FHWA – Federal Highway Administration

Some data is collected solely for HPMS Purposes, but so be it – They give us money for our roads and they want a little data in return, seems fair.

Most of the data elements are collected for NYSDOT Use
In general, the HPMS contains administrative and extent of system information on all public roads, while information on other characteristics is represented in HPMS as a mix of universe and sample data for arterial and collector functional systems.
The HPMS data is used extensively in the analysis of highway system condition, performance, and investment needs that make up the biennial Condition and Performance Reports to Congress. These Reports are used by the Congress in establishing both authorization and appropriation legislation, activities that ultimately determine the scope and size of the Federal-aid Highway Program, and determine the level of Federal highway taxation.

[from the FHWA website]
Federal uses of HPMS
Not sure the last time it was actually used for apportionment
2017 data

Both NYSDOT AND FHWA put out reports on their data annually.
### HPMS Public Road Length

<table>
<thead>
<tr>
<th>Category</th>
<th>Length (in miles)</th>
<th>Percent of State</th>
<th>Percent of Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>76,521</td>
<td>67.4 %</td>
<td>2.6 %</td>
</tr>
<tr>
<td>Minor Collector</td>
<td>9,559</td>
<td>8.4 %</td>
<td>3.4 %</td>
</tr>
<tr>
<td>Major Collector</td>
<td>11,139</td>
<td>9.8 %</td>
<td>2.1 %</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>8,338</td>
<td>7.3 %</td>
<td>3.4 %</td>
</tr>
<tr>
<td>Principle Arterials</td>
<td>5,262</td>
<td>4.6 %</td>
<td>3.4 %</td>
</tr>
<tr>
<td>Freeways and Expressways</td>
<td>997</td>
<td>0.9 %</td>
<td>5.3 %</td>
</tr>
<tr>
<td>Interstate</td>
<td>1,744</td>
<td>1.5 %</td>
<td>3.6 %</td>
</tr>
</tbody>
</table>

2017 data
2017 Data – We have since adjusted an out dated Rural Minor Collector VMT
Texas has 2.75 times as many roads as we do. . . . They have 127,000 Rural County Roads alone.
70 data items that we submit along with some that FHWA maintains, some on full extent FE others on sample only depending on FC and Urban/Rural designation. Feds use FC 1-7, while the state uses an urban and rural classifier.

Latest Errata has changed up the extent on how some of these items are collected. I’ve been told we can’t get an updated manual because PM made the manual part of legislation? I’m wondering if we can get unofficial version with errata updates included?

Speed Limit has been changed from sample to FE on the NHS – so we are working in house on the PSL updates to the NHS.

HOV / HOT lanes not to be confused with congestion pricing.
Route elements are the easiest data attributes we have.

Go through AASHTO and another office deals with all this leg work, we handle any FC/NHS needs.
As mentioned yesterday, hopefully we can pull 31-33 from “whomever” is collecting our State MIRE elements.
Geometric is all sample based for now.
<table>
<thead>
<tr>
<th>Data Item Type</th>
<th>Item Number</th>
<th>Data Item</th>
<th>Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement</td>
<td>47</td>
<td>International Roughness Index (IRI)</td>
<td>FE**</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>Present Serviceability Rating (PSR)</td>
<td>FE***#</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>Surface Type</td>
<td>SP*</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>Rutting</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>Faulting</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>Cracking Percent</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Year of Last Improvement</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>Year of Last Construction</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>Last Overlay Thickness</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>Thickness Rigid</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>58</td>
<td>Thickness Flexible</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>59</td>
<td>Base Type</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>Base Thickness</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>Climate Zone</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>62</td>
<td>Soil Type</td>
<td>SP</td>
</tr>
<tr>
<td>Data Item Type</td>
<td>Item Number</td>
<td>Data Item</td>
<td>Extent</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Inventory</td>
<td>63</td>
<td>County Code</td>
<td>FE</td>
</tr>
<tr>
<td>Special Networks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>National Highway System (NHS)</td>
<td>FE**</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>Strategic Highways Network (CHW/INET)</td>
<td>FE**</td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>National Truck Network (NT)</td>
<td>FE**</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>Future Facility (%Tenned/Unbuilt NHS)</td>
<td>FE**</td>
</tr>
<tr>
<td>Inventory</td>
<td>68</td>
<td>Maintenance and Operations</td>
<td>FE</td>
</tr>
<tr>
<td>Traffic</td>
<td>69</td>
<td>Capacity</td>
<td>GF</td>
</tr>
<tr>
<td>Inventory</td>
<td>70</td>
<td>Directional Through Lanes</td>
<td>FE****#</td>
</tr>
</tbody>
</table>

*FE = Full Extent for all functional systems (including State and non-State roadways)*
*FE* = Full Extent for some functional systems, (see Chap. 4, Sec. 4.4 for more details)*
*FE** = Full Extent wherever data item is applicable, (see Chap. 4, Sec. 4.4 for more details)*
*FE*** = Full Extent for all NHS roadways (including State and non-State roadways)*
*FE****# = (Optional) Full Extent for NHS roadways (including State and non-State roadways)*
*FE****# = (Optional) Full Extent for Interstate roadways (including State and non-State roadways)*
*FE + R = Full Extent including ramps located within grade-separated interchanges*
*GF = All Sample Panel Sections (as defined by HPMS)*
*SP = Some Sample Panel Sections (see Chap. 4, Sec. 4.4 for more details)*
What’s New (old?)

