

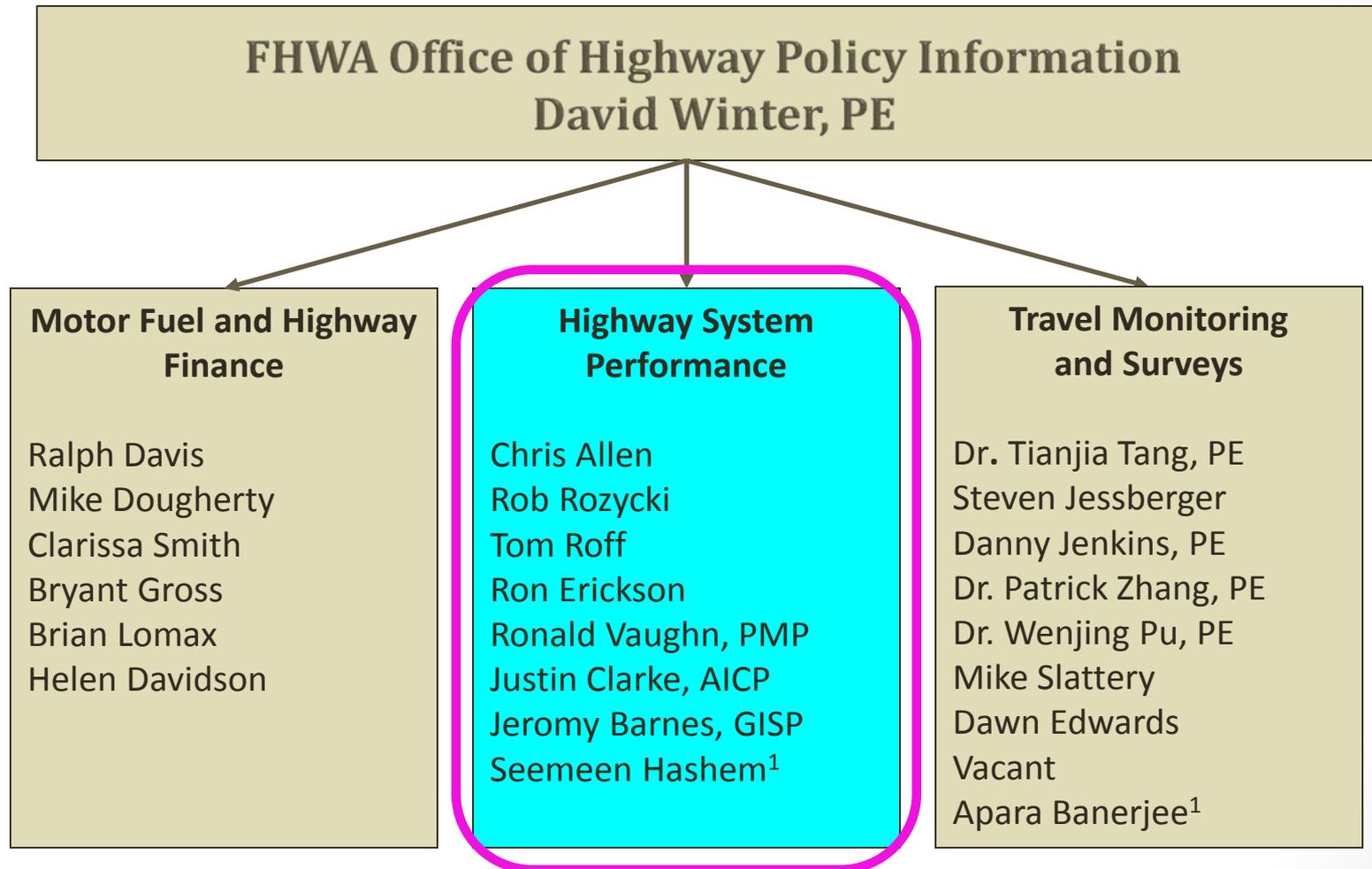
HPMS Field Manual & Software Updates

FHWA Highway Information Seminar

Arlington, VA

November 16, 2017

Office Organizational Chart



HPMS References & Resources

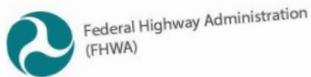
Highway Performance Monitoring System
Field Manual

Highway Performance Monitoring System
Software Guide for Version 8.0

Traffic
Monitoring

ALL PUBLIC
ROADS GEOSPATIAL
REPRESENTATION STUDY

ALL ROAD NETWORK OF LINEAR REFERENCED DATA
ARNOLD
Reference Manual



| Section Length | Value Numeric | Value Text |
|----------------|---------------|------------|
| 0.350 | 0.100 | 103.000 |
| 0.450 | 0.100 | 106.000 |
| 0.550 | 0.100 | 93.000 |
| 0.650 | 0.100 | 89.000 |
| 0.750 | 0.100 | 88.000 |
| 0.850 | 0.100 | 98.000 |
| 0.950 | 0.100 | 85.000 |
| 1.070 | 0.100 | 100.000 |

U.S. Department of Transportation
Federal Highway Administration

Highway Functional Classification Concepts,
Criteria and Procedures

2013 Edition

Field Manual



Summary of Updates

- General Discussions
- Data Items
 - Descriptions
 - Reporting Requirements
 - Coding Guidance
- References
 - Tables
 - Figures



HPMS 2010+

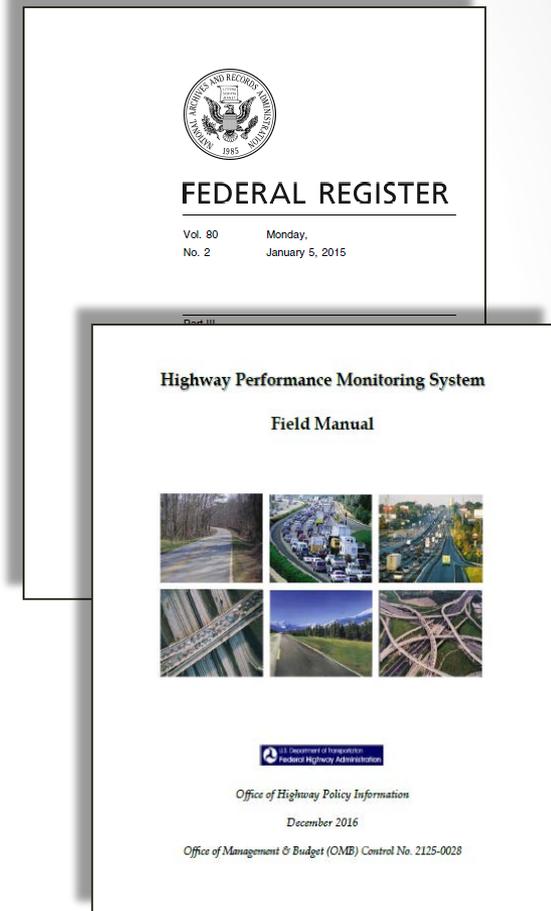
Field Manual Releases

- February & September 2010
- March 2012
- March 2013
- March 2014
- March 2015 (Addendum Only)
- April 2016 (Addendum Only)
- **December 2016**

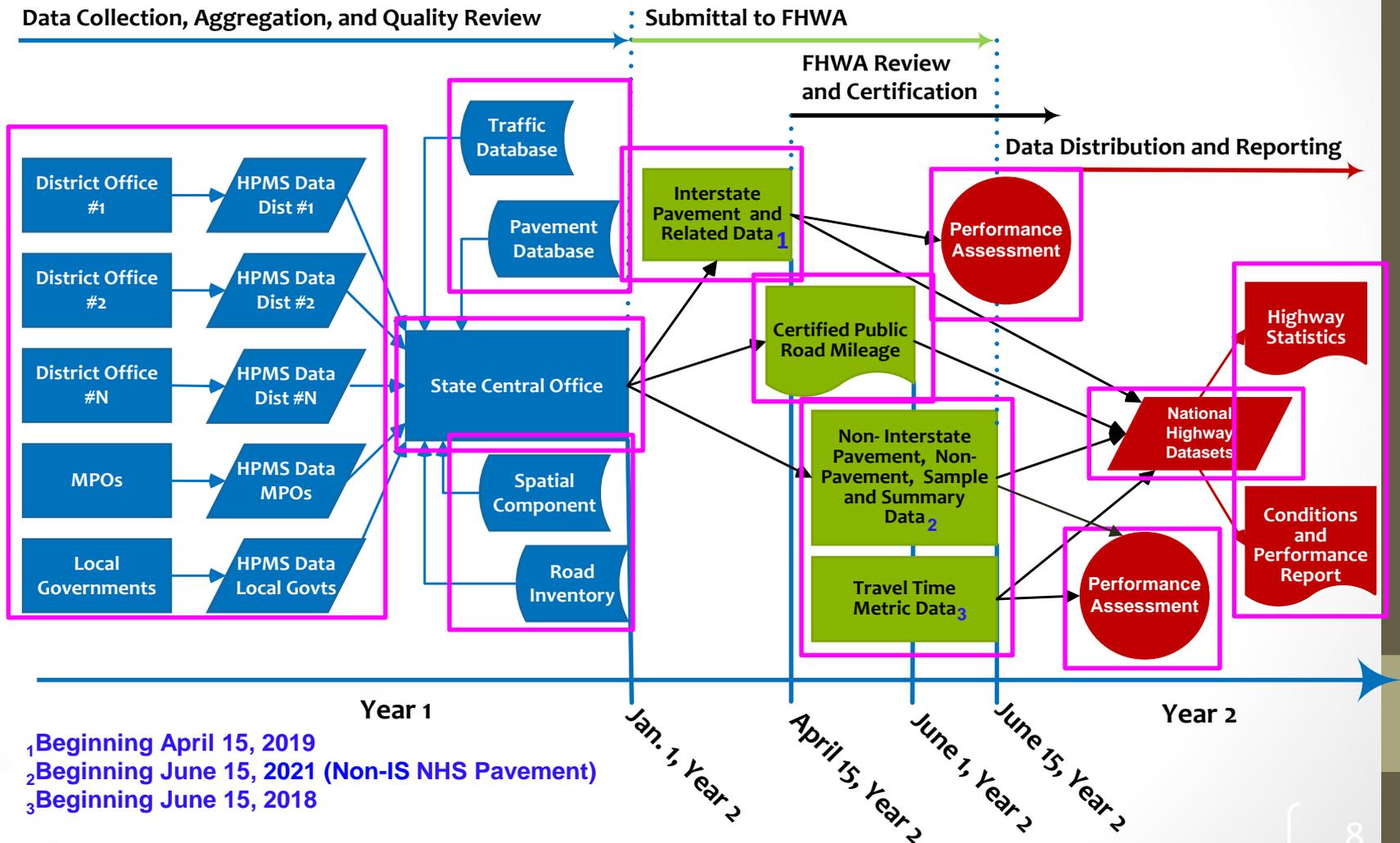


HPMS Field Manual 2016

- Addresses updated data requirements needed to support the Pavement & Bridge Performance Measures (PM2) Final Rule
- Provides additional clarification on existing data collection and reporting guidance



HPMS Submission Timeline (Revised)



