A sailboat with a white hull and a tall mast is sailing on the open ocean. The mast has a white sail and a red spinnaker. Two crew members are visible on the deck, wearing life jackets. The water is a deep blue-green, and the sky is a clear, bright blue. The text is overlaid on the image.

How to Achieve HPMS Work Flow Zen

Or, How to make the HPMS Submission Process
Smooth Sailing Year after Year



Submit Data



Submit



Check

Last Submitted On: N/A Last Submitted By: N/A

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

There are editors that need to be validated before submitting.

Certified Miles

HPMS Calculated Miles:

State Certified Miles:

Submittal Comment (Required)

Comment:

Save Comments Without Submitting



Submit Data



Submit



Unlock



Check

Last Submitted On: 9/26/2013 9:02:37 AM Last Submitted By: Kumar, Sanjay

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:

State Certified Miles:

Submittal Comment (Required)

Comment: Delaware's 2012 HPMS Submission Comments

June 14, 2013

- Delaware submitted the 2012 Certified Miles of public roads on May 28, 2013.
- DelDOT maintains 5379.08 miles or 84.34% of the total Certified Miles 6,377.15.
- We have totaled 579 Sample sections; covering 424.62 miles of roads statewide out of 1759.1 non-local state-maintained road miles.
- We added 89 new samples and removed 109 samples.

Components of HPMS Workflow

- Data Preparation
- Validation/Updates
- Submission
- Post Processing/Extraction
- Storage

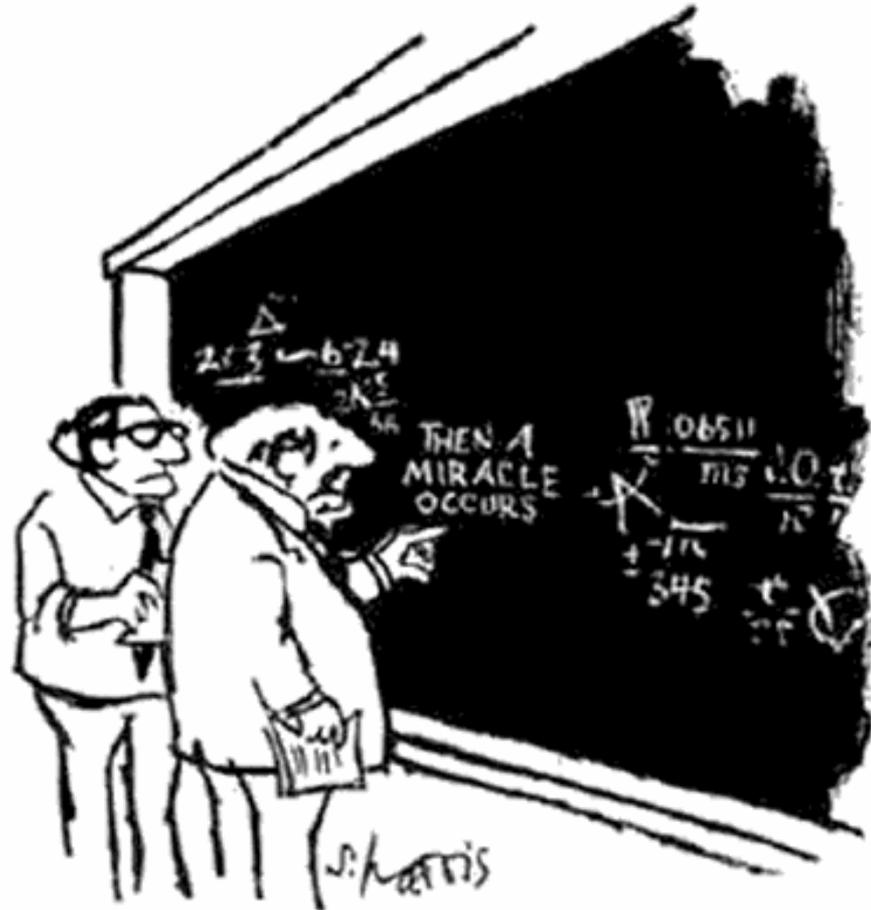
HPMS Submission Timeline

- January 1 – June 15th
 - State Prepares for HPMS Submission (working with HQ staff)
- June 1st
 - Certified Mileage Due
- June 15th
 - HPMS Submission Due
- June 15th – December 15th
 - HQ/Division Review/Conference Calls
- October 1st
 - Data to National
- December 15th
 - Division Review/Certification Due

Reducing Submissions

- Total Submissions
 - May – October 2013 = 121
 - Goal = 52

Preparation at the State DOT



"I THINK YOU SHOULD BE MORE EXPLICIT
HERE IN STEP TWO."