- Data items in support of TPM
  - Pavement and Structures
  - Special Networks
  - MIRE
- ARNOLD (but that’s old news)

MIRE – Model Inventory of Roadway Elements
NPMRDS – National Performance Management Research Dataset
ARNOLD – All Roads Network of Linear Referenced Data
FHWA recognizes HPMS as the authoritative data source to support TPM2. Pavement data items, and the current specifications remain largely the same according to the HPMS Field Manual.

The main changes include: Reporting cycle and frequency – April 15th for Interstates in 2019

Speed limit specifications for International Roughness Index (IRI) and Present Serviceability Rating/Index (PSR)

Cracking Percent
FHWA proposes the addition of a new data item, a unique structure NBI_ID, that will link data in the National Bridge Inventory (NBI) to the physical structure location. This will help to reduce redundancy, streamline performance management reporting efforts, and align the physical location of structures (i.e., bridges, tunnels and bridge sized culverts) with their associated data in the National Bridge Inventory (NBI). Further discussion on location editing later on when talking about EAMP.
Pavement data gets reported on the 10\textsuperscript{th} of a mile
Option to report it with breaks at the bridges. IRI and cracking can be considerable higher on the bridges.
Minimum segment in the current RIS is 0.01 miles or 52.8’ (Data Item 4 - Structure Type – Bridge)
Yearly HPMS Pavement Data Report and how it relates to TPM2
2016 or 2017 data

BRIDGES ARE EXCLUDED FROM THE PERFORMANCE MEASURE CALCULATION. THE ABILITY TO ACCURATELY LOCATE BRIDGES IN HPMS IS VERY IMPORTANT IN THE CORRECT CALCULATION OF PAVMENT CONDITIONS. Violation of these limits brings all the bridge location data back into analysis for the TPM measures.

Currently 7,333 of the 19,844 bridges in NYS are less than 53’. Are our lengths that far off or are the structures and HDSB reporting different lanes?
HPMS

Structures Data:

- HPMS also asks for reporting on Tunnels and Causeways.
- Currently not Maintained in our system
Similar pavement conditions as if you were going onto a bridge, but these will be used in pavement ratings
The location of Special Networks may be taken over FHWA. The National Highway System (NHS) includes the Interstate Highway System as well as other roads important to the nation’s economy, defense, and mobility. The Strategic Highway Network (STRAHNET), defines highways within the NHS that can be used by the Department of Defense for transport of equipment and routing purposes. The National Network requires states to allow conventional combinations on “the Interstate System and those portions of the Federal-aid Primary System ... serving to link principal cities and densely developed portions of the States ... [on] high volume route[s] utilized extensively by large vehicles for interstate commerce ... [which do] not have any unusual characteristics causing current or anticipated safety problems.” Conventional combinations are tractors with one semitrailer up to 48 feet in length or with one 28-foot semitrailer and one 28-foot trailer, and can be up to 102 inches wide. The FAST Act repealed both the Primary Freight Network and National Freight Network from Moving Ahead for Progress in the 21st Century Act (MAP-21), and directed the FHWA Administrator to establish a National Highway Freight Network (NHFN) to strategically direct Federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system. The NHFN includes the following subsystems of roadways: Primary Highway Freight System (PHFS): This is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by
measurable and objective national data.

**Other Interstate portions not on the PHFS** (NPHFS): These highways consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities.

**Critical Rural Freight Corridors** (CRFCs): These are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities.

**Critical Urban Freight Corridors** (CUFCs): These are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

Planning and MPO’s to help define this network
Traditionally handled by Office of Traffic and Safety
FDE’s vary based on Non-Local Paved Roads, Local Paved Roads, and Unpaved Roads.
Further Broken down into Roadway Segments, Intersection, and Interchange/Ramps (some repeated by class).
Highway Safety Improvement Program.
Joked yesterday about MIRE differentiating themselves as a new “model” for inventory, but to be honest I’m excited to start looking beyond the state network in our inventory.
Proposed to have 17 of these FDE’s “optionally” reported in HPMS

Additional Discussion needed between Office of traffic and Safety and HDSB as to who is collecting and storing this data.