Edits: Chapter 3

- Revised 'Metadata Type', 'Description', and 'Value Numeric' information in Table 3.19

| METADATA TYPES AND VALUE NUMERIC SPECIFICATIONS | | |
|---|--|---|
| Type | Description | Value Numeric |
| Class_Pct_Actual | Percent of class AADTs (i.e., Single-unit Truck & Bus, and Combination Truck AADT) reported that are based on actual counts for the reported data year | Enter value to the nearest whole percent. |
| Class_24 | Number of permanent and portable classification count locations that were counted for a duration of 24 hours or more | Integer. |
| IRI_Equip_Type | Type of equipment used predominately for measuring the International Roughness Index (IRI) | <i>Code</i> |
| | | <i>Description</i> |
| | | 1 |
| | | 2 |
| 3 | | |
| 3 | 3-dimensional (3-D) imaging system/scanning laser | |
| 2 | Laser | |
| 3 | Other | |
| Rutting_Interval | For <u>manual</u> rutting method: sampling interval. (Ref: AASHTO Designation R48-10(2013); 7.1.6) <u>or</u> For <u>automatic</u> rutting method: report interval—the travel distance between the reported data. (Ref: AASHTO Designation PP70-14 (2016); 4.2) | Report interval to the nearest foot. |
| Faulting_Interval | Sampling interval. (Ref: AASHTO Designation R36-13; 5.2.5) | Report interval to the nearest 0.1 inch. |



Edits: Chapter 3 (cont'd)

- Revised 'Metadata Type', 'Description', and 'Value Numeric' information in Table 3.19

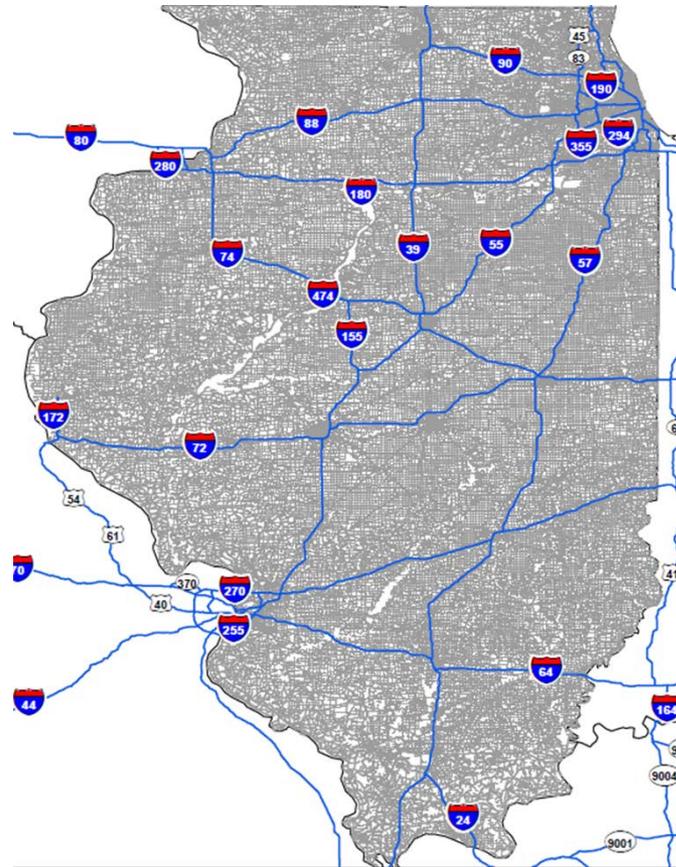
| METADATA TYPES AND VALUE NUMERIC SPECIFICATIONS | | | |
|---|---|--|--|
| Type | Description | Value Numeric | |
| Travel_Source | Source of Travel Data | <i>Code</i> | <i>Description</i> |
| | | 1 | State traffic database only |
| | | 2 | State traffic database and local governments (MPO, Cities, and Counties) |
| | | 3 | Other |
| IRI_Sample_Interval | Longitudinal distance between data capture points. These data points are combined to create one profile data point. These points, in turn, may be combined to create a final value in the reported profile. (Ref: AASHTO Designation M328-14; 3.1.18) | Report interval to the nearest 0.1 inch. | |
| Rutting_Method | Method (Manual or Automated) used to collect most of the rutting data. | <i>Code</i> | <i>Description</i> |
| | | 1 | Manual |
| | | 2 | Automatic |
| Rutt_Trans_Prof_Interval | Transverse profile data point separation distance. (Ref: AASHTO Designation PP70-14 (2016); 5.1) | Report interval to the nearest 0.1 inch. | |
| Pave_Rep_Method | Reporting method for pavement distresses and related data items (e.g., IRI, PSR, Surface Type, etc.) associated with divided Interstate roadway sections | <i>Code</i> | <i>Description</i> |
| | | 1 | Inventory direction (only) |
| | | 2 | Inventory & Non-inventory direction |

*Removed Cracking Length Equipment metadata item



Edits: Chapter 4

- The following data items are required to be reported for rural minor collector and local roads
 - *Functional System*
 - *Facility Type*
 - *Ownership*



Edits: Chapter 4

- The following data items are required to be reported for both directions of travel on divided highway sections
 - **Functional System**
 - **Facility Type**
 - **Ownership**
 - **NHS**



Edits: Chapter 4 (cont'd)

- Modified reporting extent requirements for ***Speed Limit*** data item
 - Required to be reported on a Full Extent (FE) basis for NHS roadways
 - Baseline data will be provided by FHWA; State will be required to validate and/or update this data annually



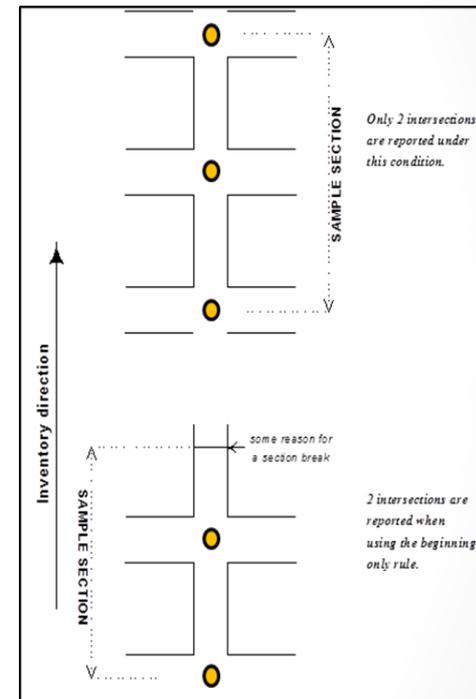
| Functional System | NHS | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-------|
| | | Int | OFE | OPA | MiA | MaC | MiC | Local |
| Rural | FE | FE | SP | SP | SP | SP | | |
| Urban | FE | FE | SP | SP | SP | SP | SP | |

FE = Full Extent SP = Sample Panel Sections



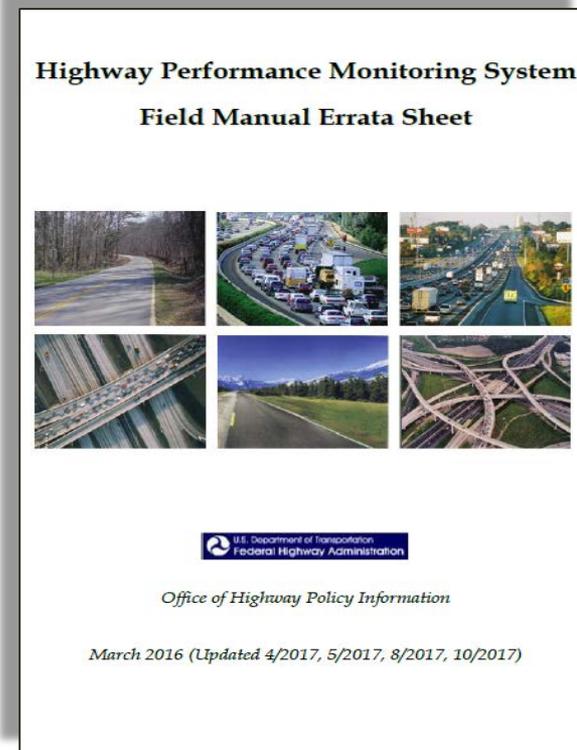
Edits: Chapter 4 (cont'd)

- Revised guidance for intersection-based data items (***No. of Signalized, No. of Stop Sign-Controlled, and No. of At-grade Other Intersections***)
 - Intersection counting approach is to be applied to all 3 data items
 - Intersections where non stop sign or multi-phase signals traffic control devices are present must be reported as part of ***No. of At-grade Other Intersections***



HPMS Field Manual Errata

- Contains revisions to various HPMS Field Manual contents
- Awaiting FHWA Office of Chief Counsel approval
 - Release Date: TBD



HPMS Field Manual Errata (cont'd)

- Revised the definitions for the following coverage specifications used in Table 4.2 (*“Data Items, Related Submission Deadlines and Required Reporting Formats”*)
 - Full Extent (FE), FE*, FE**, FE+R (Ramps), Sample Panel (SP), SP*
- Clarified extent reporting requirements for:
 - Urban Code, Through Lanes, and County Code
- Clarified sample section reporting requirements for:
 - PSR, Rutting, Faulting, and Cracking Percent



