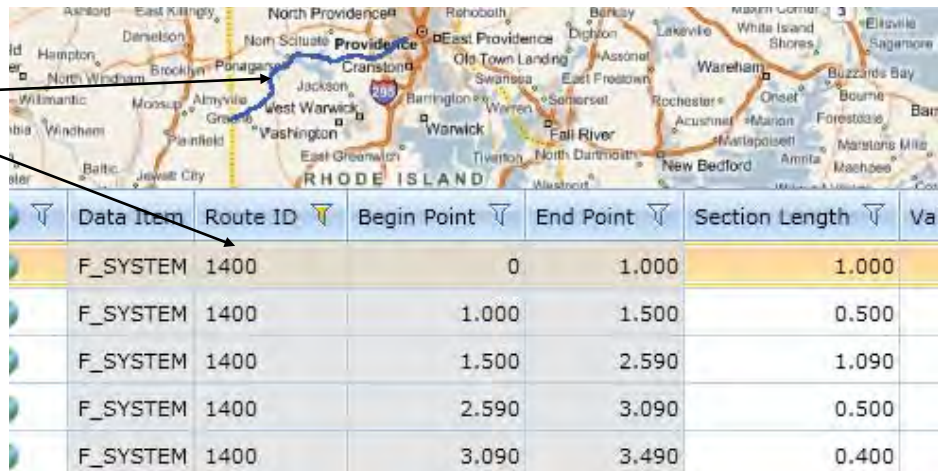
Grid Filters Continued

After entering query parameters, click Filter.

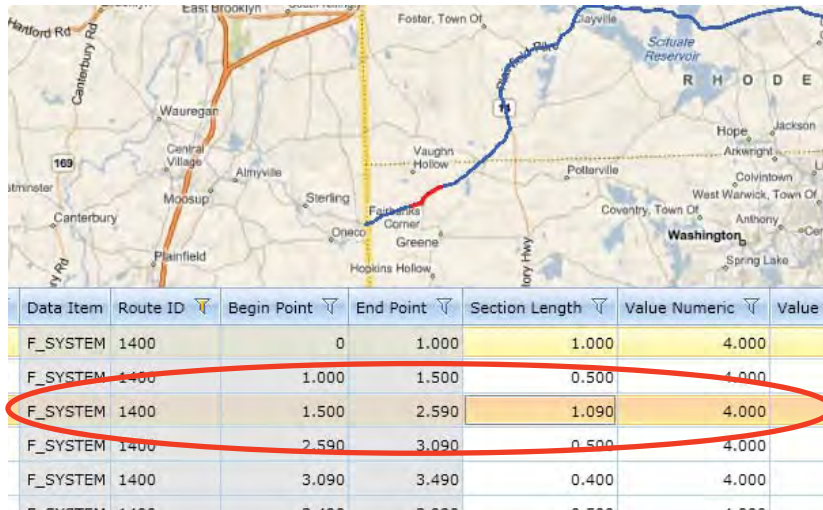


The Records Are Displayed in the Grid and the sections are displayed where there is a spatial link.

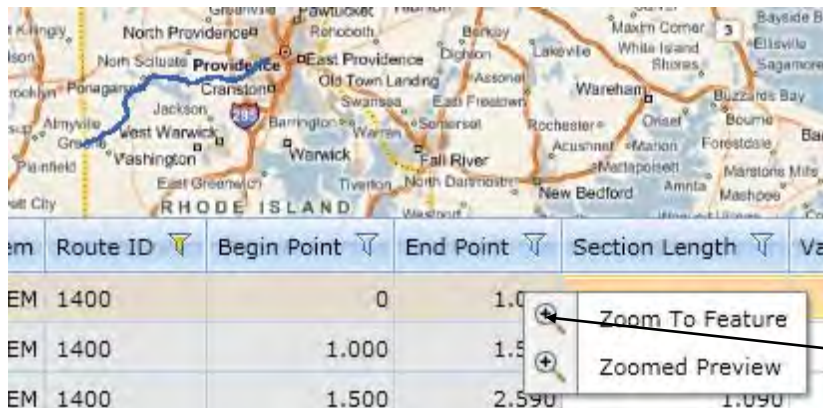
*Deleting and editing data are covered in another section of this manual.*



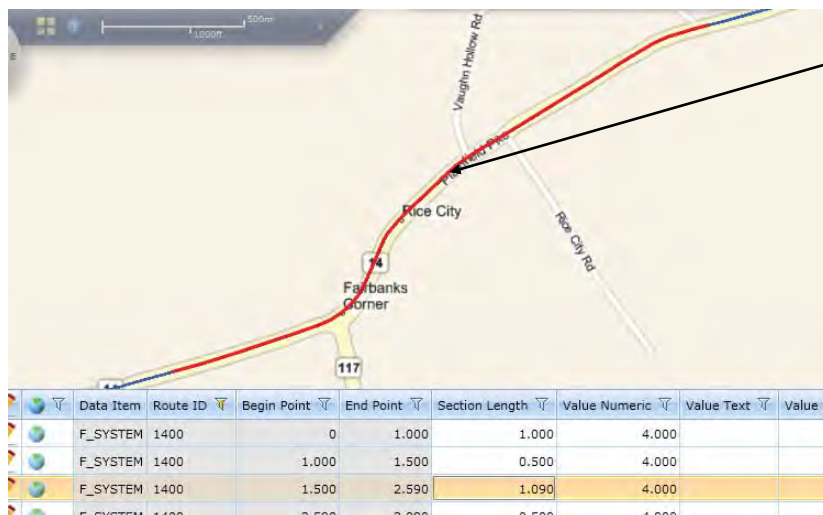
Grid Filters Continued



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.



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.



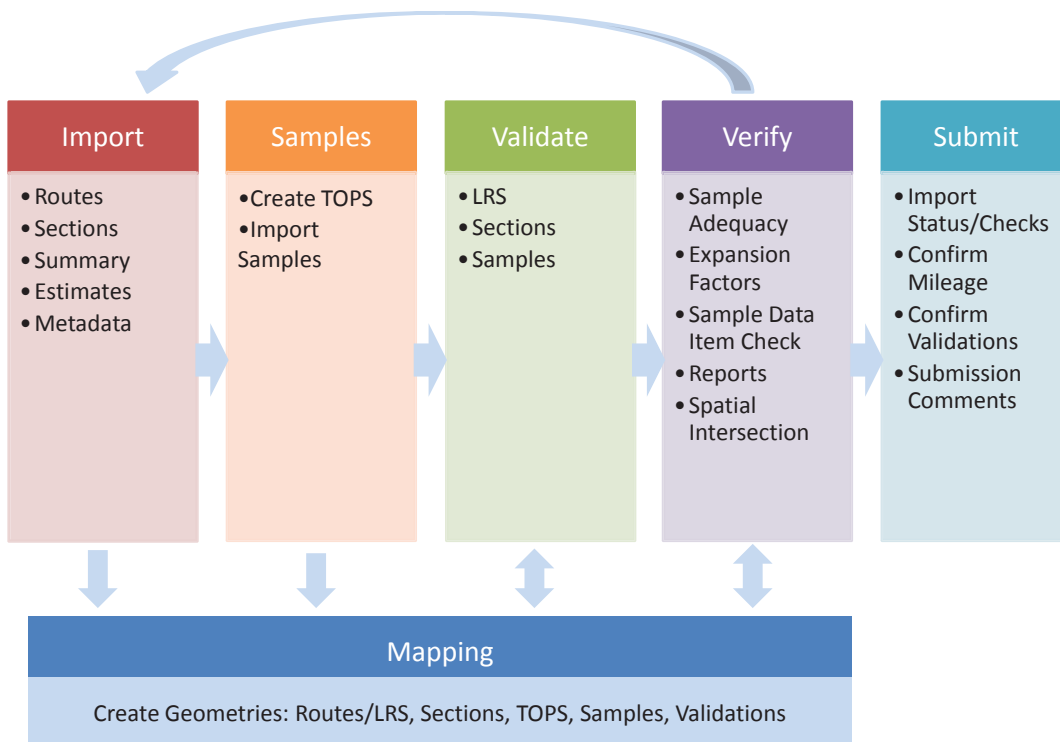
## Chapter 4—The Application Menu

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

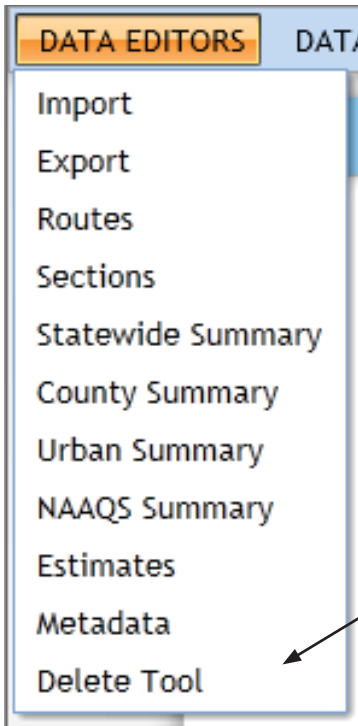
The HPMS application menu is intended for use from left to right (from Data Editors to Submittal) but can also be used in a non linear fashion as data may be entered, reviewed, and edited intermixed with other data loads, validation checks and report views. Use the workflow diagram shown in Chapter 2, 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.



## Data Editors Menu

### The Data Editor Drop Down Menu.

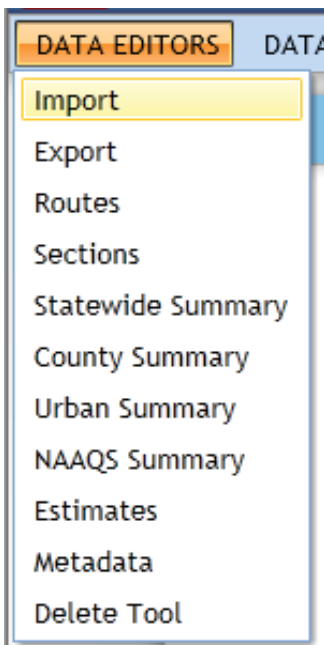
The functions listed under the Data Editors heading provide users with access to import, export, modify and view data in preparation of the annual HPMS submittal. As such, a firm understanding of the tools provided within this portion of the software interface is important for all users of the HPMS software 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).

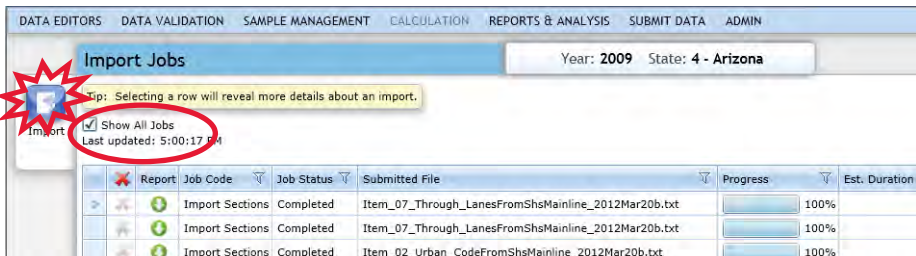
Step 2: Uploaded data are incorporated into necessary tables in the National HPMS Database. This insert process takes place in the background. (User does not need to be logged in during this step).

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.

## 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.

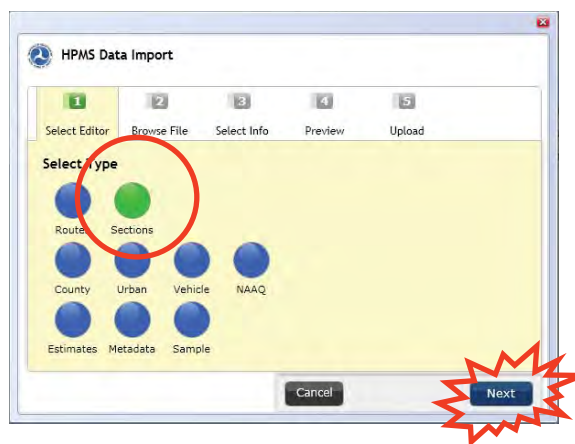


The Import Log automatically shows the most recent imports. To see the full list of imports check the Show All Jobs box.

### 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.

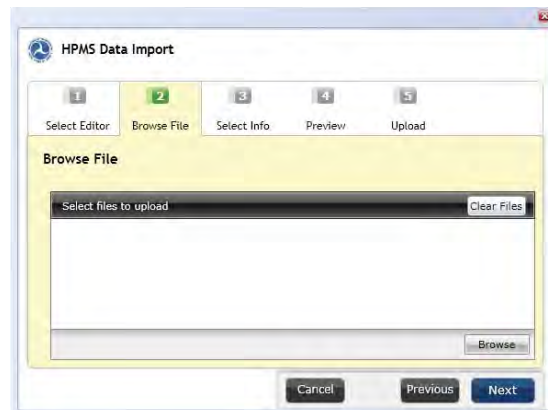
Click "Next".



**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.

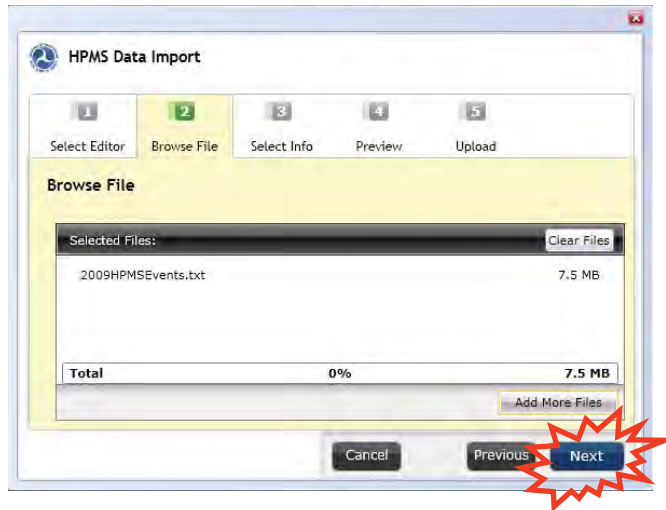




Import Steps Continued

Step 4—Verify File to Import

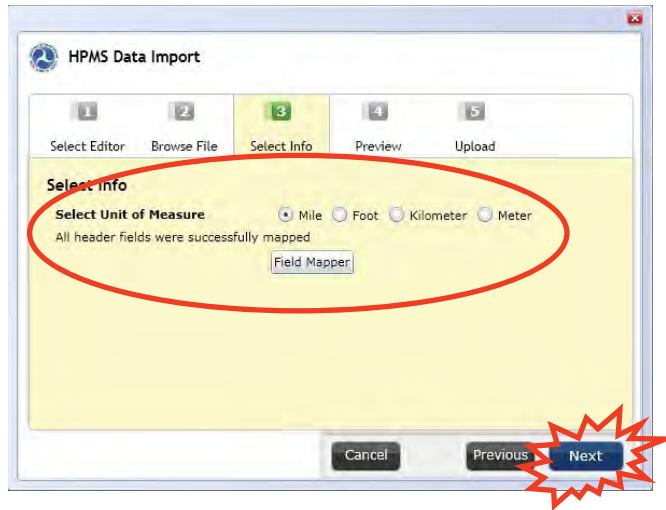
After selecting that appropriate file from your system, verify that the imported file is correct and click “Next”.



Step 5—Enter Special Information for the Data Type.

Enter the requested information about the imported data on the following screen and click “Next”.

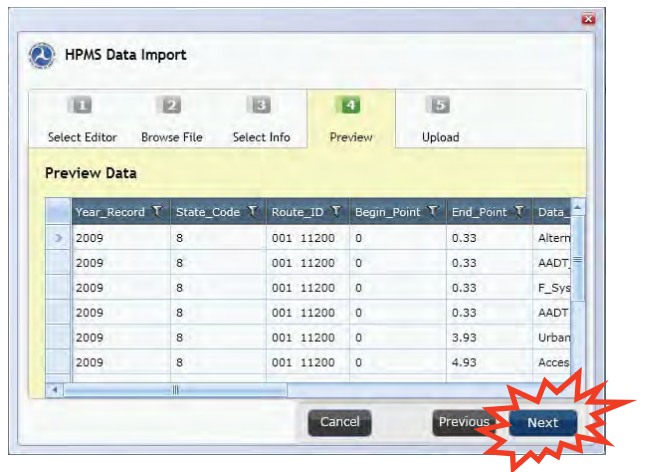
*This is an example of a shape file import. Details on formats are listed in the Routes section of this chapter.*



Step 6—Click the Next Button

Review the preview of imported records and click “Next”.

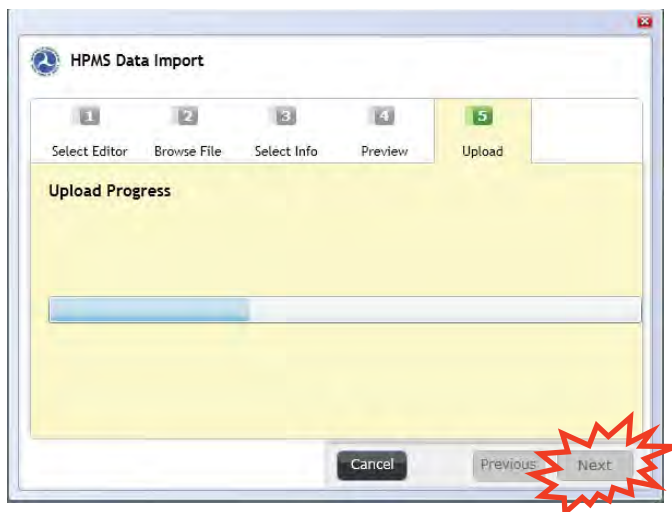
*The preview feature may not be available for all data types.*



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.

Report	Job Code	Job Status	Submitted File	Progress	Est. Duration
Import Routes	Completed	RIHMPSRtes_GCS83	100%		
Import Sections	Completed	test295_rampsFACTYPE.csv	100%		

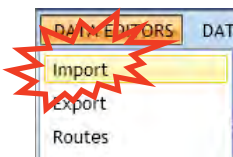
Click on a row in the import table to display information about the import process.

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.

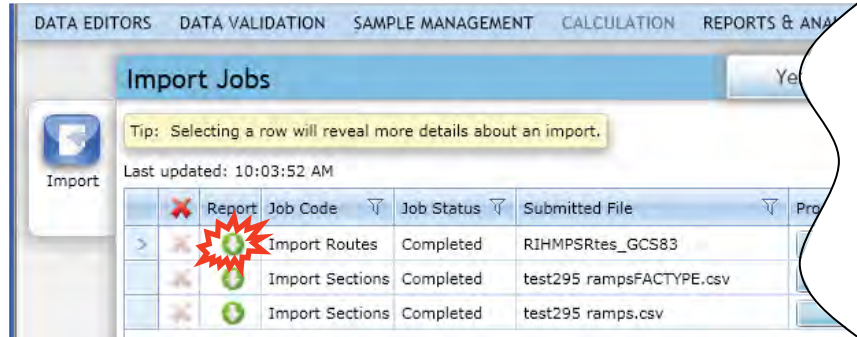


Remember... to import any kind of data, just go to Data Editors —> Import. From here, the user can also review the import logs for any issues.

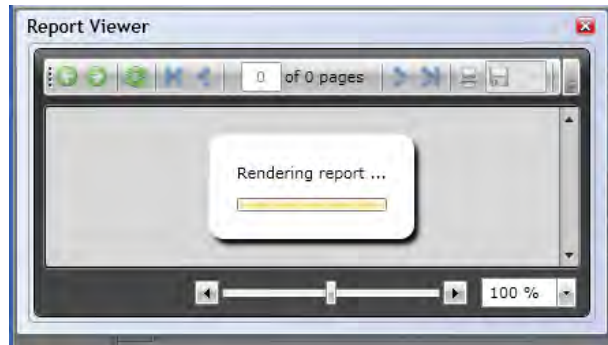
Import Results—Continued

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.

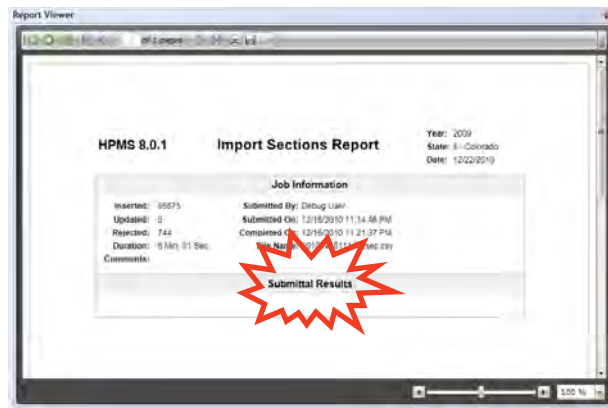


This will display a Report Viewer window. The report will then expand to a summary. Click "Next".



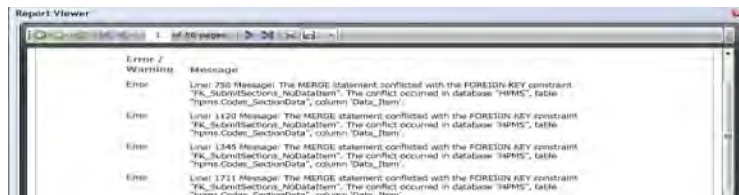
Click "Submittal Results" to show the Error and Warning Messages.

Print and Save options are available.



Import Reports Can Be Expanded to Submittal Results

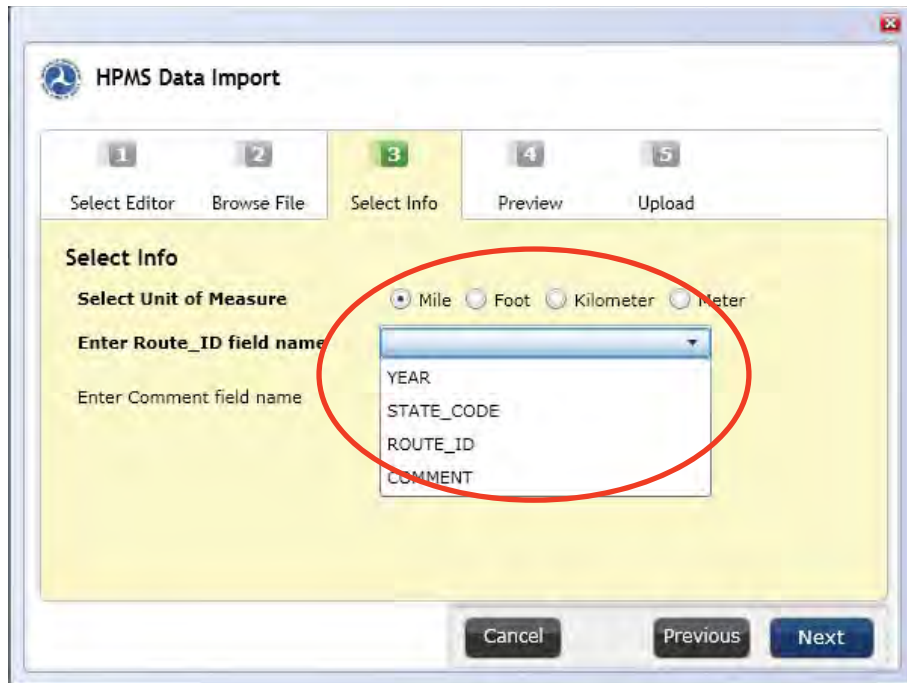
Note: This sample error report is based on fictitious data.



## Import Specifics

Although the import process for the various HPMS file types is essentially the same, screens through the import process will differ slightly due to import file format variations and file types. The following pages illustrate several of the nuances of these import screens.

### Select the Field Identifying the Route



These screens are used to insure that Route data is imported properly into the FHWA HPMS system.

Options are provided for various units of measure including Kilometers, Miles and Feet.

For Route importing, the user must select the unit of measure in the source file.

Also, the user must define which field in the shape files being imported will act as the unique route identifier.

The user also has the opportunity to map the Comment field name.

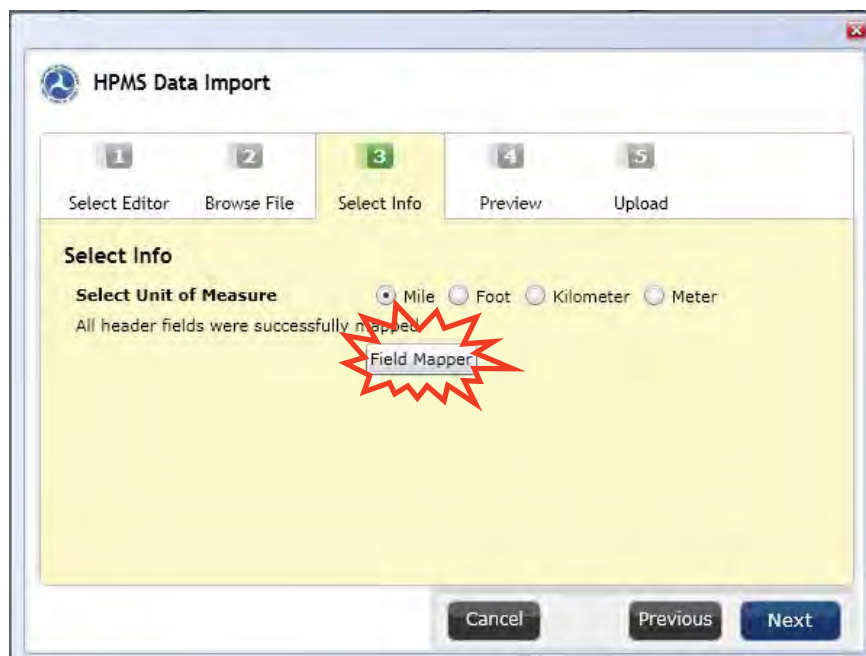
## Field Mapping for Import Files

Each file imported is going to have its own format. The order of the columns may vary or the data being imported may vary.

The field mapper lets the user define (for each type of import—summary, sections, routes, 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



Field Mapping Continued

Step Three (3) of the Import process for Routes looks quite different if the Route is a Shape File or another format. The example below is for an ESRI Geodatabase file. Note that for this file format there are no drop down lists and all field names must be entered manually.



