

Technical Issues to Be Aware of with MOVES

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Overview

- ❖ Hopefully helpful thoughts based on experience from MOVES pilot group & with Greene County
- ❖ Focused on MOVES inputs
- ❖ Complements Craig's presentation on converters, but more on new data and sensitivity



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County Data Manger

MOVES County Data Manager

Source Type Population Vehicle Type VMT IM Programs Tools

Fuel Formulation Meteorology Data Ramp Fraction Road Type Distribution

RunSpec Summary Database **Age Distribution** Average Speed Distribution Fuel Supply

Select or create a database to hold the imported data.

Server: localhost

Database: aqs4_2015_715in

Log:

2010-09-13 13:49:15.0 Vehicle Type VMT Filled DayVMTFraction table
2010-09-13 13:49:15.0 Vehicle Type VMT Filled HourVMTFraction table
2010-09-13 13:49:14.0 Vehicle Type VMT Filled MonthVMTFraction table
2010-09-13 13:49:14.0 Vehicle Type VMT Filled HPMSVTypeYear table
2010-07-15 10:41:12.0 Source Type Population Filled SourceTypeYear table
2010-07-15 10:41:01.0 Meteorology Data Filled ZoneMonthHour table
2010-07-15 10:40:52.0 Road Type Distribution Filled RoadTypeDistribution table
2010-07-15 10:40:41.0 Fuel Supply Filled FuelSupply table
2010-07-15 10:40:30.0 Average Speed Distribution Filled AvgSpeedDistribution table
2010-07-15 10:40:16.0 Age Distribution Filled SourceTypeAgeDistribution table

Age Distribution

- ❖ Key difference from MOBILE6: 30 years
- ❖ Data source: vehicle registration data
 - 2009 data still being quality assured, but preliminary indications that Indiana's 2009 fleet is significantly older and dirtier than its 2004 fleet
 - For some pollutants, for some areas, emissions could be as much as 25% higher with 2009 fleet versus 2004



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Average Speed Distribution

- ❖ Key difference from MOBILE6: Required - by road type, hour & vehicle class
- ❖ Data source: Travel demand model
- ❖ Table has 19,968 rows, hence post-processing
- ❖ Speeds must reflect signal & stop delays
 - Test without lead to higher NO_x, lower VOCs
- ❖ Other sensitivity tests for slightly higher speeds, slower trucks showed only moderate sensitivity
- ❖ Consistency will be the key



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Fuel Formulation ✓ Meteorology Data ✓ Ramp Fraction ✓ Road Type Distribution ✓
RunSpec Summary Database Age Distribution Average Speed Distribution Fuel Supply

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Server: localhost

Database: aq5_2015_715in Create Database Refresh

Log: Clear All Imported Data

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Ramp Fraction

- ❖ Sensitivity analysis showed that using more realistic ramp fractions for rural restricted access facilities could result in lower emissions versus the default value for all freeways