Software

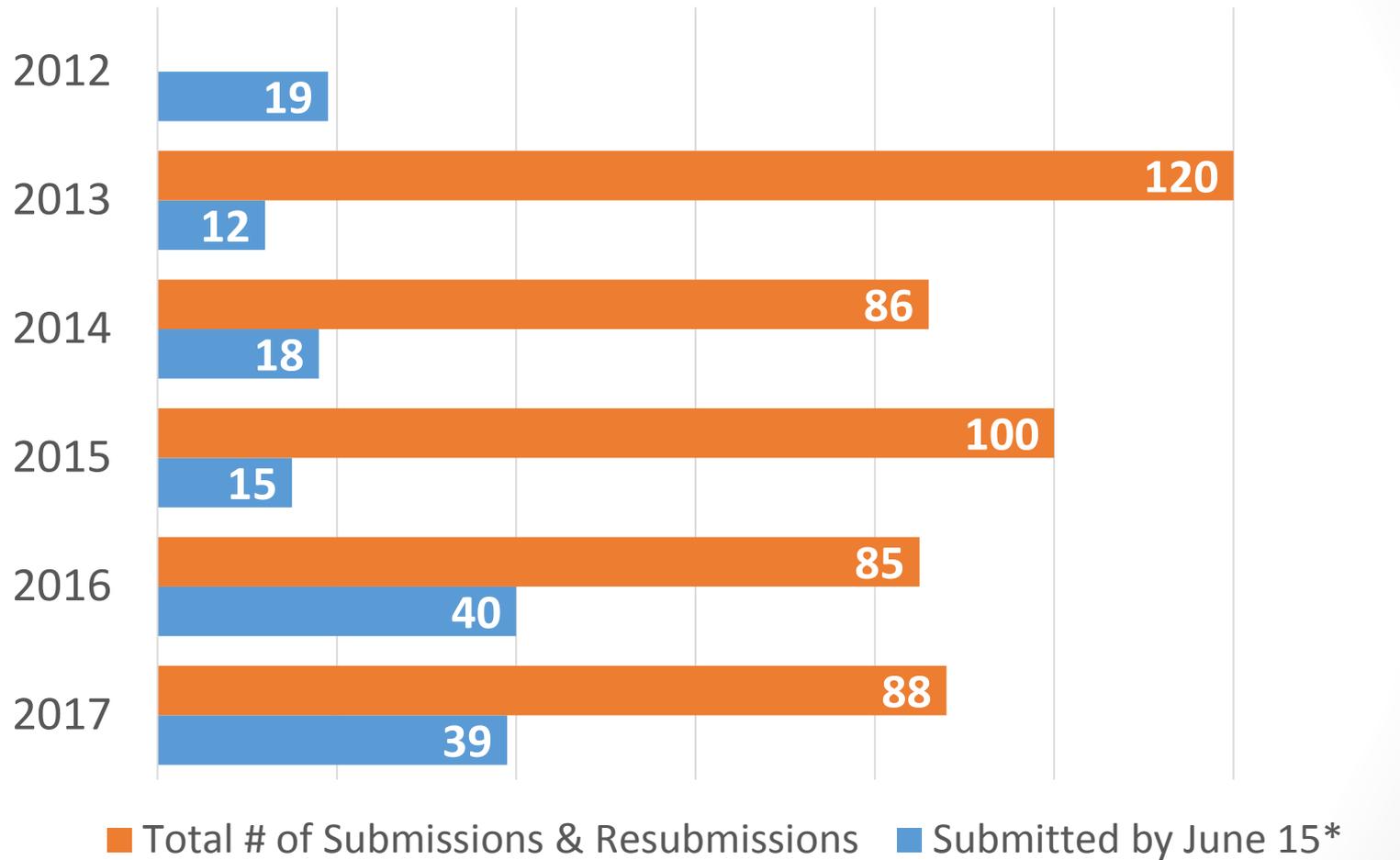


Topics

- Submission 2017 Review
- Recent Software Updates
- Changes for TPM



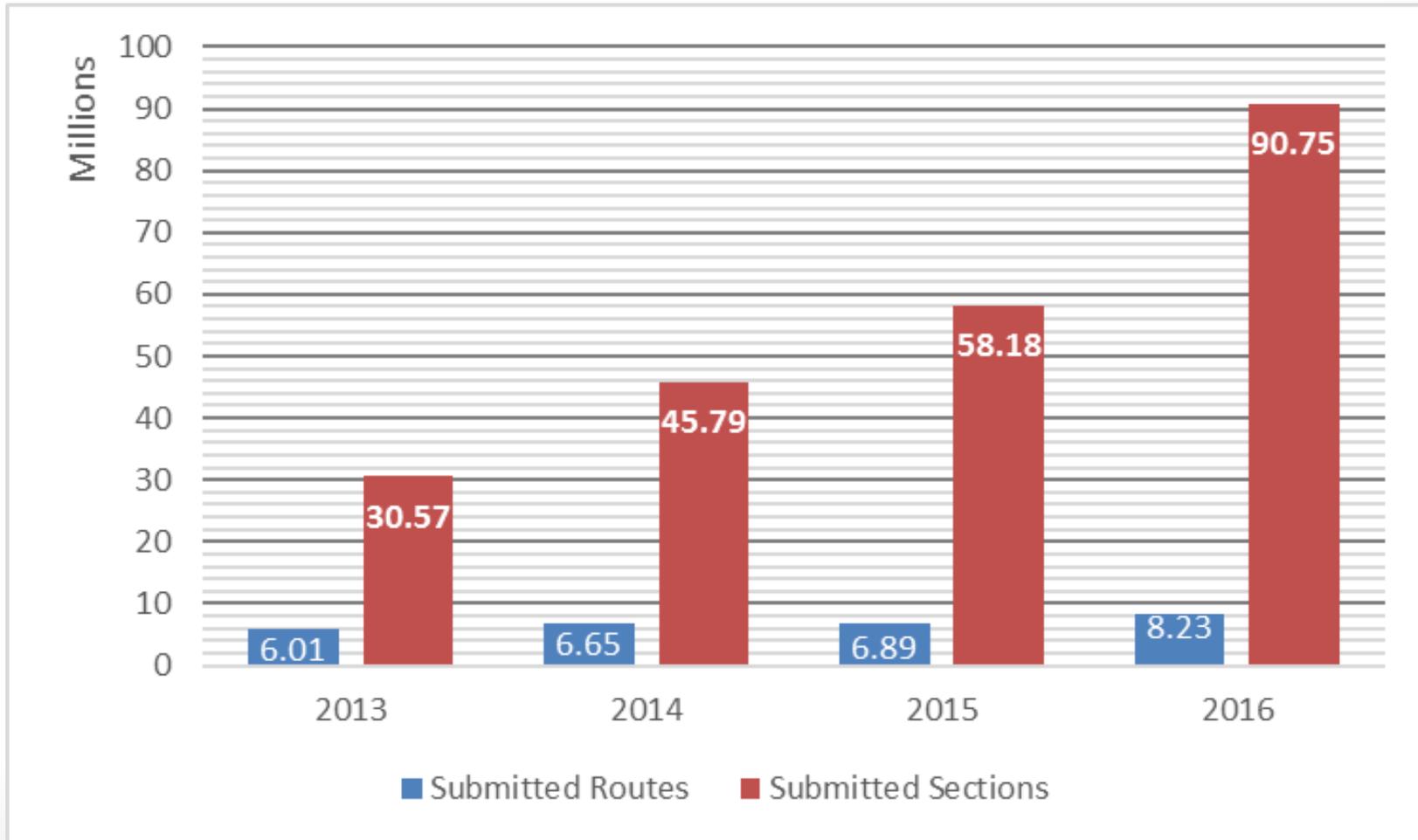
2017 Submissions



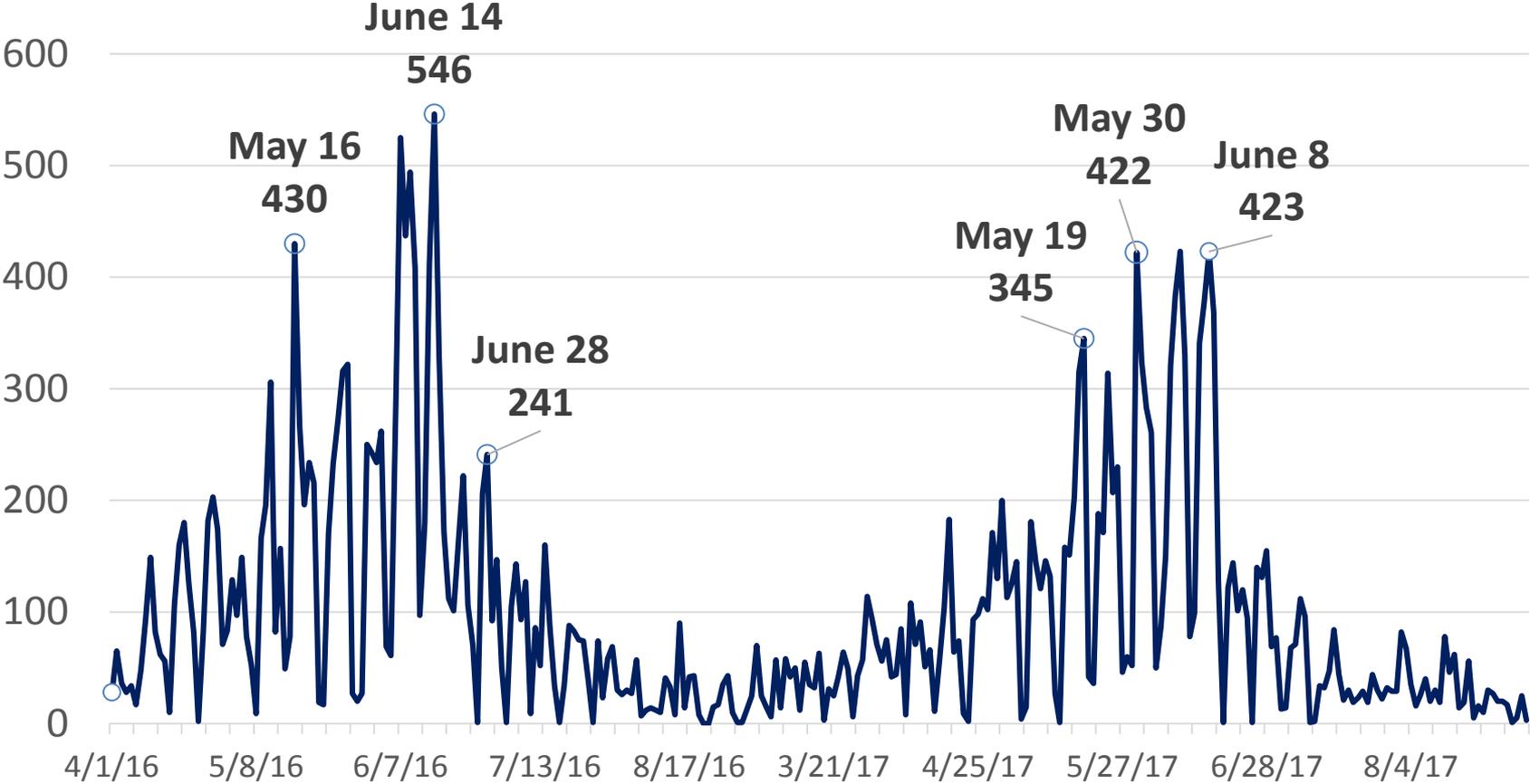
Data through September 7, 2017



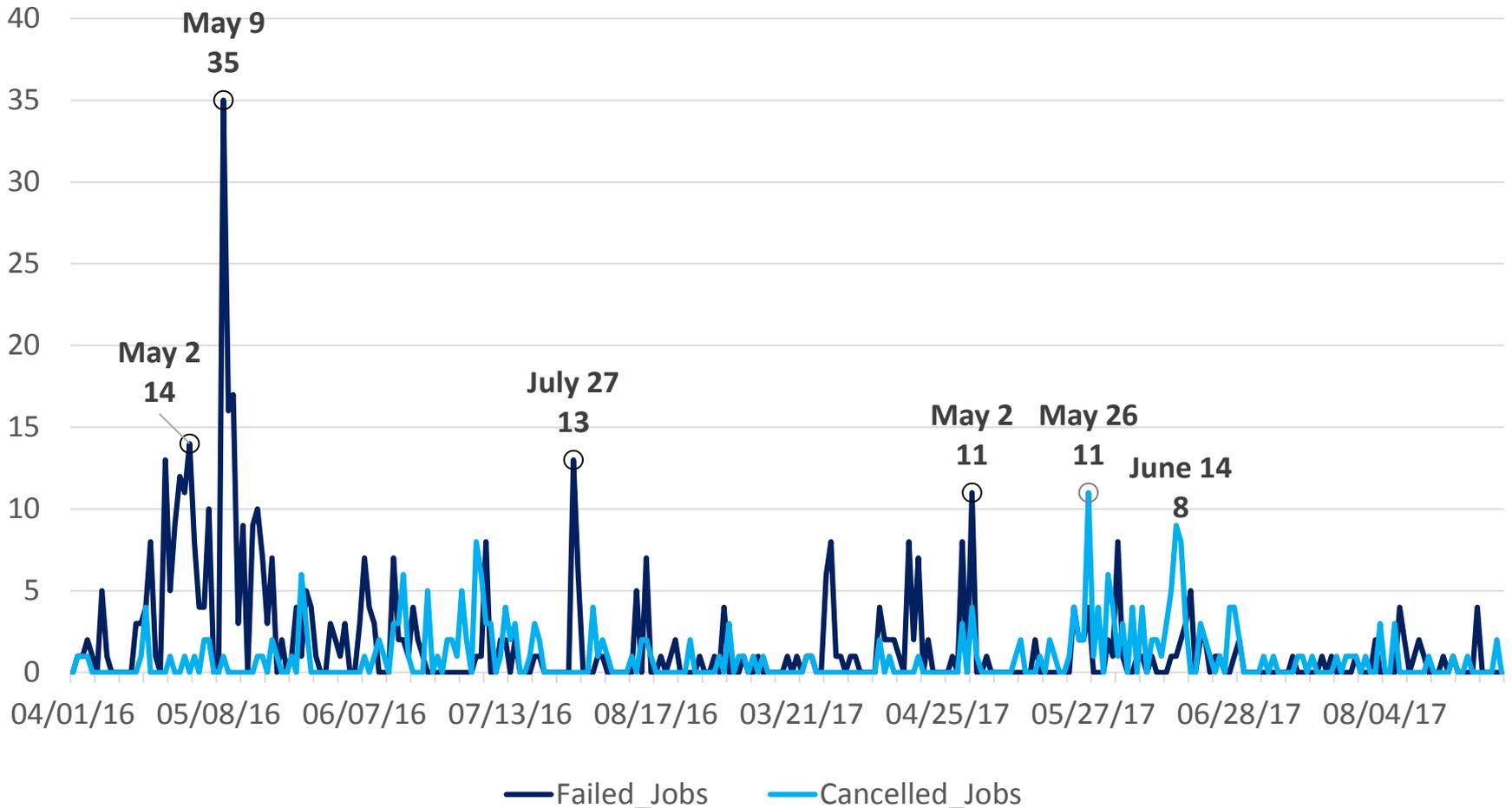
2016 Data Analysis



Count of Successful HPMS Jobs April 2016 - September 2017



Cancelled and Failed HPMS Jobs April 2016 - September 2017



Software Updates



Recent Software Updates

- Fix for section map slowness
- Remove report creation in Review and National
- Pavement Report Card update for 2016 data
- Sample Validation fix
- Interstate and NHS Report updates (two year comparison)
- Urban Area updates
- Metadata Update for 2016 Field Manual
- Capacity Module updates
- Sample Adequacy fix for large sample sets
- Implement sample export tool with spatial output



Recent Software Updates

- Fix for section map slowness
- **Remove report creation in Review and National**
- **Pavement Report Card update for 2016 data**
- Sample Validation fix
- **Interstate and NHS Report updates (two year comparison)**
- Urban Area updates
- **Metadata Update for 2016 Field Manual**
- **Capacity Module updates**
- Sample Adequacy fix for large sample sets
- **Implement sample export tool with spatial output**



Existing Sample "Drill" Tool

Sample Data Items

Sample Details

Year Record: 2016
 State Code: 5
 Sample ID: 301400005500
 Route ID: 10x30x14xA
 Begin Point: 55.087
 End Point: 55.918

F System: 1 - Interstate
 Urban Code: Rural
 Facility Type: 2
 Through Lanes: 4
 AADT: 26000
 Volume Group: 20,000 - 34,999

Section Length: 0.831
 Expansion Factor: 6.971
 Comments:
 Invalid: 0
 Has Geometry: Yes
 Last Modified On: 4/2017 10:46:01 AM
 Last Modified By: Hanley, Maria R

Sample Data Items

Sample Details

Year Record: 2016
 State Code: 5
 Sample ID: 301400005500
 Route ID: 10x30x14xA
 Begin Point: 55.087
 End Point: 55.918

F System: 1 - Interstate
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Section Length: 0.831
 Expansion Factor: 6.971
 Comments:
 Invalid: 0
 Has Geometry: Yes
 Last Modified On: 4/2017 10:46:01 AM
 Last Modified By: Hanley, Maria R

Data Items

| Inventory | Traffic |
|-------------------------------|---|
| Structure Type | AADT Single Unit: 1846 Widening Obstacle |
| Access Control: 1 | Pct Peak Single: 0.7 Widening Potential |
| Ownership: 1 | AADT Combination: 9672 Curves A |
| HOV Type: 1 | Pct Peak Combination: 4.2 Curves B |
| HOV Lanes: 1 | K_Factor: 10 Curves C |
| Peak Lanes: 2 | Dir Factor: 55 Curves D |
| Counter Peak Lanes: 2 | Future AADT: 35230 Curves E |
| Turn Lanes R: 1 | Future AADT (Year): 2036 Curves F |
| Turn Lanes L: 1 | Signal Type: Terrain Type |
| Turn Lanes T: 70 | Pct Green Time: Grades A |
| Toll Charged: 1 | Number Signals: Grades B |
| Toll Charged (ID): 0 | Stop Signs: 0 Grades C |
| Toll Type: 0 | At Grade Other: 0 Grades D |
| County Code: 19 | Grades E: Grades E |
| | Grades F: Grades F |
| | Pct Pass Sight |
| Geometric | |
| Route: Lane Width: 12 | |
| Median Type: 4 | Pavement |