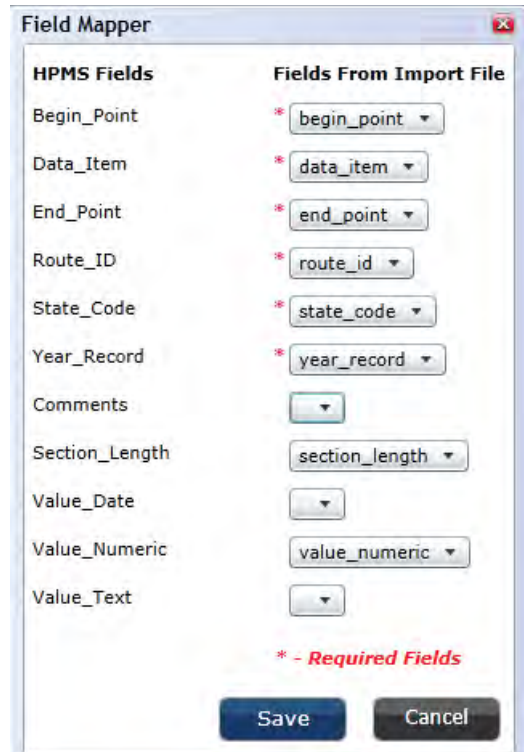
Items typed into this dialogue box must EXACTLY match the input file.

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.

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

The screenshot shows the 'Field Mapper' dialog box with the following field mappings:

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

Buttons: 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 header 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.

The screenshot shows the 'Field Mapper' dialog box with the following field mappings:

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

Buttons: Save, Cancel

## The Create Geometries Tool

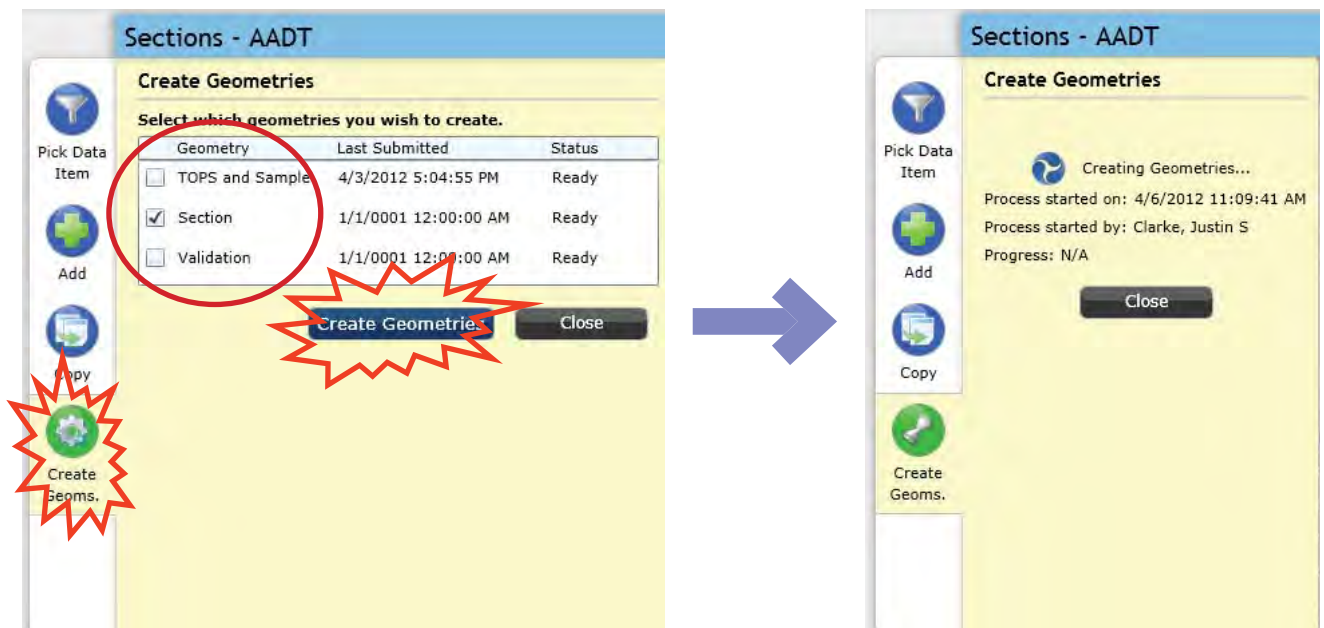
Before Route or Section data can be viewed in the map window of HPMS software screens, the Create Geometries process must be run. This process creates a spatial file from Section, Sample, TOPS and Validation records. Once geometries are created, users can view data in the map window. The process for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

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.

Sample ID	Route ID	Begin Point	End Point	Volume Group	F System
A0051-0.235	A0051	0.235	0.394	2,000 - 4,999	4 - Minor Arter
A0051-0.696	A0051	0.696	0.956	5,000 - 9,999	4 - Minor Arter
A0051-0.956	A0051	0.956	1.282		
B004-0.225	B004	0.225	0.425	5,000 - 9,999	2 - PA - Other

Total Samples: 1202

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

Sample ID	Route ID	Begin Point	End Point	Volume Group	F System
A0051-0.235	A0051	0.235	0.394	2,000 - 4,999	4 - Minor Arte
A0051-0.696	A0051	0.696	0.956	5,000 - 9,999	4 - Minor Arte
A0051-0.956	A0051	0.956	1.282		
B004-0.225	B004	0.225	0.425	5,000 - 9,999	2 - PA - Other

Total Samples: 1202

*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.

Sample ID	Route ID	Begin Point	End Point	Volume Group	F System
A0051-0.956	A0051	0.956	1.282		
B004-3.334	B004	3.334	3.739		
B004-EA001-0	B004-EA001	0.000	0.061		
I089-0	I089	0.000	0.599		

Total Samples: 375



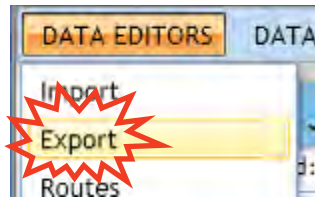
## Exporting Data

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

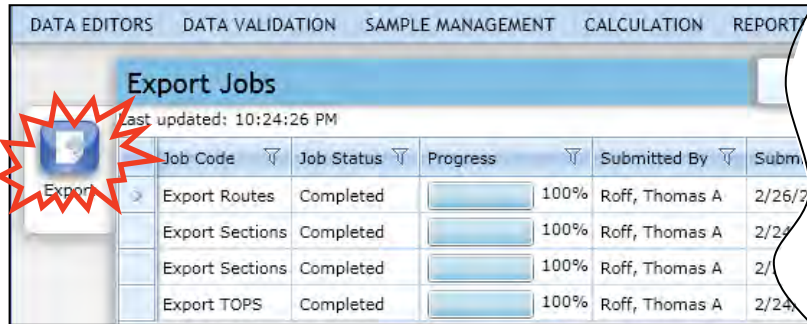
Click on “Export” from the Application Menu -> Data Editor Option.



### 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. The selected data item will turn green. Click Next.

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

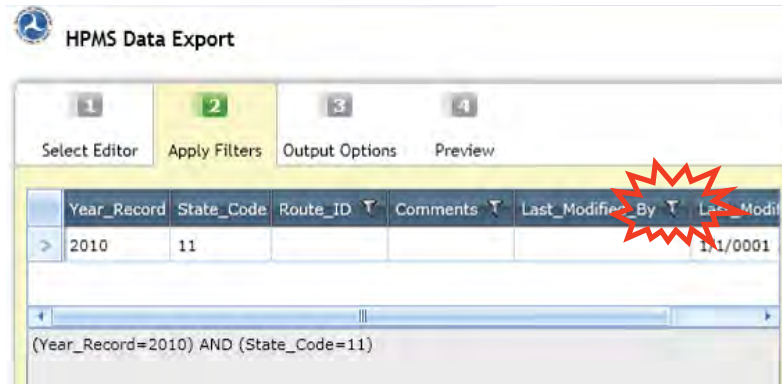


Export Continued

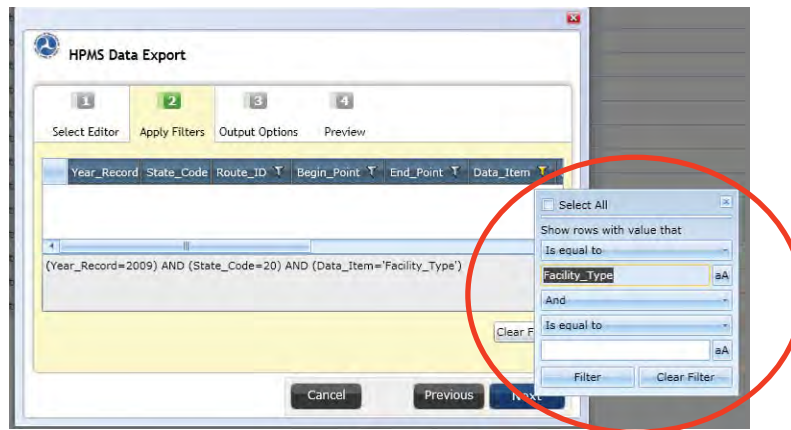
Step 4—Filter the data

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.*

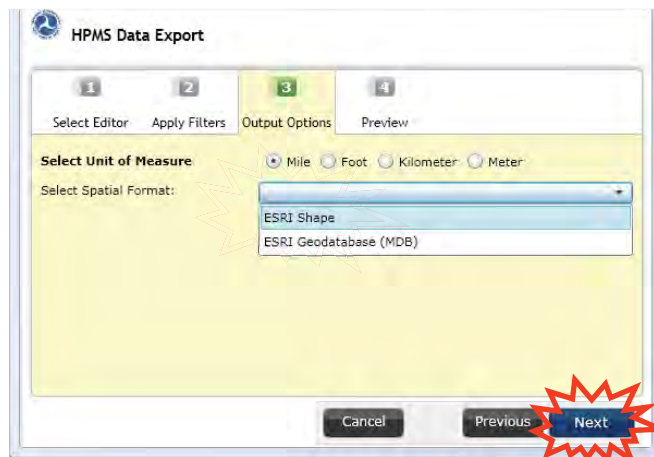


Filter text should be entered into the resulting dialog box.



Step 5—Select Data Format for Export

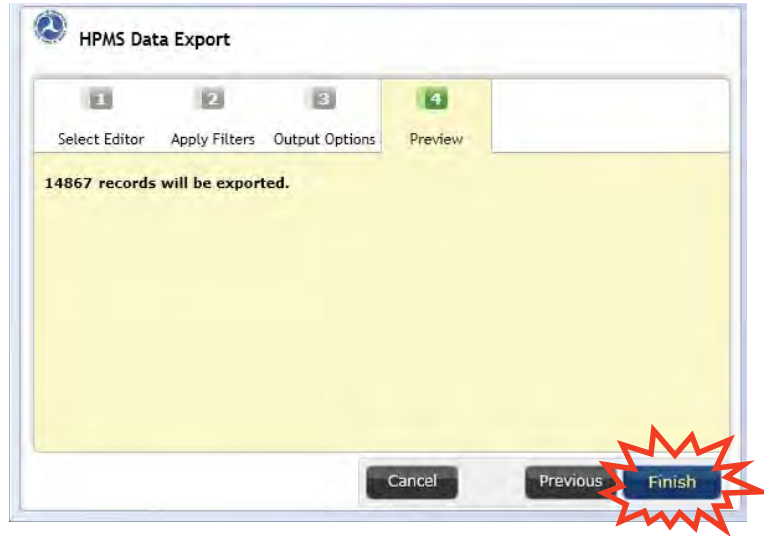
Select a Unit of Measure and format of the Data to be exported and click Next.



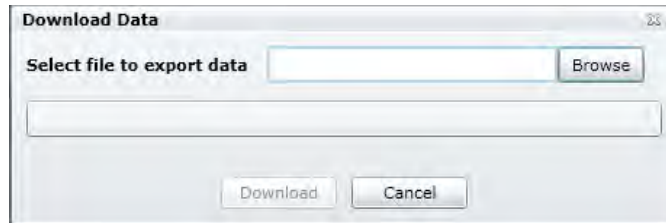
Export Continued

Step 6 - Review Screen/Saving the Data

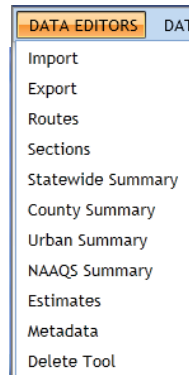
Review information provided on the Preview Screen and click Finish.



Select the desired location to save the data.



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.)



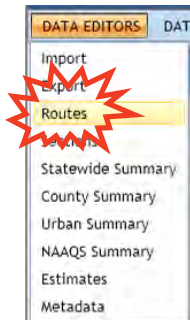
Job Code	Job Status	Progress	Submitted By	Submitted On	Completed On	Download
Export Routes	Files Uploaded	<div style="width: 0%;"></div> 0%	Roff, Thomas A	2/26/2011 10:29:10 PM		
Export Routes	Completed	<div style="width: 100%;"></div> 100%	Roff, Thomas A	2/26/2011 9:37:36 PM	2/26/2011 9:38:01 PM	
Export Sections	Completed	<div style="width: 100%;"></div> 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

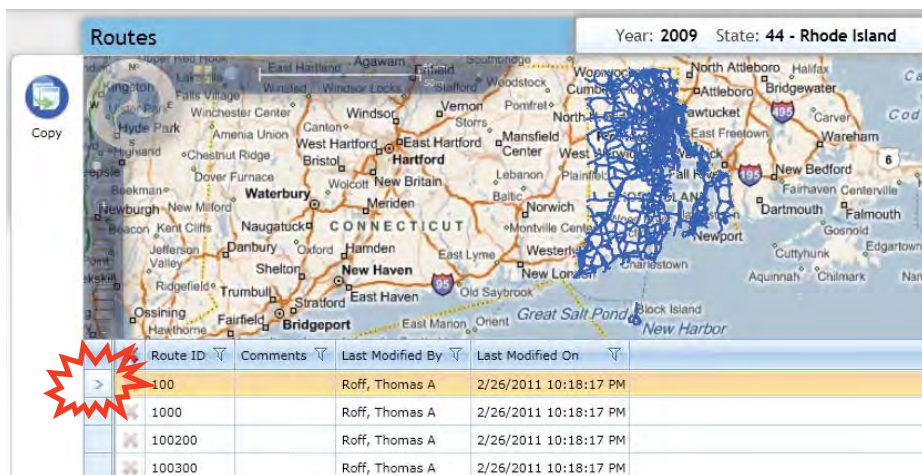
The Routes menu allows users to view and query Route data.

Select Routes from the Data Editors Menu within the Application Menu to view or query Route data.

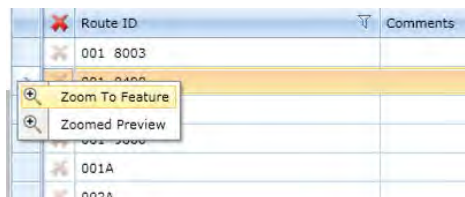


The steps below provide direction on how to examine route information in more detail.

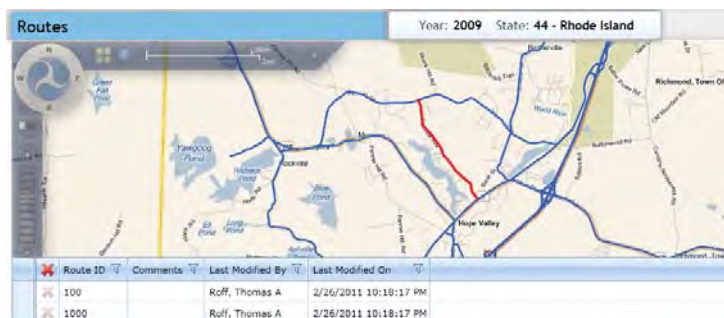
Select a desired Route from the grid window below the map to view a close-up of a specific Route.



Right click on the highlighted record and select Zoom to Feature.



The map display window will be updated to reveal the route selected.

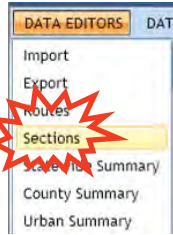


*To see a preview of the selected route, select the Zoomed Preview option instead of Zoom to Feature. This is a helpful way to ensure that the route segment selected is the one in question. This is often most useful on crowded urban networks.*

## Data Viewers—Sections

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

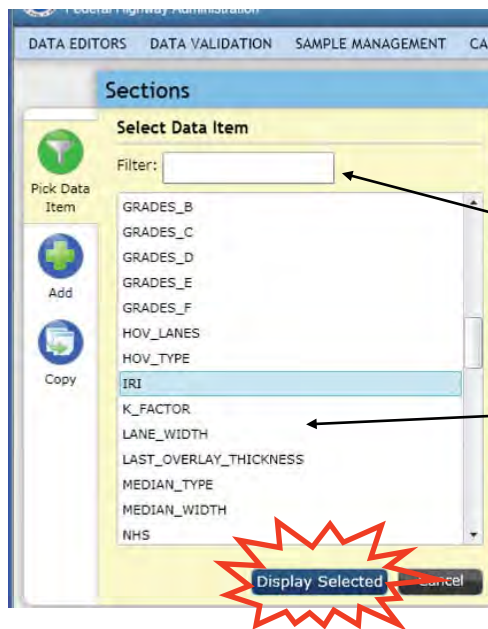
Select Sections from the Data Editors Menu to access section data.



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.

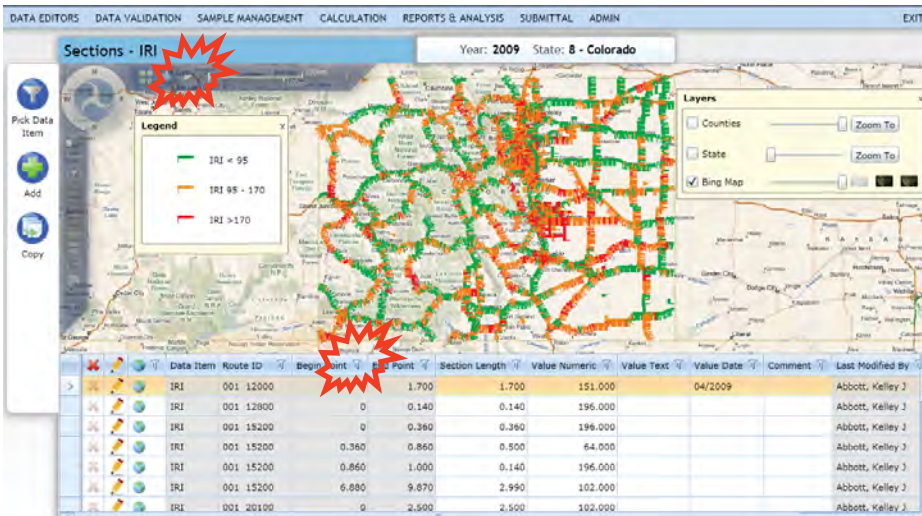
Items are listed alphabetically by their HPMS Data Item name.

Data Viewers—Sections Continued

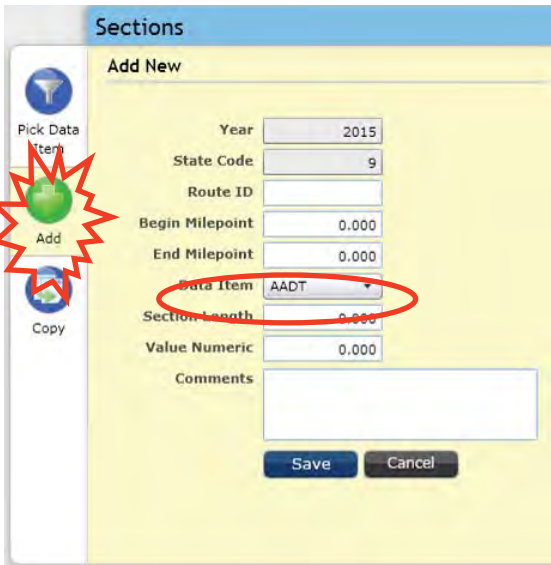
Click on the Map toolbar to turn on (or off) the **Legend**.

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.



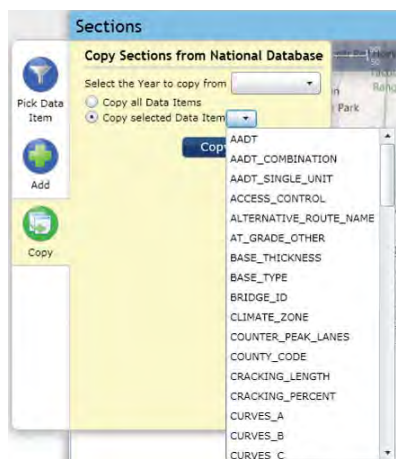
Click on the **Add** tool to manually add records. Select the appropriate data item from the drop down menu before entering any data.



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.



## 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

**State Summary** Year: 2010 State: 37 - North Carolina

**SUMMARY** PAVEMENT DATA VEHICLE TYPE

Travel

	Local	29,047	Small Urban (x1000)	3,756
	Minor Collector	9466		

Demography

	Population (x1000)	3,647		1,058
	Net Land Area	43,345		1,263

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

**State Summary** Year: 2010 State: 37 - North Carolina

**SUMMARY** PAVEMENT DATA VEHICLE TYPE

	Rural		Urban	Total
	Minor Collector	Local	Local	
Paved	6,538.164	44,291.751	25,904.509	76734.424
Un-Paved	19.273	6,223.456	721.631	6964.360
Total	6557.437	50515.207	26626.140	83698.784
Control Total	6557.000	50515.230	26626.140	

Control Total data comes from County Summary. Totals must match Control Totals within one mile.

Calculate Totals

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.

**State Summary** Year: 2010 State: 37 - North Carolina

**SUMMARY** PAVEMENT DATA VEHICLE TYPE

	Rural			Urban		
	Interstate	Other Arterial	Other Rural	Interstate	Other Arterial	Other Urban
Motorcycles	0.36 %	0.53 %	0.72 %	0.39 %	0.58 %	0.71 %
Passenger Cars	65.04 %	68.70 %	69.26 %	71.27 %	75.34 %	75.55 %
Light Trucks	13.41 %	19.05 %	20.80 %	14.69 %	16.73 %	17.35 %
Buses	0.64 %	0.73 %	0.79 %	0.63 %	0.56 %	1.11 %
Single Unit Trucks	3.19 %	4.36 %	4.63 %	3.10 %	3.50 %	3.88 %
Combination Trucks	17.36 %	6.63 %	3.80 %	9.92 %	3.29 %	1.40 %
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Last Modified On 7/6/2011 3:53:24 PM  
Last Modified By Schroeder, Thomas C

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.

U.S. Department of Transportation  
Federal Highway Administration  
Highway Performance Monitoring System v8.0

Year: 2009 State: 37 - North Carolina

County Code	Functional System	Urban Code	Ownership	RMC L System Length	Last Modified By	Last Modified On
1 - Alamance	6 - Minor Collector	Rural	1 - State Highway Agency	78.081	Arnold, Jonathan L	12/15/2010 10:15:05 A
1 - Alamance	7 - Local	Burlington, NC	1 - State Highway Agency	113.742	Arnold, Jonathan L	10/26/2010 12:52:29 F
1 - Alamance	7 - Local	Burlington, NC	4 - City or Municipal Highway Agency	395.920	Arnold, Jonathan L	10/26/2010 12:52:29 F
1 - Alamance	7 - Local	Rural	1 - State Highway Agency	446.866	Arnold, Jonathan L	12/15/2010 10:15:06 A
1 - Alamance	7 - Local	Rural	4 - City or Municipal Highway Agency	4.260	Arnold, Jonathan L	12/15/2010 10:15:06 A
3 - Alexander	6 - Minor Collector	Rural	1 - State Highway Agency	83.746	Arnold, Jonathan L	10/26/2010 12:52:30 F
3 - Alexander	7 - Local	Hickory, NC	1 - State Highway Agency	35.971	Arnold, Jonathan L	10/26/2010 12:52:30 F
3 - Alexander	7 - Local	Rural	1 - State Highway Agency	398.184	Arnold, Jonathan L	10/26/2010 12:52:30 F
3 - Alexander	7 - Local	Rural	4 - City or Municipal Highway Agency	10.940	Arnold, Jonathan L	12/15/2010 10:15:06 A
3 - Alexander	7 - Local	Rural	11 - State Park, Forest, or Resv. Agency	0.900	Arnold, Jonathan L	10/26/2010 12:52:30 F
5 - Alleghany	6 - Minor Collector	Rural	1 - State Highway Agency	6.250	Arnold, Jonathan L	12/15/2010 10:15:06 A
5 - Alleghany	7 - Local	Rural	1 - State Highway Agency	349.388	Arnold, Jonathan L	12/15/2010 10:15:06 A
5 - Alleghany	7 - Local	Rural	4 - City or Municipal Highway Agency	15.530	Arnold, Jonathan L	12/15/2010 10:15:06 A
5 - Alleghany	7 - Local	Rural	66 - National Park Service	2.470	Arnold, Jonathan L	10/26/2010 12:52:30 F
7 - Anson	6 - Minor Collector	Rural	1 - State Highway Agency	115.533	Arnold, Jonathan L	10/26/2010 12:52:30 F
7 - Anson	7 - Local	Small Urban	1 - State Highway Agency	11.848	Arnold, Jonathan L	10/26/2010 12:52:30 F
7 - Anson	7 - Local	Rural	1 - State Highway Agency	530.504	Arnold, Jonathan L	10/26/2010 12:52:30 F
7 - Anson	7 - Local	Rural	4 - City or Municipal Highway Agency	77.070	Arnold, Jonathan L	12/15/2010 10:15:06 A
7 - Anson	7 - Local	Rural	11 - State Park, Forest, or Resv. Agency	0.500	Arnold, Jonathan L	10/26/2010 12:52:30 F
7 - Anson	7 - Local	Rural	63 - Bureau of Fish and Wildlife	15.750	Arnold, Jonathan L	10/26/2010 12:52:30 F
9 - Ashe	6 - Minor Collector	Rural	1 - State Highway Agency	21.969	Arnold, Jonathan L	12/15/2010 10:15:06 A

Total County Summaries: 574 Page 1 of 23

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.

