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Cover Photo: US 30, Bedford County

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East HPMS Coordinator

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West HPMS Coordinator

pennsylvania
DEPARTMENT OF TRANSPORTATION
INTRODUCTION

The Highway Performance Monitoring System (HPMS) is an annual data reporting program created by the Federal Highway Administration (FHWA) to meet their need to provide information to the Congress for development and analysis of national policy and programs relating to highways.

In Pennsylvania, HPMS serves as the primary source of highway information utilized in the allocation of highway maintenance funds, revenue enhancement initiatives, reporting of pavement roughness and PennDOT’s annual report of mileage and travel statistics. HPMS data are also used to fulfill requests for information received from consulting firms, District Engineering Offices, Metropolitan Planning Organizations and national organizations like The Road Information Program (TRIP), as well as the general public.

Each year, an annual quality review of Pennsylvania’s Highway Performance Monitoring System (HPMS) is conducted. The review is performed by the Bureau of Planning and Research’s (BPR) HPMS staff and consists of HPMS field views of randomly selected sample sections in several counties. The purpose of this review is:

1. To ascertain the current state of HPMS data quality and ensure that any errors found are corrected;

2. To determine if any common problem areas exist and identify subsequent training needs;

3. To determine if any organizational or procedural changes to the HPMS program are warranted;

4. To ensure that communications regarding HPMS are maintained between PennDOT, MPOs and PennDOT Districts.

The HPMS program continues to deliver a high level of timely and accurate data for the purpose of allocating national and state highway funds, project planning and programming, assessing air quality conformity and travel monitoring.

The following pages contain the results of this year’s review.
EXECUTIVE SUMMARY

Between June and October 2016, the Bureau of Planning and Research’s (BPR) HPMS staff conducted its annual quality review of Pennsylvania’s Highway Performance Monitoring System (HPMS). The quality reviews were conducted with the appropriate MPO and/or PennDOT District HPMS representative present, resulting in improved communication between our HPMS staff and our data providers. The review included HPMS field views of sample sections on which HPMS data are provided by:

- Blair County Planning Commission
- Cambria County Planning Commission
- Centre County Planning Agency
- Erie County Department of Planning
- Lackawanna County Department of Planning and Economic Development
- Lancaster County Planning Commission
- Lebanon County Planning Department
- Lehigh Valley Planning Commission
- Mercer County Regional Planning Commission
- Southwestern Pennsylvania Commission
- Tri-County Regional Planning Commission
- York County Planning Commission
- PennDOT District 1-0
- PennDOT District 2-0
- PennDOT District 5-0
- PennDOT District 11-0

All sixteen (16) of the data providers reviewed this year recorded an accuracy rate of 93% or greater. The average overall accuracy rates of the data providers reviewed for the last ten years appear in the chart below.

![Overall Accuracy Chart]

All sixteen (16) of the data providers reviewed this year recorded an accuracy rate of 93% or greater. The average overall accuracy rates of the data providers reviewed for the last ten years appear in the chart below.
<table>
<thead>
<tr>
<th>Organization</th>
<th>Participants</th>
<th>Counties Reviewed</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>PennDOT District 5-0</td>
<td>Jeff Williams, Sandra Renninger</td>
<td>Schuylkill</td>
<td>June 8</td>
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<tr>
<td>Lebanon County Planning Commission</td>
<td>Jon Fitzkee, Song Kim, Jerry Gibboney, Sandra Renninger, John Moloney</td>
<td>Lebanon</td>
<td>June 20</td>
</tr>
<tr>
<td>York County Planning Commission</td>
<td>Heather Bitner, Jerry Gibboney, Sandra Renninger, John Moloney</td>
<td>York</td>
<td>June 27</td>
</tr>
<tr>
<td>Lancaster County Planning Commission</td>
<td>Gary Jones, Robert Bini, Jeremy Freeland, Sandra Renninger, John Moloney</td>
<td>Lancaster</td>
<td>July 11</td>
</tr>
<tr>
<td>Lehigh Valley Planning Commission</td>
<td>Gabe Hurtado, Brian Hite, Jeff Williams, Sandra Renninger, John Moloney, Marwa Said</td>
<td>Lehigh/Northampton</td>
<td>July 25 &amp; 26</td>
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<tr>
<td>Tri-County Regional Planning Commission</td>
<td>Tim Jones, Sandra Renninger, John Moloney, Barbara Schaffer**, David Alas*</td>
<td>Cumberland</td>
<td>August 1</td>
</tr>
<tr>
<td>Lackawanna County Department of Planning And Economic Development</td>
<td>Chris Chapman, John Hitchcock, Richard Chang, Sarah Fenton, Sandra Renninger, John Moloney</td>
<td>Lackawanna</td>
<td>August 11 &amp; 12</td>
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<tr>
<td>PennDOT District 2-0</td>
<td>John Schneider, Sandra Renninger, John Moloney</td>
<td>Clinton</td>
<td>September 12</td>
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<tr>
<td>Centre Regional Planning Agency</td>
<td>Tom Zilla, John Schneider, Sandra Renninger, John Moloney</td>
<td>Centre</td>
<td>September 13</td>
</tr>
<tr>
<td>Location</td>
<td>Name(s)</td>
<td>County</td>
<td>Date(s)</td>
</tr>
<tr>
<td>----------------------------------</td>
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</tr>
<tr>
<td>Southwest Pennsylvania Commission</td>
<td>Allen Miller, Cort McCombs, Andrew Clevenger, Timothy Tagmyer, Sandra Renninger, John Moloney</td>
<td>Lawrence</td>
<td>September 27 &amp; 28</td>
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<tr>
<td>PennDOT District 11-0</td>
<td>Jason Molinero, Timothy Tagmyer, Sandra Renninger, John Moloney</td>
<td>Beaver</td>
<td>September 29</td>
</tr>
<tr>
<td>Blair County Planning Commission</td>
<td>Wes Burket, Kevin Boslet, Sandra Renninger, John Moloney</td>
<td>Blair</td>
<td>October 4</td>
</tr>
<tr>
<td>Cambria County Planning Commission</td>
<td>Chris Allison, Kevin Boslet, Sandra Renninger, John Moloney</td>
<td>Cambria</td>
<td>October 5</td>
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<tr>
<td>Erie County Department of Planning</td>
<td>Christopher Friday, Jacki Deeter, John Moloney</td>
<td>Erie</td>
<td>October 18</td>
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<tr>
<td>PennDOT District 1-0</td>
<td>Jacki Deeter, Julie Hart, John Moloney</td>
<td>Venango</td>
<td>October 19</td>
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<td>Mercer County Regional Planning Commission</td>
<td>Matt Stewart, Jacki Deeter, John Moloney</td>
<td>Mercer</td>
<td>October 20</td>
</tr>
</tbody>
</table>

