



MEMORANDUM

Eastern Research Group, Inc.
2731 Shelter Island Drive Suite D
San Diego, CA 92106
(508) 868-0786

To: CRC A-88 Project Team
Brent Bailey, CRC
Betty Taylor, CRC

From: Allison DenBleyker, ERG
John Koupal, ERG

Date: July 25, 2014

Re: Revised Deliverable for CRC A-88 Task 2: Age Distribution and Vehicle Population Data

This memo accompanies the delivery of revised vehicle age distribution and vehicle population data under Task 2 of CRC A-88, “State-Supported MOVES Input Improvements”, documenting how the data were derived and its proposed use in Version 2 of the 2011 National Emissions Inventory (NEI). Accompanying this memo are four MS Excel files containing the following:

- Vehicle population for passenger cars (MOVES source type 21) and light trucks (MOVES source types 31+32) as of July 1 2011, for each U.S. county.
- Age distributions for passenger cars and light trucks (in separate files) as of July 1 2011, for each U.S. county
- County FIPS code key (i.e. state and county)

The revised age distributions and population data reflect the results of an analysis conducted by the CRC A-88 Project Team which determined that the IHS data does not adequately account for pre-1981 vehicles.

These revised data will be used in Version 2 of the NEI automatically for any county that did not submit unique vehicle population and/or age distribution data through EPA’s NEI data submission system (EIS) for either Version 1 or Version 2. This would occur if a state made no submission of MOVES inputs, or a partial submission that did not include these data. For the latter case, the NEI submission checklist provided for a county through EIS was reviewed to determine whether the tables “source type year” (where vehicle population data resides), or

“source type age distribution” were not checked, and/or if “Accept EPA default values” was chosen for the county. In addition, these data will be used by states instead of what they submitted if they have already indicated this preference to EPA.

The age distributions and populations were derived from vehicle count data by county and model year (for models years 1981 through 2012) as of July 1 2011, purchased from IHS Automotive, Inc. (formerly R.L. Polk). IHS compiled and processed the data from state vehicle registration databases, producing a dataset of vehicle counts separately for cars and light trucks (defined as <10,001 lbs Gross Vehicle Weight Rating). Age distribution was derived from the IHS vehicle count data by converting into relative age distributions that sum to one (1) over 31 age categories from 0 to 30 years old. In a first processing step, the model year populations were assigned to MOVES age identification (ID) codes from zero (0) to 30 years old. The age IDs were primarily assigned by subtracting the vehicle model year from 2011 (for example, 2010 model year vehicles are 1 year old in 2011). The vehicle counts from the late model years 2012 and 2011 were summed and labeled as age ID 0. A similar exercise would have been performed for vehicles older than 30 (model year 1981), but the IHS data did not include vehicles counts for 1980 and earlier. The CRC A-88 Project Team conducted an analysis of state-provided percents of car and truck fleets that are age 30 and older and determined the median values were 2.25% and 0.6%, respectively, for cars and trucks. In order to remain conservative and avoid over-correcting the IHS data, the CRC A-88 Project Team specified these data were to be used as a floor; counties where the oldest age category already exceeded the 2.25% and 0.6% thresholds should not change. ERG implemented this correction to account for missing vehicles in a stepwise process. First, the counties whose vehicle age distributions contained age 30 proportions of the fleet below the CRC thresholds (2.25% for cars, 0.6% for trucks) were flagged for further adjustment. Most counties were flagged for the adjustment; only two counties' car age distributions exceeded 2.25% in the raw data and 385 counties' truck age distributions exceeded 0.6%. The next step was to add vehicle population to the age 30 category until it comprised 2.25% of the total. Similarly truck population was added the age 30 category such that it became 0.6% of the fleet total. The final step was to normalize the revised populations by county and age ID, by dividing each model year population by the county total population, so that the car and light truck age distributions sum to one within each county. For the NEI, the age distributions derived from the IHS car data will apply to source type 21 (Passenger Car), and the light truck age distributions will apply to both source types 31 (Passenger Truck) and 32 (Light Commercial Truck).

Vehicle population was then summed directly from the revised IHS data by county into the MOVES passenger car, passenger truck and light commercial truck source types. This was a straightforward aggregation of the revised IHS vehicle counts. IHS light truck populations by county correspond to total light trucks (passenger and light commercial, source types 31 and 32); for each county, ERG split the light truck totals into passenger trucks and light commercial trucks (source types 31 and 32) using the MOVES national default population splits between these source types, approximately a 75/25 percent split.

The nationwide impact of increasing the pre-1981 car and truck populations was an overall increase in these populations by 2.15% and 0.4%, respectively. Another important impact is that the revised age distributions now exhibit a tail on the end of the age distribution reflecting the presence of older vehicles in a magnitude aligned with state-provided data.