Sample Timeline

December 1 st	<p>GIS prepares a new public road shape-file with LRS. This shape-file will constitute the upcoming calendar year's HPMS routes submission. All data provider's will use this LRS starting January 1st of each year.</p> <p>The current year's public roads shape-file, prepared last December, will still control the upcoming HPMS submission.</p>
January 1 st <i>Census + VSAC</i>	<p>Planners supply 1) official urban boundary shape-file and 2) "csv" file containing F_System and Urban_Code data items. The F_System data should be for all roads having a functional classification greater than "local" as of this date. The "csv" file must use the LRS described in the new GIS shape-file. F_System and Urban_Code prepared here will be used in TOPS generation (see below).</p> <p>The F_System and Urban_Code data, prepared last January, will still control the upcoming HPMS submission.</p>
February 15 th	<p>Inventory supplies "csv" file containing Facility_Type and Through_Lanes data items. At a minimum, those roads designated as Federal-Aid eligible by the planner's must be reported, however, it is preferable to match the F_System limits above. The "csv" file must use the LRS described in the new GIS shape-file. Facility_Type and Through_Lanes prepared here will be used in TOPS generation (see below).</p> <p>The Facility_Type and Through_Lanes, prepared last February, will still control the upcoming HPMS submission.</p>
March 15 th	<p>Traffic Surveys supplies "csv" file containing AADT data item. At a minimum, those roads designated as Federal-Aid eligible by the planner's must be reported. The AADT file will consist of previous calendar year data and LRS. This data will be used for this year's HPMS submission.</p>
April 1 st	<p>Highway Statistics will create Table of Potential Software (TOPS) using new F_System, Urban_Code, Facility_Type, Through_Lanes, and previous years AADT. Sample locations will be determined allowing various data collectors to incorporate the locations into this year's data collection season.</p>
May 1 st	<p>Statewide Summary (for previous calendar year)</p> <ol style="list-style-type: none"> Inventory supplies paved and unpaved lengths for rural minor collector, rural local, and urban local functional classifications. Mileages must match County Summary. Traffic Surveys supplies VMTs for rural minor collector, rural local, and urban local functional classifications. Planners supply <ol style="list-style-type: none"> population for rural and small-urban areas. land area for rural and small-urban areas. <p>Vehicle Summary (for previous calendar year)</p> <ol style="list-style-type: none"> Traffic Surveys supplies travel activities data summarized by functional system group covering all public roads.