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Server: localhost

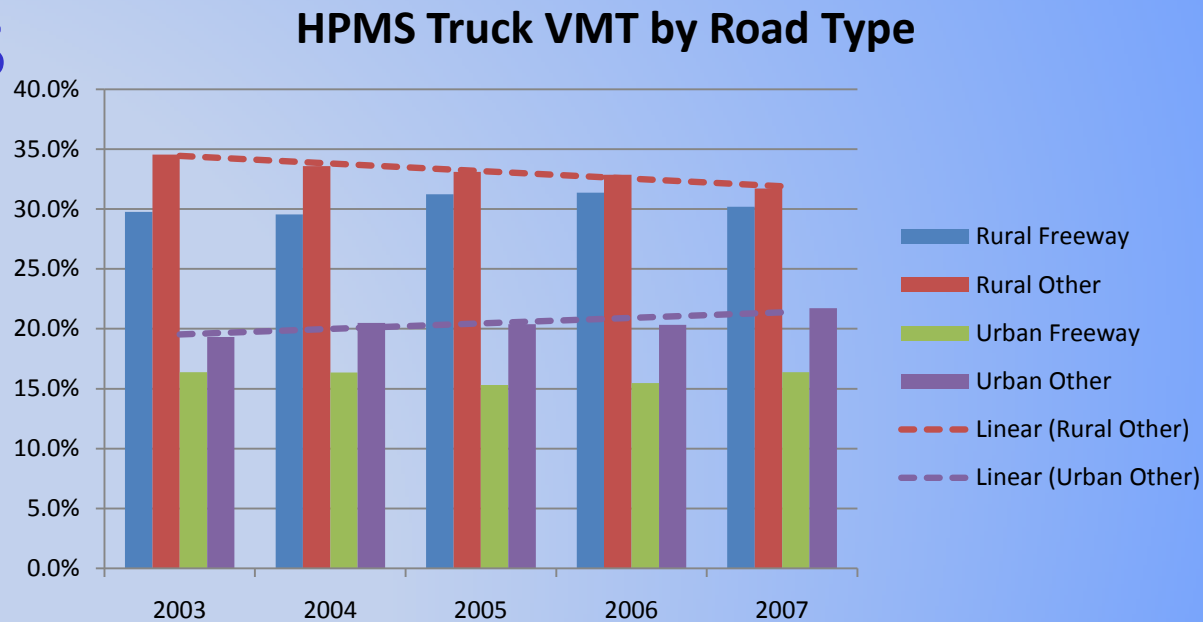
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Road Type Distribution

- ❖ Road types share of VMT by vehicle class
- ❖ Source: HPMS
- ❖ Trend: Shift in trucks from rural to urban non-freeways



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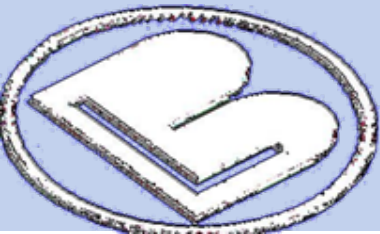
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Source Type Population

- ❖ New for MOVES – number of garaged vehicles by vehicle class for start and soak emissions
- ❖ Some estimation is allowed, but likely will be required to collect info on number of local refuse trucks, buses by type, etc.
- ❖ Same VMT & speeds with different vehicle populations can result in very different emissions



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Vehicle Type VMT

- ❖ Actually 4 input tables
 - *Annual* VMT by vehicle class
 - Fraction in each month, by vehicle class
 - Fraction in each day, by vehicle class & road type
 - Fraction in each hour, by vehicle class, road type & day (1,560 rows)
- ❖ Must estimate weekend travel