Little more discussion on Direction of Inventory in the EAMP presentation
<table>
<thead>
<tr>
<th>MIRE FDE Name (MIRE Number)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interchange Ramp</td>
<td></td>
</tr>
<tr>
<td>11 Unique Interchange Identifier</td>
<td>2026</td>
</tr>
<tr>
<td>12 Location Identifier for Roadway at Beginning Ramp Terminal</td>
<td>2026</td>
</tr>
<tr>
<td>13 Location Identifier for Roadway at Ending Ramp Terminal</td>
<td>2026</td>
</tr>
<tr>
<td>14 Ramp Length</td>
<td>2026</td>
</tr>
<tr>
<td>15 Roadway Type at Beginning Ramp Terminal</td>
<td>2026</td>
</tr>
<tr>
<td>16 Roadway Type at Ending Ramp Terminal</td>
<td>2026</td>
</tr>
<tr>
<td>17 Interchange Type</td>
<td>2026</td>
</tr>
</tbody>
</table>
HDSB is used to being the reporting entity at NYSDOT (outside of the 500 series data) – Office of Planning to handle the loading of HPMS data to the FHWA website

Directional Traffic is new - AADT has been provided as both directions reported on the primary direction
Adds 30 new data items to HPMS.

Unknown number of Reporting segments?

SUNY AVAL is handling the calculation and preparation of this data for the state.
4 data items per line for
LOTTR = 80% divided by 50%

AM – 6a-10a
Midday – 10a-4p
PM – 4p-8p
Weekend – 6am to 8pm

50% of travel times are shorter/50% is Longer
80% is shorter/20% is Longer
5 data items per line for (overnight is not in the others – Truck don’t enjoy traveling with us “4 wheelers”)

LOTTR = 95% divided by 50%

AM – 6a-10a
Midday – 10a-4p
PM – 4p-8p
Overnight – 8p-6a
Weekend – 6am to 8pm

50% of travel times are shorter/50% is Longer
95% is shorter/5% is Longer

PHED - Traffic congestion will be measured by the annual hours of peak hour excessive delay (PHED) per capita on the NHS. The threshold for excessive delay will be based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater, and will be measured in 15-minute intervals. Peak travel hours are defined as 6-10 a.m. local time on weekday mornings; the weekday afternoon period is 3-7 p.m. or 4-8 p.m.
local time, providing flexibility to State DOTs and MPOs. The total excessive delay metric will be weighted by vehicle volumes and occupancy.

PHED - is calculated to the nearest one hundredth of a person-hour. A State DOT is required to report PHED metric values if mainline highways on the NHS that cross any part of an urbanized area with a population more than 1 million (a population greater then 200,000, starting with HPMS reporting in 2022) within its State geographic boundary and that urbanized area contains any part of nonattainment or maintenance areas listed under the National Ambient Air Quality Standards. PHED values must be reported in units of person-hours to the nearest thousandths.
All Roads Network of Linear Referenced Data

- Dual carriageway representation of divided facilities for all roads
- Grade Separated Interchanges, including ramps and connectors
FHWA is considering that the ARNOLD network be developed, over time, into a fully routable, topologically connected roadway network including interchange and ramp geometry (at grade and grade separated), and intersection nodes with turn restrictions.

DOT is working off two networks
ELRS – Arnold
And the NYSGIS Program Office Streets layer for routable network – HOOCS and the Office of Traffic and Safety
Proposed time frame is 2023 for intersection nodes, 2026 turn and flow restrictions (MIRE)
State uses it for this same purpose
USDOT sees it uses in everything as does NYSDOT
FHWA is also going to be working with the states to get the national network to be routable. Currently have issues with NYSDOT use of county to county representation of routes. Also state to state LRS alignment.

USDOT sees it uses in everything as does NYSDOT
USDOT sees it uses in everything as does NYSDOT
State to state alignments
State to state alignment
Federal
Owned by public authority – including instrumentalities.
Open to public travel.
The term "maintenance and operations" covers the preservation and performance of the highway, including surface, shoulders, roadsides, structures, and such traffic-control devices as are necessary for safe and efficient utilization of the highway.
“State” maintained means one of the 50 States, the District of Columbia, or the Commonwealth of Puerto Rico including quasi-official State commissions or organizations;
“County, local, municipal, town, or township” means maintained by one of the officially recognized governments established under State authority;
“Federal” means maintained by one of the branches of the U.S. Government or independent establishments, government corporations, quasi-official agencies, organizations, or instrumentalities;
“Other” means any other group not already described above or nongovernmental organization that maintains the highway.
State

Similar to Feds

Restrict it to:
Define it as through traffic.
And for purposes of our LHI – we limit ownership to NYS forms of government and some instrumentalities

This may be excluding schools, libraries, municipally owned non-through roadways.
Speed Limit missing on 60+ miles (1800 if you include ramps, but HPMS does not.

Through Lanes – ARNOLD asked for us to divide our roads, which also lead to the inventory getting divided, but still does not allow for through lanes to be delivered on the non-inventory direction unless
With transactional deliveries a possibility for the feds, would other data collection times frames work better for the regions?

Some have commented on the HPMS collection time frame coinciding with the program delivery update and having an issues doing both.
One type of Toll ID is currently already provided in the Value_Text fields of items 15 and 16.
Questions?

Comments?

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Patrick.Kemble@dot.ny.gov

518-457-1965