Documentation for preparation of the 2016 beta platform onroad activity

Several local agencies submitted new VMT and/or VPOP and/or HOTELLING for the beta platform.

VMT

For Colorado, Connecticut, Georgia, Illinois, Maryland, New Jersey, North Carolina, Virginia, Wisconsin, and Pima County AZ:
These agencies provided VMT for 2016 by county-HPMS. This data was put into 2016 MOVES CDBs to produce a new VMT FF10 by SCC for these areas.

For Massachusetts:
MA provided VMT for 2016 by county-HPMS in which the county total VMT was split to HPMS type using the same HPMS splits in every county in the state. In order to introduce variability between counties, a new set of county-specific HPMS splits was developed for Massachusetts. The starting point was the county-specific road type splits that MA had submitted separately. Using the FHWA VM-4 report for 2015 (this report is not available for 2016), we repeated the process used for the 2014v1 EPA default VMT, in which HPMS distributions in each county are a function of the road type distributions in each county as provided by MA. We then scaled the resulting county-specific HPMS splits so that the state total HPMS splits matched the state-wide splits as provided by MA. The resulting VMT matches MA's county totals and state-wide HPMS splits, but has varying HPMS splits between counties.

For South Carolina:
SC provided VMT for 2016 by county-HPMS, although their county total VMT was split to HPMS type using the same HPMS splits (i.e. percentages) in every county in the state. In order to introduce variability between counties, a new set of county-specific HPMS splits in South Carolina was developed. First, county-HPMS ratios were calculated from the 2016 alpha VMT. For all HPMS types except 25, the alpha-based county-HPMS ratios were scaled up or down such that the overall state-HPMS ratio matches South Carolina's state-HPMS ratio. For HPMS type 25, we set the county-HPMS ratios equal to the remainder within each county so that all ratios within each county sum to 1. The result was new county-HPMS ratios that vary by county based on the county variability in the alpha VMT, and in which the state-HPMS ratios come very close to matching South Carolina's provided statewide HPMS ratios.

For Pennsylvania and New Hampshire:
These states provided FF10-level data directly (county-SCC-month). These were converted into FF10 format and used directly, except for redistribution of LD VMT among source types 21/31/32 (see below).

For Michigan and Minnesota:
These states provided VMT by county-road. The VMT were split into county-SCC-month data using county-road to county-SCC-month ratios calculated from the 2016 alpha VMT.

For West Virginia:
WV provided VMT by county total only. The VMT were split to county-SCC-month using county to county-SCC-month ratios calculated from the 2016 alpha VMT.

For Clark County NV:
Clark provided VMT by county-vehicle. The VMT were split to county-SCC-month using county-vehicle to county-SCC-month ratios calculated from 2016 alpha VMT.

Light Duty vehicle type splits (source types 21/31/32): Similar to what was done to state data in 2014NEIv2, the 21/31/32 activity were summed back up to HPMS 25 totals, and then split into 21/31/32 using the 21/31/32 splits from the alpha platform VMT. This was done for all states and counties listed above where 21/31/32 splits were not already based on the 2016 alpha VMT (all but MI, MN, and WV). Most of the states listed above did not provide VMT down to the source type, so resplitting LD VMT does not create an inconsistency with state-provided data in most states. Exceptions to that are NH and PA: those two states provided SCC-level VMT, but these were reallocated to 21/31/32 so that the splits are somewhat consistent across the country, as the 2014v2 splits were based on the 2014NEIv2 VPOP data obtained from IHS-Polk.

VPOP

For Georgia, Maryland, Massachusetts, New Jersey, North Carolina, Wisconsin, and Pima County AZ:
These agencies provided VPOP for 2016 by county-vehicle (or county-HPMS in the case of Wisconsin). These data were put into MOVES CDBs to produce a new VMT FF10 for these areas.
For Massachusetts, unlike with the VMT, the VPOP were not adjusted further following quality assurance.