U.S. Department of Transportation  
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Highway Performance Monitoring System v8.0

Year: 2010 State: 8 - Colorado

County Code	Functional System	Urban Code	Ownership	RMC L System Length	Last Modified By	Last Modified On
1 - Adams	1 - Interstate	23527 - Denver-Aurora, CO	1 - State Highway Agency	2.408	Abbott, Kelley J	5/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	86.390	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	6.260	Abbott, Kelley J	6/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	202.025	Abbott, Kelley J	5/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	818.760	Abbott, Kelley J	5/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	27.700	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	115.955	Abbott, Kelley J	5/3/2011 4:08
1 - Adams	1 - State Highway Agency		1 - State Highway Agency	6.661	Abbott, Kelley J	5/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	709.330	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	42.010	Abbott, Kelley J	6/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	54.220	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	3.030	Abbott, Kelley J	6/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	14.050	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	42.080	Abbott, Kelley J	6/3/2011 4:08
2 - Adams	2 - County Highway Agency		2 - County Highway Agency	489.870	Abbott, Kelley J	6/3/2011 4:08
4 - Adams	4 - City or Municipal Highway Agency		4 - City or Municipal Highway Agency	3.985	Abbott, Kelley J	6/3/2011 4:08
26 - Adams	26 - Private (Other than Railroad)		26 - Private (Other than Railroad)	83.340	Abbott, Kelley J	6/3/2011 4:08
66 - Adams	66 - National Park Service		66 - National Park Service	3.770	Abbott, Kelley J	6/3/2011 4:08
1 - Adams	1 - State Highway Agency		1 - State Highway Agency	3.288	Abbott, Kelley J	6/3/2011 4:08

Total County Summaries: 535 Page 0 of 22

\* 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.

Urban Summary

Year: 2010 State: 8 - Colorado

Urban Code	Local DVMT	State Portion Pop (x1000)	State Portion Land (Sq. Mile)	Last Modified By	Last Modified On
9298 - Boulder, CO	206000	107	37	Abbott, Kelley J	6/3/2011 4:08:23 PM
18856 - Colorado Springs, CO	1108000	531	380	Abbott, Kelley J	6/3/2011 4:08:23 PM
23527 - Denver--Aurora, CO	5053000	2,293	814	Abbott, Kelley J	6/3/2011 4:08:23 PM
30628 - Fort Collins, CO	502000	242	187	Abbott, Kelley J	6/3/2011 4:08:23 PM
34273 - Grand Junction, CO	198000	112	85	Abbott, Kelley J	6/3/2011 4:08:23 PM
34786 - Greeley, CO	192000	133	91	Abbott, Kelley J	6/3/2011 4:08:23 PM
46126 - Lafayette--Louisville, CO	133000	54	38	Abbott, Kelley J	6/3/2011 4:08:23 PM
51175 - Longmont, CO	122000	76	30	Abbott, Kelley J	6/3/2011 4:08:23 PM
72613 - Pueblo, CO	300000	143	246	Abbott, Kelley J	6/3/2011 4:08:23 PM
99998 - Small Urban	1014000	220	558	Abbott, Kelley J	6/3/2011 4:08:23 PM
99999 - Rural	6049000	1,164	101,230	Abbott, Kelley J	6/3/2011 4:08:23 PM

Total Urban Summaries: 11

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

U.S. Department of Transportation  
Federal Highway Administration

Highway Performance Monitoring System v8.0

Submittal

Urban Summary

Year: 2010 State: 8 - Colorado

**Add New**

Urban Code: 9298 - Boulder, CO

Local DVMT: 0

State Portion Pop: 0

State Portion Land: 0

Last Modified On: 4/2/2012 3:34:42 PM

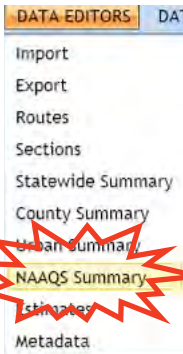
Last Modified By: Clarke, Justin S

Save Cancel

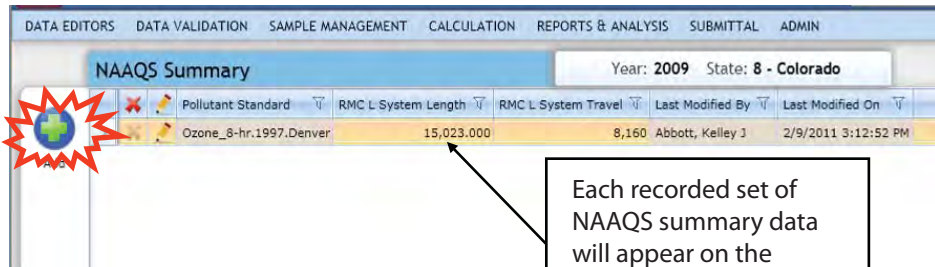
State Portion Pop (x1000)	State Portion Land (Sq. Mile)	Last Modified By	Last Modified On
107	37	Abbott, Kelley J	6/3/2011 4:08:23 PM
531	380	Abbott, Kelley J	6/3/2011 4:08:23 PM
2,293	814	Abbott, Kelley J	6/3/2011 4:08:23 PM
242	187	Abbott, Kelley J	6/3/2011 4:08:23 PM
112	85	Abbott, Kelley J	6/3/2011 4:08:23 PM
133	91	Abbott, Kelley J	6/3/2011 4:08:23 PM
54	38	Abbott, Kelley J	6/3/2011 4:08:23 PM
76	30	Abbott, Kelley J	6/3/2011 4:08:23 PM
143	246	Abbott, Kelley J	6/3/2011 4:08:23 PM
220	558	Abbott, Kelley J	6/3/2011 4:08:23 PM
1,164	101,230	Abbott, Kelley J	6/3/2011 4:08:23 PM

## Summary Features—NAAQS Summary

Annual review and update of NAAQS travel and system length is performed in the NAAQS Summary portion of the Data Editors Menu.



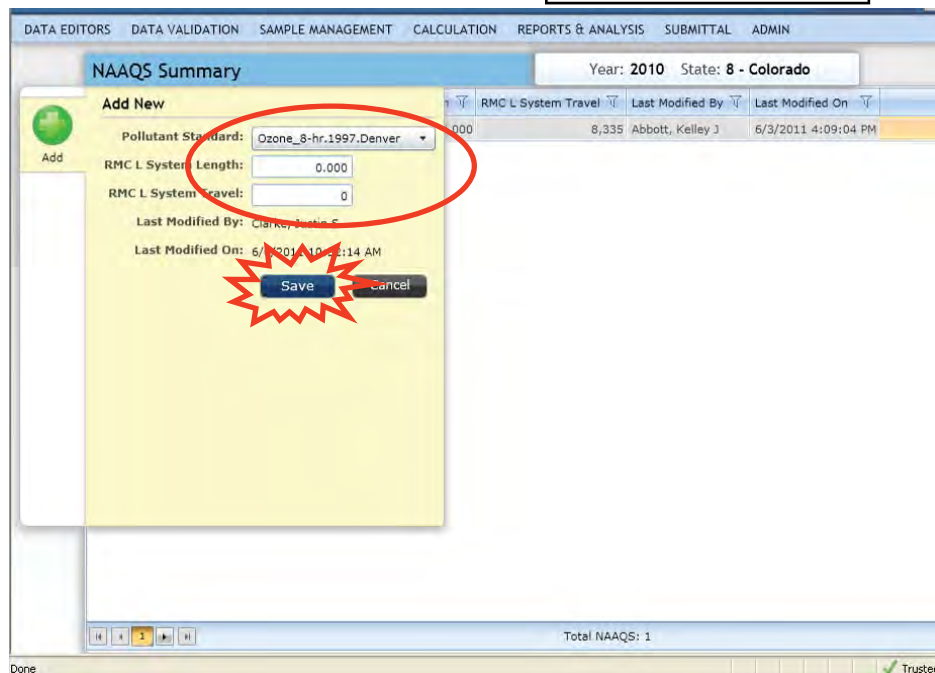
To add new data, select the Add button on the left side of screen.



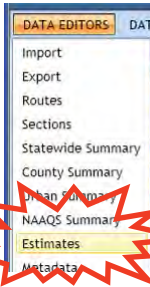
Each recorded set of NAAQS summary data will appear on the summary matrix in the NAAQS Summary screen.

Select a NAAQS area from the Pollution Standard dropdown 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

**Estimate** Year: 2010 State: 8 - Colorado

	Estimate Type	Functional System	Is Urban	Is State Owned	Data Item Value	Last Modified By
1 Add	Base Thickness	1 - Interstate	No	Yes	20.0	Clarke, Justin S
2 Edit	Base Thickness	1 - Interstate	Yes	Yes	30.0	Clarke, Justin S
3 Copy	Base Thickness	2 - PA - Other Freeways and Expressways	No	Yes	20.0	Clarke, Justin S
	Base Thickness	2 - PA - Other Freeways and Expressways	Yes	Yes	30.0	Clarke, Justin S
	Base Thickness	3 - PA - Other	No	Yes	20.0	Clarke, Justin S
	Base Thickness	3 - PA - Other	Yes	Yes	30.0	Clarke, Justin S
	Base Thickness	4 - Minor Arterial	No	Yes	20.0	Clarke, Justin S
	Base Thickness	4 - Minor Arterial	Yes	Yes	30.0	Clarke, Justin S
	Base Thickness	5 - Major Collector	No	Yes	20.0	Clarke, Justin S

**1 Estimate**

Estimate Type: Base Thickness  
 F System: 1 - Interstate  
 Is Urban:   
 Is State Owned:   
 Value Numeric: 0.0  
 Last Modified On: 6/10/2011 11:03:36 AM  
 Last Modified By: Clarke, Justin S

Buttons: Add, Edit, Save, Cancel

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.*

**2 Estimate** Year: 2011 State: 13 - Georgia

	Estimate Type	Functional System	Is Urban	Is State Owned	Data Item Value	Last Modified By
Save	Base Thickness	1 - Interstate	No	Yes	10.5	Roff, Thi
Cancel	Base Thickness	1 - Interstate	Yes	Yes	10.5	Roff, Thi
	Base Thickness	2 - PA - Other Freeways and Expressways	Yes	Yes	10.5	Roff, Thi
	Base Thickness	3 - PA - Other	No	Yes	8.0	Roff, Thi
	Base Thickness	3 - PA - Other	Yes	Yes	8.0	Roff, Thi
	Base Thickness	4 - Minor Arterial	No	Yes	8.0	Roff, Thi
	Base Thickness	4 - Minor Arterial	Yes	Yes	8.0	Roff, Thi
	Base Thickness	5 - Major Collector	No	Yes	8.0	Roff, Thi
	Base Thickness	5 - Major Collector	Yes	Yes	8.0	Roff, Thi

**3 Estimate**

**Copy National Data**  
 Copy Previous Year's National Data?

Buttons: Add, Edit, Copy, Close

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.

The screenshot shows the Metadata screen with a navigation menu at the top: DATA EDITORS, DATA VALIDATION, SAMPLE MANAGEMENT, CALCULATION, REPORTS & ANALYSIS, SUBMITTAL, ADMIN. The main header displays 'Year: 2010' and 'State: 11 - District of Columbia'. Below this is a table with columns: Metadata Type, Functional System, Is Urban, Is State Owned, and Data Item Value. The table contains several rows of 'Cracking Length Equip.' entries with varying Functional Systems and attributes. On the left side, there are 'Add' and 'Edit' buttons.

Metadata Type	Functional System	Is Urban	Is State Owned	Data Item Value
Cracking Length Equip.	1 - Interstate	No	No	1.0
Cracking Length Equip.	1 - Interstate	No	Yes	1.0
Cracking Length Equip.	1 - Interstate	Yes	No	1.0
Cracking Length Equip.	1 - Interstate	Yes	Yes	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	No	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	Yes	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	Yes	No	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	Yes	Yes	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	No	1.0
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	Yes	1.0

The 'Add New' dialog box is shown, allowing users to input metadata details. It includes fields for Metadata Type (set to AADT 24), F System (set to 1 - Interstate), Is Urban (checkbox), Is State Owned (checkbox), and Value Numeric (set to 0.0). It also displays 'Last Modified On: 6/10/2011 2:36:01 PM' and 'Last Modified By: Clarke, Justin S'. There are 'Save' and 'Cancel' buttons at the bottom.

This screenshot shows the Metadata screen with a navigation menu at the top: DATA EDITORS, DATA VALIDATION, SAMPLE MANAGEMENT, CALCULATION, REPORTS & ANALYSIS, SUBMITTAL, ADMIN. The main header displays 'Year: 2010' and 'State: 11 - District of Columbia'. Below this is a table with columns: Metadata Type, Functional System, Is Urban, Is State Owned, Data Item Value, and Last Modified By. The table contains several rows of 'Cracking Length Equip.' entries. On the left side, there are 'Save' and 'Cancel' buttons.

Metadata Type	Functional System	Is Urban	Is State Owned	Data Item Value	Last Modified By
Cracking Length Equip.	1 - Interstate	No	No	1.0	Shirazi, Aga M
Cracking Length Equip.	1 - Interstate	No	Yes	1.0	Shirazi, Aga M
Cracking Length Equip.	1 - Interstate	Yes	No	1.0	Shirazi, Aga M
Cracking Length Equip.	1 - Interstate	Yes	Yes	1.0	Shirazi, Aga M
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	No	1.0	Shirazi, Aga M
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	No	Yes	1.0	Shirazi, Aga M
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	Yes	No	1.0	Shirazi, Aga M
Cracking Length Equip.	2 - PA - Other Freeways and Expressways	Yes	Yes	1.0	Shirazi, Aga M

## Data Validation Menu

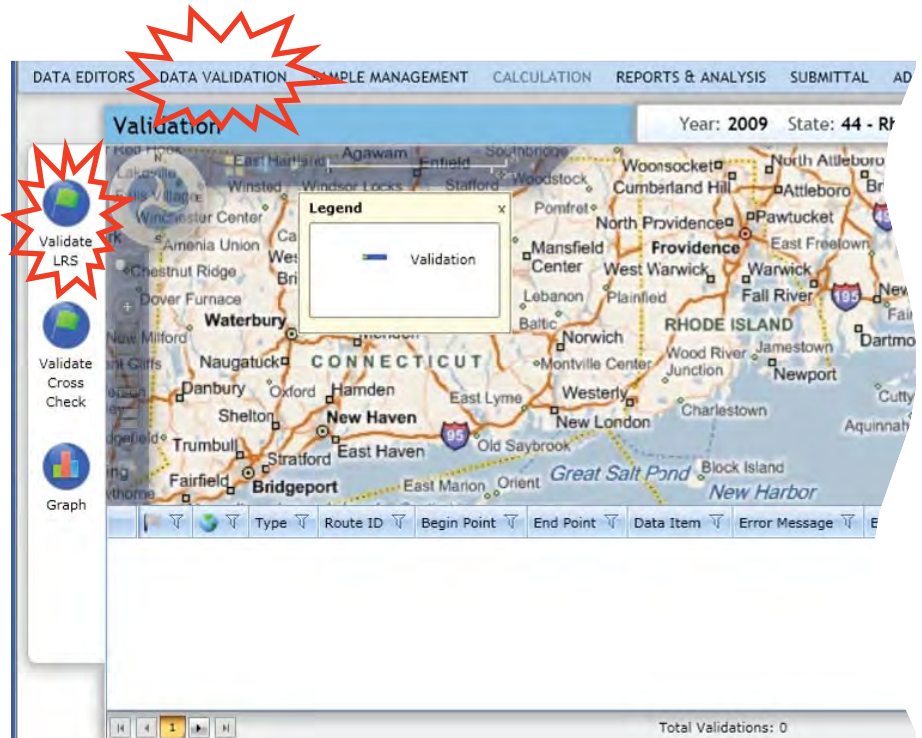
After successfully uploading route and section data, the next step in the HPMS submission process is a two part validation. First, Route and Section data should be validated via the Validate LRS tool. Second, the Sections need to be validated against each other using the Validate Cross Check tool. If there are errors associated with these validations, each phase of the validation will generate a unique set of error records, which are visible in the matrix area below the map view.

## LRS Validation

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

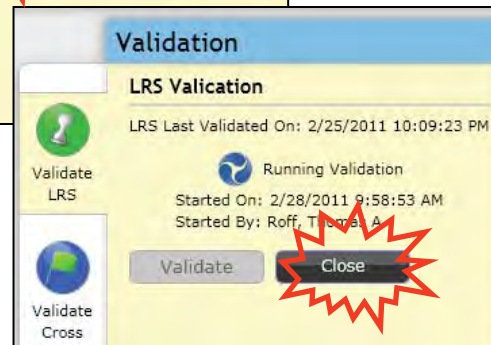
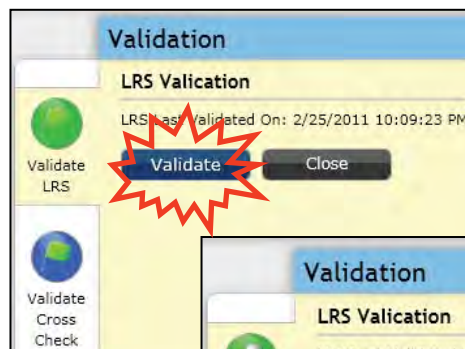
Next click on Validate LRS to begin the LRS Validation.

*More information on validations can be found in Chapter 7 of the HPMS Field Manual (<http://www.fhwa.dot.gov/policy/ohpi/hpms/fieldmanual>) and Appendix A of this Guide.*



The LRS Validation pop up box will display the last time a validation was run.

Click the Validate button to run the validation and Close when the Validation process is complete.



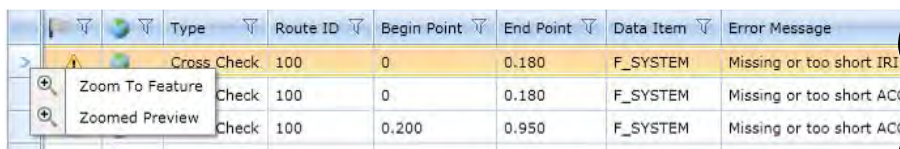
LRS Validation Continued

The resulting screen will display a matrix of validation records. The Error Message Field describes validation errors while the other data fields provide more information about each section listed.

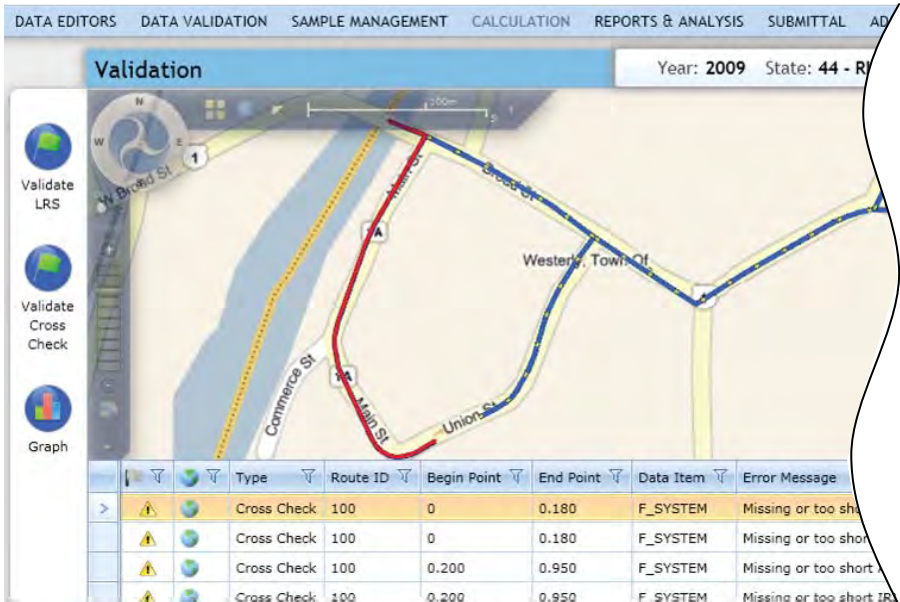
*In the view at right, the Error Message field has been repositioned by clicking and dragging the column to a location adjacent to the Route ID field.*



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.



*To export the Validate LRS or Validate Cross Check record set after running Validations, use the Validation button on the Export screen (in the Data Editors menu).*

## Cross Check Validation

The second Validation step involves checks of the Section data—for formatting, correct coding and values, and logical relationships.

Click on the Validate Cross Check button in the Validation Screen.

Click Validate to run the Validation process.

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

Validation

Year: 2009

**Cross Check Validation**

Cross-Check Last Validated On: 6/20/2011 2:10:19 PM

Select All Clear

- 1 - Bristol
- 3 - Kent
- 5 - Newport
- 7 - Providence
- 9 - Washington

Validate Close

Point	End Point	Data Item	Error
0.180	0.180	F_SYSTEM	Mis
0.180	0.950	F_SYSTEM	Mis
0.950	0.950	F_SYSTEM	Mis
0.950	1.150	F_SYSTEM	Mis
1.150	1.150	F_SYSTEM	Mis

Total Validations: 3510

The Cross Check Validation process will populate a table with records that can be viewed, filtered and examined spatially via the Zoom to Feature process.

Validation

Year: 2009

Route ID	Begin Point	End Point	Data Item	Error Message
100	0	0.180	F_SYSTEM	ACCESS_CONTROL d
100	0.200	0.950	F_SYSTEM	ACCESS_CONTROL da
100	0.950	1.150	F_SYSTEM	ACCESS_CONTROL doe
100	1.150	1.760	F_SYSTEM	ACCESS_CONTROL does

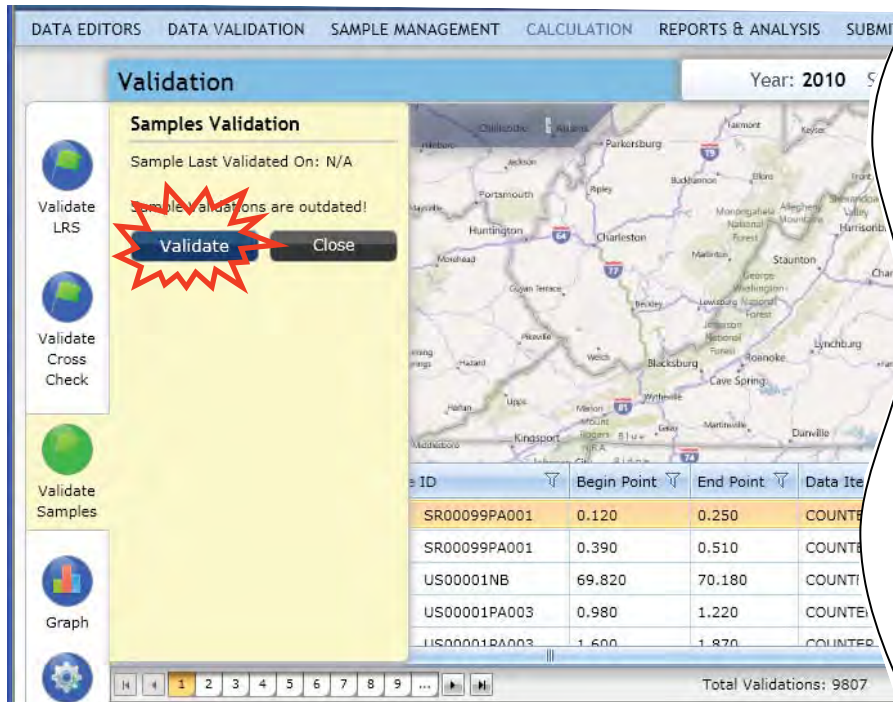
## Sample Validation

The final Validation step is the validation of Sample data. Samples are measured against the Table of Potential Samples or TOPS. Two errors can result from the Sample Validation process—TOPS Not Found, Sample Crosses Over TOPS. A warning, Sample Breaks TOPS, may also be returned.

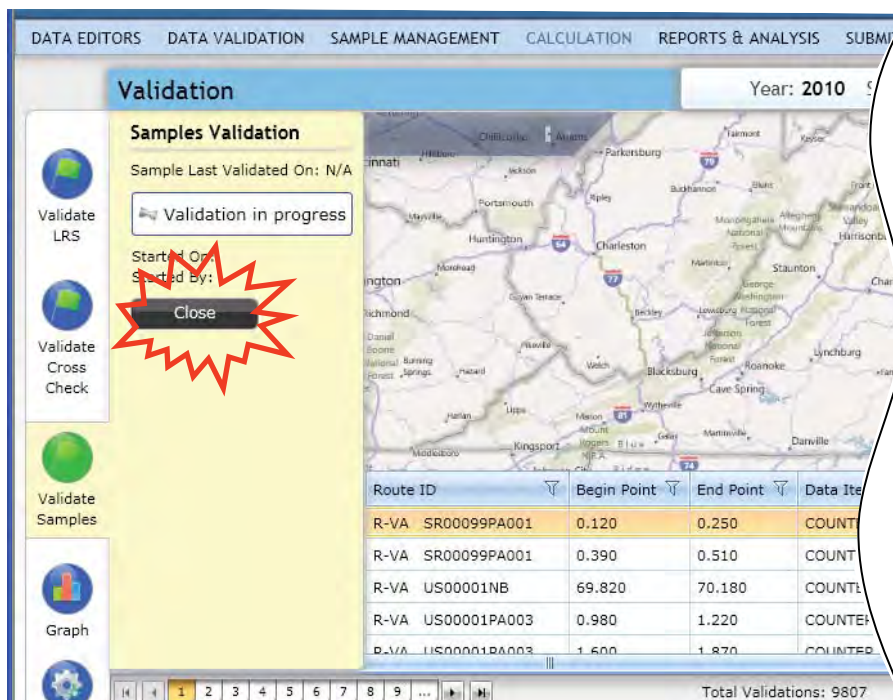
Click on the Validate Samples button in the Validation Screen.

Click Validate to run the Validation process.