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Vehicle Type VMT

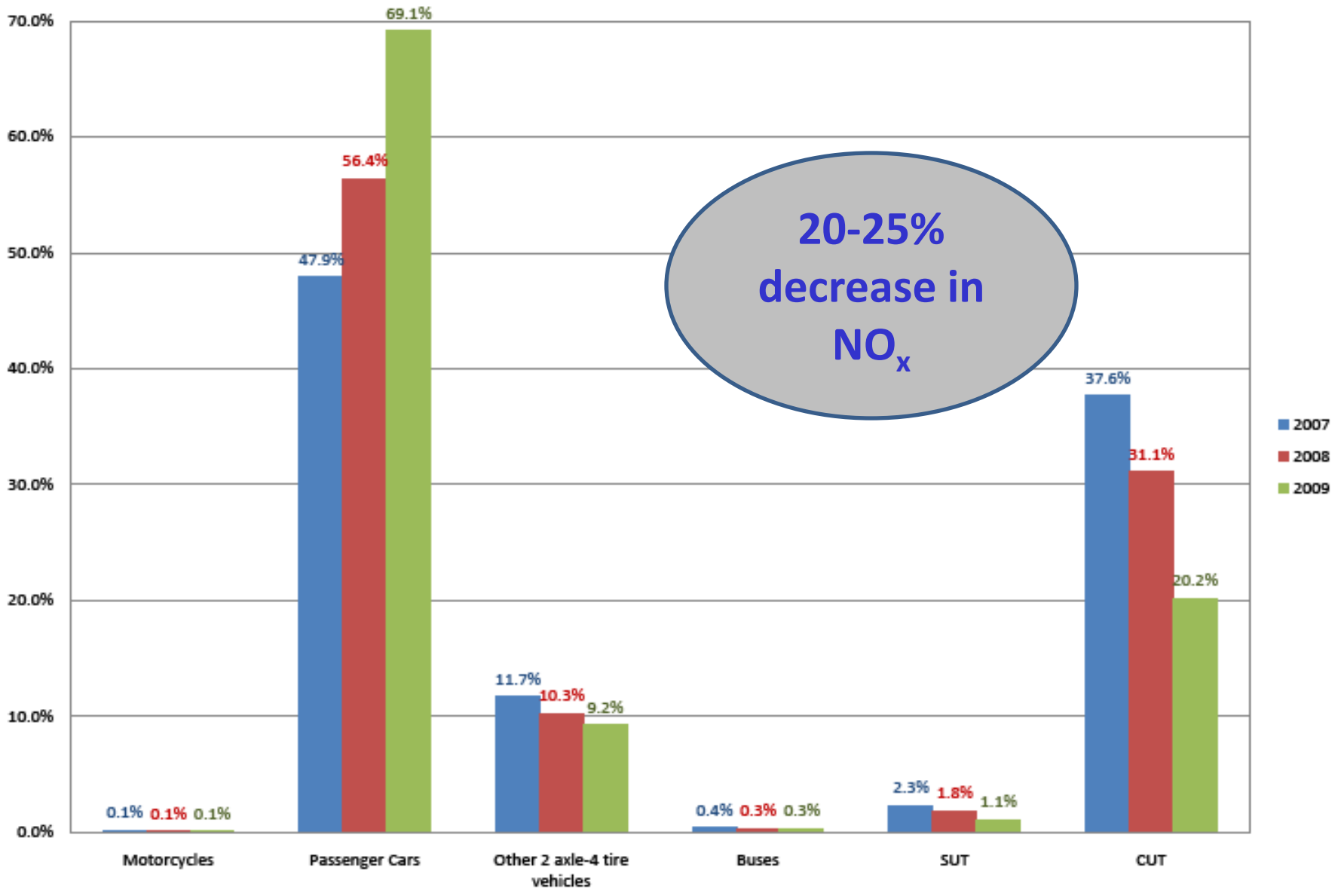
- ❖ Source: ATR data
- ❖ Significant trend toward decreasing semi VMT in recent years – would rebound with economy – may use multi-year averages



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Percent of Vehicles by Type I-70