* This served as cross training for other BPR staff.
** FHWA Division Representative.
DATA ITEMS

Each review consisted of field verifying data that could be measured through field observations in accordance with the Federal Highway Administration's HPMS Field Manual. The field verifiable data items included in this assessment are listed below. Those items shown in **bold type** are data items collected by the MPOs and District Offices exclusively for the HPMS program. All other items reside in the Roadway Management System (RMS) and are controlled by the Districts’ RMS staff. MPOs must notify their Central Office HPMS Coordinators of inaccuracies found in the RMS data items and the Districts are responsible for correcting the errors.

<table>
<thead>
<tr>
<th>Data Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>Facility Type</td>
</tr>
<tr>
<td>4</td>
<td>Is Structure</td>
</tr>
<tr>
<td>5</td>
<td>Access Control</td>
</tr>
<tr>
<td>7</td>
<td>Through Lanes</td>
</tr>
<tr>
<td>10</td>
<td>Peak Lanes</td>
</tr>
<tr>
<td>11</td>
<td>Counter Peak Lanes</td>
</tr>
<tr>
<td>12</td>
<td>Turning Lanes, Right</td>
</tr>
<tr>
<td>13</td>
<td>Turning Lanes, Left</td>
</tr>
<tr>
<td>14</td>
<td>Speed Limit</td>
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<tr>
<td>29</td>
<td>Signal Type</td>
</tr>
<tr>
<td>30</td>
<td>% Green Time</td>
</tr>
<tr>
<td>31</td>
<td>Number Signals</td>
</tr>
<tr>
<td>32</td>
<td>Stop Signs</td>
</tr>
<tr>
<td>33</td>
<td>At-Grade Other</td>
</tr>
<tr>
<td>34</td>
<td>Lane Width</td>
</tr>
<tr>
<td>35</td>
<td>Median Type</td>
</tr>
<tr>
<td>36</td>
<td>Median Width</td>
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<tr>
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<td>Shoulder Type</td>
</tr>
<tr>
<td>38</td>
<td>Shoulder Width R</td>
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<td>39</td>
<td>Shoulder Width L</td>
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<tr>
<td>40</td>
<td>Peak Parking</td>
</tr>
<tr>
<td>41</td>
<td>Widening Obstacle</td>
</tr>
<tr>
<td>42</td>
<td>Widening Potential</td>
</tr>
</tbody>
</table>
REVIEW ANALYSIS

The following table quantifies the findings of this year’s quality reviews. The table indicates, by data source, the number of errors found for each field verifiable data item for each of the agencies reviewed the total number of errors for each agency, and the percent of error for each agency. The overall accuracy rate for each agency is also included in this table. Percent of error was calculated by dividing the total number of errors by the number of segments reviewed in each agency multiplied by the number of data items reviewed per data source.
AGENCY SUMMARY

The following chart shows the accuracy trend for each Metropolitan Planning Organization over the past three reviews.

Accuracy Trend

METROPOLITAN PLANNING ORGANIZATIONS


*Blair, and Cambria MPO's previous reviews were in 2010 & 2013
**Centre, and Erie MPO's previous review was in 2012
DISTRICT SUMMARY

The following chart shows the accuracy trend for each PennDOT Engineering Office over the past three reviews.

