Input data preparation for the SMOKE-MOVES Integration Tool

1. **Source Type Population**
   1. **Date sources**

**2002-2003 Polk’s data:** Registration data from R. L. Polk & Co.'s National Vehicle Population Profile ® (current as of October 2002) and R. L. Polk & Co.'s TIPNet ® (current as of March 2003) are used. This database includes number of vehicles by age and 16 vehicle types in each Georgia county, and has been used to develop age distribution.

**Georgia registration data (2003 and 2007)**: These registration data were obtained from [www.georgiastats.uga.edu](http://www.georgiastats.uga.edu). This database includes number of vehicles by passenger vehicles, trucks, trailers, motorcycles, buses and others in each county as explained on the Georgia Department of Revenue website (<http://motor.etax.dor.ga.gov/stats/renewalsstats.aspx>). Passenger Vehicles include Ambulances, Convertibles, Coupes, Hearses, Jeeps, Limousines, Mixers, Motor Homes, Multi-Purpose Vehicles, Roadsters, Station Wagons, Touring Cars, Vans, 2 Doors, 3 Doors, and 4 Doors. Trucks include Truck Tractors, Trucks, and Wreckers.

* 1. **Methodology**

The Polk’s data were summarized by 16 vehicles types in each county and then grown to 2007 using different growth factors by vehicle types (Table 1). The number of HDBS, HDBT and MC in Polk’s data is comparable to Georgia registration data (Table 2 and Table 3). Therefore, the numbers of HDBS and HDBT were grown to 2007 by multiplying ratios of the number of buses in Georgia motor vehicle registration data in 2007 and 2003. The number of MC was grown to 2007 by multiplying ratios of the number of motor cycles in Georgia motor vehicle registration data in 2007 and 2003. The number of the rest of vehicle types was grown to 2007 by multiplying ratios of human population in 2007 and 2002. The Georgia motor vehicle registration data were not used for these vehicle types due to the difficulty to match the vehicle type used in Georgia motor vehicle registration data to the 16 vehicle types as used in the Polk's data. Since the ratios of 2007 and 2003 passenger cars and trucks in motor vehicle registration data are comparable to the ratios of population data (Table 4), population data were used as the growth indicator.

Table 1. List of different growth factors used by vehicle types

|  |  |
| --- | --- |
| **Vehicle types** | **Growth factor** |
| HDBS | Georgia registration data (2003 and 2007), Buses |
| HDBT | Georgia registration data (2003 and 2007), Buses |
| HDV2B | Population 2002 and 2007 |
| HDV3 | Population 2002 and 2007 |
| HDV4 | Population 2002 and 2007 |
| HDV5 | Population 2002 and 2007 |
| HDV6 | Population 2002 and 2007 |
| HDV7 | Population 2002 and 2007 |
| HDV8A | Population 2002 and 2007 |
| HDV8B | Population 2002 and 2007 |
| LDT1 | Population 2002 and 2007 |
| LDT2 | Population 2002 and 2007 |
| LDT3 | Population 2002 and 2007 |
| LDT4 | Population 2002 and 2007 |
| LDV | Population 2002 and 2007 |
| MC | Georgia registration data (2003 and 2007), Motor cycles |

Table 2. Summary of 2002-2003 Polk’s data by 16 mobile vehicle types in four Georgia regions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vehicle types | **ATL13** | **ATL7** | **GAGAS** | **GAOTHER** | **Total** |
| HDBS | 7,854 | 1,333 | 2,032 | 8,221 | 19,440 |
| HDBT | 1,362 | 102 | 139 | 540 | 2,143 |
| HDV2B | 56,809 | 11,761 | 15,405 | 49,039 | 133,014 |
| HDV3 | 27,628 | 5,996 | 7,822 | 23,797 | 65,243 |
| HDV4 | 13,623 | 2,262 | 2,850 | 10,351 | 29,086 |
| HDV5 | 6,005 | 1,162 | 1,550 | 5,577 | 14,294 |
| HDV6 | 19,294 | 4,088 | 5,932 | 21,688 | 51,002 |
| HDV7 | 16,380 | 2,528 | 3,838 | 15,309 | 38,055 |
| HDV8A | 37,555 | 4,307 | 6,619 | 31,883 | 80,364 |
| HDV8B | 14,449 | 2,201 | 3,061 | 10,926 | 30,637 |
| LDT1 | 722,044 | 131,873 | 181,393 | 607,189 | 1,642,499 |
| LDT2 | 95,101 | 28,933 | 37,692 | 156,187 | 317,913 |
| LDT3 | 302,139 | 62,530 | 75,409 | 284,851 | 724,929 |
| LDT4 | 43,616 | 8,019 | 9,721 | 39,432 | 100,788 |
| LDV | 1,723,769 | 255,647 | 346,907 | 1,383,696 | 3,710,019 |
| MC | 50,081 | 10,657 | 13,767 | 41,123 | 115,628 |

