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. 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.

2) 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.

2. 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.

2) 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.