Accuracy Trend

PENNDOT ENGINEERING OFFICES

*District 5-0 previous review was in 2011

**District 11-0 previous review was in 2013
The following chart shows the five highest reported errors in 2016. Of the data items reviewed, At-Grade Other with a reported error rate of 21.05%, Widening Obstacle with a reported error rate of 15.79% and Lane Width with a reported error rate of 15.79% was most often reported in error. Widening Potential with a reported error rate of 10.53% and Turning Lanes Right with a reported error rate of 5.26% are the next highest reported errors. Of the five highest reported errors in 2016, three of the items were consistently one of the top errors reported over the past three reviews.

The cause of errors for the At-Grade Others are due to the changes in sample segment lengths over the years. The Widening Obstacle and Widening Potential items are very subjective and subject to differing interpretations. Variations in Lane Width measurements are often caused by the repositioning of the outer paint line or striping and differing interpretations of the break between the travel lane and the shoulder.

The Bureau of Planning and Research (BPR) provided a web link to the FHWA’s HPMS Field Manual (in April 2014) to all PennDOT Districts and Metropolitan Planning Organizations (MPOs) to assist them with collecting HPMS data. The PennDOT HPMS Data Collection Guide’s latest update was in August 2016 and a web link is available. Both the FHWA HPMS Field Manual and the PennDOT HPMS Data Collection Guide include photos and graphic representations of the various situations encountered in the field and explain the data items in detail.
CONCLUSIONS & RECOMMENDATIONS

HPMS Field Program

Through the review of the field findings, the following conclusions and recommendations can be made:

- **Blair County Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Cambria County Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Centre County Planning Agency**: The overall quality of the data is outstanding. Keep up the great work.

- **Erie County Department of Planning**: A 100% accuracy rate is outstanding. Keep up the great work.

- **Lackawanna County Department of Planning and Economic Development**: The quality of the data is excellent. Data items in error should be reviewed in the 2014 FHWA HPMS Field Manual.

- **Lancaster County Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Lebanon County Planning Department**: The quality of the data is good. Data items in error should be reviewed in the 2014 FHWA HPMS Field Manual. Particular attention should be paid to widening obstacle, widening potential, at-grade-other, and lane width.

- **Lehigh Valley Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Mercer County Regional Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Southwestern Pennsylvania Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **Tri-County Regional Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **York County Planning Commission**: The overall quality of the data is outstanding. Keep up the great work.

- **PennDOT District 1-0**: The overall quality of the data is outstanding. Keep up the great work.

- **PennDOT District 2-0**: The overall quality of the data is outstanding. Keep up the great work.

- **PennDOT District 5-0**: The overall quality of the data is outstanding. Keep up the great work.

- **PennDOT District 11-0**: A 100% accuracy rate is outstanding. Keep up the great work.
It should be noted that each quality review is held with the appropriate agency’s HPMS staff present, therefore each quality review also serves as onsite training for our HPMS partners. Since the District Offices are responsible for RMS data, the appropriate District RMS coordinator is invited to each MPO quality review. Data reporting inadequacies are addressed immediately as conditions are found during the field view. Additional training is provided by the Bureau of Planning and Research on request.
PROPOSED 2017 ACTION ITEMS

**HPMS Training:** An annual statewide HPMS workshop was held in August 2016. These types of meetings and workshops are an effective way to provide attendees with new information and discuss HPMS data coding problems.

**2017 Action Item:** Hold a statewide HPMS workshop in 2017. The focus of this conference will be the data items that are consistently troublesome during the quality reviews. Any changes and updates from FHWA pertaining to HPMS data items will also be discussed.

**Quality Reviews:** The HPMS Quality Review serves as a measuring tool for assessing the quality of the HPMS data submitted to the FHWA and reported in the Department’s highway statistics report. It is used to ensure continuity and consistency of the field observations regardless of who is doing the review, the location of the review and the time of the review. The HPMS Quality Assurance field reviews include the participation of our data providers.

**2017 Action Item:** Thirteen Quality Reviews will be conducted in 2017. Each review will be conducted by the Transportation Planning Division’s HPMS staff and the appropriate District and/or MPO representative. The following Agencies and District Offices will be scheduled for a review in 2017.

- Berks County Planning Commission
- Blair County Planning Commission
- Cambria County Planning Commission
- DVRPC
- Luzerne County Planning Commission
- Lycoming County Planning Commission
- PennDOT District 3-0
- PennDOT District 4-0
- PennDOT District 6-0
- PennDOT District 8-0
- PennDOT District 9-0
- PennDOT District 10-0
- PennDOT District 12-0

*Blair County Planning Commission and Cambria County Planning Commission are being reviewed in 2017 to re-establish proper rotation lost during the travel ban in 2015.

**Use of PennDOT SharePoint website:** In 2016 the HPMS yearly sample packets were posted to the PennDOT SharePoint website for distribution to the MPO’s and District Engineering Offices. This enabled the Department to provide the packets faster and eliminate postage and printing costs.

**2017 Action Item:** Continue the use of SharePoint for the distribution of HPMS yearly sample packets. The MPO’s and District Engineering Offices will be notified via email when the 2017 packets are completed and posted on SharePoint. Also posted on SharePoint are technical manuals and information pertinent to data collection and coding.