| Route Number: 30 | Median Width: 99 |
| Route Number (T): 2 | Shoulder Type: 2 IRI |
| Route Signing: 2 | Shoulder Width R: 10 IRI (Year) |
| Route Qualifier: 10 | Shoulder Width L: 4 IRI (Month) |
| Alt. Route Name: Peak Parking | PSR |
| | Missing and Required |
| | Missing, but Not Required |
| | Reported |
| | Special Networks |
| | NHS: 1 |
| | Future Facility: 48 |
| | STRAHNET Type: 2016 |
| | Truck: 9 |
| | Maintenance Operation: 1 |

Need for Additional Features

- ✓ Assist with Division Office Sample Review
- ✓ Facilitate review of samples with missing data
- ✓ Spatial output
- ✓ Make an easy option



Automatic Report Output

30 Tops and 30 Sample Sections

U.S. Department of Transportation
Federal Highway Administration

Highway Performance

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT REPORTS & ANALYSIS DOCUMENTATION ADMIN HELP

Reports

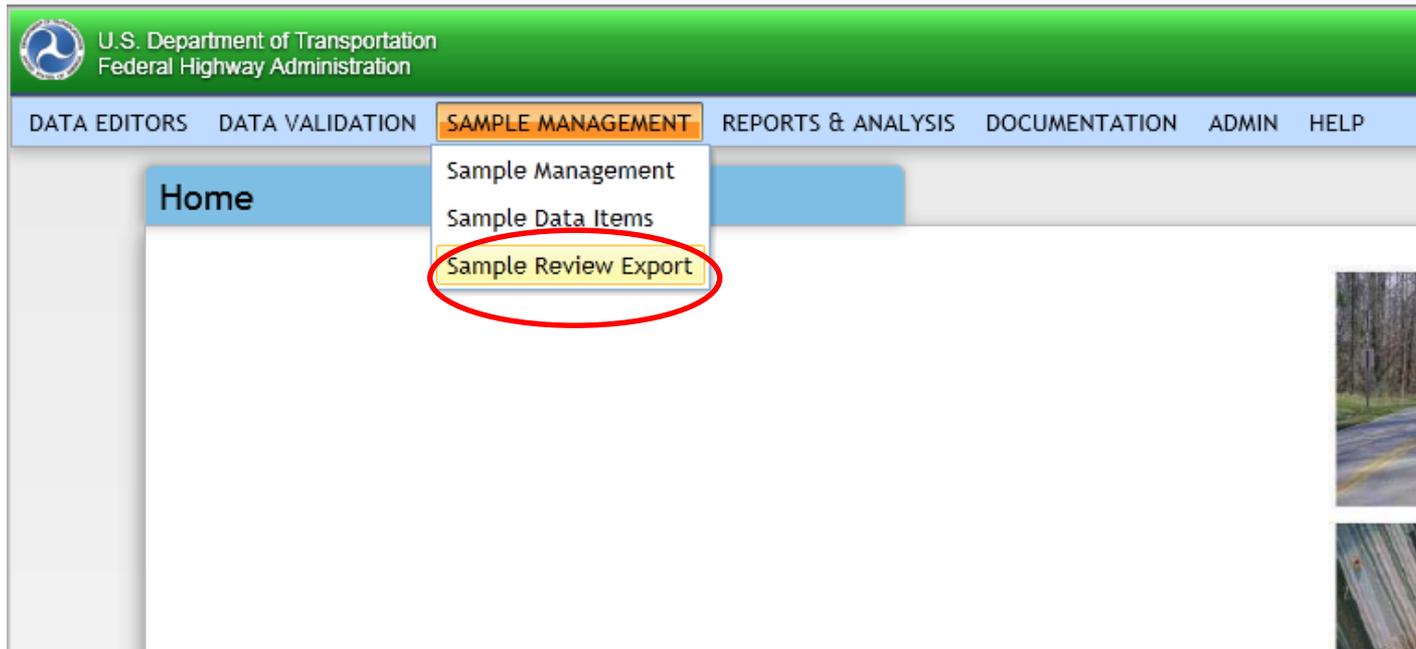
Last updated: 5:07:51 PM

Year: 2

| Report Name | Report Status | Submitted By | Submitted On | Create |
|---|-------------------------------|------------------|-----------------------|--------|
| Consistency | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Extent and Travel on the Interstates | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Extent and Travel on the NHS | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Extent and Travel Report | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Extent and Travel Report (Urban/Rural Summary) | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| IRI on the Federal Aid Highways | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| IRI on the NHS | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Length of Missing Pavement Data | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Overview | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Ownership | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Pavement Report Card | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Validation Summary | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Sample Adequacy | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Vehicle Summary Changes | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Sample VMT Comparison | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Sample and TOPS Review Report | 5 - Report Created | Koester, Kevin | 6/15/2017 10:52:53 PM | |
| Extent and Travel Report (Nationwide) | 7 - Report Creation Cancelled | Einolf, Jerry D | 9/13/2017 8:55:25 AM | |
| HM-20 (Public Road Length by Functional System) | 7 - Report Creation Cancelled | Einolf, Jerry D | 9/13/2017 8:55:25 AM | |
| HM-60 (Estimated Public Road Lane - Miles by Functional System) | 7 - Report Creation Cancelled | Einolf, Jerry D | 9/13/2017 8:55:25 AM | |
| VM-2 (Vehicle -Miles of Travel by Functional System) | 5 - Report Created | Zhang, Patrick P | 10/30/2017 2:47:18 PM | |



New Tool (Interactive Option)



New Tool

U.S. Department of Transportation
Federal Highway Administration

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT REPORTS & ANALYSIS DOCUMENTS