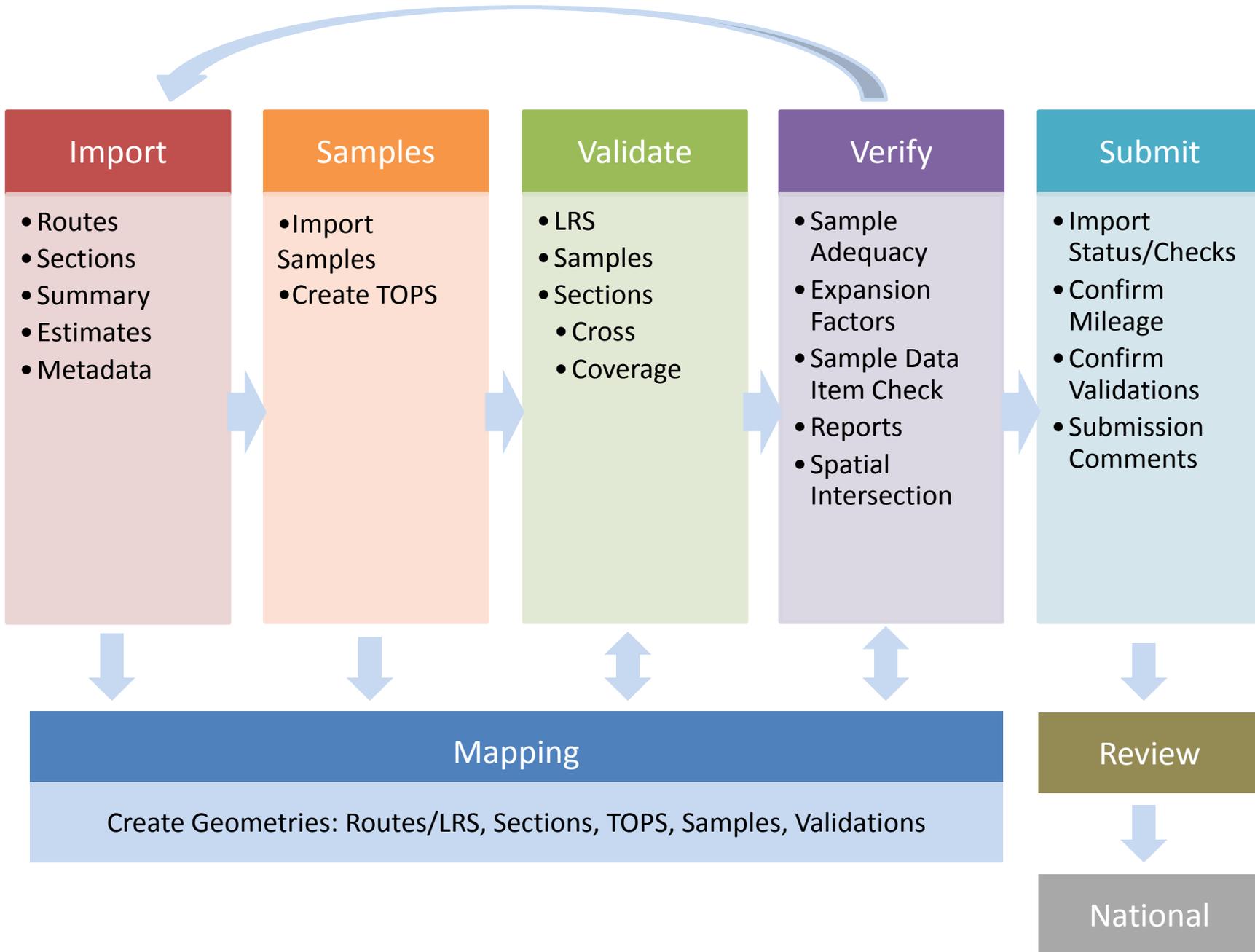
May 1 st (cont.)	<p>Urbanized Area Summary (for previous calendar year)</p> <ol style="list-style-type: none"> Traffic Surveys supplies VMT for Casper and Cheyenne local functional classification. Planners supply population and land area for Casper and Cheyenne urbanized areas. <p>County Summary (for previous calendar year)</p> <ol style="list-style-type: none"> Inventory supplies "csv" file of lengths designated as rural minor collector and rural/urban local. File must be aggregated by county, urban code, and ownership. <p>Estimates (for previous calendar year)</p> <ol style="list-style-type: none"> Materials supplies "csv" file showing statewide pavement defaults for all federal-aid eligible roads. <p>Metadata (for previous calendar year)</p> <ol style="list-style-type: none"> Materials supplies "csv" file describing variability of pavement collection for all federal-aid eligible roads. Traffic Surveys supplies "csv" file describing variability of traffic collection for all federal-aid eligible roads. <p>Sections (for previous calendar year)</p> <p>Inventory, Planners, Traffic Surveys, Traffic Operations, and Materials supply "csv" files for remaining data items collected last year. The "csv" files must use last year's LRS and not the new one. However, data items being collected this year will use this year's new LRS.</p> <p>This should conclude HPMS data submission for previous year.</p>
May 15 th	<p>Inventory submits certified mileage letter for previous calendar year. Mileage must match HPMS submitted mileage.</p>

Note 1: TOPS uses the data from F_System, Urban_Code, Facility_Type, Through_Lanes, and AADT to provide a table of "potential" samples. Whenever possible, selected sample locations will correspond to previously used sample locations. However, FHWA's sample adequacy requirements will always cause a few new locations to be selected every year.