*If samples are modified or reloaded, the Sample Validation window that appears after clicking the Validate Samples button will show the message, "Sample Validations are outdated". If this is this message appears, Validations need to be run.*



*It is OK to close the Samples Validation window while the validation process is running (this is also true for the other validation processes). The hour glass icon will indicate that the process is running.*





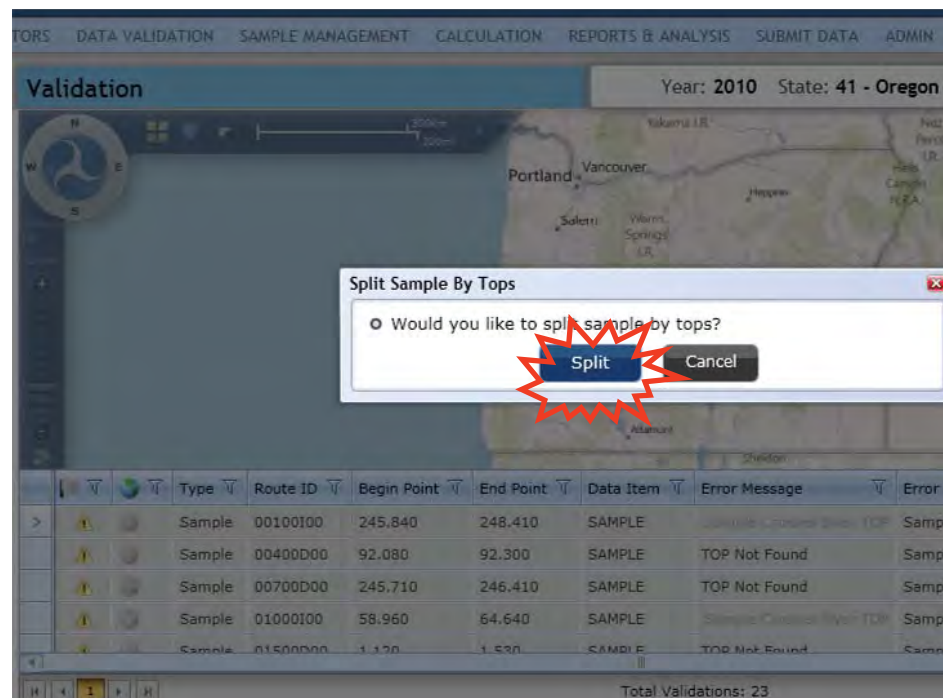
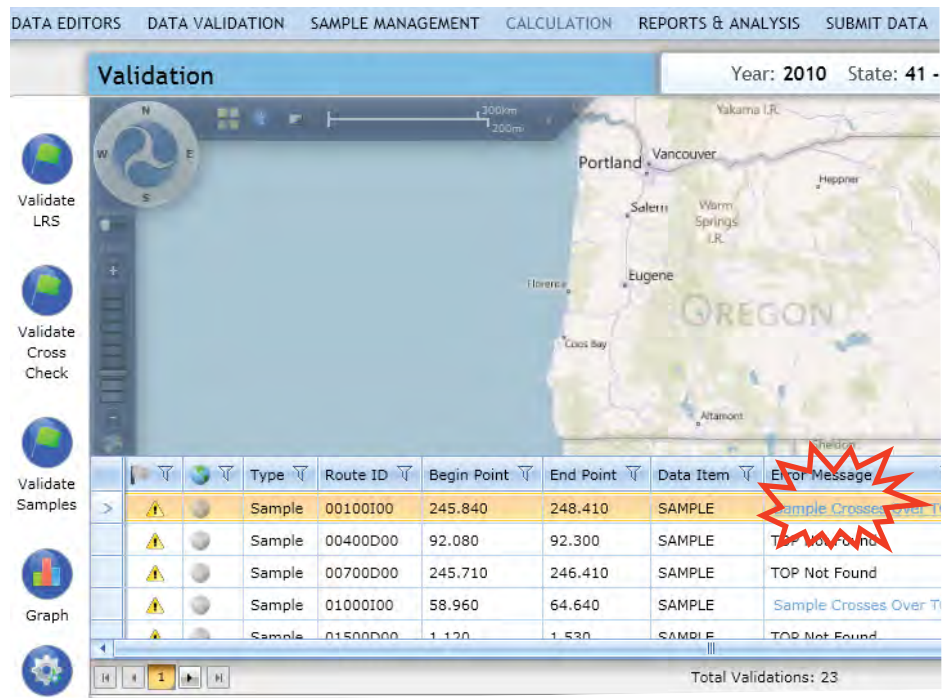
## The Sample Splitter Tool

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.

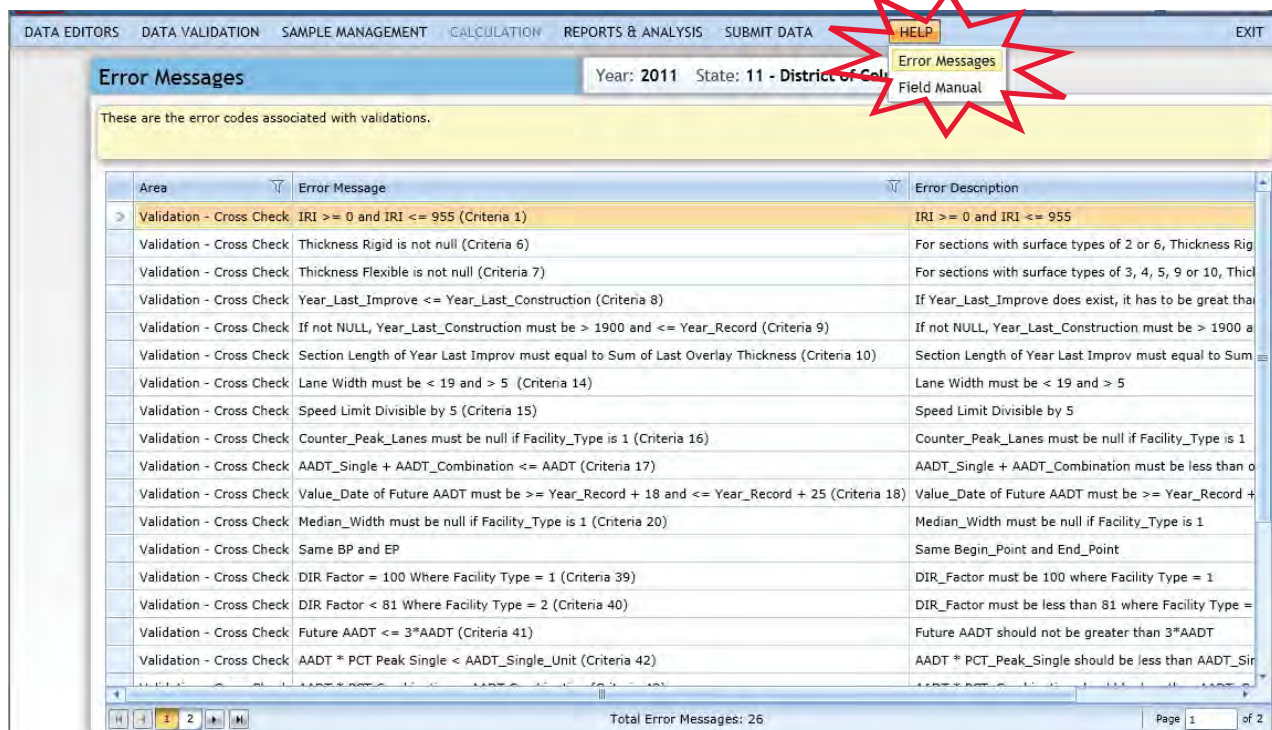
*A sample split can not be undone, so be sure to use the splitter tool with caution.*



## 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.



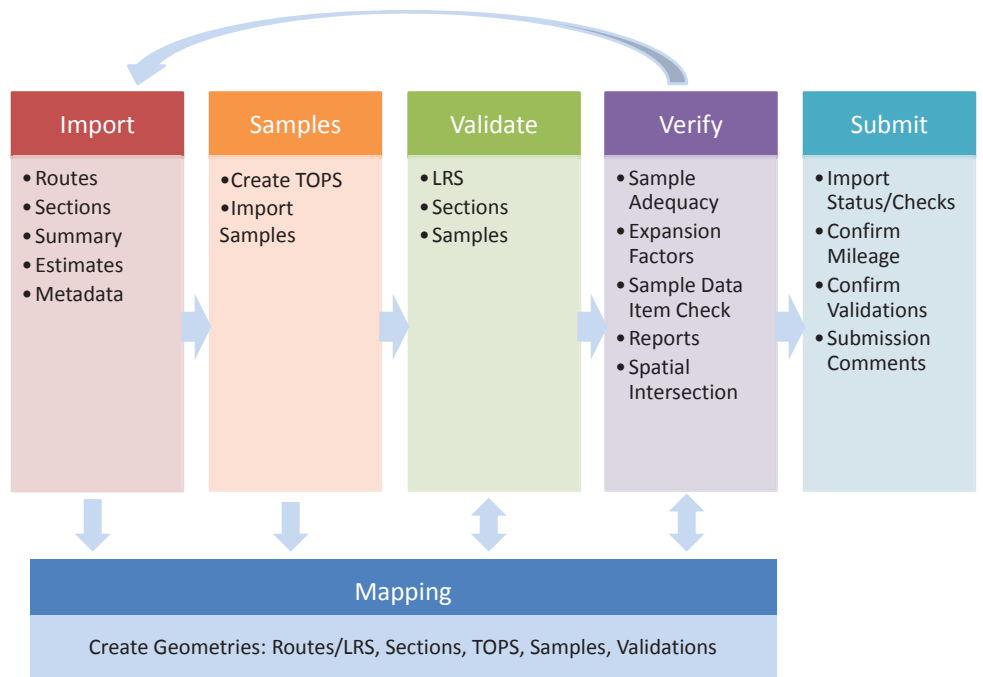
*This list is comprised of the LRS, Cross Check and Sample Validations currently employed in the HPMS Software. Import Validations are reported to users in Import reports associated with each Import Job. For a complete list of Validations see Appendix A.*

## Sample Management Menu

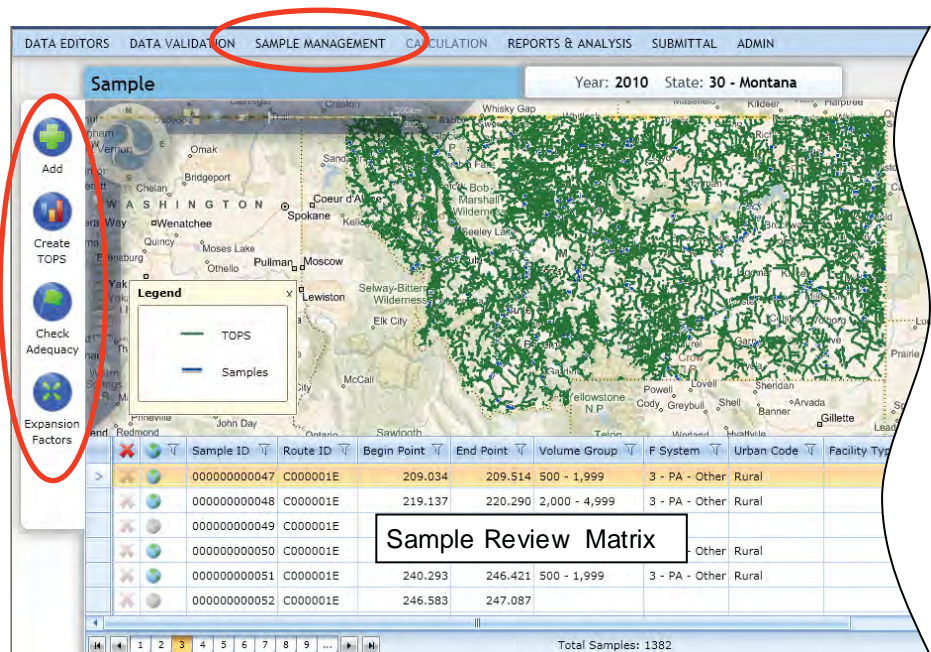
Once Route, Section and Sample data are Imported and Validations have been reviewed, there are several processes that must be completed by States in order to appropriately manage their sample data sets. This review process is performed through the Sample Management Menu and its two components - Sample 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.



*Sample Management tasks fall into the Verify component of the workflow.*



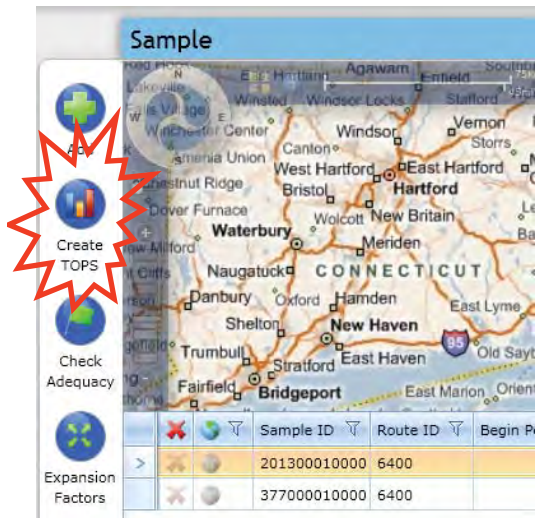
A view of the Sample Management Menu Screen with its four tools on the left margin.



## Create TOPS

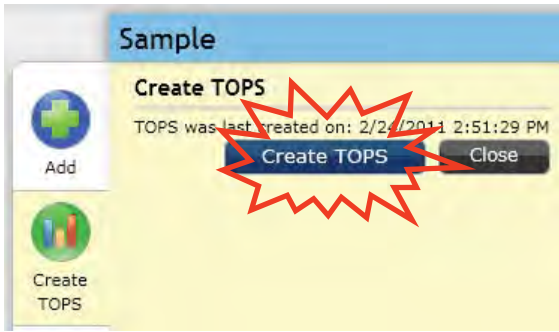
The Table of Potential Samples, or TOPS is the sampling frame for HPMS and is based on five elements—Functional System, Facility Type, Urban Code, AADT and Through Lanes. State sample submissions are compared to the HPMS TOPS sample frame as part of the HPMS submission process. Typically, States submit 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.



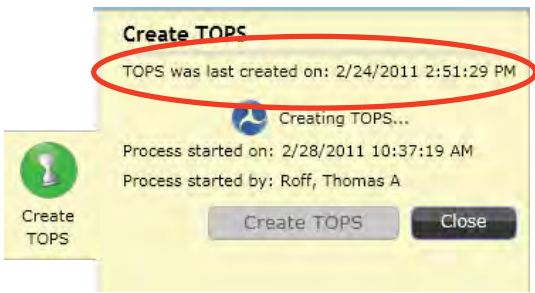
*NOTE: The TOPS process runs automatically upon import of sample data. Although this guide describes a linear process for importing files, many States edit, delete and re-import files throughout the import process. It is therefore recommended that TOPS be run manually before examining sample adequacy 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.

	Precision Level	Volume Group															
		1	2	3	4	5	6	7	8	9	10	11	12				
Interstate																	
Other Freeways																	
Other Arterial																	
Boulder, CO	80-10	0	0	0	0	1	4	4	8	3	12	0	2	0	0	0	0
Colorado Springs, CO	90-10	0	0	0	1	5	3	7	15	8	12	5	17	4	8	0	0
Denver--Aurora, CO	90-10	0	0	0	0	6	5	10	7	8	17	6	21	4	13	1	7
Fort Collins, CO	90-10	0	0	0	0	0	0	3	2	7	8	6	11	0	6	0	0
Grand Junction, CO	80-10	0	0	0	0	1	4	3	4	9	4	8	0	1	0	0	0
Greeley, CO	80-10	0	0	0	2	7	2	4	6	12	0	5	0	0	0	0	0
Lafayette--Louisville, CO	80-10	0	0	0	0	1	1	2	9	2	4	0	0	0	0	0	0
Longmont, CO	80-10	0	0	0	0	0	5	4	20	0	0	0	0	0	0	0	0
Pueblo, CO	80-10	1	1	7	3	5	4	4	5	5	10	0	0	0	0	0	0
Small Urban	90-5	0	0	10	6	31	42	32	27	36	25	19	14	0	0	0	0
Rural	90-5	11	4	65	25	59	109	34	39	30	17	16	12	1	2	0	1
Minor Arterial																	
Major Collector																	

Legend:   - Required   - Selected Samples \* Red numbers indicate insufficient selected samples.

### 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.

The screenshot shows the 'Add Sample' dialog box in the HPMS software. The dialog box is titled 'Sample' and 'Add Sample'. It includes a sidebar with icons for 'Add', 'Create TOPS', 'Check Adequacy', and 'Expansion Factors'. The main area contains a message: 'Please select the minimum number of samples to save. You may choose to select a random sample as well.' Below this are three dropdown menus: 'Volume Group: 1 - Under 500', 'F System: 1 - Interstate', and 'Urban Code: 18856 - Colorado Springs, CO'. A table below the dropdowns shows columns for 'Add', 'Sample ID', 'Route ID', 'Begin Point', 'End Point', 'Facility Type', 'Through Lines', 'AADT', 'Last Modified On', and 'Last Modified By'. At the bottom of the dialog are buttons for 'Random Select', 'Save', and 'Cancel'. Below the dialog, three dropdown menus are shown, each with a list of options. Arrows point from the dropdown menus in the dialog to these expanded lists.

**Volume Group:** 1 - Under 500

- 1 - Under 500
- 2 - 500 - 1,999
- 3 - 2,000 - 4,999
- 4 - 5,000 - 9,999
- 5 - 10,000 - 19,999
- 6 - 20,000 - 34,999
- 7 - 35,000 - 54,999
- 8 - 55,000 - 84,999
- 9 - 85,000 - 124,999
- 10 - 125,000 - 174,999
- 11 - 175,000 - 249,999
- 12 - 250,000 and more

**F System:** 1 - Interstate

- 1 - Interstate
- 2 - PA - Other Freeways and Expressways
- 3 - PA - Other
- 4 - Minor Arterial
- 5 - Major Collector

**Urban Code:** 18856 - Colorado Springs, CO

- 18856 - Colorado Springs, CO
- 23527 - Denver--Aurora, CO
- 30628 - Fort Collins, CO
- 34273 - Grand Junction, CO
- 34786 - Greeley, CO
- 46126 - Lafayette--Louisville, CO
- 51175 - Longmont, CO
- 72613 - Pueblo, CO
- 9298 - Boulder, CO
- 99998 - Small Urban
- 99999 - Rural

## 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.*

The screenshot shows the 'Expansion Factor' window in the HPMS software. The window title is 'Sample' and it includes a sub-header 'Expansion Factor' with a timestamp 'Expansion Factor Last Created On: 7/5/2011 3:28:30 PM'. A table displays data for Year\_Record, State\_Code, Urban\_Name, F\_System, Volume\_Group, Expansion\_Factor, Sample\_Length, and Universe\_Length. A 'Calculate' button is highlighted with a red starburst.

Year_Record	State_Code	Urban_Name	F_System	Volume_Group	Expansion_Factor	Sample_Length	Universe_Length
2009	8	Boulder, CO		5	10.156		0.782
2009	8	Boulder, CO		6	1.216		2.732
2009	8	Boulder, CO		7	1.86		10.052
2009	8	Boulder, CO		8	1.352		1.159
2009	8	Boulder, CO		4	1.592		3.227



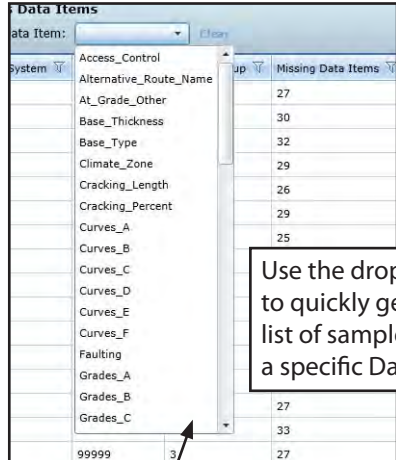
## Sample Data Item Area

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.

**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: [Dropdown]

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

Total: 1878 Page 1 of 76

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.

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

Filter by Samples with Missing Data Item: [ ]

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-NR	1.003	3.011	5	99999	1	26

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.

Sample Data Items

**1 Sample Details**

State Code 13

Sample ID 000400100400

Route ID 0011000400

Begin Point 0.420

End Point 2.460

Comments

F System 3 - PA - Other

Facility Type 2

Urban Code 99999

Through Lanes 2

AADT 2280

Volume Group 3

**Expansion Factor**

**2**

Map Data Items

Print OK

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 this list is not currently intelligent, so data may be legitimately missing or not reported but still flagged. For example, every section of roadway that has Curves A may not have other Curves data.

**Sample Data Items**

3

**Sample Details**

State Code	13
Sample ID	000400100400
Route ID	0011000400
Begin Point	0.420
End Point	2.460
Comments	
F System	3 - PA - Other
Facility Type	2
Urban Code	99999
Through Lanes	2
AADT	2280
Volume Group	3
<b>Expansion Factor</b>	

**Data Items**

Traffic	Pavement	Geometric	
AADT Combination	775	IRI	81
AADT Single Unit	674	IRI (Year)	2009
Pct Peak Single	5.7	IRI (Month)	10
Pct Peak Combination	6.1	PSR	
<b>K Factor</b>		<b>Surface Type</b>	
Dir Factor	57	<b>Rutting</b>	
Future AADT	3594	<b>Faulting</b>	
<b>Future AADT (Year)</b>		<b>Cracking Length</b>	
		<b>Cracking Percent</b>	
<b>Jurisdiction</b>		<b>Year Last Constr.</b>	
Ownership	1	<b>Year Last Improv</b>	
<b>Ownership (S)</b>		<b>Thickness Flexible</b>	
Route Number	1	<b>Thickness Rigid</b>	
<b>Route Number (T)</b>		<b>Base Thickness</b>	
Route Qualifier	9	<b>Last Overlay Thickness</b>	
Route Signing	3	<b>Base Type</b>	
<b>Toll Charged</b>		<b>Soil Type</b>	
<b>Toll Charged (ID)</b>			
<b>Toll Type</b>			
<b>Climate Zone</b>			
County Code	1		
		Access Control	3
		At Grade Other	4
		Curves A	2.04
		<b>Curves B</b>	
		<b>Curves C</b>	
		<b>Curves D</b>	
		<b>Curves E</b>	
		<b>Curves F</b>	
		Grades A	1.48
		Grades B	0.56
		<b>Grades C</b>	
		<b>Grades D</b>	
		<b>Grades E</b>	
		<b>Grades F</b>	
		<b>HOV Lanes</b>	
		<b>HOV Type</b>	
		Lane Width	12
		<b>Peak Parking</b>	
		Peak Lanes	2
		<b>Alternative Route Name</b>	
		<b>Counter Peak Lanes</b>	
		<b>Median Type</b>	
		<b>Median Width</b>	
		Number Signals	0
		<b>Pct Green Time</b>	
		Pct Pass Sight	50
		Shoulder Type	5
		<b>Shoulder Width L</b>	
		Shoulder Width R	8
		Signal Type	5
		Stop Signs	0
		Speed Limit	55
		Structure Type	1
		Terrain Type	1
		<b>Turn Lanes L</b>	
		<b>Turn Lanes R</b>	
		<b>Widening Obstacle</b>	
		<b>Widening Potential</b>	

Print OK

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

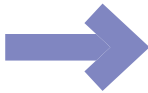
Sample Data Item Area Continued

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.

**Sample Data Items**  
Overall Summary: Total Samples: 1

Sample ID	Route ID
> 201300010000	001K0022400-EB
377000010000	001U0005400-EB
117400010000	001U0005400-EB
114100010000	001U0005400-EB
548000010000	001U0005900-NB
548500010000	001U0005900-NB
549000010000	001U0005900-NB
202300020000	002K0003100-NB
278300020000	002K0003100-NB
126300020000	002K0003100-NB
119300020000	002K0003100-NB
850200020000	002R0001100X0
850400020000	002R0116000X0
550000020000	002U0005900-NB
117600020000	002U0005900-NB
238500020000	002U0016900-NB
607000020000	002U0016900-NB

1 2 3 4 5 6 7 8 9



**Sample Data Items**  
Missing Data Items Breakdown Summary

Missing Data Item	# of Samples
Access_Control	67
Alternative_Route_Name	1878
At_Grade_Other	10
Base_Thickness	1093
Base_Type	1093
Climate_Zone	1878
Cracking_Length	987
Cracking_Percent	988
Curves_A	1118
Curves_B	1848
Curves_C	1868
Curves_D	1870
Curves_E	1868
Curves_F	1878
Faulting	1640
Grades_A	1174
Grades_B	1164
Grades_C	1595
Grades_D	1831
Grades_E	1876

Close

## Reports & Analysis

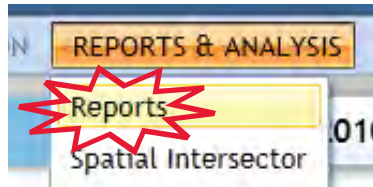
There are two options for users in the Reports & Analysis menu Reports and Spatial Intersector.

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 including Validation Summary, Overview and Extent and Travel Report. The image on the next page lists the full set of available reports. Each report can be downloaded or printed for further analysis.



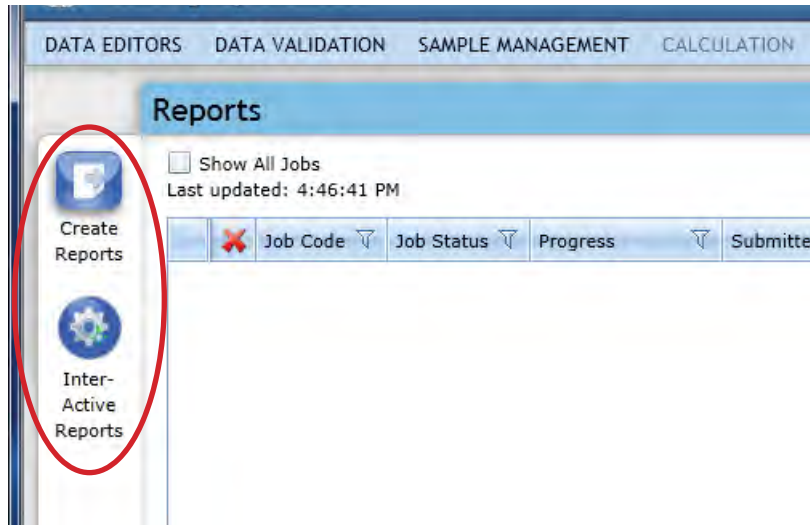
## Generating Reports

Select Reports from the Reports & Analysis Menu.



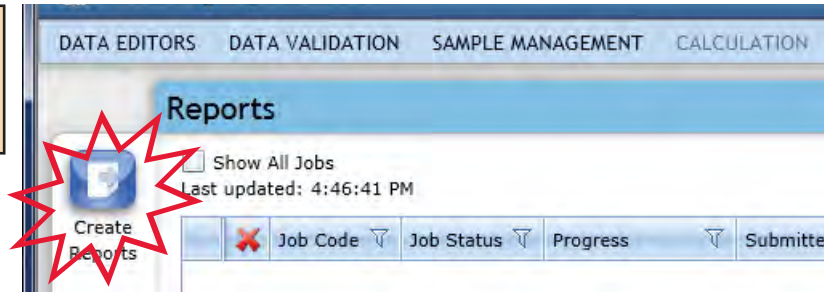
On the resulting screen, users will see that reports are grouped into two categories accessed via the Create Reports and Interactive Reports tools.