Samples Export

Random Select Samples and Tops

Random Select

Export Selected

Samples Number All Samples

TOPS Number

Filter Samples by Missing Data Items: [Select/Unselect All](#)

- Base_Thickness
- Base_Type
- Cracking_Percent
- Faulting
- IRI

Within Counties OR Within Urbans

| | |
|-------------|---------------------------|
| 1 - Adair | 30925 - Fort Smith, AR--C |
| 3 - Alfalfa | 48394 - Lawton, OK |
| 5 - Atoka | 63433 - Norman, OK |
| 7 - Beaver | 65080 - Oklahoma City, O |
| 9 - Beckham | 88948 - Tulsa, OK |
| 11 - Blaine | |

FHWA HPMS program guidelines require an annual review of 30 TOPS Sections and 30 Sample Selections

Random Select **Close**

Zoom To Year Record State Code Route ID Begin Point End Point Section Length



New Tool

The screenshot shows the 'Samples Export' tool interface. At the top, there are two green banners for the U.S. Department of Transportation Federal Highway Administration. Below them is a navigation bar with 'DATA EDITORS', 'DATA VALIDATION', 'SAMPLE MANAGEMENT', 'REPORTS & ANALYSIS', and 'DOCUMENT'. The main window is titled 'Samples Export' and contains a 'Random Select Samples and Tops' dialog box. This dialog has input fields for 'Samples Number' (set to 5) and 'TOPS Number' (set to 0), with an 'All Samples' checkbox. Below these are filter options for missing data items, a list of data items (Base_Thickness, Base_Type, Cracking_Percent, Faulting, IRI), and two lists for 'Within Counties' and 'OR Within Urbans'. The 'Random Select' button is circled in red. A callout box on the right points to the input fields with the text 'Adjust # of Samples/TOPS Sections'. A callout box on the left points to the filter options with the text 'Filter for Missing Data Items'. Another callout box on the left points to the county/urban lists with the text 'Filter/Select UAs or Counties'.

Filter for Missing Data Items

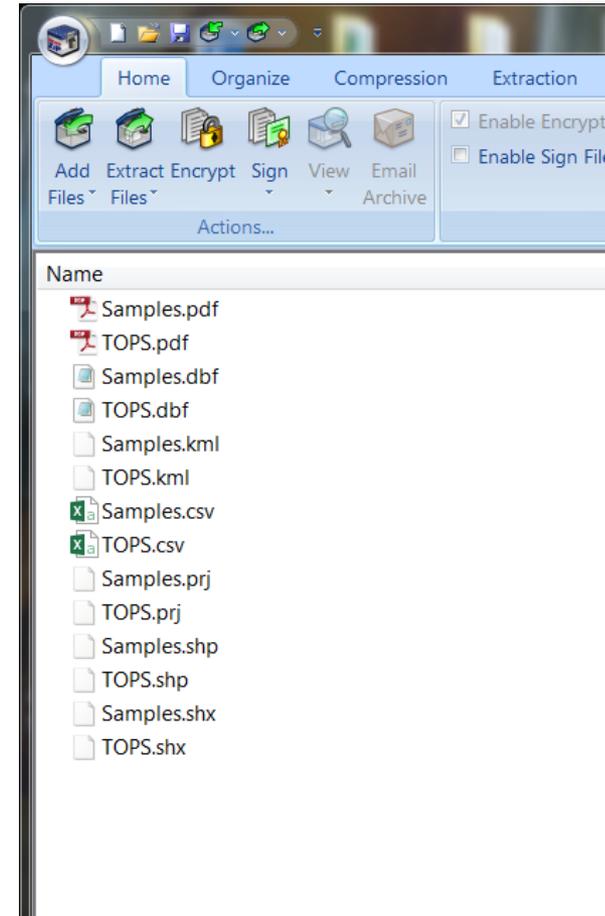
Filter/Select UAs or Counties

Adjust # of Samples/TOPS Sections

Example Report Output

Output (As zip file –)

- **PDF** report for Samples and TOPS
- **.csv** files for Samples and TOPS
- **Shapefile** for Samples and TOPS
- **.kml** for Samples and TOPS for Google Earth



Example Report Output

HPMS 8.0.1 Sample Review Report Stage: Review
Year: 2015
State: 40 - Oklahoma
Date: 09/13/2017

| Sample Details | | | |
|----------------|---------------------|--------------|------------------------|
| Sample ID | 0000000010 | Route ID | 0112 0000 |
| F System | 6 - Major Collector | Urban | Rural |
| AAADT | 1800 | Vol. Grp | 800 - 1,999 |
| Comments | | | |
| Last Mod. By | stewart, Ron | Last Mod. On | 09/04/2016 11:30:13 AM |

■ Missing and Required
 ■ Missing, but Not Required
 ■ Reported

| Inventory | | | | | |
|----------------|----------------|---|--------------|---|-----------------|
| Structure Type | Access Control | 3 | Ownership | 1 | HOV Type |
| Counter Peak | Turn Lanes R | | Turn Lanes L | | HOV Lanes |
| Toll Type | County Code | 1 | | | Peak Lanes |
| | | | | | 2 |
| | | | | | Speed |
| | | | | | 65 |
| | | | | | Toll Charged |
| | | | | | Toll Charged ID |

| Route | | | | | |
|-------|----|--------------|------|-----------------|------|
| Route | 10 | Route Number | 2010 | Route | 4 |
| | | | | Route | 1 |
| | | | | Alt. Route Name | 2010 |

| Traffic | | | | | |
|----------------|----|-----------------|------|--------------------|------|
| AAADT Single | 54 | Pct Peak Single | 0.3 | AAADT Comb. | 48 |
| Dir Factor | 55 | Future AADT | 2100 | Future AADT (Year) | 2035 |
| Number Signals | 0 | Stop Signs | 0 | At Grade Other | 4 |
| | | | | Pct Peak Comb. | 0.2 |
| | | | | K Factor | 10 |
| | | | | Signal Type | |
| | | | | Pct Green Time | |

| Geometry | | | | | |
|------------|--------|-----------|--------|----------------|---|
| Lane Width | 12 | Med. Type | 1 | Med. Width | |
| Curves | A 1.58 | B 0.55 | C 0.32 | D | E |
| Grades | A 0.52 | B 1.47 | C 0.42 | D 0.07 | E |
| | | | | F | |
| | | | | Sh. Type | 0 |
| | | | | Sh. Width R | 0 |
| | | | | Sh. Width L | |
| | | | | Widen. Obst | D |
| | | | | Pot Pass Sight | 0 |
| | | | | Peak Parking | 3 |
| | | | | Terrain Type | 2 |

| Pavement | | | | | |
|------------------------|-----|--------------------|------|------------------------|------|
| IRI | 137 | IRI (Year) | 2015 | IRI (Month) | 12 |
| Cracking Percent | 3 | Cracking Length | | PSR | |
| Last Overlay Thickness | 2 | Thickness Rigid | | Surface Type | 0 |
| Base Thickness | 3 | Thickness Flexible | | Year Last Improv | 2005 |
| | | Soil Type | | Year Last Construction | 1989 |
| | | Climate Zone | | Thickness Flexible | 5 |
| | | | | Base Type | 3 |

| Special Network | | | |
|-----------------|-----------------|---------------|------------------------|
| NHS | Future Facility | STRAHNET Type | Truck |
| | | | Maintenance Operations |

Report Generated On - 09/13/2017 3:17:46 PM Page 1 of 30

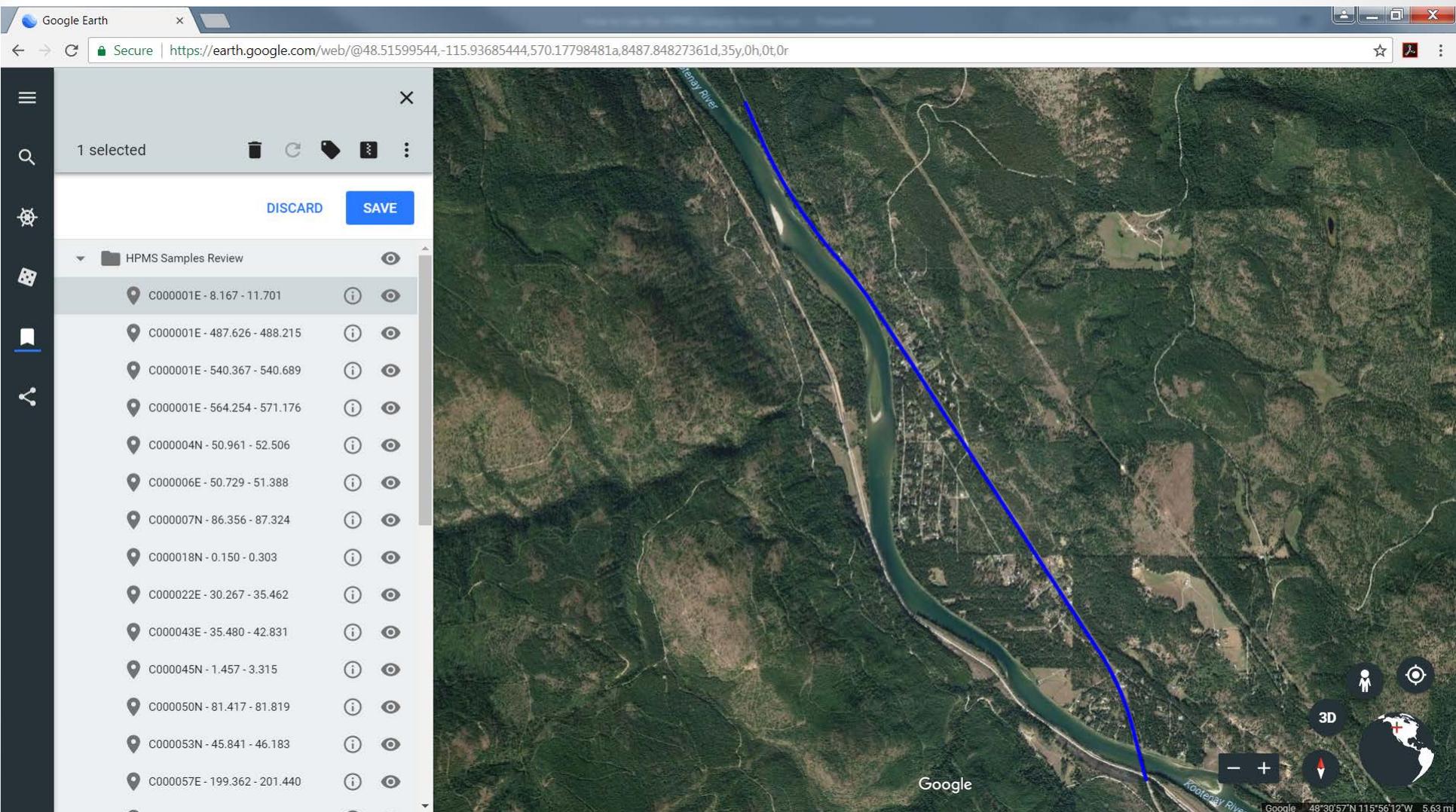
HPMS 8.0.1 TOPS Review Report Stage: Review
Year: 2015
State: 40 - Oklahoma
Date: 09/13/2017

| TOPS Details | | | |
|---------------|--------------|--------------|------------------------|
| Route ID | 0000 0000 | Begin Point | 0.000 |
| Facility Type | 2 | End Point | 7.760 |
| LMT Mod. By | stewart, Ron | F System | 8 |
| | | Urban Code | 9999 |
| | | AAADT | 1800 |
| | | Volume Group | 2 |
| | | Last Mod. On | 09/04/2016 11:16:23 AM |
| | | | Through Lanes |
| | | | 2 |

| TOPS Details | | | |
|---------------|--------------|--------------|------------------------|
| Route ID | 1001U 0000 | Begin Point | 0.760 |
| Facility Type | 2 | End Point | 1.040 |
| LMT Mod. By | stewart, Ron | F System | 4 |
| | | Urban Code | 9999 |
| | | AAADT | 2076 |
| | | Volume Group | 3 |
| | | Last Mod. On | 09/04/2016 11:16:23 AM |
| | | | Through Lanes |
| | | | 2 |