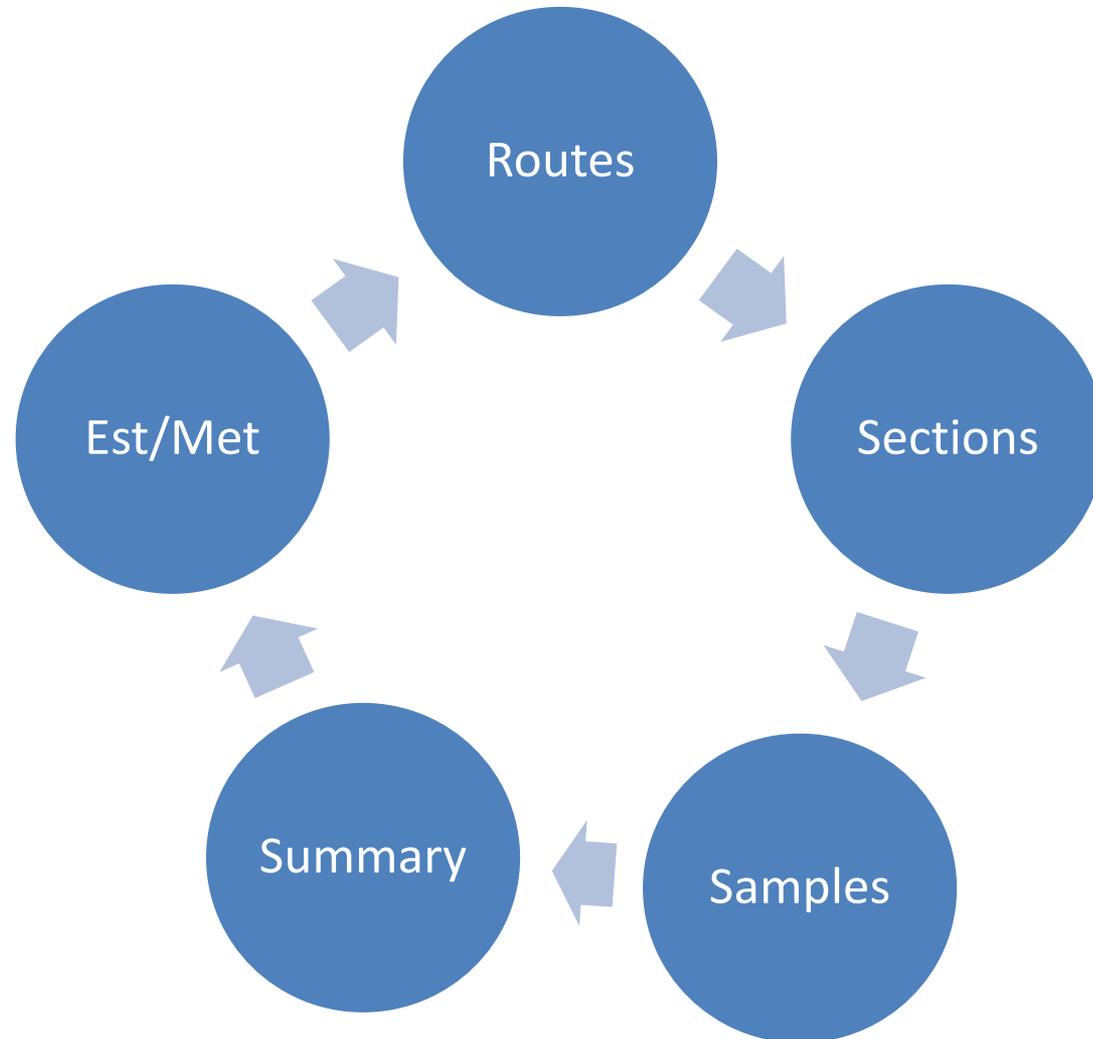
Note 2: Data for the previous year can always be submitted earlier than the shown dates. The above dates should be considered an absolute deadline. Earlier submission will facilitate the fixing of errors in a group's data and is highly encouraged.

Note 3: All "section" data items must be processed through a computer program that removes milepost equations. If milepost equations are used during data collection or are just part of the source data, the data provider should not try to remove them. GIS has developed a computer program to accomplish the task.