Table 3. Summary of 2003 Georgia registration data by 4 mobile vehicle types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vehicle types | **ATL13** | **ATL7** | **GAGAS** | **GAOTHER** | **Total** |
| Buses | 10,676 | 1,559 | 2,434 | 9,797 | 21,237 |
| Trucks | 558,496 | 168,930 | 237,022 | 823,867 | 1,788,315 |
| Passenger Cars | 2,259,027 | 339,456 | 449,177 | 1,744,474 | 4,792,134 |
| Motorcycles | 46,836 | 10,203 | 13,124 | 38,561 | 108,724 |

Table 4. Comparison between different growth factors

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Ratios** | |
|  | **2002** | **2003** | **2007** | **2007/2002** | **2007/2003** |
| Motor vehicle registration | | | | | |
| Passenger Car |  | 4,792,134 | 5,330,256 |  | 1.112 |
| Trucks |  | 1,788,315 | 1,952,470 |  | 1.092 |
| Motor Cycle |  | 108,724 | 174,617 |  | 1.606 |
| Bus |  | 21,237 | 35,124 |  | 1.654 |
| Population in Georgia, U.S. Census | | | | | |
| Population | 8,585,535 | 8,735,259 | 9,533,761 | 1.110 | 1.091 |
| Total Average Annual Daily VMT in Georgia, Georgia DOT 445 report, miles | | | | | |
| VMT | 292,562,380 | 296,810,994 | 305,327,543 | 1.044 | 1.029 |
| MOVES national SALESGROWTH factor defaults | | | | | |
| Motorcycle |  |  |  | 1.383 | 1.311 |
| Passenger Car |  |  |  | 0.940 | 1.001 |  |
| Passenger Truck |  |  |  | 0.972 | 0.948 |
| Light Commercial Truck |  |  |  | 0.972 | 0.948 |
| Intercity Bus |  |  |  | 1.353 | 1.268 |
| Transit Bus |  |  |  | 1.353 | 1.268 |
| School Bus |  |  |  | 1.353 | 1.268 |
| Refuse Truck |  |  |  | 1.353 | 1.268 |
| Single Unit Short-haul Truck |  |  |  | 1.353 | 1.268 |
| Single Unit Long-haul Truck |  |  |  | 1.353 | 1.268 |
| Motor Home |  |  |  | 1.353 | 1.268 |
| Combination Short-haul Truck |  |  |  | 1.464 | 1.405 |
| Combination Long-haul Truck |  |  |  | 1.464 | 1.405 |

The projected 2007 vehicle population by 16 vehicle types in each county were then converted to 32 vehicles types, which were matched with 28 vehicle types and 12 vehicle types (corresponding to 12 SCC codes) as shown in the EPA MOVES converter tool. The EPA MOVES converter tool was also used to convert vehicle population in MOVES format by each of the four reference counties. These populations are the sum of populations of all counties sharing the same reference counties.

1. **VMT**
   1. **Date sources**

**GADOT445 report:** 2007 VMT by 18 road types was obtained from: <http://www.dot.state.ga.us/statistics/RoadData/Pages/400Series.aspx>.

The VMT by 18 road types was converted to the 12 HPMS road types as follows:

Rural Interstate + Small Urban Interstate + Small Urban Freeway

Rural Principal Arterial + Small Urban Principal Arterial

Rural Minor Arterial + Small Urban Minor Arterial

Rural Minor Collector + Small Urban Collector

Rural Local + Small Urban Local

**VMT mix by 28 vehicle types:** Three types of VMT mix were used for three groups of counties respectively, including ATL13, ATL7 and others. These VMT mix were outputs from Mobile6 runs, with different age distribution inputs for each group of counties.

* 1. **Methodology**

VMT by 12 road types was multiplied by the VMT mix to get VMT by 12 road types and 28 vehicle types, which were matched with SCCs to get VMT by SCC.

The VMT by 12 road types was also summed up for all counties sharing the same representative county. Such VMT by each representative county and corresponding VMT mix was input into the EPA converter tool to the MOVES format.