The Create Reports tool will produce reports from a menu of available reports while the Interactive Reports tool allows users to drill down into reports for detail via links within the selected report.

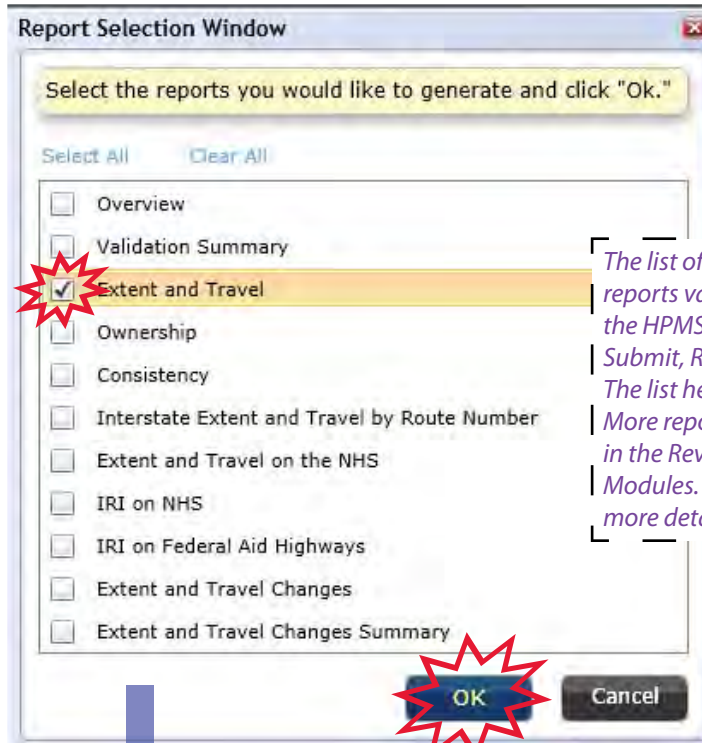


Generating Reports Continued: Static Report Process

To create static reports for viewing or printing, select Create Reports from the Reports & Analysis Menu.



Generate a report from the resulting list of available reports by checking one or more of the boxes on the Report Selection Window. Click OK to run the reports. Select All and Clear All options are also available for quick selections for multiple reports.



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.

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.



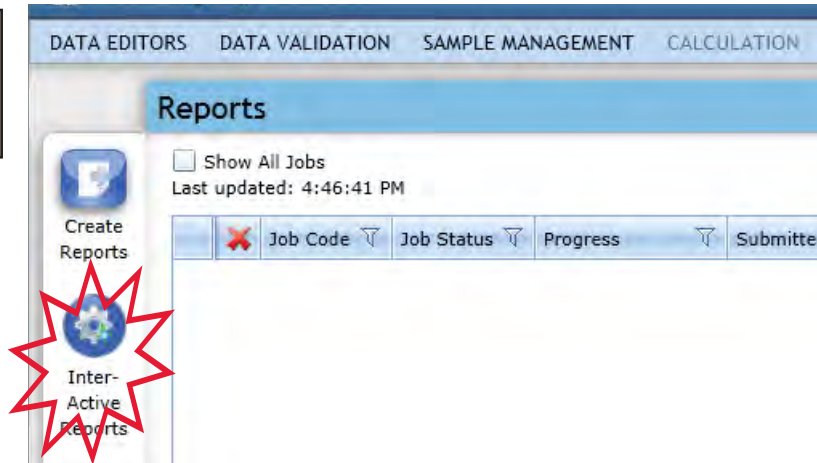
The Reports jobs is refreshed periodically. Use the Show All Jobs button to bring up a list of all reports run for the given submission year and module (Submit, Review or National).

Unwanted reports can also be removed from the log by clicking the red X to the left of job records.

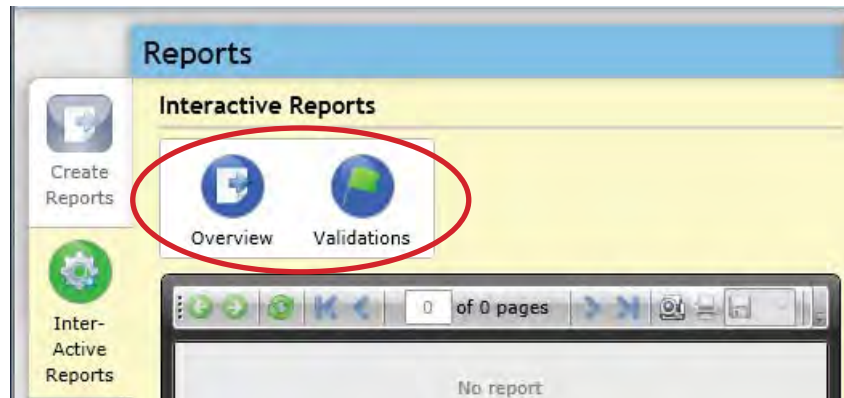
After selecting reports to run, the Reports log will be updated with the most recent job. When the Progress reaches 100%, the report can be viewed or downloaded via the tools on the right of the job log entry.

*Generating Reports Continued: Interactive Report Process*

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.



*Available Report Types*

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

**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.

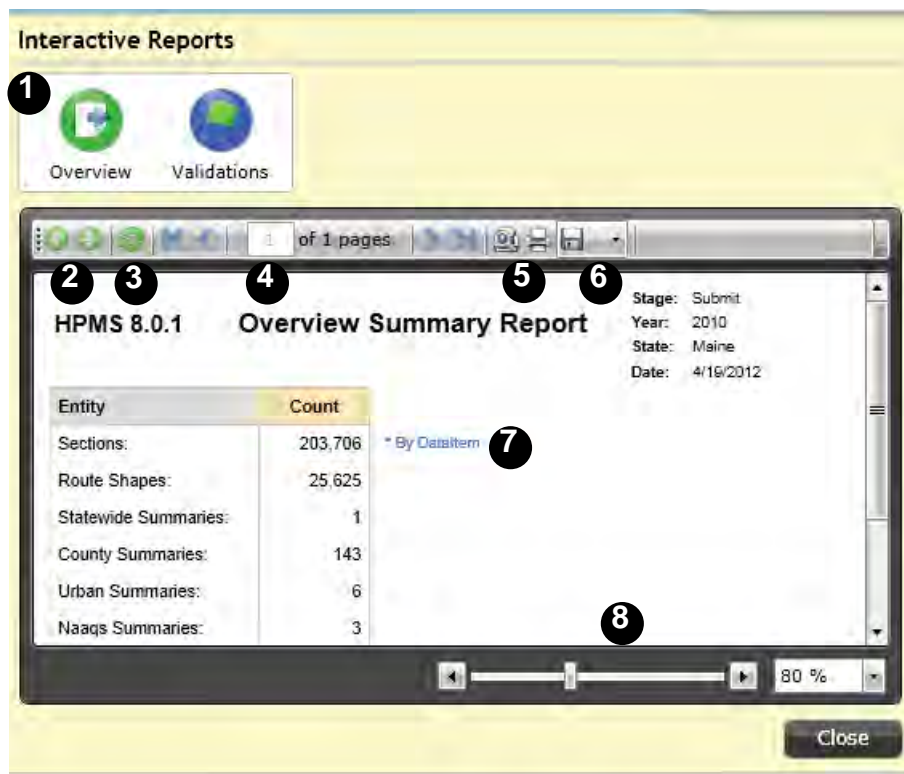
**Extent and Travel (also on the NHS, Interstate, Extent and Travel Changes and Changes Summary):** This group of reports produces a table of miles, lane miles and travel by Functional System. The base report (Extent and Travel) also groups records by Urban Area. The Changes report compares the current 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).

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

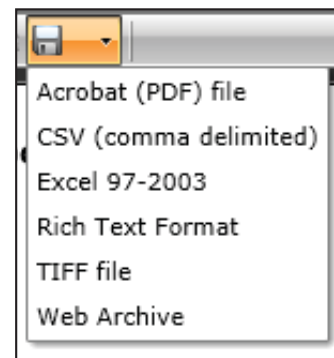
**Consistency:** This report compares the total mileage for several key Data Items with the HPMS Control Total (F\_System, Facility\_Type and Urban\_Code) for upper level systems. Data is reported by Functional System for Section data only.

**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.

*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.



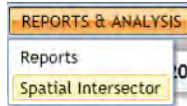
- 7 Text in the report window may have links to other reports or sub reports. Click these links to generate related reports.
- 8 Use the slider bar or preset zoom levels to enlarge or shrink reports for better reading or format review.



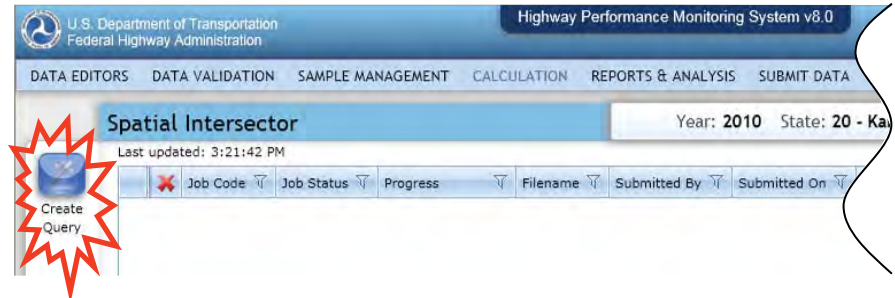
## Spatial Intersector Tool

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.

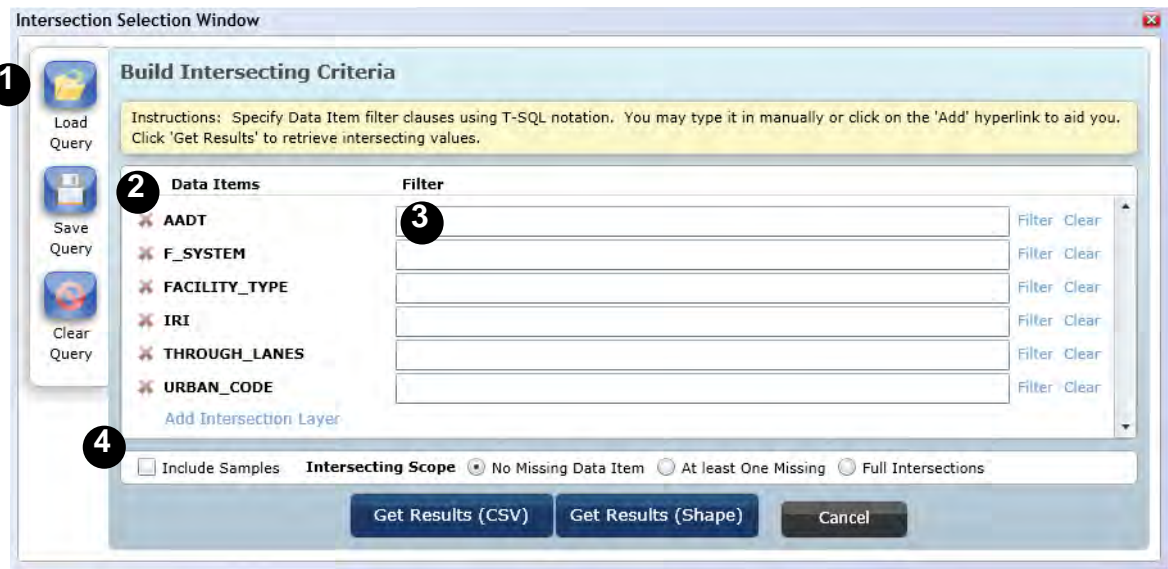
Select Spatial Intersector from the Reports & Analysis menu to begin using the tool.



Click on the Create Query button to launch the Intersector dialog box.



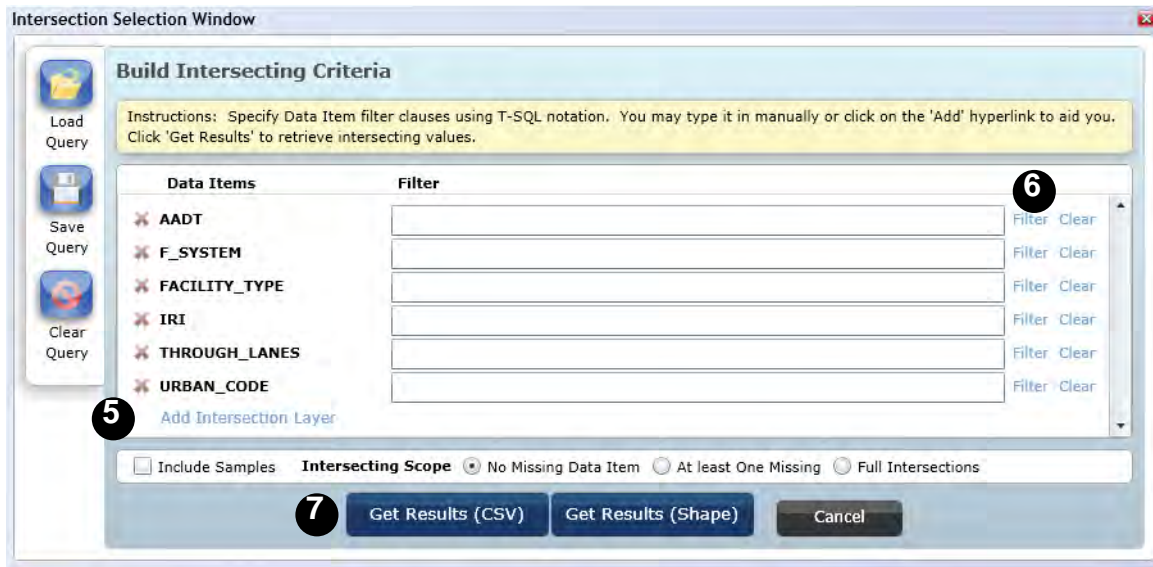
### Features of the Spatial Intersector Dialog Box



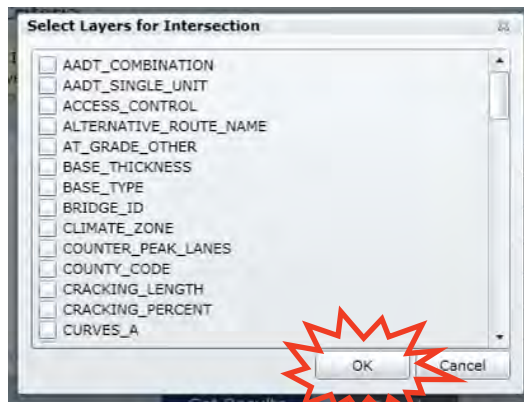
- 1 Existing SQL queries can be loaded into the application, and can be saved once generated. Use the Clear Query button to clear an existing query or refresh the query screen.
- 2 Use the 'X' marks next to the default list of data items for remove them from the query.
- 3 Add query text for data items in the boxes to the right of data items. The Intersector Query tool uses T-SQL notation.
- 4 By default, the Spatial Intersector does not include Samples. Click here to include Samples in the analysis. This function will be automatically triggered if a Sample Data Item is included in the Query.

Continued Next Page...

*Spatial Intersector Tool Continued*



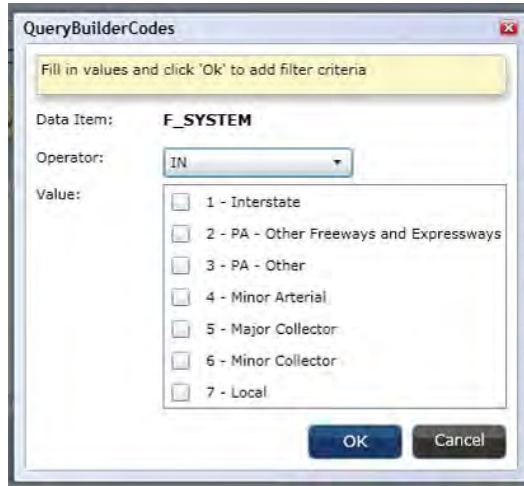
**5** Data items can be added to the query by clicking on the Add Intersection Layer link. In the resulting dialog box, select data items by clicking in the boxes to the left of the data items and click OK.



*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.

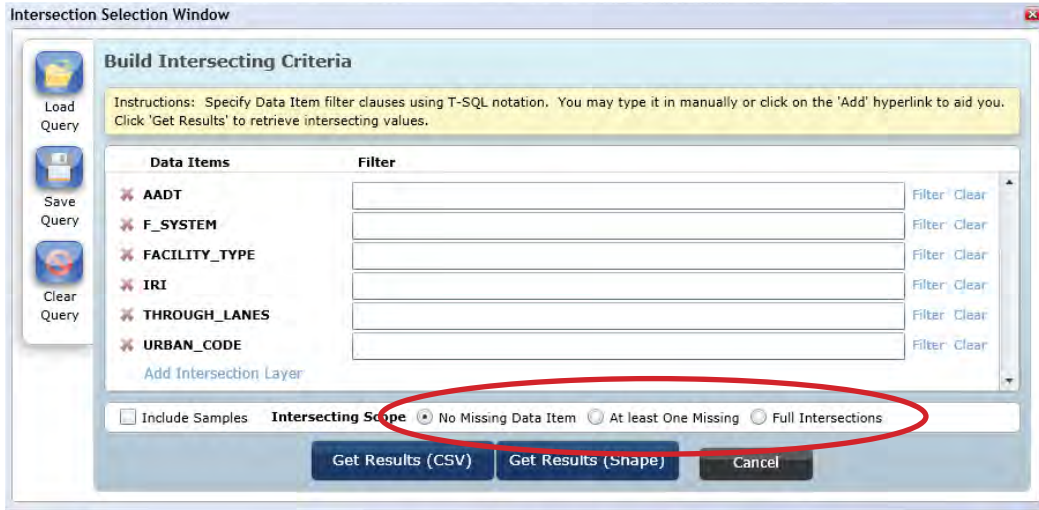


**7** Click either the CSV or Shape Results button to generate the corresponding output file. Note that Geometries must be run in order to obtain a Shape output.

*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.



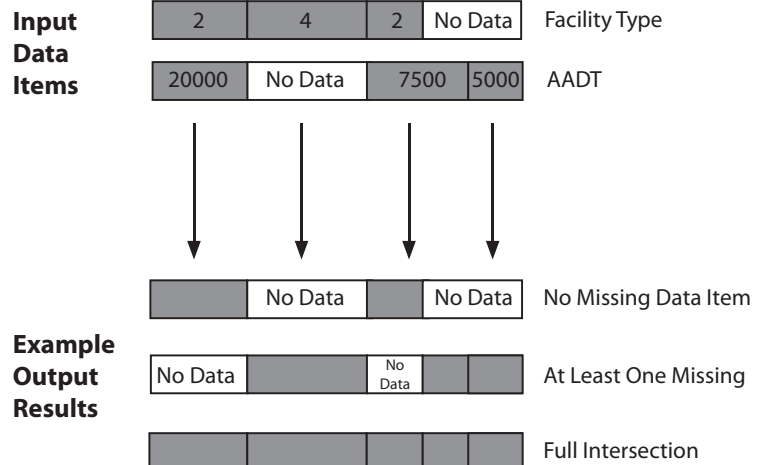
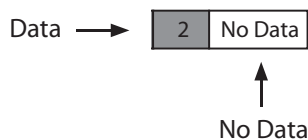
**No Missing Data Item** – This includes all of the intersected sections that were selected as part of the intersection (this is the previous format for the tool). If there is data missing on a given piece of roadway for one of the included items then all data items will be left out of the result set for that section of road.

**At Least One Missing** – In this intersection, only one data item can have a missing value. Records will be created for many data items but only one data item can be missing from a given section of roadway. This result set will indicate where data is reported for a subset of data. For example, this could be used to determine the coverage of Curve data for samples. If the Data Items Curves A-F are included, the sum of their section lengths should total to the sum of the length of the submitted samples.

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

*Illustrative Diagram*

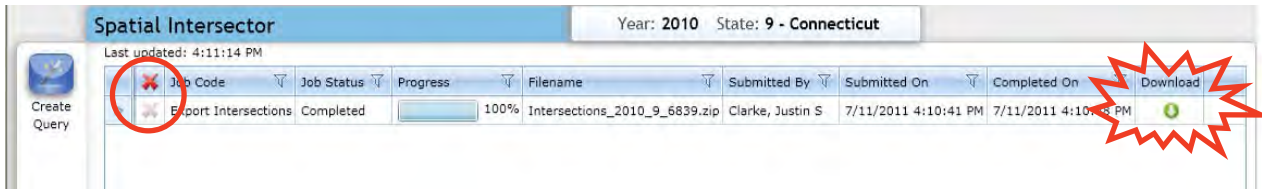
*In the example intersection with sample sections for two data items, shaded areas contain data, those without shading do not contain data. Note also that new section breaks are created when input section data contains different break points.*



*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 uses 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		9E084 009	0	0.26	1	22096
2010		9E084 018	0	0.19	1	22096
2010		9E084 029	0.62	0.63	1	22096
2010		9E084 240	0	0.12	1	22096
2010		9E084 013	0	0.15	1	22096
2010		9E084 021	0	0.27	1	22096
2010		9E084 801	0	0.4	1	22096
2010		9E084 236	0	0.06	1	22096
2010		9E084 243	0	0.88	1	22096
2010		9E084 010	0	0.13	1	22096
2010		9E084 019	0	0.2	1	22096
2010		9E084 031	0.22	0.57	1	22096
2010		9E084 241	0	0.26	1	22096
2010		9E084 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. There are five main components of the screen: Summary Validation, Data Editor Validation, Certified Miles, Submittal Comment and the Submit Data button. Details for each of these components are discussed below.

Select the Submit Data function on the application menu to activate the submittal review screen.



- 1 **Summary Validation:** Summary 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 email." 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 email FHWA staff any comments.

Submittal Continued

Example of submission still in progress

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT CALCULATION REPORTS & ANALYSIS SUBMIT DATA

Submit Data Year: 2010 State: 11 - District of Columbia

**Summary Validation**

- ✓ County Summary
- ✗ Demography Summary
- ✗ NAAQS Summary
- ✗ Pavement Summary
- ✓ Travel Summary
- ✓ Urban Summary
- ✗ Vehicle Summary - Rural
- ✓ Vehicle Summary - Urban

There are editors that need to be validated before submitting.

**Data Editor Validation**

- ⚠ Crosscheck Validation
- ✓ LRS Validation

**Certified Miles**

HPMS Calculated Miles: 961.874

State Certified Miles: 0

**Submittal Comment (Required)**

Comment:

Example of submission ready to submit after entering Certified Miles and Comment information.

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT CALCULATION REPORTS & ANALYSIS SUBMIT DATA ADMIN

Submit Data Year: 2010 State: 23 - Maine

Last Submitted On: 1/30/2012 3:29:15 PM Last Submitted By: Beckwith, Edward C

**Summary Validation**

- ✓ County Summary
- ✓ Demography Summary
- ✓ NAAQS Summary
- ✓ Pavement Summary
- ✓ Travel Summary
- ✓ Urban Summary
- ✓ Vehicle Summary - Rural
- ✓ Vehicle Summary - Urban

**Data Editor Validation**

- ⚠ Crosscheck Validation
- ⚠ LRS Validation

**Certified Miles**

HPMS Calculated Miles: 22863.750

State Certified Miles: 22863.750

**Submittal Comment (Required)**

Comment: Submit for NHS

Save Miles and Comments Without Submitting

Save Cancel

Note that the Lock button appears when the submittal is complete. This prevents data changes from moving into Review without the knowledge of FHWA. If edits to the HPMS submittal are necessary, contact HPMS staff at FHWA to Unlock the Submittal screen.

## Chapter 5—Quick Reference

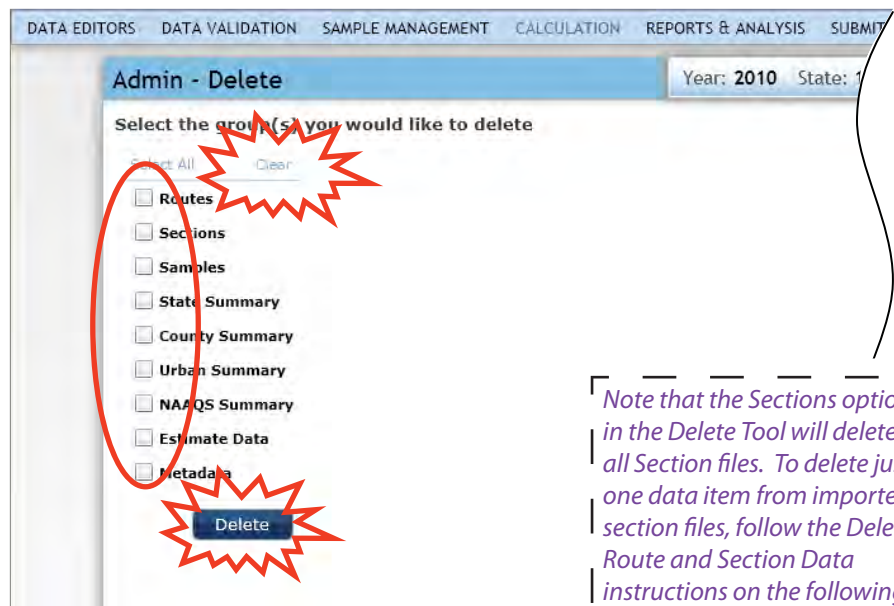
### Deleting Data

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

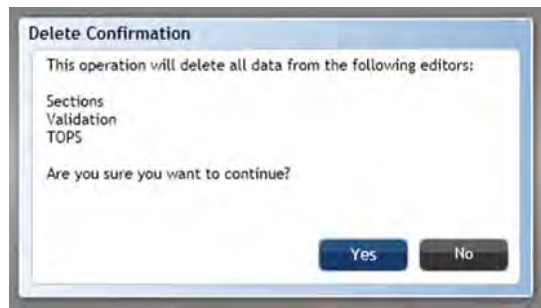
The Delete Tool is the most efficient option for deleting data sets that have been uploaded into the HPMS system. Currently this tool is available via the Admin menu. The tool enables users to delete entire data sets with a few clicks.