Process Summary



Upload data



HPMS Software Job Queues

- **Import** – (Users May Load Several Import Jobs to Queue)
 - Import Routes (All 3 formats routes imports)
 - Other Imports (Sections, any Summary, Estimate and Metadata)
- **Export**
 - Export Geometry (All export jobs with geometry included, issued from Export Screen)
 - Exports from Export Screen
- **Spatial Intersection and AdHoc Query**
- **Sample and TOPS** (Import Samples, Create TOPs, Expansion Factor)
- **Validations**
- **Copy, Delete, Submit**
- **Report** (all reports)
- **Create Geometry** (All jobs for creating geometry)
- **HPMS Use**

Create TOPS


U.S. Department of Transportation
Federal Highway Administration

Highway Performance Monitoring System v8.0

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT CALCULATIONS REPORTS & ANALYSIS SUBMIT DATA ADMIN HELP

Samples

Year: 2012 State: 9 - Connecticut

+

Add



Create TOPs



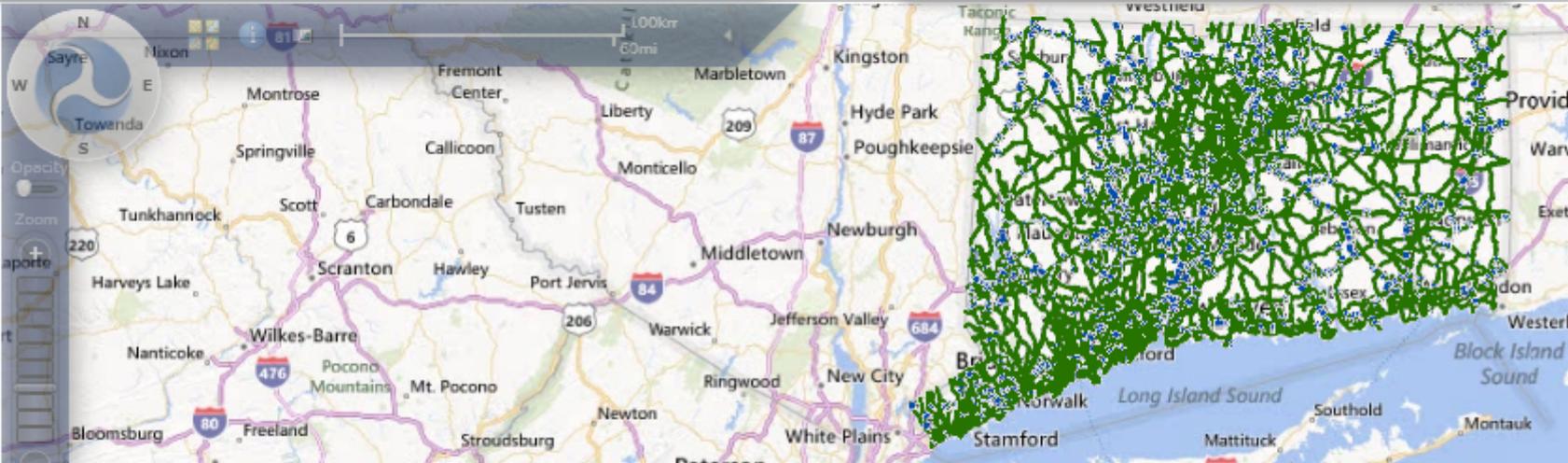
Check Adequacy



Expansion Factors



Create



			Sample ID	Route ID	Begin Point	End Point	Volume Group	F System	Urban Code
>			002A001	0020013	1.390	1.580	2,000 - 4,999	5 - Major Collector	Bridgeport--Stamford, CT--NY
			002A534	0020017	0.000	0.560	500 - 1,999	5 - Major Collector	Bridgeport--Stamford, CT--NY
			002A003	0020050	0.000	0.310	500 - 1,999	5 - Major Collector	Bridgeport--Stamford, CT--NY
			002A415	0020079	0.300	0.570	2,000 - 4,999	5 - Major Collector	Bridgeport--Stamford, CT--NY



Total Samples: 2447

Create TOPS

- Creates Universe for Sample Selection
- Populates Sample Panel with Data
 - Aggregates Sample Expansion Factors and Sample Validity by Volume Group/Urban Area, etc.
- Establishes “Control Length” for Consistency Report
- Generates/Updates “HPMS Calculated Miles” for Submission Screen

