Improved in Depth HPMS
Traffic Data Reviews

Office of Highway Policy Information
2018 Highway Information Seminar
Wednesday - October 31, 2018
Steven Jessberger
Subjects Covered

- Key link level traffic data checks
- Extensive SAS runs performed
- Vehicle summary data - weighting
- GIS traffic data review
2018 (2017 data) HPMS Traffic Data Review Summary

• Common issue is missing data: Future AADT, AADT, Truck AADT, K factor, D factor, or % Peak Hour Truck
• Vehicle summary data must be VMT weighted
• % Peak SU/CU checked using the % Peak SU*AADT vs SU AADT and peak hour SU values reported
• Annualize both the SU and CU AADT data
• Annual Axle Correction Factor (ACF) generation from WIM and per vehicle class data
• State to state check of AADT, SU AADT and CU AADT
## Traffic Data Reported in HPMS

### Traffic Volume
- AADT
- K Factor
- D Factor
- Future AADT
- Ramp AADT
- Metadata

### Vehicle Classification
- AADT Single Unit
- % Peak Single
- AADT Combination
- % Peak Combination
- Summary Table
Key Link Level Data SAS Checks

1. AADT full extent check
2. SU and CU AADT – NHS/PAS and all samples
3. K, D and % Peak (SU and CU) values – all samples
4. Ramp AADT full extent
5. FAADT – all samples
Additional SAS Checks

• Range of values

• Data to data checks like:
  • SU AADT + CU AADT > AADT
  • % Peak SU * AADT > 30% of SU AADT
  • % Peak CU * AADT > 30% of CU AADT
  • many others (see staff for details)
Key Link Level Data: K-Factor

Facility_Type_VN <=3, Is_sample=1, K_FACTOR_VN=null?

- K_FACTOR <= 4.2  -- impossible
- 4.3% < K_factor <= 5.0 -- questionable
- 5.1% < K_factor 5.0 <= > 6.9 -- caution
- 7.0% < K_factor 7 <= > 20.0 -- acceptable
- 20.1% < K_factor 20.1 <= > 25.0 -- caution
- K_FACTOR > 25.1  -- questionable
HPMS Traffic Data Compared to Other Sources: “data needs to make sense”

- Population
- Fuel Consumption
- Number of licensed drivers
- Number of vehicles
- Gross Domestic Product (GDP)
# Vehicle Summary Data

## State Summary

**Year:** 2016  
**State:** 9 - Connecticut

### Summary

<table>
<thead>
<tr>
<th>VEHICLE TYPE</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interstate</td>
<td>Other Arterial</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>0.04 %</td>
<td>1.71 %</td>
</tr>
<tr>
<td>Passenger Cars</td>
<td>74.17 %</td>
<td>72.42 %</td>
</tr>
<tr>
<td>Light Trucks</td>
<td>13.82 %</td>
<td>17.31 %</td>
</tr>
<tr>
<td>Buses</td>
<td>0.29 %</td>
<td>1.20 %</td>
</tr>
<tr>
<td>Single Unit Trucks</td>
<td>3.75 %</td>
<td>4.69 %</td>
</tr>
<tr>
<td>Combination Trucks</td>
<td>7.93 %</td>
<td>2.67 %</td>
</tr>
<tr>
<td>Total</td>
<td>100.00 %</td>
<td>100.00 %</td>
</tr>
</tbody>
</table>

Last Modified On: 6/1/2017 9:43:51 AM  
Last Modified By: Domínguez, Facundo
Vehicle Summary % Values Compared to Summation of the Link Values When Applied to Each Section Length

- VMT by CU obtained from the Vehicle Summary Table * VM-2 VMT by FC should be equal to the CU AADT * Section Lengths when they are all summed up for the whole state.
Special Attention!

• Dramatic VMT % changes from year to year detected for various vehicle types lead to large changes in the VMT by vehicle type
• Some states have not adopted the FHWA VMT weighted method
• Some lower function class of roadways for certain geographical areas do not have class data
• Vehicle Summary Table VMT weighting is recommended

https://www.fhwa.dot.gov/policyinformation/knowledgecenter/vmt_training/
VMT% Trends

- 6 vehicle types by 6 function class groups, trend of each of 36 VMT%
- States are expected to use FHWA vehicle summary data procedure
- Dramatic changes will be altered and asked to resubmit
Factoring for Classification Counts

- Factor all portable classification counts to properly annualize at a minimum the 6 vehicle types in the HPMS Vehicle Summary Table (classes:1, 2, 3, 4, 5-7, 8-13) 2016 TMG PDF pages 3-31 thru 3-49 (86 – 104)
- Factoring will reduce error rates by 15% to 40% depending on the roadway
- 1/3 of all portable counts should be class
- Must have class sites in each factor group for each vehicle type
- Factor for HOD, DOW, MOY and year to year
- Factor just like volume but for each vehicle type
- Properly normalize the data so total volumes are consistent
- See the 2016 TMG for a worked out example
GIS Review of HPMS Traffic Data
It’s Getting Better!!

- AADT – Annual Average Daily Traffic
- Ramp AADT
- Future AADT
- D Factor and K Factor
- % Peak SU and % Peak CU
- SU AADT and CU AADT
- State to state AADT
- State to state both SU AADT and CU AADT
GIS Traffic Review – K Factors Reported By Area/Roadway
GIS Traffic Review - % Peak SU

Zero SU AADT when AADT>3,300 also many zero % values reported adjacent to much higher % Peak SU values all around the state.
Urban values look fine – rural values all seem to be nearly one of two values reported, there is little variance by route which one would expect.
HPMS DATA GIS Review Feedback

• What can be improved:
  • GIS review – is by route data reported showing travel trends that have large changes or if there are large changes they are verified okay.
  • % Peak SU and CU – check AADT, SU AADT and % Peak SU to make sure the proper ratio of number of trucks is in the peak hour that balances well with not to few or not to many for the day.

• What is going right:
  • GIS networks are looking a lot better
  • AADT and Ramp AADT - excellent
  • SU AADT and CU AADT – for the most part the by route data looks great
  • State to state AADT – nearly all checked out fine, nice job

Steven Jessberger
202-366-5052
steven.jessberger@dot.gov