Vehicle Type VMT

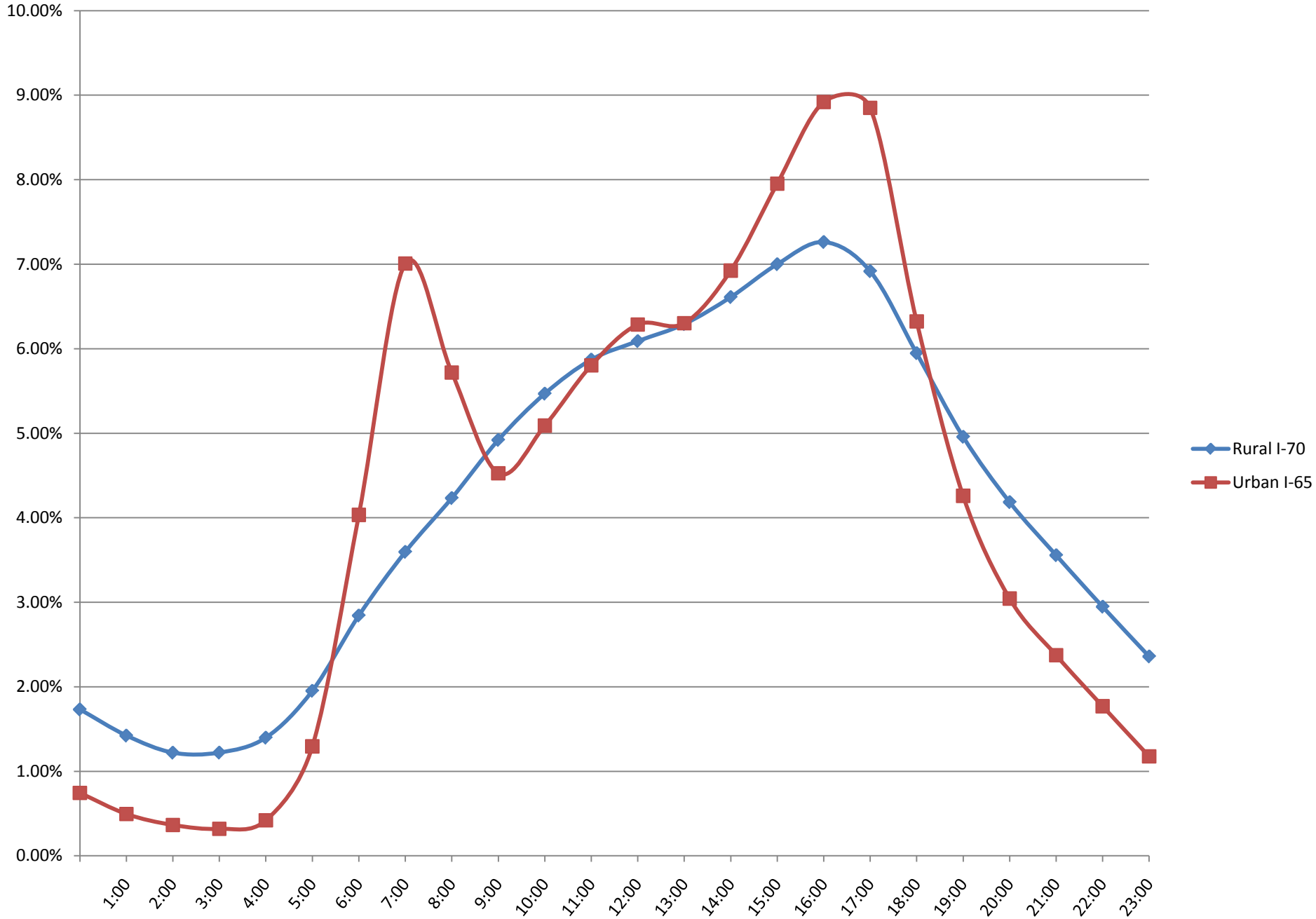
- ❖ Source: ATR data
- ❖ Significant trend toward decreasing semi VMT in recent years – would rebound with economy – may use multi-year averages
- ❖ Variations in hourly distributions less important but still significant data processing