Validate



U.S. Department of Transportation
Federal Highway Administration

Highway Performance Monitoring System v8.0

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT CALCULATIONS REPORTS & ANALYSIS SUBMIT DATA ADMIN HELP

Validation

Year: 2012 State: 4 - Arizona

Validation Error Summary Graph



LRS



Cross



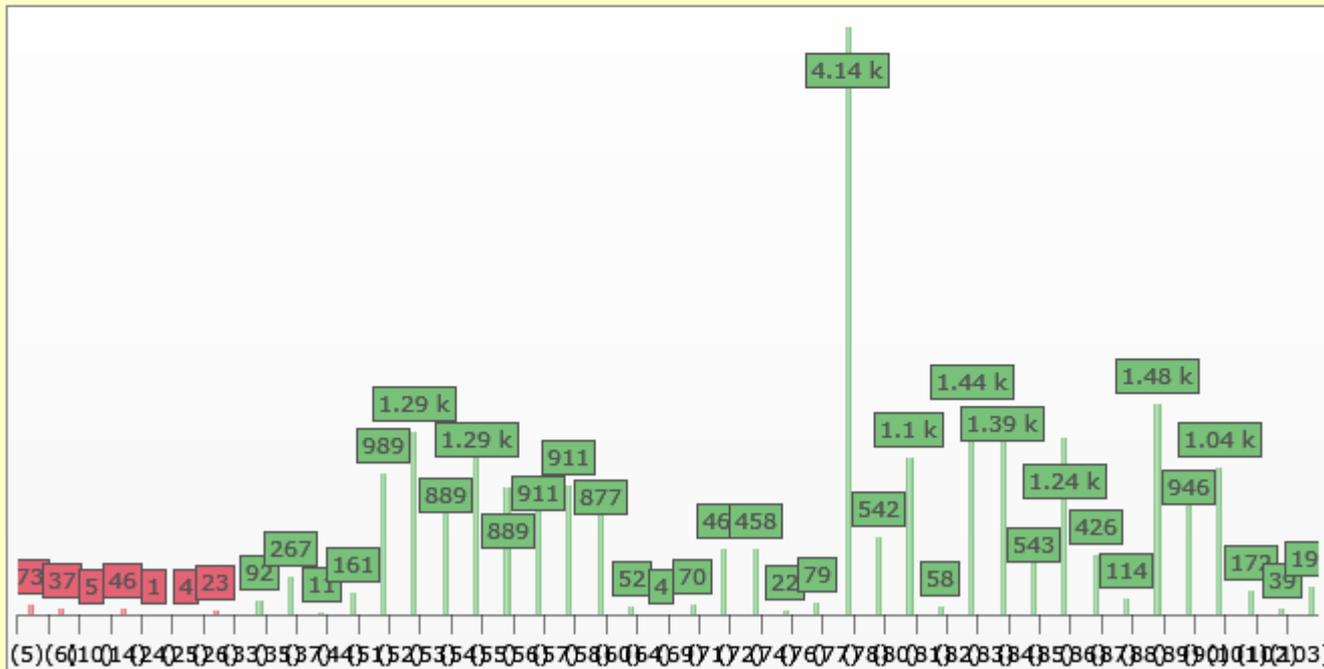
Samples



Coverage



Graph



Legend

- LRS
- CrossCheck
- Sample
- Coverage

Close

Validate

Preview Report

Year: 2012
State: 4 - Arizona
Date: 11/12/2013

Validation Category: Coverage Validation

Error Message	Records
Facility_Type Must Exist Where F_System in (1,2,3,4,5) or (F_System=6 and Urban_code <> 99999) or NHS (Coverage Criteria 3)	92
Access_Control Must Exist Where Facility_Type in (1,2,3) and (F_System in (1,2,3) or Sample or NHS) (Coverage Criteria 5)	267
Through_Lanes Must Exist Where (F_System in (1,2,3,4,5) or NHS) and Facility_Type in (1,2,3,4) or (F_System = 6 and Urban_code < 99999) (Coverage Criteria 7)	11
Speed_Limit Must Exist on Sample (Coverage Criteria 14)	161
AADT Must Exist on Facility Type 1,2,3 or 4 and (F_System in (1,2,3,4,5) or NHS or F_System = 6 and Urban_code < 99999) (Coverage Criteria 21)	989
AADT_Single_Unit Must Exist Where (F_System in (1) or NHS) and Facility_Type in (1,2,3) or Sample (Coverage Criteria 22)	1287
Pct_Peak_Single Must Exist on Sample (Coverage Criteria 23)	889
AADT_Combination Must Exist Where (F_System in (1) or NHS) and Facility_Type in (1,2,3) or Sample (Coverage Criteria 24)	1287
Pct_Peak_Combination Must Exist on Sample (Coverage Criteria 25)	889
K_Factor Must Exist on Sample (Coverage Criteria 26)	011

Validate

- Identify Errors
 - Sample Invalid
- Flag Suspect Data
- Identify Gaps in Data
- Addressing Validations – Submission Comments
- Role of State and HPMS Coach