After selecting the tool from the Data Editors menu, the Delete screen will appear. Check the box next to the data element that you'd like to delete and click 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.



## 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.*

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

#### 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.

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



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

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

And

Is equal to

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

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 record?

**Delete Confirmation**

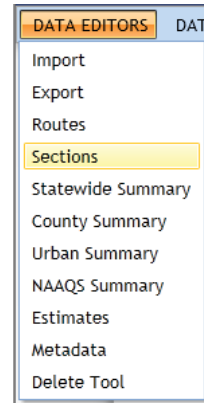
16795 records will be deleted.

Are you sure you want to continue?

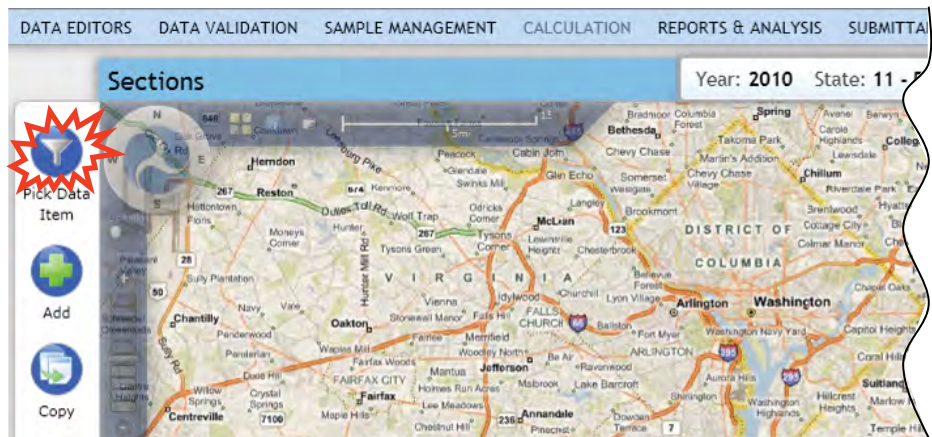
Yes No

Deleting Section Data

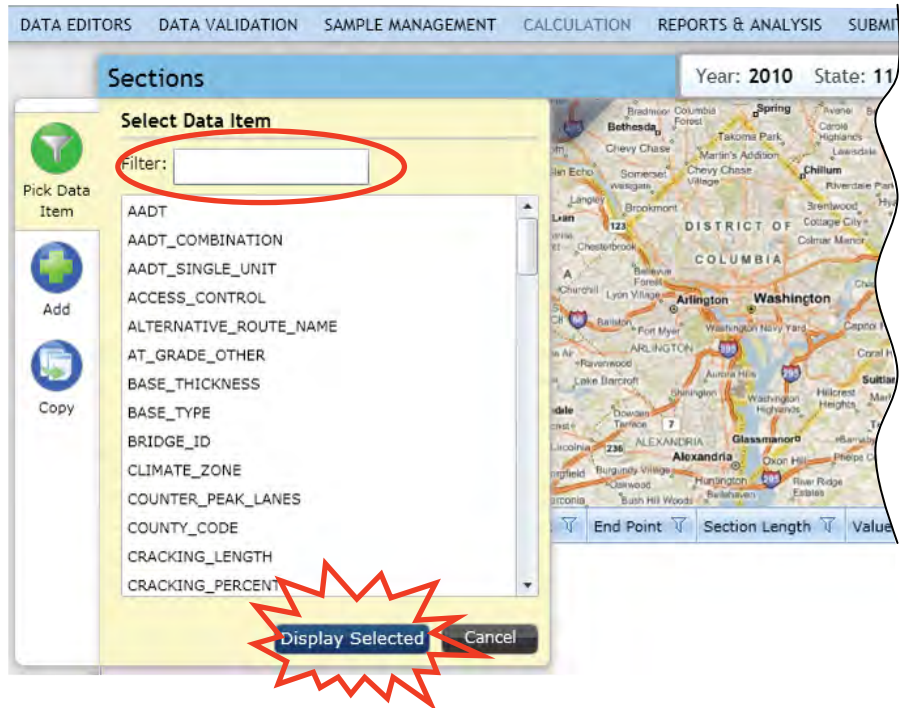
Deleting section data is done through a procedure very much like that for route data. The major distinction between the two processes, is that Section data must first be selected through the 'Select Data Item' filter in the Sections screen (accessible via the Data Editors menu).



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.

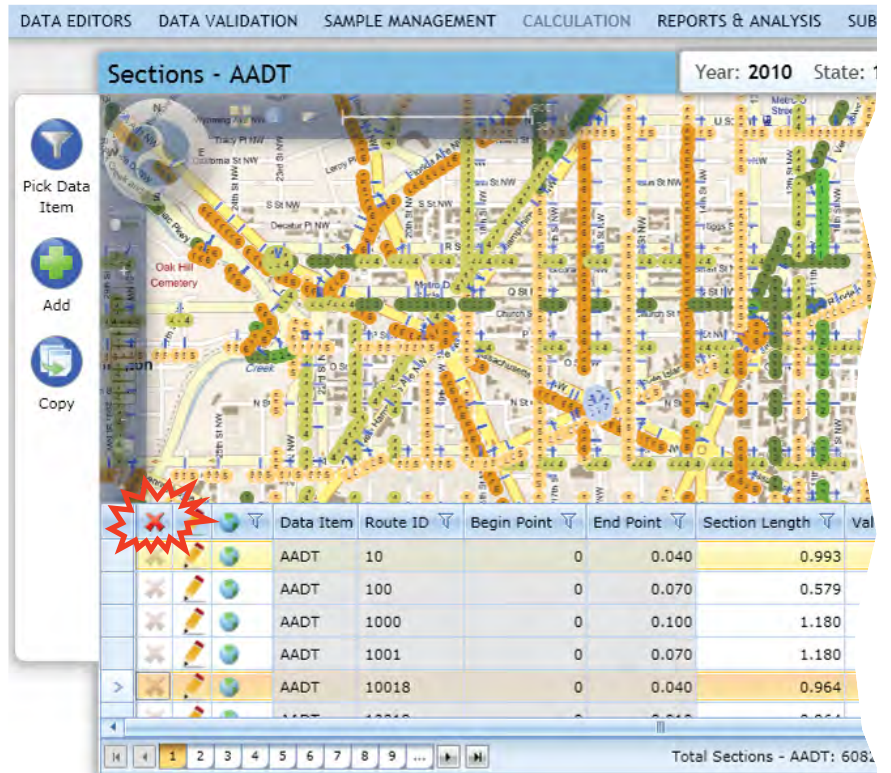


Deleting Section Data—Continued

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.

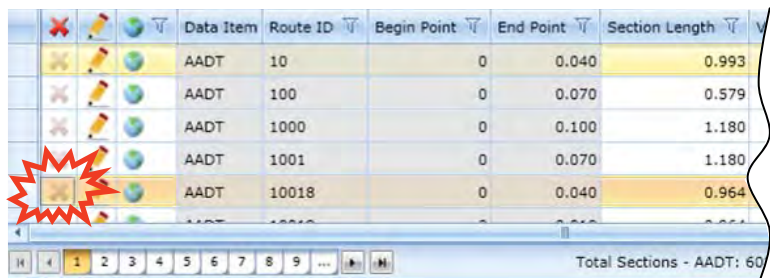
Delete One Data Item

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.

		Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value
		AA	10	0	0.040	0.993	10068.000	
		AA	100	0	0.070	0.579	5300.000	
		AA	1000	0	0.100	1.180	27478.000	
		AA	1001	0	0.070	1.180	27478.000	
		AA	10018	0	0.040	0.964	4000.000	

Total Sections - AADT: 6082

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

Select All

Show rows with value that

Is greater than

10000

And

Is equal to

Filter Clear Filter

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

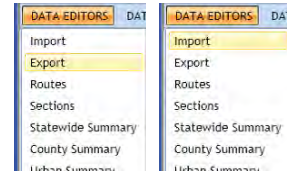
After the filter has run, the entire filtered record set can be deleted by clicking on the red 'X' above the data in the Routes Matrix.

		Data Item	Route ID	Begin Point	End Point	Section Length	Value Numeric	Value
		AA	10	0	0.040	0.993	10068.000	
		AA	1000	0	0.100	1.180	27478.000	
		AA	1001	0	0.070	1.180	27478.000	
		AA	1002	0	0.080	1.180	27478.000	
		AA	1003	0	0.070	1.180	27478.000	

Total Sections - AADT: 3119

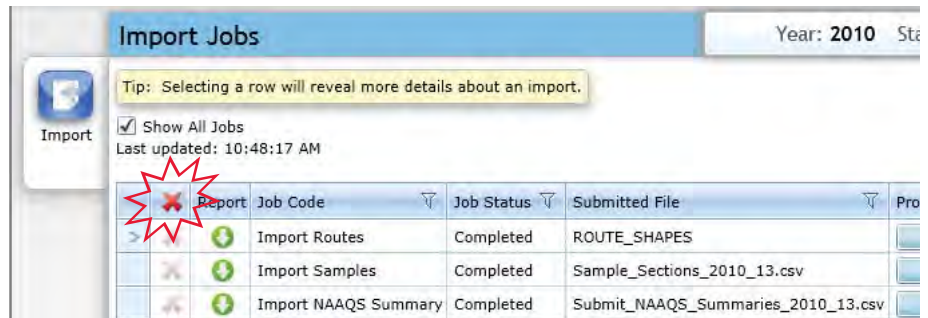
## Deleting Import or Export Jobs

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.



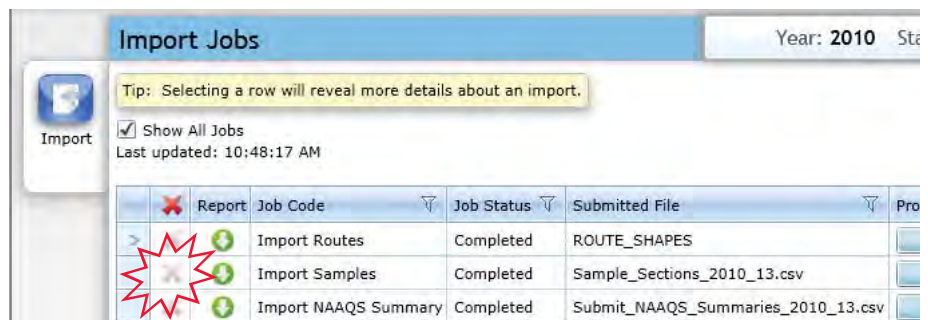
### Delete All Log Records

Click on the 'X' at the top of the jobs log table to remove all jobs from the log.

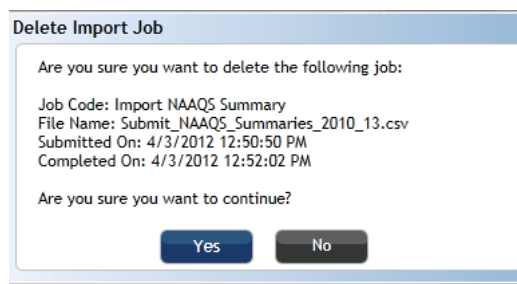


### Delete Individual Import / Export Logs Records

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 UPAC 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 screenshot shows the HPMS software interface with the 'Error Messages' window open. The window title is 'Error Messages' and it displays a list of validation error codes and descriptions. A red starburst graphic highlights the 'HELP' menu item in the top navigation bar, which has opened a dropdown menu with 'Error Messages' and 'Field Manual' options. The 'Error Messages' window shows a table with columns for 'Area', 'Error Message', and 'Error Description'. The first row is highlighted in orange and reads: 'Validation - Cross Check IRI >= 0 and IRI <= 955 (Criteria 1) IRI >= 0 and IRI <= 955'. The status bar at the bottom indicates 'Total Error Messages: 25' and 'Page 1 of 2'.

Area	Error Message	Error Description
Validation - Cross Check	IRI >= 0 and IRI <= 955 (Criteria 1)	IRI >= 0 and IRI <= 955
Validation - Cross Check	Thickness Rigid is not null (Criteria 6)	For sections with surface types of 2 or 6, Thickness Rigid must be greater than 0
Validation - Cross Check	Thickness Flexible is not null (Criteria 7)	For sections with surface types of 3, 4, 5, 9 or 10, Thickness Flexible must be greater than 0
Validation - Cross Check	Year_Last_Improve <= Year_Last_Construction (Criteria 8)	If Year_Last_Improve does exist, it has to be great than or equal to Year_Last_Construction
Validation - Cross Check	If not NULL, Year_Last_Construction must be > 1900 and <= Year_Record (Criteria 9)	If not NULL, Year_Last_Construction must be > 1900 and <= Year_Record
Validation - Cross Check	Section Length of Year Last Improv must equal to Sum of Last Overlay Thickness (Criteria 10)	Section Length of Year Last Improv must equal to Sum of Last Overlay Thickness
Validation - Cross Check	Lane Width must be < 19 and > 5 (Criteria 14)	Lane Width must be < 19 and > 5
Validation - Cross Check	Speed Limit Divisible by 5 (Criteria 15)	Speed Limit Divisible by 5
Validation - Cross Check	Counter_Peak_Lanes must be null if Facility_Type is 1 (Criteria 16)	Counter_Peak_Lanes must be null if Facility_Type is 1
Validation - Cross Check	AADT_Single + AADT_Combination <= AADT (Criteria 17)	AADT_Single + AADT_Combination must be less than or equal to AADT
Validation - Cross Check	Value_Date of Future AADT must be >= Year_Record + 18 and <= Year_Record + 25 (Criteria 18)	Value_Date of Future AADT must be >= Year_Record + 18 and <= Year_Record + 25
Validation - Cross Check	Median_Width must be null if Facility_Type is 1 (Criteria 20)	Median_Width must be null if Facility_Type is 1
Validation - Cross Check	Same BP and EP	Same Begin_Point and End_Point
Validation - Cross Check	DIR Factor = 100 Where Facility Type = 1 (Criteria 39)	DIR_Factor must be 100 where Facility Type = 1
Validation - Cross Check	DIR Factor < 81 Where Facility Type = 2 (Criteria 40)	DIR_Factor must be less than 81 where Facility Type = 2
Validation - Cross Check	Future AADT <= 3*AADT (Criteria 41)	Future AADT should not be greater than 3*AADT
Validation - Cross Check	AADT * PCT Peak Single < AADT_Single_Unit (Criteria 42)	AADT * PCT_Peak_Single should be less than AADT_Single_Unit



## HPMS v8 User Guide Appendices

## Appendix A - Validations

### Import Validations

Data Item #	Data Item Name	Validation
1	F_System	(1,2,3,4,5,6,7)
2	Urban_Code	>=1 and <=99999
3	Facility_Type	(1,2,3,4,5,6,7)
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	>3 and <17
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 <19
35	Median_Type	(1,2,3,4,5,6,7)

## Appendix A: Validations Continued

## Import Validations Continued

Data Item #	Data Item Name	Validation
36	Median_Width	>=0
37	Shoulder_Type	(1,2,3,4,5,6,7)
38	Shoulder_Width_R	> 0
39	Shoulder_Width_L	> 0
40	Peak_Parking	(1,2,3)
41	Widening_Obstacle	(X,A,B,C,D,E,F,G)
42	Widening_Potential	>= 0
43	Curves_A-F	>= 0 and <= 100
44	Terrain_Type	(1,2,3)
45	Grades A-F	>= 0 and <= 100
46	Pct_Pass_Sight	>= 0 and <= 100
47	IRI	>= 0
48	PSR	>=0.0 and <=5.0
49	Surface_Type	(1,2,3,4,5,6,7,8,9,10,11)
50	Rutting	>=0.0
51	Faulting	>=0.0
52	Cracking_Percent	>= 0 and <= 100
53	Cracking_Length	
54	Year_Last_Improv	
55	Year_Last_Construction	
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)
All	Criteria 25	Begin_Point can not equal End_Point

Appendix A: Validations Continued

Coverage Validations

Data Item #	Data Item must exist	Where
1	F_System	Facility_Type in (1,2,3,4) or (NHS and Facility_Type in (1,2,3,4))
2	Urban_Code	(F_System in (1,2,3,4,5) or NHS) and Facility_Type (1,2,3,4) or (F_System ==6 and Urban_Code < 99999)
3	Facility_Type	F_System in (1,2,3,4,5) or (F_System ==6 and Urban_Code <> 99999) or NHS
4	Structure_Type	(F_System in (1,2,3,4,5) or NHS) and Facility_Type (1,2,3,4) or (F_System ==6 and Urban_Code < 99999)
5	Access_Control	F_System in (1,2,3) or Sample
6	Ownership	(F_System in (1,2,3,4,5) or NHS) and Facility_Type (1,2,3,4) or (F_System ==6 and Urban_Code < 99999)
7	Through_Lanes	(F_System in (1,2,3,4,5) or NHS) and Facility_Type (1,2,3,4) or (F_System ==6 and Urban_Code < 99999)
8	HOV_Type	HOV Lanes Exist
9	HOV_Lanes	HOV Type Exists
10	Peak_Lanes	Sample
11	Counter_Peak_Lanes	Sample and Facility_Type = 2
12	Turn_Lanes_R	Sample and Urban_Code < 99999
13	Turn_Lanes_L	Sample and Urban_Code < 99999
14	Speed_Limit	Sample
15	Toll_Charged	Toll_Type exists
16	Toll_Type	Toll_Charged Exists
17	Route_Number	
18	Route_Signing	
19	Route_Qualifier	
20	Alternative_Route_Name	
21	AADT	(F_System in (1,2,3,4,5) or NHS) and Facility_Type (1,2,3,4) or (F_System ==6 and Urban_Code < 99999)
22	AADT_Single_Unit	(F_System in (1) or NHS) and Facility_Type (1,2,3) or (F_System in (2,3,4,5) and Facility_Type (1,2,3) and Sample) or (F_System ==6 and Urban_Code < 99999)
23	Pct_Peak_Single	Sample
24	AADT_Combination	(F_System in (1) or NHS) and Facility_Type (1,2,3) or (F_System in (2,3,4,5) and Facility_Type (1,2,3) and Sample) or (F_System ==6 and Urban_Code < 99999)
25	Pct_Peak_Combination	Sample
26	K_Factor	Sample
27	Dir_Factor	Sample
28	Future_AADT	Sample
29	Signal_Type	Sample
30	Pct_Green_Time	Sample and Number_Signals exists
31	Number_Signals	

## Appendix A: Validations Continued

## Coverage Validations Continued

Data Item #	Data Item must exist	Where
32	Stop_Signs	
33	At_Grade_Other	
34	Lane_Width	Sample
35	Median_Type	Sample
36	Median_Width	
37	Shoulder_Type	Sample
38	Shoulder_Width_R	Sample
39	Shoulder_Width_L	Sample
40	Peak_Parking	Sample and Urban_Code < 99999
41	Widening_Obstacle	Sample
42	Widening_Potential	Sample
43	Curves_A-F	Sample and Urban_Code = 99999
44	Terrain_Type	Sample and Urban_Code = 99999
45	Grades A-F	Sample and Urban_Code = 99999
46	Pct_Pass_Sight	Sample and Urban_Code = 99999
47	IRI	(F_System in (1,2,3) or NHS) and Facility_Type (1,2,3) or Sample
48	F_System in ( 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 (3,4,9,11) and Sample
52	Cracking_Percent	Surface_Type in (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	Sample
55	Year_Last_Construction	Sample
56	Last_Overlay_Thickness	Sample and Year_Last_Improv exists
57	Thickness_Rigid	Surface_Type (3,4,5,7,8,9,10) or Estimate Table
58	Thickness_Flexible	Surface_Type (2,6,7,8) or Estimate Table
59	Base_Type	Sample
60	Base_Thickness	Surface_Type >1 or Estimate Table
61	Climate_Zone	
62	Soil_Type	
63	County_Code	
64	NHS	
65	STRAHNET_Type	
66	Truck	
67	Future_Facility	
68	Maintenance_Operations	

Appendix A: Validations Continued

Cross Validations

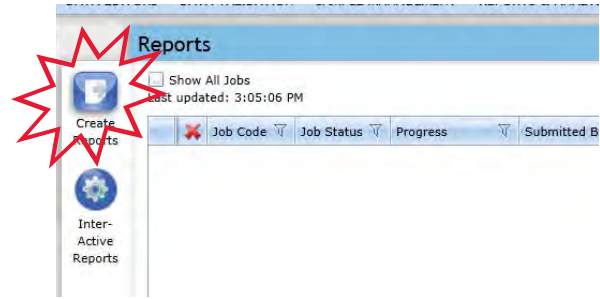
Error#	Data Item	Current Validation
1	IRI	$\geq 0$ and $\leq 955$
6	Surface Type in (2,6)	Thickness Rigid is Null
7	Surface Type in (3,4,5,9,10)	Thickness Flexible is Null
8	Year Last Improv	$\leq$ Year_Record > Year_Last Construction or NULL
9	Year_Last Construction	$\leq$ Year_Record > 1900 or NULL
10	Last Overlay Thickness	Section Length of Year_Last_Improv must = Sum of Last_Overlay_Thickness
14	Lane Width	$> 5$ and $< 19$
15	Speed Limit	Divisible by 5
16	Counter Peak Lanes	NULL if FACILITY_TYPE is 1
17	AADT Combination	$AADT\_Single + AADT\ Combination < AADT$
18	Future AADT	$Year\_Record + 25 \geq Value\_Date \geq Year\_Record + 18$
20	Median Width	NULL if FACILITY_TYPE is 1
25	Begin_Point	Begin_Point cannot equal End_Point
39	DIR_Factor	DIR_Factor must be 100 where Facility_Type = 1
40	DIR_Factor	DIR_Factor must be less than 81 where Facility_Type = 2
41	Future AADT	Future AADT should not be greater than $3 * AADT$
42	PCT_Peak_Single	$AADT * PCT\_Peak\_Single < AADT\_Single\_Unit$
43	PCT_Combination	$AADT * PCT\_Combination < AADT\_Combination$
44	AADT Combination	$AADT\_Combination < AADT / 2$
45	$AADT\_Single\_Unit < AADT / 2$	AADT_Single_Unit should be less than 50% of AADT
LRS	Section Begin_Point Out of Bounds	A Section's Begin_Point cannot be less than the Begin_Point for the associated Route
LRS	Section End_Point Out of Bounds	A Section's End_Point cannot be more than the End_Point for the associated Route
LRS	Route ID Not Found	Section data references a Route ID that does not exist in the LRS file
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.
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.

*Note: The validation rules above 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.*

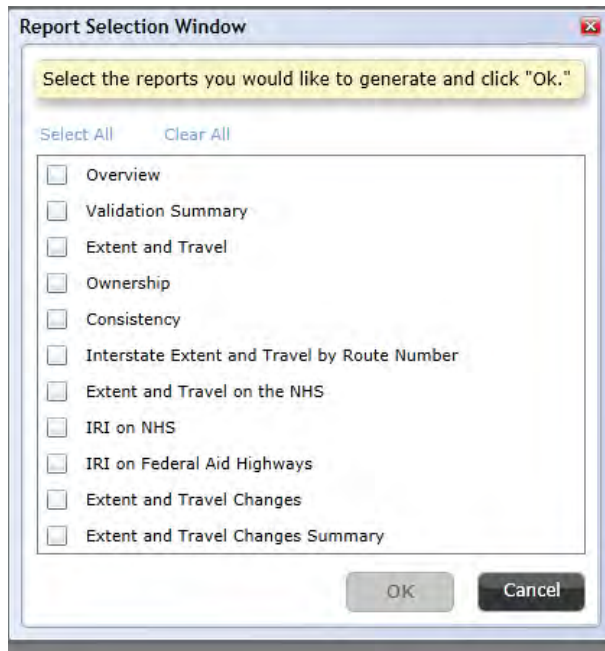
## Appendix B: Report Types

### Software Generated Static Reports

Static reports in the HPMS 8.x software are generated from the Reports & Analysis Menu. The options for reports varies depending on the active module (Submit, Review, National) as depicted below.

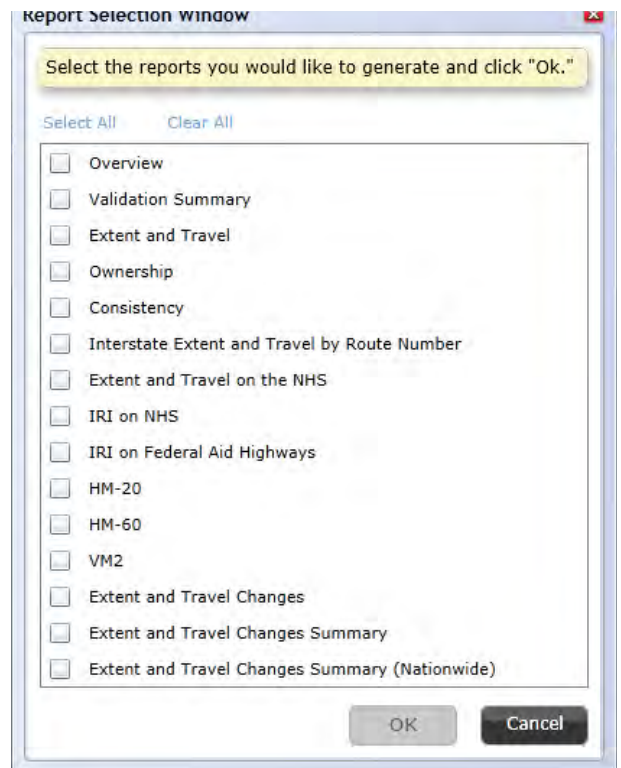


#### Static Reports Available in Submit



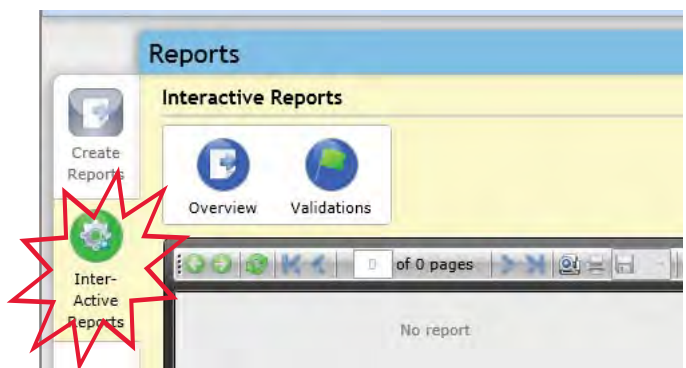
*General Note on Report Output where Two Years of Data is Reported: Many Reports in the HPMS system (submittal year 2011 and higher) provide year to year comparisons of submitted HPMS data. In the Submit and Review Modules, data for the previous year is taken from the National module for comparison.*

#### Static Reports Available in Review/National



### Software Generated Interactive Reports

There are just two Interactive Reports in the HPMS 8.x software are generated from the Reports & Analysis Menu, Overview and Validations. Although both of these reports are also available via the Create (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.



