Highway Performance Monitoring System (HPMS): Concepts, Data Collection & Reporting Requirements

Module I
HPMS Background and Core Components

- Lesson 1
  - HPMS Background
- Lesson 2
  - HPMS Core Components Overview
Lesson One

HPMS Background
HPMS-related Statute & Regulations

- **Statute**

- **Regulations**
  - 23 CFR §1.5*, §420.105(b)*
    - State highway info required for Fed-aid program purposes
  - 23 CFR §460.3(b)
    - Certified public mileage
  - 23 CFR §470.105(a)
    - Urban area boundaries

*Denotes key regulatory references
• **Regulations**
  - 23 CFR §470.105(2)
    - Functional classification
  - 23 CFR §470.113
    - National Highway System (NHS)
  - 23 CFR §490.207(a)(2)*
    - TPM - Safety
  - 23 CFR §490.307(a)*
    - TPM - Pavement condition
  - 23 CFR §490.511(e), 611(b), 711(f)8*
    - TPM - System performance

*Denotes key regulatory references
HPMS Background

- Developed in 1978
- Roadway condition & performance data
- Used to help determine apportionment of Federal-aid funds
- Key source of data for *Conditions & Performance (C&P) Report to Congress*
- Program objectives/business needs must be reassessed periodically
All Public Roads
- Open to public travel
- Certified by the States’ Governors annually
- Owned by a Federal, State, or local entity
- Includes privately owned roads (e.g. toll roads)
- Includes roads located on Indian Reservations
Uses of HPMS Data

- Federal Uses
  - Federal-Aid Funding Apportionment Formula
  - Highway Economic Requirements System (HERS) Model
  - Highway Safety Improvement Program (HSIP)
  - Freight Analysis Framework (FAF)
  - Transportation Performance Management (TPM)
Uses of HPMS Data (cont’d)

• Non-Federal Uses
  – Statewide Planning Programs
  – Real Estate/Business Sector
  – Transportation Research
HPMS…..Why It Matters

Program/Policy Requirements & Guidance

State DOTs → HPMS → FHWA → HERS → Apportionment Factors Dev. → Federal-aid Budget Recommendations

Congress

Heritage, HSIP, FAF, TPM

Apportionment Factors Dev.

Apportionment Process

Federal-aid Budget – (Highway & Transit)

State “A” Funding → State “B” Funding → State “C” Funding
HPMS Reporting Requirements

• Key annual HPMS submittal dates
  – April 15th and June 15th
• Mileage must be consistent with Certified Public Road Mileage
• Linear referencing system (LRS) data
• Roadway inventory/attribute data
• HPMS submittal must be transmitted to FHWA via web-based application
HPMS Workflow / Timeline

Data Collection, Aggregation, and Quality Review

- District Office #1
  - HPMS Data Dist #1
- District Office #2
  - HPMS Data Dist #2
- District Office #N
  - HPMS Data Dist #N
- MPOs
  - HPMS Data MPOs
- Local Governments
  - HPMS Data Local Govts

State Central Office

- Traffic Database
- Pavement Database
- Spatial Component
- Road Inventory

Interstate Pavement and Related Data

Certified Public Road Mileage

Non-Interstate Pavement, Non-Pavement, Sample and Summary Data

Travel Time Metric Data

FHWA Review and Certification

Data Distribution and Reporting

- Highway Statistics
- National Highway Datasets
- Conditions and Performance Report

Submittal to FHWA

- Performance Assessment

Jan. 1, Year 2
- Jan. 1, Year 2
- April 15, Year 2
- June 1, Year 2
- June 15, Year 2
- Year 2

1. Beginning April 15, 2019
2. Beginning June 15, 2021 (Non-IS NHS Pavement)
3. Beginning June 15, 2018
Lesson 1 Summary

- HPMS serves as a major input to the C&P Report
- HPMS consists of data for all publically-traveled roads
- The key dates for HPMS submittals are April 15th and June 15th
- HPMS involves a coordinated effort between FHWA and the States
Questions???
Lesson Two

HPMS Core Components Overview
HPMS Core Data Components

- Geospatial Data
  - Linear Referencing System (LRS)
- Attribute Data
  - Full Extent
  - Sample Panel
  - Partial Extent
  - Summary
  - Estimates & Metadata
• Full Extent Data
  – Reported for an entire roadway system
  – Reported for ramps at grade-separated interchanges
• Sample Panel Data
  – Reported for randomly selected roadway sections
• Partial Extent Data
  – Reported on a Full Extent basis for certain functional systems and a Sample Panel basis for others
NOTE: Select Full Extent attribute data is required to be reported on ramps (e.g., Functional System)
• Summary Data
  – Reported for lower functional system roads
  – Summarized from State, and local data sources
• Estimates Data
  – Reported for various pavement-related data elements
• Metadata
  – Reported various traffic and pavement-related data elements
• Linear Referencing System (LRS)
  – Provides a geospatial representation of a road network
  – Retains record of linear measures along roadways
  – Measured using milepoint, milepost, reference point, etc.
  – Provides the framework for analysis and reporting
Lesson 2 Summary

- Full Extent, Sample Panel, and Partial Extent Data are reported for roadway sections
- Summary Data is reported as area-wide totals
- Estimates and Metadata provide supplemental descriptive information
- LRS networks provide the framework for geospatial analysis/reporting in HPMS
Questions???
1) In what year was the HPMS developed?

a. 1956  
'b. 1978  
c. 2010  
d. 1776
Module One Quiz

2) The HPMS program was established for the purpose of monitoring the condition and performance of the nation’s roadway system.

a. True
b. False
3) HPMS data is primarily used to determine which of the following?

a. Federal authorization legislation
b. Highway Trust Fund development
**c. Apportionment of Federal-aid highway funds**
d. Both b and c
4) HPMS encompasses all roads that are open to public travel, excluding privately-owned roads.

a. True
b. False
5) The due date for the annual submittal of HPMS data to FHWA is which of the following?

a. April 15\textsuperscript{th}

b. July 4\textsuperscript{th}

c. December 25\textsuperscript{th}

d. June 15\textsuperscript{th}

e. Both a and d
6) HPMS is the primary source of roadway and bridge condition and performance data as it pertains to the Federal-aid system.

a. True
b. False
7) A State’s Certified Public Road Mileage is due to be submitted to FHWA before the annual HPMS submittal.

a. True
b. False
8) The scope of roads reported into HPMS is to include roads located on Indian Reservations, where applicable.

a. True
b. False
9) Full Extent Data is reported for portions of a given roadway system.

a. True
b. False
10) Sample Panel Data is reported for randomly selected sections of road.

a. True
b. False
11) Partial Extent Data encompasses which of the following?

a. Full Extent Data
b. Metadata
c. Sample Panel Data
d. Both a and c
12) Which of the following types of data is to consist of information for the lower functional system roads (e.g. local roads)?

- a. Summary Data
- b. Metadata
- c. Estimates Data
- d. Composite Data