Report

Reports

Year: 2012 State: 11 - District of Columbia

Last updated: 9:56:01 PM



Inter-Active Reports

Report Name	Report Status	Submitted By	Submitted On	Last Modified On	Create	Cancel	Download	Preview PDF
Consistency		Carpenter, Edward	10/30/2013 12:11:23 PM	10/30/2013 12:11:32 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Extent and Travel Report		Carpenter, Edward	10/30/2013 12:11:23 PM	10/30/2013 12:11:51 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Extent and Travel Report (Urban/Rural Summary)		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:11:56 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Extent and Travel on the NHS		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:11:59 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Extent and Travel on the Interstates		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:02 PM	<input type="checkbox"/>		<input type="checkbox"/>	
IRI on the Federal Aid Highways		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:04 PM	<input type="checkbox"/>		<input type="checkbox"/>	
IRI on the NHS		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:05 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Overview		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:06 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Ownership		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:08 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Sample Adequacy		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:12 PM	<input type="checkbox"/>		<input type="checkbox"/>	
Validation Summary		Carpenter, Edward	10/30/2013 12:11:24 PM	10/30/2013 12:12:13 PM	<input type="checkbox"/>		<input type="checkbox"/>	

Create Selected Reports

Cancel Selected Reports

Download Selected Reports

Report

- Check Consistency, Extent and Travel
- Ensure Ownership/NHS reports match submitted data
- Update and Review
- Comparison with Systems – TVT/Certified

Length - In Miles				
F System	< 95	95 - 170	> 170	Total
1 - Interstate	931.5	205.7	31.4	1,168.7
2 - PA - Other Freeways and Expressways	303.6	103.8	17.4	424.8
3 - PA - Other	1,936.4	1,077.3	302.9	3,316.5
4 - Minor Arterial	230.8	105.8	24.3	360.9
5 - Major Collector	108.1	82.1	16.4	206.5
6 - Minor Collector	0.0	0.0	0.0	0.0
7 - Local	0.0	0.0	0.1	0.1
Sub-Totals	3,510.4 (64.1%)	1,574.6 (28.7%)	392.6 (7.2%)	5,477.6

Travel - In Vehicle Miles				
F System	< 95	95 - 170	> 170	Total
1 - Interstate	45,240,480.4	11,164,543.2	1,831,797.9	58,236,821.5
2 - PA - Other Freeways and Expressways	9,556,944.4	3,826,627.4	680,274.0	14,063,845.8
3 - PA - Other	28,577,658.6	17,037,159.1	5,213,719.3	50,828,537.0
4 - Minor Arterial	2,508,717.1	1,235,574.1	292,194.2	4,036,485.4
5 - Major Collector	548,302.1	417,530.3	93,668.8	1,059,501.3
6 - Minor Collector	0.0	0.0	0.0	0.0
7 - Local	0.0	0.0	1,309.0	1,309.0
Sub-Totals	86,432,102.7 (67.4%)	33,681,434.1 (26.3%)	8,112,963.1 (6.3%)	128,226,499.9

HPMS 8.0.1

Ownership Report

Stage: Review
Year: 2012
State: 37 - North Carolina
Date: 09/26/2013

All	Miles
1 - Interstate	1,254.000
2 - PA - Other Freeways and Expressways	461.727
3 - PA - Other	3,647.610
4 - Minor Arterial	5,904.448
5 - Major Collector	10,818.652
6 - Minor Collector	6,550.962
7 - Local	77,425.676
Total	106,063.075

State Highway Agency	Miles
1 - Interstate	1,151.943
2 - PA - Other Freeways and Expressways	446.007
3 - PA - Other	3,615.998
4 - Minor Arterial	5,339.845
5 - Major Collector	10,318.028
6 - Minor Collector	6,546.172
7 - Local	51,914.915
Total	79,332.908

Interstate Extent and Travel by Route Number

Stage: Review

Year: 2012

State: 37 - North Carolina

Date: 07/02/2013

Route Number	Miles	Lane Miles	Vehicle Miles
17	0.01	0.06	196.00
26	52.71	226.47	2,196,588.90
40	420.26	1,989.79	21,394,274.00
70	0.19	0.41	4,053.00
73	80.86	367.74	1,657,006.43
74	35.99	143.99	533,910.00
77	101.36	471.98	6,025,936.00
85	204.85	1,128.16	12,223,651.00
95	181.34	725.34	6,882,884.00
140	6.79	27.16	98,222.00
240	9.55	44.10	595,936.00
264	0.34	1.34	5,360.00
277	4.45	27.24	394,815.00
421	0.47	2.84	8,058.00
440	16.76	93.02	1,705,488.00
485	59.97	314.13	3,566,577.00
540	25.85	159.24	1,804,141.00
795	25.46	101.84	360,322.50
840	2.83	11.32	32,316.40
Total	1,230.04	5,836.17	59,489,735.23