Appendix B: Report Types Continued

Overview Summary Report

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.

The screenshot shows the HPMS 8.0.1 Overview Summary Report interface. The report title is "HPMS 8.0.1 Overview Summary Report". The parameters are: Stage: Submit, Year: 2010, State: Georgia, Date: 5/3/2012. The report displays a table with the following data:

Entity	Count
Sections:	236,268
Route Shapes:	9,201
Statewide Summaries:	1
County Summaries:	955
Urban Summaries:	15
Naaqs Summaries:	2
Estimates:	45
Metadata:	452

A red starburst highlights the "By Data Item" link next to the "Sections" row. An arrow points from this link to a second screenshot of the "Section Breakdown Summary" report.

The second screenshot shows the "Section Breakdown Summary" report for the same parameters. It displays a table with the following data:

Data Item	Count
AADT	20,720
AADT_COMBINATION	6,579
AADT_SINGLE_UNIT	6,579
ACCESS_CONTROL	2,621
AT_GRADE_OTHER	2,560
COUNTER_PEAK_LANES	2,408
COUNTY_CODE	9,932
CRACKING_LENGTH	10,396
CRACKING_PERCENT	10,340
CURVES_A	1,246
CURVES_B	143

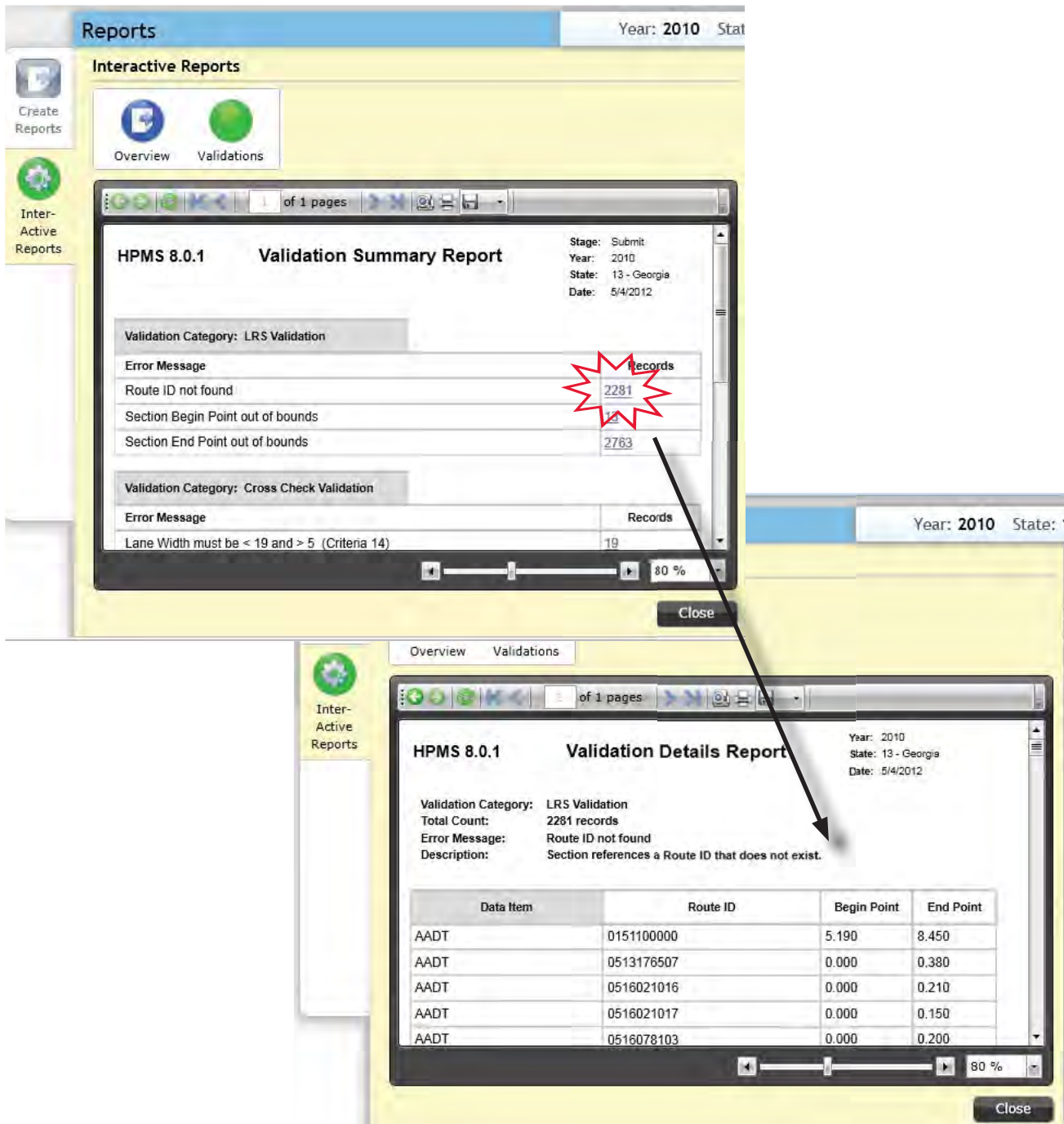


Appendix B: Report Types Continued

Validation Summary Report

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.



## *Appendix B: Report Types Continued*

### Extent and Travel Report

This report 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 County 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 although the universe of data (e.g. Total Milage vs. National Highway System Mileage) is unique.

The example to the right depicts the components 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 full report and the various iterations of the Extent and Travel Report in the HPMS v. 8.x software.

#### Miles

- Establishes the length (“HPMS Calculated Miles”) which should be compared to the Certified Mileage. Note: The comparison of these two mileage figures can be viewed on the Submit Data screen.
- Length is calculated by running 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.
- The Length is determined by summing the difference of (End\_Point - Begin\_Point) and grouping by F\_System.
- For Functional Class equal to 6-Minor Collector and 7-Local, the table represents the combination of County Summary and Section data. Mileage for Urban Minor Collectors is summed as described above for Functional Systems 1 through 5. The mileage for Rural Minor Collector all Local roadways is a sum of the length for those Functional Systems as reported in the County Summary table.
- This information is also reported in Highway Statistics Table: HM-60 (and the HPMS v 8.x report of the same name).

#### Lane Miles

- Lane-Length is calculated by running a spatial intersection of Through Lanes, Functional System, Facility Type and Urban Code. In this query, only the Facility Type codes 1-3 (one way, two way and couplets) are included. Sections coded as Ramps, Non-Mainline and Non-Inventory Direction (codes 4-6) are excluded.
- The Length is determined by summing the (End Point – Begin Point)\* Through Lanes for each reported HPMS Section, and grouping by Functional System.
- For Functional Class equal to 6- Minor Collector where the Urban Code Value is any urban area (i.e. not 99999, Rural) and 7-Local (for all urban and rural codes), lane-mileage is the sum of system length in the County Summary Table multiplied by 2 (so the total may not agree with lane miles in State records).

#### Vehicle Miles

- 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 equal to 1-One-Way, 2-Two-Way, or 3-Couplet.
- The DVMT is determined by summing the (End\_Point – Begin\_Point)\*AADT and Grouping by F\_System.
- For Functional Class equal to 6- Minor Collector and 7-Local, the table represents the data in the Sections Table which is optional. The official DVMT for these classifications is in the State Summary and Urban Summary Tables so the total will probably not agree.

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

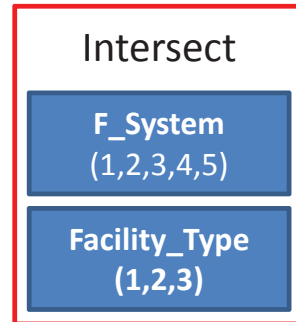
All Areas	Miles
1 - Interstate	729.810
2 - PA - Other Freeways and Expressways	58.870
3 - PA - Other	3,583.470
4 - Minor Arterial	3,498.480
5 - Major Collector	10,278.170
6 - Minor Collector	7,413.250
7 - Local	33,588.830
<b>Total</b>	<b>59,150.880</b>

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
<b>Total</b>	<b>440.920</b>

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
<b>Total</b>	<b>3,673.060</b>

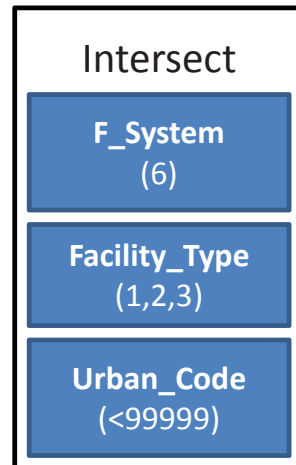
99999 - Rural	Miles
1 - Interstate	553.070
2 - PA - Other Freeways and Expressways	0.000
3 - PA - Other	2,817.850
4 - Minor Arterial	2,366.880
5 - Major Collector	8,385.050
6 - Minor Collector	7,413.250
7 - Local	24,716.130
<b>Total</b>	<b>46,252.230</b>

Sum section lengths:



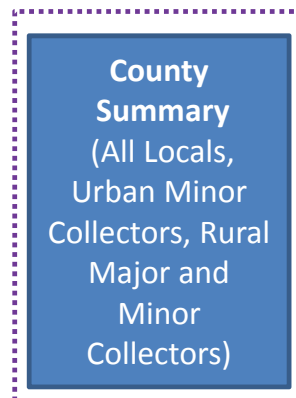
+

Sum section lengths:



+

Sum mileage:



*Appendix B: Report Types Continued*

*Extent and Travel Report Continued*

The image below depicts the first page of the Extent and Travel Report for 2011/Submit. Subsequent pages list the remaining urban areas for those areas designated as State as well as the Small Urban and Rural.

**HPMS 8.0.1**

**Extent and Travel Report**

**Stage:** Submit  
**Year:** 2011  
**State:** 40 - Oklahoma  
**Date:** 05/02/2012

All Areas	Miles	Lane Miles	Vehicle Miles
1 - Interstate	932.650	3,955.540	27,309,365.000
2 - PA - Other Freeways and Expressways	188.130	881.060	7,709,204.100
3 - PA - Other	3,388.020	10,675.370	29,331,456.710
4 - Minor Arterial	4,843.840	11,302.620	23,271,951.010
5 - Major Collector	22,318.050	45,139.000	18,977,562.020
6 - Minor Collector	2,990.710	5,981.420	495,984.000
7 - Local	78,146.480	156,292.960	22,894,649.000
<b>Total</b>	<b>112,807.880</b>	<b>234,227.970</b>	<b>129,990,171.840</b>

30925 - Fort Smith, AR--OK	Miles	Lane Miles	Vehicle Miles
1 - Interstate	0.000	0.000	0.000
2 - PA - Other Freeways and Expressways	0.000	0.000	0.000
3 - PA - Other	1.980	7.920	43,848.000
4 - Minor Arterial	5.880	11.760	15,381.000
5 - Major Collector	3.860	8.340	5,977.720
6 - Minor Collector	0.000	0.000	0.000
7 - Local	25.150	50.300	12,628.000
<b>Total</b>	<b>36.870</b>	<b>78.320</b>	<b>77,834.720</b>

Appendix B: Report Types Continued

Extent and Travel Changes

The Extent and Travel Changes 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 as with the standard Extent and Travel Report. 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
<b>All Areas</b>									
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%
<b>Total</b>	<b>88,352.8</b>	<b>88,259.0</b>	<b>0.11%</b>	<b>183,740.4</b>	<b>183,538.3</b>	<b>0.11%</b>	<b>128,602,540.5</b>	<b>126,658,485.0</b>	<b>1.53%</b>
<b>9298 - Boulder, CO</b>									
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%
<b>Total</b>	<b>421.6</b>	<b>420.9</b>	<b>0.16%</b>	<b>942.4</b>	<b>941.0</b>	<b>0.15%</b>	<b>2,059,137.0</b>	<b>1,952,645.2</b>	<b>5.45%</b>
<b>18856 - Colorado Springs, CO</b>									
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%
<b>Total</b>	<b>2,529.3</b>	<b>2,523.2</b>	<b>0.24%</b>	<b>5,725.6</b>	<b>5,713.9</b>	<b>0.21%</b>	<b>11,078,674.6</b>	<b>10,659,615.1</b>	<b>3.93%</b>

Appendix B: Report Types Continued

Extent and Travel 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
<b>All Areas</b>									
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%
<b>Total</b>	<b>112,806.8</b>	<b>112,873.0</b>	<b>-0.06%</b>	<b>234,225.8</b>	<b>234,296.3</b>	<b>-0.03%</b>	<b>129,989,996.8</b>	<b>130,810,732.4</b>	<b>-0.63%</b>
<b>99998 - Small Urban</b>									
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%
<b>Total</b>	<b>7,147.2</b>	<b>7,113.4</b>	<b>0.48%</b>	<b>15,569.2</b>	<b>15,501.8</b>	<b>0.43%</b>	<b>16,576,418.5</b>	<b>16,706,155.7</b>	<b>-0.78%</b>
<b>99999 - Rural</b>									
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%	133,648.18	133,644.98	-0.18%	7,509,662.00	7,501,000.00	0.12%
<b>Total</b>	<b>96,671.9</b>	<b>96,783.9</b>	<b>-0.12%</b>	<b>197,880.9</b>	<b>198,059.1</b>	<b>-0.09%</b>	<b>59,013,524.8</b>	<b>59,651,090.9</b>	<b>-1.07%</b>
<b>All Urbanized</b>									
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%
<b>Total</b>	<b>8,987.7</b>	<b>8,975.7</b>	<b>0.13%</b>	<b>20,775.7</b>	<b>20,735.4</b>	<b>0.19%</b>	<b>54,400,053.6</b>	<b>54,453,485.8</b>	<b>-0.10%</b>
<b>All Urban</b>									
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%
<b>Total</b>	<b>16,134.9</b>	<b>16,089.1</b>	<b>0.28%</b>	<b>36,344.9</b>	<b>36,237.2</b>	<b>0.30%</b>	<b>70,976,472.0</b>	<b>71,159,641.5</b>	<b>-0.26%</b>

Appendix B: Report Types Continued

**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 row in Table 1 and with the Interstate rows on the ETR.

**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.

**Miles of Lanes**

- 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)**

- 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 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
<b>Total</b>	<b>1,495.30</b>	<b>7,879.10</b>	<b>94,815,503.86</b>

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 shows the Interstate Mileage, Lane-Mileage and Vehicle Miles (DVMT) for the 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.

Miles of Lanes

- 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

- 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 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: Submit  
 Year: 2010  
 State: 37 - North Carolina  
 Date: 04/24/2012

This example depicts data for the first two of nine NHS codes.

NHS: 1 - Non Connector NHS			
F System	Miles	Lane Miles	Vehicle Miles
1 - Interstate	1,171.17	5,584.31	57,245,388.10
2 - PA - Other Freeways and Expressways	400.54	1,703.77	12,818,463.80
3 - PA - Other	2,025.16	7,265.03	30,026,529.42
4 - Minor Arterial	171.98	508.41	1,461,489.90
5 - Major Collector	90.17	195.60	500,413.23
6 - Minor Collector	0.00	0.00	0.00
7 - Local	43.06	185.93	505,072.30
<b>Sub-Totals</b>	<b>3,902.09</b>	<b>15,443.06</b>	<b>102,557,356.75</b>

NHS: 2 - Airport			
F System	Miles	Lane Miles	Vehicle Miles
1 - Interstate	0.00	0.00	0.00
2 - PA - Other Freeways and Expressways	1.47	5.87	31,798.00
3 - PA - Other	8.13	32.52	108,460.00
4 - Minor Arterial	4.74	12.35	41,439.80
5 - Major Collector	7.12	15.84	76,586.10
6 - Minor Collector	0.00	0.00	0.00
7 - Local	0.00	0.00	0.00
<b>Sub-Totals</b>	<b>21.45</b>	<b>66.58</b>	<b>258,283.90</b>



Appendix B: Report Types Continued

**Consistency**

The output for this report is a comparison of key full extent Data Items. The Miles column establishes the control and should agree with the State’s Certified Miles for upper level Functional Systems. The Miles of Lanes, AADT and Ownership indicate the number of miles that are covered by the 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 length so miles reported 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. Finally, this report only represents system length for select Data Items, it does not reflect the coded numeric values on those Sections.

**Miles**

- This is the same calculation that is used for the Extent and Travel Report.
- 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.
- The Length is determined by summing the End\_Point – Begin\_Point and Grouping by F\_System.

**Miles of Lanes**

- Length is calculated by 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.
- The Length is determined by summing the End\_Point – Begin\_Point and Grouping by F\_System.

**Miles of AADT**

- Length is calculated by 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.
- The Length is determined by summing the End\_Point – Begin\_Point and Grouping by F\_System.

**Miles of Ownership**

- Length is calculated by 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.
- The Length is determined by summing the End\_Point – Begin\_Point and Grouping by F\_System.

**HPMS 8.0.1**

**Consistency Report**

**Stage:** Submit  
**Year:** 2010  
**State:** 37 - North Carolina

F System	Length	Length	Length	Length
	AADT	Through Lanes	Ownership	Control
	(Miles)	(Miles)	(Miles)	(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

Appendix B: Report Types Continued

Ownership

Ownership totals are show by functional system for each ownership category coded in the State submittal, as well as the sum for submitted data statewide. The "All" table reflects the State Total. Subsequent tables reflect individual ownership categories. The length of this report varies greatly depending on the number of Ownership categories reported in a State submittal.

**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
<b>Total</b>	<b>21,390.720</b>

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
<b>Total</b>	<b>3,719.090</b>

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), IRI greater than 94 but less than 171 (Fair) and IRI is greater than 170 (Poor). The totals in this report should be consistent with the Extent and Travel on the NHS report.

**Length/Miles**

- Length includes all control sections that have a FACILITY\_TYPE of 1 or 2 and are covered by IRI and any 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/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
<b>Sub-Totals</b>	<b>3,125.1 (82.7%)</b>	<b>625.5 (16.6%)</b>	<b>28.6 (0.8%)</b>	<b>3,779.1</b>

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
<b>Sub-Totals</b>	<b>25,686,197.3 (73.1%)</b>	<b>9,211,397.1 (26.2%)</b>	<b>250,501.1 (0.7%)</b>	<b>35,148,095.4</b>

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**

- Select all control 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 control 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 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 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
<b>Sub-Totals</b>	<b>3,684.5 (74.8%)</b>	<b>1,048.5 (21.3%)</b>	<b>192.7 (3.9%)</b>	<b>4,925.6</b>

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
<b>Sub-Totals</b>	<b>28,539,164.7 (62.9%)</b>	<b>14,406,621.0 (31.7%)</b>	<b>2,430,409.1 (5.4%)</b>	<b>45,376,194.8</b>

## Appendix B: Report Types Continued

### National Level Reports

The National reports match the format and content of the annual FHWA Highway Statistics Series. These 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 section length of 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)

#### **VM2 - 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

Appendix B: Report Types Continued

National Level Reports Continued

Stage: National  
Year: 2010  
Date: 05/07/2012

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

HPMS 8.0.1

State	RURAL										URBAN										Total
	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total					
Alabama	532.49	0.00	2,224.04	4,053.75	12,373.26	6,698.24	50,502.38	76,384	373.23	35.22	1,060.80	2,084.33	2,987.83	6.11	18,642.94	25,190	101,575				
Alaska	1,005.15	0.00	809.27	1,395.20	1,024.09	9,045.21	9,045.21	1,395.20	79.28	0.00	68.75	242.19	0.00	343.88	1,850.78	2,585	16,303				
Arizona	980.48	0.00	1,267.86	1,328.09	4,338.81	2,119.99	31,206.79	41,242	187.63	176.29	1,438.85	1,789.82	1,652.96	0.99	17,819.87	23,066	64,308				
Arkansas	434.35	127.61	2,073.67	2,967.60	12,437.82	6,998.52	62,052.74	87,116	220.98	92.05	675.78	1,333.69	1,434.84	55.66	91,431.01	12,956	100,068				
California	1,274.95	0.00	3,518.96	6,685.02	12,857.82	8,205.60	49,524.62	82,046	1,177.84	1,525.68	6,475.98	10,776.45	11,373.60	0.00	58,762.90	90,092	172,139				
Colorado	681.84	0.00	2,320.44	3,752.72	5,508.31	8,972.03	47,687.64	68,923	270.88	319.73	1,192.15	1,659.34	1,790.04	0.00	14,203.48	19,430	88,353				
Connecticut	43.28	39.14	1,265.61	2,567.70	939.61	398.91	4,411.70	6,216	302.89	239.73	680.70	1,659.64	1,829.63	34.06	10,428.12	15,125	21,391				
Delaware	0.00	0.00	1,617.74	1,115.11	458.54	224.46	2,386.48	3,346	40.61	30.37	175.29	1,002.56	361.06	0.00	2,190.95	2,991	6,337				
Florida	748.45	180.58	2,674.09	2,404.92	4,167.51	3,310.16	26,703.54	40,189	747.14	565.75	3,617.43	4,100.36	7,018.45	0.00	65,463.54	81,513	121,702				
Georgia	719.35	0.00	2,658.12	5,200.05	12,804.35	7,478.46	54,232.51	83,093	528.66	140.69	1,951.93	4,316.87	2,455.58	0.00	30,140.10	39,824	122,917				
Hawaii	6.35	0.00	110.84	906.79	316.38	172.38	1,195.87	2,050	48.55	33.65	460.59	653.56	704.02	0.00	3,513.92	5,822	4,971				
Idaho	521.64	0.00	1,731.32	1,406.03	5,773.53	4,012.34	29,502.89	42,949	89.99	0.00	3,141.00	4,501.32	4,702.59	0.00	28,049.34	41,320	139,319				
Illinois	1,355.24	0.00	2,533.69	4,670.93	17,332.06	3,381.36	72,702.29	96,199	827.00	96.94	1,846.26	2,982.50	3,199.50	1.57	18,205.30	26,877	96,988				
Indiana	711.31	0.00	1,579.85	2,066.61	9,938.41	9,159.55	46,653.59	70,111	460.02	171.36	1,846.26	2,982.50	3,199.50	1.57	18,205.30	26,877	96,988				
Iowa	628.42	0.00	3,074.84	4,280.59	14,387.09	16,159.69	64,453.74	102,992	153.28	0.00	829.77	1,543.28	1,065.78	0.99	7,796.87	11,391	114,383				
Kansas	656.02	0.00	4,747.84	2,897.04	22,897.04	9,231.93	87,534.74	127,675	217.88	187.24	800.77	1,364.02	1,457.62	0.00	8,950.82	12,978	140,653				
Kentucky	554.16	625.43	1,882.50	1,855.38	5,971.45	9,307.15	46,241.99	66,628	208.22	64.63	829.92	994.18	1,057.63	1.00	9,460.21	12,556	79,184				
Louisiana	534.08	0.00	992.59	1,590.07	4,676.86	3,170.28	34,028.62	44,992	371.18	50.92	1,042.55	1,896.64	2,187.64	0.00	10,785.92	16,335	61,327				
Louisiana	299.02	0.00	787.84	1,017.29	3,217.89	2,180.99	12,356.02	19,859	70.39	18.86	143.17	232.11	531.56	0.00	2,008.61	3,005	22,864				
Maine	183.57	0.00	444.88	840.42	1,536.35	1,772.29	9,311.41	14,089	297.36	300.34	1,081.44	1,321.29	1,742.96	0.00	12,583.79	17,437	31,526				
Massachusetts	91.26	19.98	1,463.31	389.43	1,151.22	775.36	5,409.50	7,983	481.57	324.83	1,846.13	3,749.74	2,902.23	0.00	18,960.24	28,265	36,248				
Michigan	650.05	428.71	2,075.09	5,009.32	16,381.71	4,294.09	57,146.33	85,985	594.58	276.64	2,424.46	4,793.08	3,797.40	0.00	24,097.69	35,983	121,969				
Minnesota	629.53	9.06	3,593.25	6,614.75	16,114.99	12,017.88	78,552.72	117,532	284.37	177.63	646.24	2,557.04	2,293.86	13.03	14,659.51	20,632	138,164				
Mississippi	489.60	0.00	1,918.60	3,674.47	11,804.96	2,294.05	43,868.00	64,050	209.18	68.95	1,016.58	949.14	1,444.05	0.00	7,342.90	11,031	75,080				
Missouri	751.78	961.03	2,199.16	3,984.53	16,469.65	5,961.66	76,236.92	106,565	428.78	453.85	1,937.79	2,223.61	3,293.63	2.06	18,062.57	24,171	130,735				
Montana	1,129.38	0.00	2,622.20	2,978.72	7,046.68	8,815.98	49,025.97	71,619	62.53	0.00	190.78	245.37	329.63	0.00	2,345.90	3,174	74,793				
Nebraska	417.50	326.56	2,384.44	4,152.95	11,501.11	8,789.95	59,652.97	87,225	64.24	79.88	413.33	776.12	483.16	0.00	4,611.06	6,428	93,653				
Nevada	449.61	0.26	1,515.46	767.55	2,001.66	2,315.29	19,978.30	27,028	121.36	69.06	341.00	823.63	3.46	1,107.26	5,567.23	8,033	35,061				
New Hampshire	0.00	0.00	261.02	313.04	961.68	424.28	5,348.35	7,373	366.31	406.53	1,704.99	3,484.77	2,758.55	0.00	33,800.81	3,581	12,667				
New Jersey	65.00	0.00	1,856.35	1,949.10	3,915.86	3,139.61	48,760.78	60,469	152.32	5.00	694.77	638.19	0.00	1,416.01	5,002.28	7,909	68,378				
New Mexico	842.10	319.44	1,220.80	3,745.98	5,770.46	9,590.71	44,657.00	66,146	862.08	791.11	2,854.50	5,672.52	5,410.81	0.00	32,836.32	48,427	114,574				
New York	519.23	0.00	2,931.25	2,514.08	11,582.83	0.00	67,375.57	84,923	51.75	0.00	164.23	322.38	314.76	0.00	1,065.94	1,919	86,842				
North Dakota	723.27	0.00	1,969.27	2,656.42	11,355.54	6,613.96	54,866.60	78,185	850.33	483.89	2,427.80	3,911.53	4,673.84	0.00	32,659.43	45,007	123,192				
Oklahoma	683.52	0.00	2,326.04	2,703.28	2,989.52	2,989.52	66,822.49	96,784	249.13	185.64	1,062.27	2,141.14	1,056.67	0.00	11,394.27	16,089	112,873				
Oregon	553.07	0.00	2,817.85	2,366.88	8,385.05	7,413.25	24,716.13	46,252	176.74	58.87	765.62	1,131.60	1,893.12	0.00	8,872.70	12,899	59,151				
Pennsylvania	1,117.24	327.66	1,579.55	4,541.02	7,241.54	7,132.33	51,566.63	73,506	739.04	527.56	2,833.44	3,959.41	5,338.21	124.53	32,657.34	46,180	119,685				
Rhode Island	21.48	0.00	48.17	65.39	144.77	124.21	818.55	1,223	49.90	90.31	363.49	362.46	612.08	0.00	3,789.19	5,267	6,490				
South Carolina	580.50	0.00	1,289.15	3,287.59	10,480.69	2,152.73	31,860.63	49,651	270.09	81.88	1,054.79	1,519.32	2,454.57	0.00	10,991.75	16,372	66,024				
South Dakota	602.39	0.00	2,531.96	3,341.65	11,112.60	6,310.26	54,275.58	79,486	76.52	11.11	1,427.08	2,499.48	2,311.30	0.00	2,067.44	2,961	82,447				
Tennessee	687.49	0.00	1,873.04	3,199.91	5,112.60	18,002.90	48,570.48	69,971	417.00	152.33	1,553.00	2,499.48	3,311.30	0.00	17,303.15	24,236	94,207				
Texas	2,040.54	0.00	7,652.78	10,663.02	34,510.84	18,002.90	141,256.13	213,313	1,100.53	1,512.09	5,829.21	8,376.67	12,387.60	0.00	68,640.18	91,936	311,249				
Utah	723.95	0.00	1,054.78	1,429.32	3,364.98	3,315.68	23,418.83	33,885	212.94	16.71	394.90	688.82	883.38	28.81	8,830.64	11,239	45,154				
Vermont	279.95	0.00	319.46	732.33	2,000.34	887.19	8,750.93	12,970	40.33	17.62	103.00	149.03	220.45	0.00	955.92	1,466	14,457				
Virginia	661.82	0.65	1,402.27	3,452.94	9,377.28	2,441.40	33,203.70	50,526	462.62	260.97	1,394.84	2,276.84	2,522.90	0.00	16,933.78	23,832	74,378				
Washington	467.34	647.70	1,332.58	1,902.90	8,443.43	6,453.41	41,065.05	60,312	296.93	370.84	1,394.84	2,276.84	2,425.15	0.00	16,381.29	23,510	83,822				
West Virginia	368.04	0.00	1,068.11	1,359.47	5,651.90	2,216.59	22,613.41	33,258	186.55	8.94	336.44	744.15	735.05	0.00	3,356.35	5,367	38,625				
Wisconsin	477.93	212.69	2,966.28	4,822.11	12,469.02	7,600.82	63,962.78	92,512	284.76	343.81	1,873.07	2,520.70	2,483.52	0.00	14,965.52	22,451	114,963				
<b>US Total:</b>	<b>28,741</b>	<b>4,227</b>	<b>86,987</b>	<b>131,106</b>	<b>406,651</b>	<b>248,476</b>	<b>1,973,444</b>	<b>2,879,632</b>	<b>15,835</b>	<b>10,825</b>	<b>62,598</b>	<b>103,292</b>	<b>110,472</b>	<b>3,137</b>	<b>742,984</b>	<b>1,049,142</b>	<b>3,928,774</b>				
<b>Grand Total:</b>	<b>28,741</b>	<b>4,227</b>	<b>86,987</b>	<b>131,106</b>	<b>406,651</b>	<b>248,476</b>	<b>1,973,444</b>	<b>2,879,632</b>	<b>15,835</b>	<b>10,825</b>	<b>62,598</b>	<b>103,292</b>	<b>110,472</b>	<b>3,137</b>	<b>742,984</b>	<b>1,049,142</b>	<b>3,928,774</b>				