For South Carolina:
SC did not provide new VPOP for beta platform. The new VMT that SC provided, in addition to CSRA's recalculation of HPMS splits between counties, introduced some issues with VMT/VPOP ratios. So, the VPOP in SC were modified for bets for HD vehicles only, not for LD vehicles. The largest VMT/VPOP ratio issues were for HD vehicles, and the LD VPOP is based on the IHS-Polk data. For HD VPOP in SC: new VPOP = alpha VPOP * (beta VMT / alpha VMT). In other words, the same alpha-to-beta changes that were made to the VMT were also made to the VPOP on a percentage basis. This preserves HD VMT/VPOP ratios in SC, which were generally acceptable in alpha platform. This procedure did result in some changes to the overall HD VPOP total in SC, both at the county level and state level.

For West Virginia and Clark County NV:
These agencies provided VPOP for 2016 by county-vehicle. But because they did not provide VMT by county-HPMS, they were not put into MOVES databases for splitting. Instead, the VPOP to county-SCC were split using county-vehicle to county-SCC ratios calculated from the 2016 beta VMT, and those splits were based on 2016 alpha VMT. WV's beta VPOP dataset did not include intercity buses (41), so those were carried forward WV intercity bus VPOP from 2016 alpha.

For Pennsylvania and New Hampshire:
These states provided FF10-level data directly (county-SCC), so they were converted into FF10 format and used directly.

For all other states, including Colorado, Connecticut, Illinois, Virginia, Michigan, Minnesota:
These agencies did not provide VPOP for beta platform. Alpha platform VPOP was carried forward with no changes. Note that CO, CT, IL, and VA are included here because they provided new beta VMT. These states were included in the VPOP dataset that was derived from the MOVES CDBs, but the VPOP was replaced in those four states VPOP taken directly from 2016 alpha platform so that electric vehicles would be included. (Note that electric VPOP is removed from the inventory prior to SMOKE-MOVES processing because electric vehicles do not generate off-network emissions, but electric vehicle VMT is passed through SMOKE-MOVES, because electric vehicles generate brake and tire PM emissions.)

Light duty vehicle (21/31/32) splits in many of the states/counties listed above changed significantly compared to alpha VPOP. But unlike with VMT, we are not resplitting VPOP, since states provided separate 21/31/32 totals for VPOP and we wanted to use those directly.

HOTELING

In 2014NEIv2, and in the 2016 alpha platform, hoteling hours were reduced in many counties across the country based on truck stop parking space data. The idea there was, county total hoteling cannot exceed the number of truck stop parking spaces in that county times the number of hours in one year.

The first step in developing 2016 beta hoteling hours activity was to create a new set of county-level hoteling activity for 2016 *without* any parking space-related reductions baked in. Methodology for this first step:
- Redo the 2014-to-2016 projection of hoteling hours activity from alpha platform, except based on an alternative 2014NEIv2 hoteling dataset in which hoteling hours have not been reduced based on available parking spaces. (Let's call this alternative dataset "unreduced" hoteling.)
- Next, adjust all 2016 alpha unreduced hoteling county totals by this factor: (beta VMT)/(alpha VMT), where VMT is for source type 62 on restricted roads only*.
- In addition, two states provided new hoteling hours activity for beta platform: Georgia and New Jersey; thus the hoteling hours from the previous step were replaced with their new submissions as the final step in creating a 2016 beta unreduced hoteling dataset.

(- Note: There are some counties in MA and MI where 62 restricted VMT was nonzero in alpha but is zero in beta. Michigan in particular big changes in road type distributions from alpha to beta. The beta road type distributions appear more accurate as not all counties have restricted roads. Therefore, there will be counties in MA and MI that had nonzero alpha hoteling hours but have zero beta hoteling hours. This seems reasonable, especially in Michigan, where in alpha platform, every county in Michigan had nonzero hoteling hours, and the state total hoteling hours are actually increasing for the beta platform, subject to reductions related to parking spaces.)*

Extended idling (EXT) vs auxiliary power unit (APU) splits: Once county total hoteling activity are finalized, we will split into EXT (2202620153) and APU (2202620191) hours. EPA OTAQ provided the factor to use for calendar year 2016: 12.4351% APU. This factor will be used everywhere except New Jersey. NJ provided their own factor with their beta platform submission: 30% APU.