Submit

U.S. Department of Transportation
Federal Highway Administration

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

Submit Data

Last Submitted On: 9/26/2013 9:02:37 AM Last Submitted By: Kumar, Sanjay

Submit

Unlock

Check

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: 6377.150

State Certified Miles: 6377.000

Submittal Comment (Required)

Comment: Delaware's 2012 HPMS Submission Comments

June 14, 2013

- Delaware submitted the 2012 Certified Miles of public roads on May 28, 2013.
- DelDOT maintains 5379.08 miles or 84.34% of the total Certified Miles 6,377.15.
- We have totaled 579 Sample sections; covering 424.62 miles of roads statewide out of 1759.1 non-local state-maintained road miles.
- We added 89 new samples and removed 109 samples.

Don't forget the
Comments!

Submit

Submit Process is Completed

Submit Process is Completed. Thank You !

Step	Name	Started	Completed
1	Deleting Review Data	9/27/2013 6:00:23 PM	9/27/2013 6:02:54 PM
2	Running LRS and Cross Validation	9/27/2013 6:02:54 PM	9/27/2013 6:03:11 PM
3	Running Coverage Validation	9/27/2013 6:03:11 PM	9/27/2013 6:04:12 PM
4	Creating TOPS	9/27/2013 6:04:12 PM	9/27/2013 6:04:24 PM
5	Breaking TOPS	9/27/2013 6:04:24 PM	9/27/2013 6:04:24 PM
6	Running Sample Validation	9/27/2013 6:04:24 PM	9/27/2013 6:04:25 PM
7	Calculating Expansion Factors	9/27/2013 6:04:25 PM	Not Yet
8		Not Yet	9/27/2013 6:04:26 PM
9	Creating Full Intersections	9/27/2013 6:04:26 PM	9/27/2013 6:05:01 PM
10	Creating Section Geometries	9/27/2013 6:05:01 PM	9/27/2013 6:06:40 PM
11	Creating TOPS and Sample Geometries	9/27/2013 6:06:40 PM	9/27/2013 6:06:44 PM
12	Creating Validation Results Geometries	9/27/2013 6:06:44 PM	9/27/2013 6:06:49 PM
13	Submitting Routes	9/27/2013 6:06:49 PM	9/27/2013 6:06:55 PM

Close this Window Refresh and View Verification Process Detail

Review and Feedback

- Review Module
 - Observations
 - Recommendations
 - Recommendations Tracking/Response

Data Release

- Dates
- HERS
- Highway Statistics
- Other Customers
- Information Requests – Data Policy
- Data on our Website – Shapefiles

Data Release Policy

- The HPMS is a collection of high quality highway transportation data solely for the purpose of fulfilling requirements established through US Code, Federal Regulations and Acts such as MAP-21.
- The HPMS collection specification is documented in the HPMS Field Manual.

Data Release Policy

- It is the position of the FHWA that the State DOT is the authority of the data in HPMS. The FHWA will not alter raw HPMS data.
- FHWA offices that require data from HPMS should request the data on behalf of their consultants
- HPMS data is made available the Academia and Consultants through standard products.

Data Release Policy

- Conclusions to studies using HPMS by entities external to FHWA or FHWA Consultants are the owners of those studies.
- HPMS is a representation of data. It does not draw conclusions or compare the quality of highway conditions across states.
- FHWA does not release the contact information of the state DOT coordinators.

HPMS Zen Achieved



Clarification

- Sample Adequacy is the easy part
 - Creating a Sample Panel is nothing more than determining the limits of each Sample based on a statistical methodology.
 - The hard part is filling the Sample Panel with data.

Clarification Number 2

- “We need to get submittals in earlier, maybe as early as March”
 - Should probably say:
- We need to provide data from HPMS to customers earlier in the year through a more efficient and less burdensome process for those in the entire HPMS Community who collect, process, report and review the data.