Report Generated On - 09/13/2017 3:18:01 PM Page 1 of 15

Example KML View



Example KML View

The screenshot displays the Google Earth interface. On the left, a sidebar shows a folder named "HPMS Samples Review" containing a list of 15 sample entries, each with a location pin icon and a name like "C000001E - 8.167 - 11.701". The main view shows a 3D perspective of a road labeled "US-2" in white text on the asphalt. A data table is overlaid on the road, providing detailed information for a specific location. The table includes fields such as "stateyearkey", "year_record", "state_code", "volume_group_listing", "f_system_listing", "urban_code_listing", "sample_id", "route_id", "begin_point", "end_point", "f_system", "urban_code", "facility_type", "through_lanes", "aad", "volume_group", "expansion_factor", "last_modified_on", "last_modified_by", "structure_type", "access_control", "ownership", "peak_lanes", "speed_limit", "route_number", "route_number_t", "route_signing", and "route_qualifier". The background shows a road stretching into the distance under a cloudy sky, with trees and utility poles visible on the sides.

| | |
|----------------------|--------------------------|
| stateyearkey | 3015 |
| year_record | 2015 |
| state_code | 30 |
| volume_group_listing | 2,000 - 4,999 |
| f_system_listing | 3 - PA - Other |
| urban_code_listing | Rural |
| sample_id | 0000000000003 |
| route_id | C000001E |
| begin_point | 8.167 |
| end_point | 11.701 |
| f_system | 3 |
| urban_code | 99999 |
| facility_type | 2 |
| through_lanes | 2 |
| aadt | 2033 |
| volume_group | 3 |
| expansion_factor | 4.446 |
| last_modified_on | 09/02/2016 1:05:51 PM |
| last_modified_by | Wilson, Vicki J |
| structure_type | 1 |
| access_control | 2 |
| ownership | 1 |
| peak_lanes | 2 |
| speed_limit | 70 |
| route_number | 2 |
| route_number_t | 2 |
| route_signing | 3 |
| route_qualifier | 1 |

Guidance Documentation



- Workflow diagrams
- More Screen shots
- Available 2018
- Future integration with Software Guide

"...a solid introduction to the tool, truly a great read."

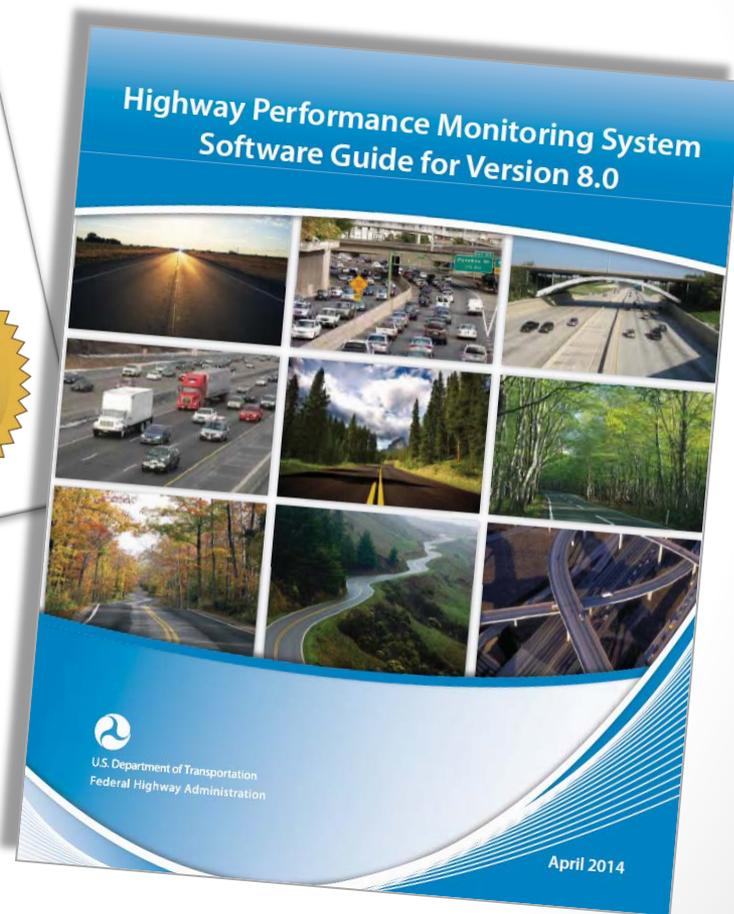
- Chris Allen, Division Chief, FHWA



Guidance Documentation

Using the HPMS
Sample Review Tool
For HPMS v8 Software

A Good
Read





- PM3 – Travel Time Data Reporting

- New Data Item
- New ‘Summary’ Table
- Validations



- PM2 – Pavement Condition

- Submission Related Updates
- Pavement Report Card
- Validations



PM3 Updates



Travel Time Reporting Segments

- **New Data Item: Travel_Time_Code**
- State-generated unique identifier for a reporting segment
- Used when states are not reporting data using FHWA provided travel time segment data (NPMRDS)

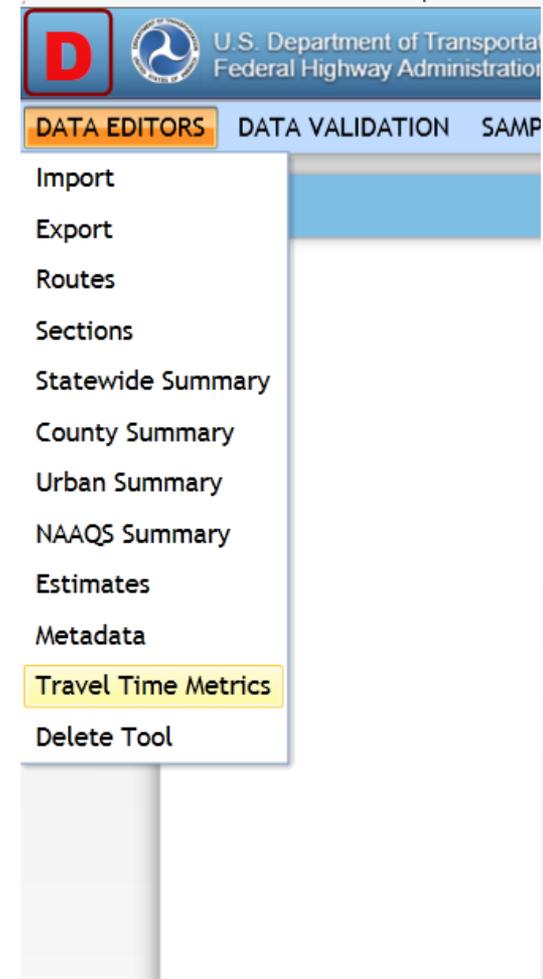
The screenshot displays the Highway Performance Monitoring System v8.0 interface. The top navigation bar includes 'DATA EDITORS', 'DATA VALIDATION', 'SAMPLE MANAGEMENT', 'CALCULATIONS', 'REPORTS & ANALYSIS', 'SUBMIT DATA', 'ADMIN', and 'HELP'. The main content area shows a map of Colorado with a network of road segments highlighted in blue. A 'Select Data Item' dialog box is open on the left, listing various data items, with 'TRAVEL_TIME_CODE' selected. Below the map, a data table is visible, showing a list of segments with columns for 'Begin Point', 'End Point', 'Section Length', 'Value Numeric', 'Value Text', 'Value Date', 'Comment', 'Last Modified By', 'Last Modified On', and 'Data Source'. The table contains several rows of data, all with a 'Comment' of 'Faked TRAVEL_TIME_CODE SW'. The status bar at the bottom indicates 'Total Sections - Travel Time Code: 11617' and 'Page 1 of 465'.

| | Begin Point | End Point | Section Length | Value Numeric | Value Text | Value Date | Comment | Last Modified By | Last Modified On | Data Source |
|--|-------------|-----------|----------------|---------------|-----------------------|------------|---------------------------|------------------|------------------------|-------------|
| | 0 | 1.730 | 1.730 | 6400.000 | 001-0-2013-0018_0_000 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 1.730 | 2.190 | 0.460 | 5000.000 | 001-0-2013-0018_1_730 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 2.190 | 3.000 | 0.810 | 4400.000 | 001-0-2013-0018_2_190 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 0 | 0.250 | 0.250 | 41000.000 | 001-0-2013-0060_0_000 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 0.250 | 1.070 | 0.820 | 35000.000 | 001-0-2013-0060_0_250 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 1.070 | 1.940 | 0.870 | 38000.000 | 001-0-2013-0060_1_070 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 1.940 | 2.260 | 0.320 | 27000.000 | 001-0-2013-0060_1_940 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |
| | 0 | 0.650 | 0.650 | 12000.000 | 001-0-2013-0090_0_000 | | Faked TRAVEL_TIME_CODE SW | | 10/16/2017 11:48:44 AM | |