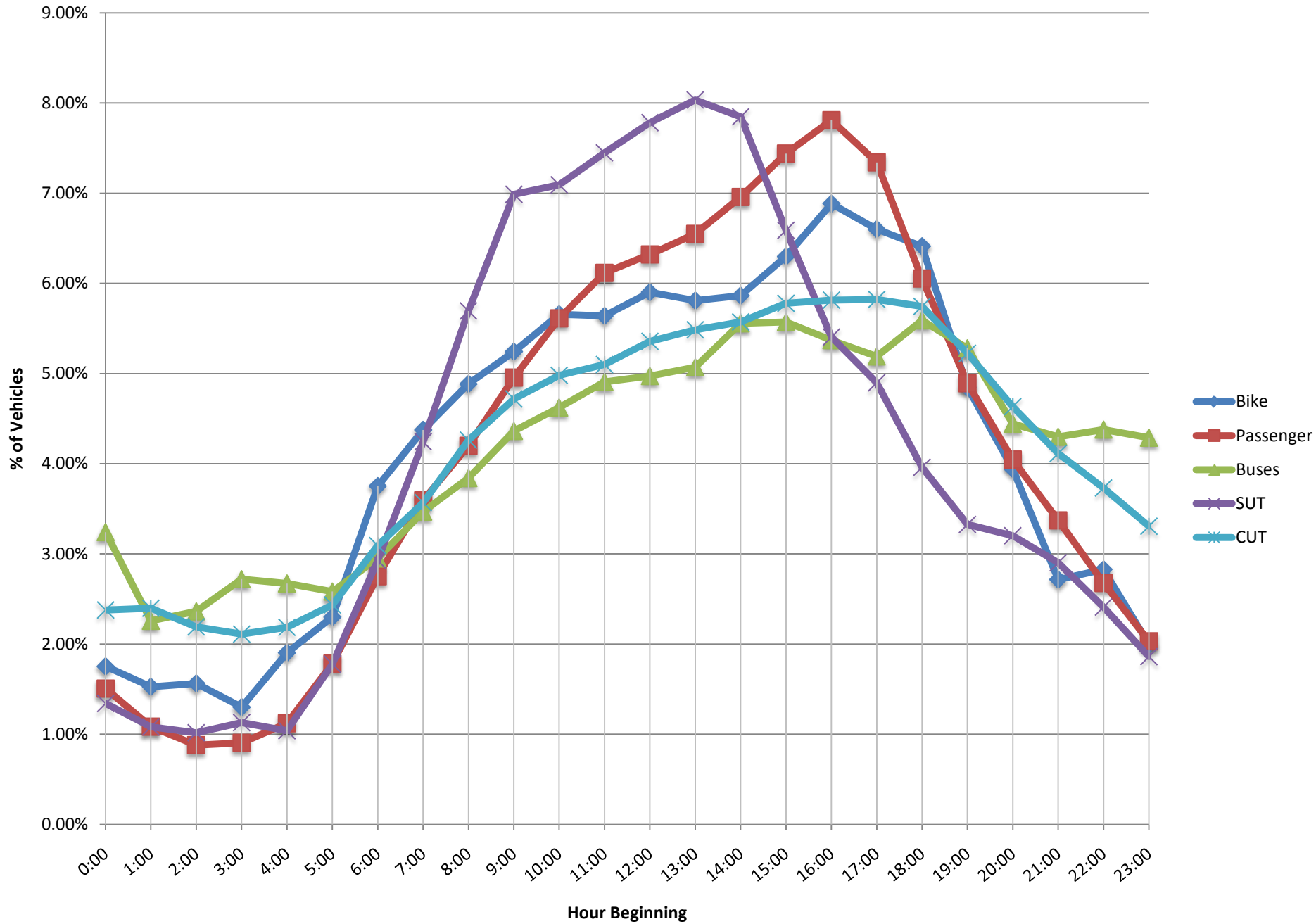
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Hourly Variation by Location/Area Type



Hourly Variation by Vehicle Class for Rural I-70



Vehicle Type VMT

- ❖ Source: ATR data
- ❖ Significant trend toward decreasing semi VMT in recent years – would rebound with economy – may use multi-year averages
- ❖ Variations in hourly distributions less important but still significant data processing
- ❖ Significant data analysis efforts for SIP development



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MOVES Runspecs

❖ Just a few notes:

- Care is required
- Can select vehicle class/fuel type and road type combinations inconsistent with other inputs and obtain invalid results with no warnings
- Large units can result in significant rounding/truncation errors



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Final Thoughts

- ❖ MOVES emissions estimates are generally significantly higher than MOBILE6
 - Update SIP first before conformity
- ❖ MOVES is significantly more data intensive and sensitive than MOBILE6
 - Allow enough time for the first analysis
 - Establish procedures to ensure consistency



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