Appendix B: Report Types Continued

National Level Reports Continued

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

HPMS 8.0.1

Stage: National  
Year: 2010  
Date: 05/07/2012

State	RURAL										URBAN										Total
	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total					
Alabama	2,191.39	0.00	6,550.74	8,579.35	24,833.97	13,396.48	101,004.76	156,557	1,833.20	167.04	3,801.10	5,223.26	6,211.79	12.23	37,285.88	54,534					
Alaska	2,063.24	0.00	1,637.46	878.03	2,798.95	2,048.18	18,090.42	27,516	308.13	0.00	251.06	632.12	0.00	708.62	3,701.56	5,601					
Arizona	4,010.79	0.00	3,497.74	2,869.89	8,895.84	4,239.98	62,413.58	85,928	1,099.08	1,308.46	6,413.56	3,689.97	1,98	35,639.74	53,743	139,617					
Arkansas	1,737.40	509.56	6,181.90	24,893.00	16,181.90	124,105.48	176,706	1,018.15	392.05	2,217.70	3,087.14	2,907.30	108.27	18,286.02	28,017	204,723					
California	5,815.35	0.00	9,490.91	13,727.67	25,507.20	13,997.04	99,049.23	170,002	8,861.03	8,615.76	25,163.54	29,620.96	23,856.20	0.00	117,524.79	213,643					
Colorado	2,764.46	0.00	5,336.42	17,630.11	11,023.74	17,944.07	95,375.29	140,074	1,355.00	1,320.78	4,427.91	4,279.19	3,876.45	0.00	28,406.96	43,666					
Connecticut	213.36	155.05	260.66	519.74	1,880.07	797.82	8,823.40	12,650	1,651.61	980.80	1,808.81	3,763.85	3,810.74	68.12	20,856.24	32,940					
Delaware	0.00	0.00	581.47	267.66	918.78	448.92	4,772.96	6,990	256.12	1,349.6	676.14	534.18	743.88	0.00	4,381.90	6,727					
Florida	3,440.65	715.08	5,717.67	5,047.45	8,408.42	6,620.33	53,407.08	85,157	4,428.90	2,699.01	15,773.15	13,755.57	16,554.45	0.00	130,927.08	184,138					
Georgia	3,516.48	0.00	8,316.67	10,939.70	25,663.02	14,956.92	108,465.02	171,862	3,440.83	652.07	6,931.04	10,769.51	5,939.99	0.00	60,280.20	88,014					
Hawaii	25.40	0.00	232.07	600.04	663.02	244.76	2,393.73	4,129	321.56	149.70	745.69	357.13	85.25	0.00	3,050.05	5,475					
Idaho	2,086.56	0.00	3,912.35	2,900.87	11,597.57	8,024.67	59,007.79	87,530	423.62	0.00	1,247.30	1,414.80	1,414.80	0.00	7,827.84	12,331					
Illinois	5,466.28	0.00	5,301.66	9,457.24	27,495.51	6,762.72	145,410.58	199,894	4,339.27	412.89	10,394.73	11,741.97	10,167.40	0.00	56,099.08	93,155					
Indiana	2,864.80	0.00	4,323.58	4,341.78	20,117.72	18,319.09	93,310.78	143,278	2,655.02	6,496.63	5,029.48	6,099.79	6,423.84	3.15	36,410.61	56,882					
Iowa	2,514.12	0.00	8,896.77	7,906.25	28,804.11	32,319.38	128,907.47	209,348	715.08	0.00	2,872.06	3,251.61	2,212.84	3.86	15,593.74	25,149					
Kansas	2,647.67	0.00	7,665.09	8,685.09	45,804.21	18,463.86	175,068.42	257,738	1,046.38	236.63	2,793.02	3,537.69	3,066.77	0.00	17,901.65	29,082					
Kentucky	2,565.21	2,329.44	5,064.03	3,772.94	12,029.03	19,014.30	92,683.98	137,262	1,228.26	217.88	3,769.90	4,877.49	4,789.05	2.00	18,920.42	27,746					
Louisiana	2,138.28	0.00	2,623.66	3,467.71	9,431.33	6,340.56	68,057.23	92,099	1,677.38	217.88	3,769.90	4,877.49	4,789.05	0.00	21,571.85	36,904					
Maine	1,274.68	0.00	1,225.84	2,083.74	6,468.84	4,361.98	24,712.04	40,610	283.72	7,093	419.14	390.53	1,110.11	0.00	4,017.22	6,492					
Maryland	899.55	0.00	1,302.09	1,719.34	3,091.21	3,544.37	18,622.81	26,279	1,677.69	1,350.79	3,861.22	3,709.22	3,756.35	0.00	25,167.58	39,843					
Massachusetts	416.93	76.36	323.90	797.96	2,829.64	1,550.72	10,819.01	16,278	2,924.46	1,337.38	4,623.49	7,840.35	5,784.48	0.00	37,920.48	60,299					
Michigan	2,752.70	1,721.14	4,547.16	10,377.17	32,797.70	8,588.17	114,292.66	175,077	3,301.82	1,265.53	8,913.61	11,832.73	7,917.72	0.00	48,195.39	81,427					
Minnesota	2,531.44	25.65	9,016.59	13,302.51	32,889.74	24,035.75	157,105.45	238,307	1,499.77	785.96	2,269.93	6,674.00	4,931.59	26.06	29,319.02	45,506					
Mississippi	1,958.42	0.00	6,472.00	7,610.62	32,988.50	11,923.32	152,473.83	217,485	873.41	266.03	3,345.77	2,218.11	3,021.48	0.00	14,685.81	24,411					
Missouri	3,013.97	3,821.73	5,241.79	6,024.83	14,035.78	17,631.95	98,051.94	145,842	2,484.64	1,999.08	3,913.89	4,656.83	4,663.99	4.11	36,125.13	53,906					
Montana	4,516.75	0.00	5,581.18	8,364.55	23,025.11	17,579.91	119,305.93	176,279	354.84	348.88	1,408.79	1,853.67	995.16	0.00	9,222.11	14,183					
Nebraska	1,735.24	1,296.46	4,971.50	8,364.55	23,025.11	17,579.91	119,305.93	176,279	354.84	348.88	1,408.79	1,853.67	995.16	0.00	9,222.11	14,183					
Nevada	1,847.21	1.32	3,469.59	1,612.87	4,001.45	4,630.57	39,956.60	55,520	649.69	334.80	1,523.79	3,131.46	6.93	2,863.75	11,134.45	19,645					
New Hampshire	0.00	0.00	0.00	0.00	0.00	2,293.83	15,879.16	18,173	0.00	0.00	0.00	0.00	0.00	0.00	7,161.62	7,162					
New Jersey	353.92	0.00	703.54	663.99	1,937.81	848.56	10,696.69	15,205	2,508.32	2,192.41	5,735.24	7,725.74	5,618.74	0.00	46,294.34	70,075					
New Mexico	3,390.45	0.00	5,557.10	4,034.55	7,899.22	6,279.21	97,521.56	124,682	698.40	10,000	2,665.60	1,619.54	0.00	2,931.41	10,004.55	17,929					
New York	3,444.10	1,085.34	2,738.95	7,742.97	19,181.42	19,181.42	89,314.00	135,094	4,433.86	3,723.75	8,681.72	13,708.30	11,345.74	0.00	65,672.64	107,566					
North Dakota	2,076.92	0.00	6,724.83	5,027.78	23,162.79	0.00	134,751.14	171,743	219.84	0.00	533.80	709.32	636.02	0.00	2,131.88	4,231					
Ohio	3,293.01	0.00	9,932.79	5,470.52	23,003.19	13,227.92	109,733.20	160,661	4,729.69	2,034.32	7,903.38	10,747.82	11,039.76	0.00	65,318.86	101,774					
Oklahoma	2,735.14	0.00	6,881.12	5,979.72	42,839.10	5,979.04	133,644.98	198,059	1,204.34	861.24	3,777.27	5,315.36	2,290.44	0.00	22,788.54	36,237					
Oregon	2,259.27	0.00	6,352.96	4,860.36	16,789.96	14,826.50	49,432.26	94,521	867.23	2,552.87	2,412.70	2,621.09	3,827.09	0.00	17,745.40	27,726					
Pennsylvania	4,520.94	1,319.09	3,706.59	9,364.75	14,553.69	14,264.66	103,133.25	150,863	3,305.15	2,155.42	8,413.82	8,730.65	10,783.54	249.05	65,314.67	98,952					
Rhode Island	85.90	0.00	107.61	142.74	296.80	248.43	1,637.10	2,519	300.70	360.28	980.00	740.27	1,223.32	0.00	7,578.38	11,183					
South Carolina	2,373.12	0.00	3,858.00	7,263.18	21,060.42	4,305.46	63,721.27	102,518	1,422.93	320.68	3,947.47	4,074.77	5,182.72	0.00	21,983.50	36,932					
South Dakota	2,413.25	0.00	5,880.75	6,748.74	24,798.00	12,620.53	108,551.15	161,012	346.79	41.74	566.73	996.98	585.37	0.00	4,134.89	6,672					
Tennessee	2,811.81	0.00	5,798.44	6,914.77	10,293.70	21,054.42	97,140.95	144,014	2,315.53	681.16	5,797.31	6,755.35	4,888.87	0.00	34,606.29	55,045					
Texas	8,313.98	0.00	22,801.57	22,496.58	69,742.85	36,005.79	282,472.25	441,833	6,903.17	7,530.08	23,066.06	25,926.97	27,795.60	0.00	137,280.37	228,502					
Utah	2,915.07	0.00	2,456.84	3,000.10	6,773.76	7,831.36	46,831.71	69,809	1,347.40	81.02	1,501.12	2,464.77	1,920.70	57.62	17,661.28	25,034					
Vermont	1,119.79	0.00	724.54	1,442.31	3,930.39	1,774.38	17,501.86	26,493	161.32	48.89	238.61	300.38	38.15	0.00	1,871.84	3,059					
Virginia	2,758.72	1.75	5,891.23	7,611.65	19,075.28	4,882.80	66,419.40	106,132	2,683.24	1,138.81	6,388.75	5,549.62	5,490.62	0.00	33,867.56	55,172					
Washington	2,080.54	1,687.28	2,321.49	8,444.26	16,891.85	12,906.83	82,130.09	122,272	1,904.53	1,423.73	4,630.33	5,763.83	4,900.62	0.00	32,662.57	51,386					
West Virginia	1,541.12	0.00	2,729.37	2,699.56	11,308.22	4,433.18	42,252.82	67,938	822.60	4,433.18	1,038.99	1,543.82	1,472.30	0.00	6,712.70	79,561					
Wisconsin	1,986.42	848.90	7,350.31	9,718.70	24,964.86	15,201.64	127,925.56	188,005	1,219.78	1,459.26	5,789.12	5,942.00	5,137.62	0.00	29,931.03	49,479					
US Total:	117,502	15,594	227,177	272,719	816,470	496,951	3,946,888	5,893,302	88,089	50,801	221,515	266,354	236,161	7,040	1,485,968	2,355,928					
Grand Total:	117,502	15,594	227,177	272,719	816,470	496,951	3,946,888	5,893,302	88,089	50,801	221,515	266,354	236,161	7,040	1,485,968	2,355,928					

Appendix B: Report Types Continued

National Level Reports Continued

Functional System Travel (VM-2)  
Vehicle-Miles

Stage: National  
Year: 2010  
Date: 05/07/2012

HPMS 8.0.1

State	RURAL										URBAN										Total
	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total					
Alabama	15,738,645	0	17,816,939	13,150,784	4,618,000	18,771,000	83,743,938	20,690,884	1,619,756	20,440,146	16,965,843	8,969,247	1,238	23,350,000	92,045,613	1,75,788,651					
Alaska	3,253,412	0	943,783	31,372	964,400	411,000	1,148,000	8,039,668	0	1,877,422	2,187,422	0	958,531	793,000	7,046,653	13,148,933					
Arizona	19,232,706	0	8,943,699	4,800,295	1,981,669	7,880,000	47,433,689	1,816,963	19,804,939	34,323,943	2,254,956	8,519,116	16,357,000	116,306,939	64,707,238						
Arkansas	11,855,679	0	4,521,274	8,193,152	1,429,356	7,688,000	5,456,000	15,172,763	2,643,313	9,930,953	13,176,660	3,681,917	44,176	48,080,000	75,309,582	81,174,666					
California	48,253,329	0	43,721,223	26,009,162	19,588,589	7,219,000	139,069,101	36,867,876	146,567,171	160,993,517	133,170,155	60,390,239	0	483,000,000	785,997,517	888,210,896					
Colorado	11,946,666	912,942	3,806,509	1,889,357	2,026,867	2,037,000	4,068,955	50,317,514	10,549,919	2,985,023	13,497,358	7,094,604	0	8,826,000	98,274,116	88,606,138					
Connecticut	1,948,466	0	3,169,300	1,886,357	1,620,698	260,000	1,101,000	96,393,353	31,893,463	106,141,934	7,827,372	2,004,604	58,881	2,866,000	16,906,833	35,738,128					
Delaware	25,916,162	5,318,733	21,851,346	11,266,600	10,169,471	4,932,000	17,311,000	96,393,353	31,893,463	106,141,934	7,827,372	2,004,604	0	99,899,000	439,320,481	536,314,253					
Florida	27,416,673	0	17,211,511	17,206,312	16,022,188	4,193,000	18,699,000	100,735,304	6,029,042	34,670,032	42,290,476	1,911,487	0	54,885,000	205,349,946	306,988,931					
Georgia	2,398,068	0	1,386,272	7,770,310	732,495	1,000,000	6,640,066	7,884,871	1,428,103	5,114,468	1,392,823	2,582,270	0	4,930,000	20,742,333	27,386,601					
Hawaii	6,038,016	0	6,031,130	2,348,450	3,919,627	667,000	6,968,000	25,282,224	3,284,478	6,109,445	1,194,433	1,827,796	0	2,385,000	17,998,732	43,520,976					
Illinois	24,837,359	0	10,596,181	12,780,147	3,768,536	1,168,000	10,348,000	73,498,466	3,284,478	67,603,145	5,145,233	22,682,063	0	26,413,000	216,331,327	289,625,733					
Indiana	19,571,102	0	12,772,043	9,392,954	7,073,014	3,230,000	13,444,000	77,705,116	3,666,232	28,874,470	22,785,423	3,895,042	238	35,454,000	129,837,922	207,365,041					
Iowa	8,509,162	0	15,365,161	6,993,109	7,338,442	2,403,000	4,300,000	32,066,273	4,836,053	9,945,163	8,962,331	2,637,746	0	3,245,000	35,889,372	85,996,443					
Kansas	18,834,613	5,785,496	14,497,178	7,603,394	7,845,132	6,954,000	9,310,340	6,975,887	2,190,493	16,226,691	8,810,930	3,253,832	3,300	6,885,000	42,003,333	51,916,872					
Kentucky	14,804,283	0	6,966,040	7,796,231	11,199,465	4,018,000	32,199,039	20,735,765	1,967,491	21,019,962	16,967,371	7,673,716	0	4,307,000	72,291,523	124,469,364					
Louisiana	6,162,900	0	1,160,005	4,390,203	6,239,663	2,334,000	3,901,000	28,127,772	15,704,726	2,043,746	2,395,510	2,633,366	0	1,171,000	11,153,332	39,861,324					
Maine	3,738,860	0	9,327,130	6,491,394	3,451,717	3,388,000	4,495,000	35,142,120	13,704,026	27,466,718	16,367,388	7,274,074	0	8,250,000	114,606,433	133,766,333					
Massachusetts	3,761,251	680,735	1,254,697	1,332,674	7,789,735	426,000	1,894,000	11,339,291	13,704,026	27,466,718	16,367,388	7,274,074	0	20,350,000	37,397,658	148,936,949					
Michigan	11,234,683	7,890,992	12,335,163	19,833,026	22,334,428	2,398,000	6,380,000	87,459,461	14,441,227	47,454,086	42,317,169	14,693,371	0	18,676,000	179,846,376	267,307,836					
Minnesota	10,305,329	0	14,964,193	9,627,768	11,689,692	16,206,000	7,125,000	67,359,356	9,855,363	12,465,642	23,477,006	7,232,468	0	12,096,000	87,995,716	135,153,272					
Mississippi	17,339,182	9,981,048	13,353,133	9,865,253	14,832,856	1,877,000	16,945,000	84,193,474	14,244,430	17,327,502	14,418,630	7,832,776	7,913	24,228,000	109,934,463	194,147,936					
Missouri	6,536,697	0	6,315,647	3,236,743	2,946,831	1,058,000	2,898,000	23,015,917	2,310,921	2,658,845	1,444,577	717,152	0	1,847,000	7,641,086	30,857,003					
Montana	7,189,709	2,698,848	6,374,571	6,293,642	4,231,132	660,000	2,986,000	304,583,100	3,770,541	6,372,529	5,792,338	1,567,974	0	3,002,000	22,816,362	33,235,662					
Nebraska	5,124,373	8,448	4,321,059	1,261,302	1,113,046	596,000	1,424,993,000	1,441,983,000	4,364,135	8,045,149	12,286,397	10,819	5,620,193	665,707,078	705,770,148	2,147,693,576					
Nevada	4,337,466	0	5,270,892	2,111,120	3,302,762	818,180,000	1,258,299,000	2,591,501,244	0	0	30,365,205	13,435,879	0	2,007,000	2,007,000	4,694,000					
New Hampshire	12,070,159	0	8,862,047	4,061,251	3,647,939	1,431,000,000	9,187,000,000	1,468,828,339	58,240	11,161,087	4,445,878	0	2,920,116	1,202,098,000	1,227,925,400	2,696,753,797					
New Jersey	16,807,227	3,329,439	7,188,941	13,107,876	11,383,393	25,759,000	12,641,000	90,207,876	46,188,699	51,581,106	53,840,067	21,810,201	0	40,305,000	269,386,813	359,594,689					
New Mexico	5,183,461	0	5,415,746	1,894,216	2,307,200	1,000,000	7,635,000	15,372,712	1,155,639	1,863,914	1,564,714	668,846	0	1,958,000	6,310,114	32,637,335					
North Dakota	25,033,137	0	18,070,897	11,900,010	23,092,383	5,353,000	15,704,000	99,061,307	18,312,737	35,097,041	36,171,980	23,396,846	0	35,243,000	297,335,889	306,909,166					
Oklahoma	14,089,911	0	13,903,265	8,129,163	15,532,582	1,660,000	7,101,000	59,061,991	7,704,404	15,824,785	15,331,558	3,520,576	0	15,851,000	71,156,641	89,810,732					
Oregon	11,625,137	5,133,817	12,442,093	5,638,660	15,532,582	5,331,000	1,151,000	99,809,816	3,658,045	13,742,474	31,184,943	6,282,714	0	6,070,000	1,675,980	92,331,786					
Pennsylvania	28,416,252	0	9,431,132	191,386,697	72,306,294	5,381,000	16,020,000	97,800,816	36,093,098	43,742,712	31,184,943	1,890,815	0	20,846,000	176,252,299	275,825,153					
Rhode Island	20,819,373	0	9,810,712	13,650,077	13,141,540	100,000	6,386,000	64,853,251	3,418,615	6,933,093	2,243,388	9,633,332	0	734,000	20,263,620	24,685,334					
South Carolina	23,716,330	0	6,640,074	3,888,846	3,892,300	804,000	2,898,000	77,444,619	5,025,290	29,519,963	22,683,847	633,109	0	935,000	115,863,574	144,830,320					
South Dakota	4,470,119	0	15,895,874	3,370,729	8,661,367	7,565,000	8,206,000	77,444,619	2,243,388	20,011,083	13,137,422	9,827,028	0	5,728,000	69,703,949	34,362,237					
Tennessee	5,674,048	0	5,852,834	32,453,320	3,428,230	7,927,000	14,864,000	189,797,932	85,296,175	29,724,026	22,683,847	60,297,658	5,817	11,186,000	432,031,547	649,138,069					
Utah	25,393,462	2,400	17,466,112	2,383,297	3,248,742	664,000	3,054,000	21,924,410	807,348	8,538,972	7,949,459	3,897,332	0	26,017,000	452,031,547	498,049,606					
Vermont	2,533,362	0	1,953,769	1,323,507	1,508,775	1,488,000	9,325,000	14,783,116	9,737,886	1,187,960	943,372	601,390	0	1,128,000	3,073,201	19,950,317					
Virginia	16,619,100	4,869,816	6,361,336	5,391,394	7,746,533	3,187,000	47,059,219	29,819,897	9,483,564	37,653,680	28,751,227	11,351,018	0	15,216,000	145,299,653	223,124,971					
Washington	1,636,385	0	6,907,622	4,332,936	1,485,399	2,935,000	2,935,000	30,299,442	32,794	24,465,099	20,690,668	8,145,468	0	12,035,000	109,626,922	126,666,142					
West Virginia	14,229,393	4,487,317	18,876,801	14,137,442	22,504,881	3,060,000	6,609,000	14,586,649	12,406,310	32,072,914	33,453,332	8,601,265	0	1,303,000	22,311,715	62,611,031					
Wisconsin	646,607,349	52,567,475	535,513,414	395,198,240	433,668,110	2,396,780,000	3,306,640,000	7,986,974,518	586,530,536	1,209,172,911	985,654,741	465,549,278	9,620,264	5,298,773,622	9,816,587,033	17,803,561,618					
<b>Grand Total:</b>	<b>646,607,349</b>	<b>52,567,475</b>	<b>535,513,414</b>	<b>395,198,240</b>	<b>433,668,110</b>	<b>2,396,780,000</b>	<b>3,306,640,000</b>	<b>7,986,974,518</b>	<b>586,530,536</b>	<b>1,209,172,911</b>	<b>985,654,741</b>	<b>465,549,278</b>	<b>9,620,264</b>	<b>5,298,773,622</b>	<b>9,816,587,033</b>	<b>17,803,561,618</b>					







U.S. Department of Transportation  
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