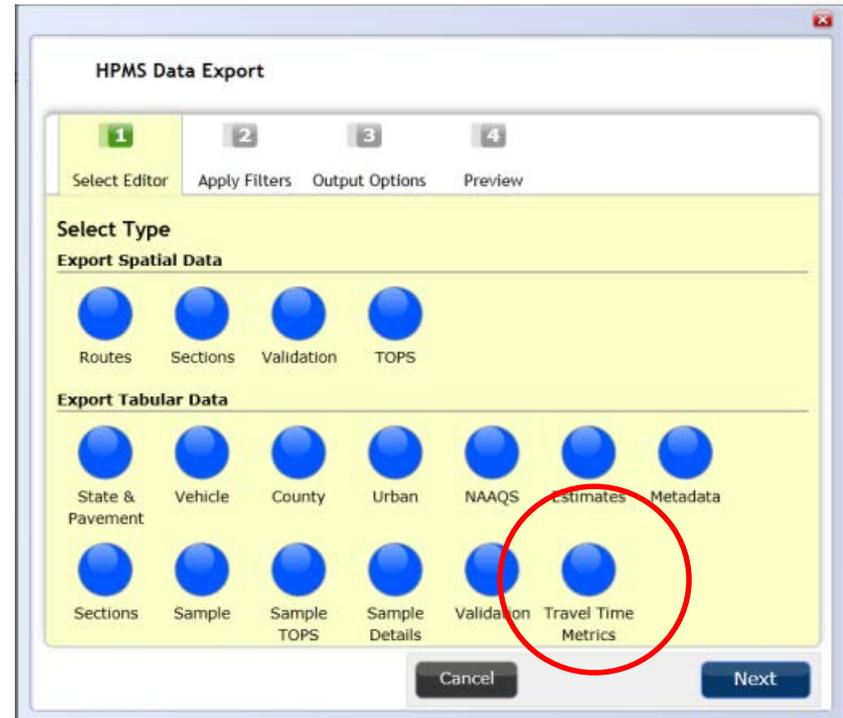
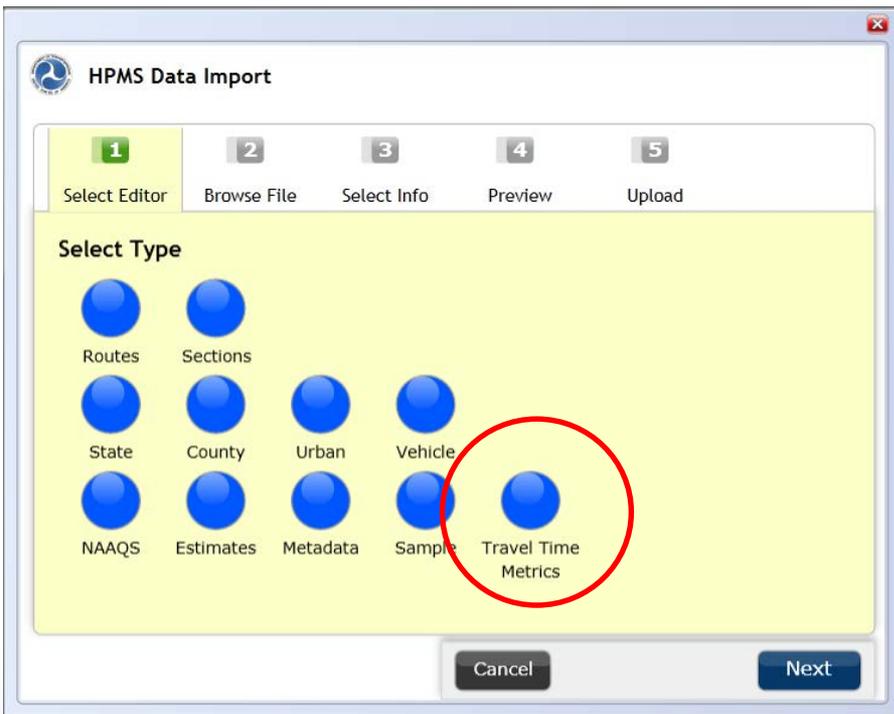
Travel Time Metrics

- **New ‘Summary’ Data Table for Travel Time Metrics**
- Fields for metric data e.g. AADT, Truck AADT, etc.
- One record for each travel time segment



Travel Time Metrics

Input and Export via existing procedures for other data sets



Travel Time Metrics

- Requirement for valid submissions
- Validations in development

The screenshot displays the 'Submit Data' page in the FHWA system. The header includes the FHWA logo and navigation tabs: DATA EDITORS, DATA VALIDATION, SAMPLE MANAGEMENT, CALCULATIONS, and REPORTS & ANALYSIS. The main content area shows submission details and validation results.

Submit Data

Last Submitted On: 6/29/2017 3:52:06 PM Last Submitted By:

| Summary Validation | Data Editor Validation |
|---------------------------|-------------------------|
| ✓ County Summary | ✗ Crosscheck Validation |
| ✓ Demography Summary | ✗ LRS Validation |
| ✓ NAAQS Summary | |
| ✓ Pavement Summary | |
| ✓ Travel Summary | |
| ✓ Travel Time Metrics | |
| ✓ Urban Summary | |
| ✓ Vehicle Summary - Rural | |
| ✓ Vehicle Summary - Urban | |

There are editors that need to be validated before submitting.

A red arrow points to the 'Check Status' button in the left sidebar.



PM2 Updates



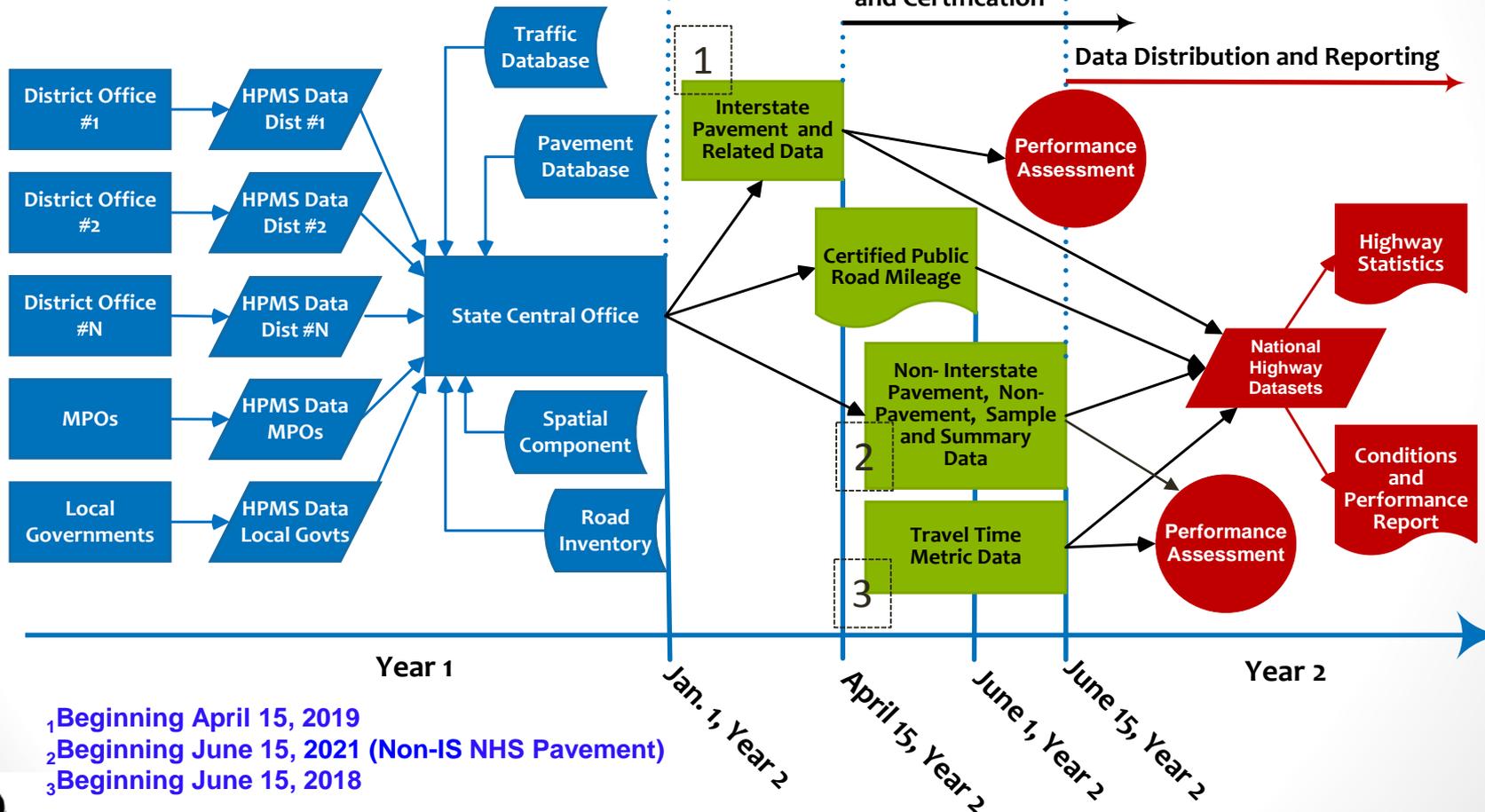
Dual Submissions

Data Collection, Aggregation, and Quality Review

Submittal to FHWA

FHWA Review and Certification

Data Distribution and Reporting



¹Beginning April 15, 2019

²Beginning June 15, 2021 (Non-IS NHS Pavement)

³Beginning June 15, 2018

Dual Submissions

- Interstate pavement condition data April 15
- Non-Interstate NHS pavement condition data June 15
- Data locked for review after each submission date
- Changes to Submit Screen e.g. Certified Mileage Check

The screenshot displays the 'Submit Data' interface for the District of Columbia in 2016. The navigation bar includes: DATA EDITORS, DATA VALIDATION, SAMPLE MANAGEMENT, CALCULATIONS, REPORTS & ANALYSIS, SUBMIT DATA, ADMIN, and HELP. The main header shows 'Submit Data' and 'Year: 2016 State: 11 - District of Columbia'. A status box indicates 'Last Submitted On: 8/17/2017 10:16:35 AM' and 'Last Submitted By: Carpenter, Edward'. The interface is divided into two validation sections: 'Summary Validation' and 'Data Editor Validation'. The 'Summary Validation' section lists several categories with green checkmarks, indicating successful validation: County Summary, Demography Summary, NAAQS Summary, Pavement Summary, Travel Summary, Urban Summary, Vehicle Summary - Rural, and Vehicle Summary - Urban. The 'Data Editor Validation' section shows two categories with yellow warning triangles: Crosscheck Validation and LRS Validation. Below these sections is a 'Certified Miles' section with two input fields: 'HPMS Calculated Miles' (1508.737) and 'State Certified Miles' (1508.950). At the bottom, there is a 'Submittal Comment (Required)' section with a text area containing the text 'District of Columbia HPMS 2016 Submittal'.



Validations for Inventory Data

Coverage Validations

- NHS – based on approved NHS
- Facility Type
- Through lanes*
- Functional system
- Surface type
- Structure type
- Urban code

*Directional through lanes for dual-carriage reporting for Interstates



Validations for Condition Data

Coverage and Cross Validations

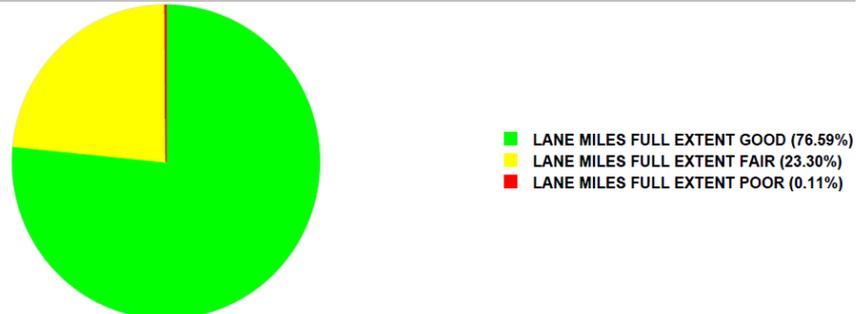
- Roughness (IRI) (MRI) – Collection Date
- Rutting (asphalt pavements only)
- Cracking Percent – by surface type
- Faulting (concrete pavements only)
- Can use Present Serviceability Rating (PSR) only where speed limit < 40 mph



Pavement Report Card

- Missing, Invalid and Unresolved Data – max limit, include Unresolved
- PSR - other distress data not required unless it is on a sample
- Dates for rutting/cracking/faulting (like IRI)

| HPMS 8.0.1 FULL EXTENT LANE MILES RATING (INTERSTATE) | | Stage: Review |
|--|-----------|-------------------|
| | | Year: 2016 |
| | | State: [REDACTED] |
| | | Date: 06/06/2017 |
| LANE MILES FULL EXTENT GOOD | 1,101.684 | |
| LANE MILES FULL EXTENT FAIR | 335.130 | |
| LANE MILES FULL EXTENT POOR | 1.600 | |
| TOTAL | 1,438.414 | |
| ESTIMATED TOTAL INTERSTATE LANE MILES MISSING OR INVALID DATA | 3,262.396 | |
| % ESTIMATED TOTAL INTERSTATE LANE MILES MISSING OR INVALID DATA - LIMIT 5.0% | 69.40 % | |
| SAMPLE SIZE | 30.57 % | |
| % SURFACE TYPE BETWEEN 2 AND 10 RATED AS G-F-P | 100.00 % | |



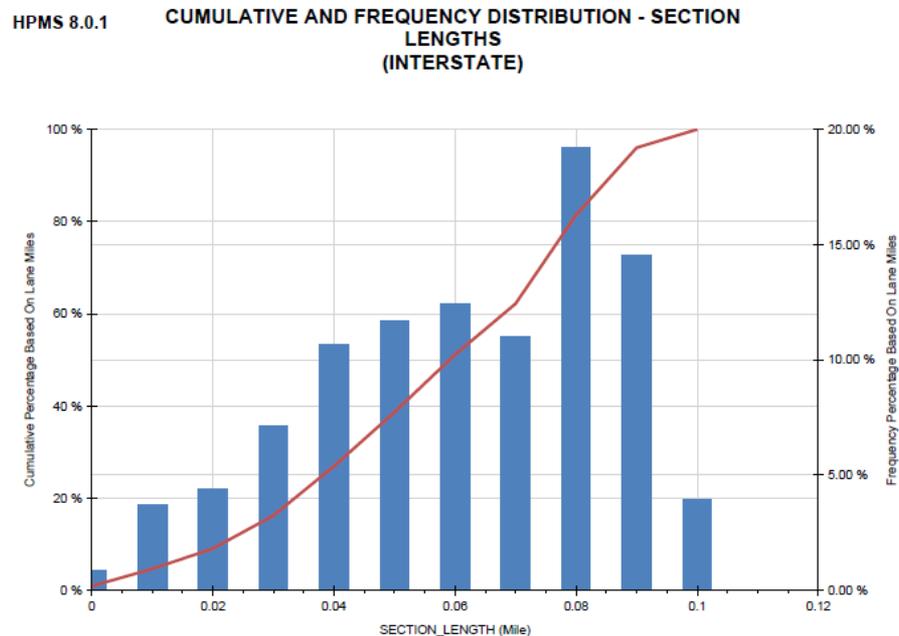
THE HPMS PAVEMENT REPORT CARD'S PURPOSE IS TO PROVIDE FEEDBACK TO DIVISIONS AND STATES ON THEIR HPMS PAVEMENT SUBMITTAL DATA IN RESPONSE TO REQUIREMENTS OF 23 CFR 490. THE REPORT CARD IS FOR INFORMATION ONLY AND SHOULD NOT BE CONSIDERED THE OFFICIAL CALCULATION OF MEASURES OR MISSING OR INVALID DATA FOR A STATE.

BASED ON 23 CFR 490 THE REPORT CARD IS ANALYZING FULL EXTENT, NOT SAMPLE BASED, PAVEMENT DATA. STATES ARE ENCOURAGED TO SUBMIT FULL EXTENT DATA PRIOR TO ITS REQUIREMENT SO THEY CAN BETTER ASSESS THEIR DATA SUBMISSION.

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

Pavement Report Card

- More up to date bridge data? - connection to NBI
- Flags for submission scenarios - e.g. data complete but not in the year required...
- Cracking - change the percentage from 54% to 54.2%
- Spatial alignment – use IRI as base



NHS and Urban Area Modules



Maintenance Module



The screenshot displays the Highway Performance Monitoring System v8.0 interface. At the top, the U.S. Department of Transportation Federal Highway Administration logo is on the left, and the system title 'Highway Performance Monitoring System v8.0' is in the center. On the right, there is a navigation bar with buttons for 'Submittal', 'Review', 'National', and 'Maintenance'. Below this, a secondary navigation bar contains 'URBAN AREAS', 'NHS', 'HELP', and an 'EXIT' link. The main content area features a 'Home' tab on the left and a dropdown menu showing 'State: 11 - District of Columbia'. The central part of the page contains a grid of six images: a road winding through trees, a highway with traffic, a highway with a yellow truck, a highway interchange, a road with mountains in the background, and a complex highway interchange. Below the grid is a magnifying glass icon.



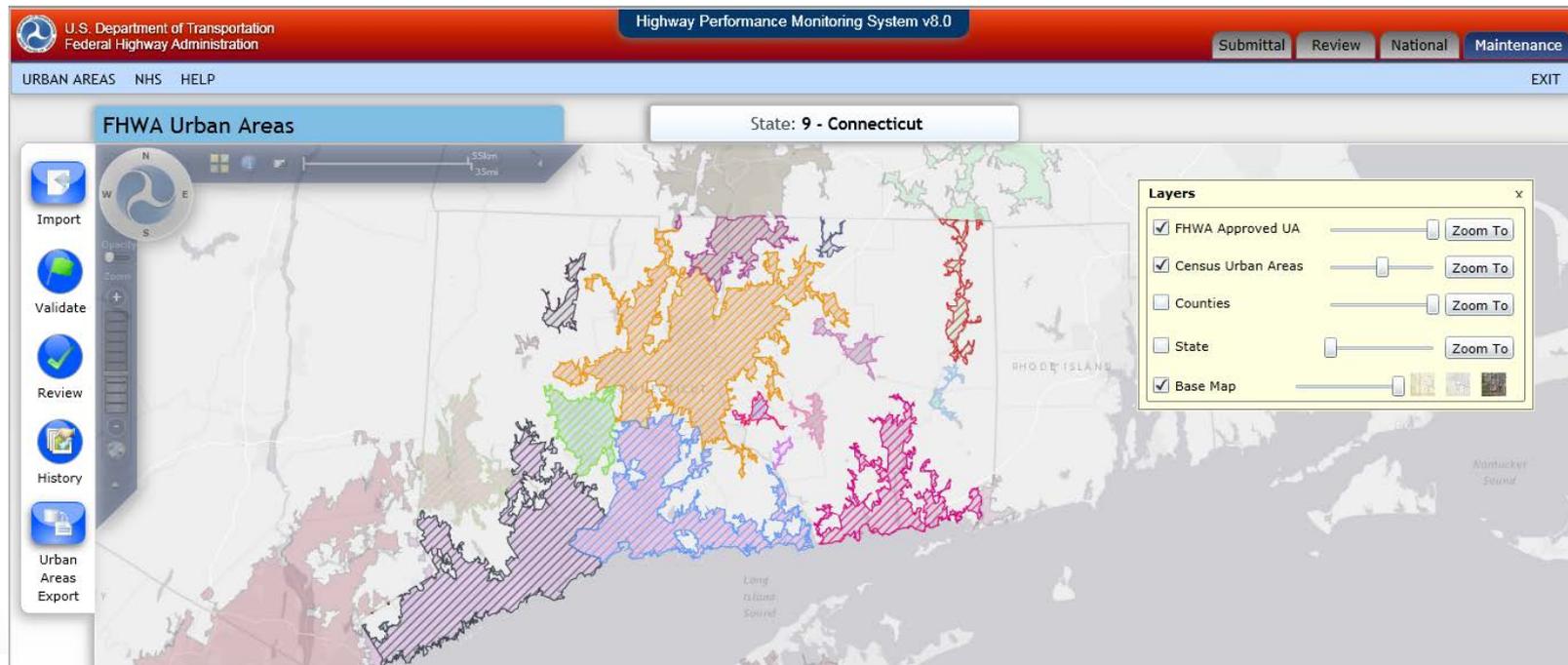
NHS

- In Production
- Incremental Approach
- Working through process with Planning Office
- Performance Improvements Underway

The screenshot shows the Highway Performance Monitoring System v8.0 interface. The top navigation bar includes 'U.S. Department of Transportation Federal Highway Administration', 'Highway Performance Monitoring System v8.0', and buttons for 'Submittal', 'Review', 'National', and 'Maintenance'. Below this, there are tabs for 'URBAN AREAS', 'NHS', and 'HELP', along with an 'EXIT' button. The main content area is titled 'NHS - Propose Changes' and 'State: 11 - District of Columbia'. It features a map of the District of Columbia with a blue and red overlay representing proposed changes. To the left of the map is a form with fields for 'Route Number' (0), 'Route ID', 'Begin Point', 'End Point', and 'NHS'. There are also checkboxes for 'Add' and 'Delete', and options for 'Is this a Technical Correction' and 'Is this part of a Realignment'. A 'Select files to upload' section is also present. At the bottom, there is a table with columns: 'Zoom To', 'Staging ID', 'State Code', 'Data Item', 'Route ID', 'Begin Point', 'End Point', 'Value Numeric', 'Value Text', 'Value Date', 'Transaction Code', 'Code Description', 'Transaction Reason', 'Reason Description', 'Justification', and 'Source'. The status bar at the bottom indicates 'Total NHS Changes Proposal: 0' and 'Page 1 of 1'.

Urban Boundaries

- In Production
- Incremental Approach
- Loading approved updates from Planning Office
- Changes to Spatial Validation required
- May also incorporate other boundaries, e.g. MPO, in the future

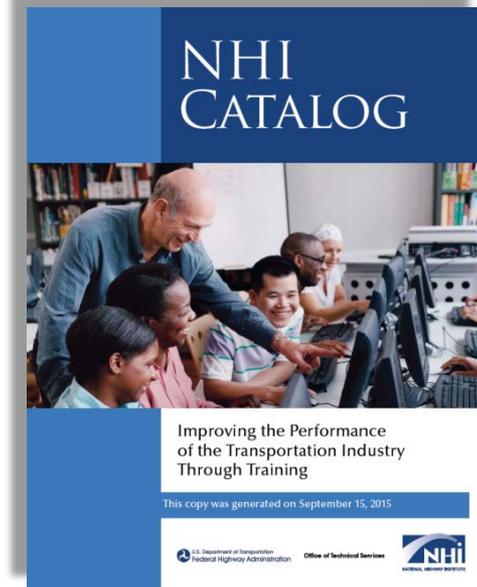


NHI HPMS Workshop/Training



Workshop Structure

- Instructor-led (2 total)
- Two days
- Class size: 20-30 participants
- Cost: \$425/participant
- Target Audience
 - HPMS Program Coordinators
 - Data Program Managers/Providers (Road Inventory, Traffic, Pavement)
 - IT / GIS Managers/Specialists
 - MPO and Local Agency Staff



Workshop Participation (since 2/2016)



Questions / Comments?



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