APPENDIX C

Documentation of Data Development Process for Mobile Source Emissions Calculations

Air Quality Conformity Analysis

National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Files
FROM: Jinchul (JC) Park, Principal Transportation Engineer
SUBJECT: Mobile Source Emissions Modeling Process and Data Development for the Air Quality Conformity Analysis of the Visualize 2050
DATE: January 14, 2025

1.0 BACKGROUND

This technical appendix documents three categories of data preparation executed for MOVES model: (1) postprocessing of MWCOG/TPB's Version 2.4.6 travel demand model results; (2) development of travel-related inputs based on the postprocessed travel demand results from (1) and local data; and (3) non-travel related inputs such as meteorology, fuel supply, fuel usage fraction, and fuel formulation, inspection/maintenance (I/M) programs and state-specific policy programs.

The MOVES model requires two broad sets of data (i.e., travel and non-travel related data) and policy programs specific to each state's requirements. Travel related data were created through data development methods established and recommended by the MOVES Task Force. Postprocessing of travel demand results is a pre-requisite for developing travel related data. Non-travel related data were provided by state air quality agencies. Vehicle registration data, or vehicle identification number (VIN), for 2023 was obtained from air agencies in the District of Columbia, the Commonwealth of Virginia, and the state of Maryland. The 2023 VIN data was used to create vehicle profiles (i.e., vehicle population and vehicle age distribution) which were applied for Visualize 2050. The data inputs are obtained from a variety of sources as shown in Table 1. Local data are applied in emissions estimations where available; otherwise, MOVES default data are used. Table 1 exhibits MOVES input data by locality and supplies sources of the data.

Emissions modeling in Metropolitan Washington Council of Governments/Transportation Planning Board (MWCOG/TPB) is executed by applying Emissions Modeling Process (EMP) version 4.0.1[1] which is compatible with MOVES4.0.1. The EMP is composed of mainly three components to be executed in order: (1) Development of travel and non-travel related data and local data for MOVES and creation of MOVES setups; (2) Execution of MOVES model; and (3) Summary of MOVES outputs. The modeling process is illustrated in Figure 1.

2.0 POSTPROCESSING OF TRAVEL DEMAND RESULTS

Travel demand results are postprocessed to create vehicle hours of travel (VHT) and vehicle miles of traveled (VMT) distributions, which later will be used to create travel related MOVES data. An emissions postprocessor had been used to calculate emissions in the Mobile 6.2 model in the past, but with MOVES, postprocessing is tailored to only create VHT and VMT distributions for each vehicle type.

For each analysis year, travel demand results are postprocessed to obtain hourly jurisdictional VHT and VMT distributions by Mobile's 14 speed bins and three vehicle types (i.e., passenger vehicles, commercial vehicles and trucks) for two facility types. In postprocessing six travel markets from the travel demand model results are grouped into three vehicle types as follows:

[1] Daniel Son and Jinchul Park to Files, "Memo_EMP400_forMOVES400_09282023.pdf," Draft memorandum, September 28, 2023, available under V:\MOVES\MOVES4\Document

- Passenger Vehicles (PVs) = SOV + HOV2 + HOV3 or more + Airport Passenger Trips;
- Commercial Vehicles (CVs) = Commercial Vehicles; and
- Heavy Duty Vehicles (HDVs) = Trucks;

And six facility types are grouped into two as follows:

- Freeway = freeway + expressway + freeway ramp; and
- Arterial = major arterial + minor arterial + collector.

The postprocessor is then executed once for each analysis year. The successful postprocessing of travel demand results produce hourly jurisdictional VHT distributions by Mobile's 14 speed bins and two facility types for three vehicle types, and jurisdictional VMT by two facility types for three vehicle types. Figure 2 illustrates the postprocessing of travel demand results.

Table 1. MOVES Input Data

Data Type	No	Data Category	Data Table Name	Locality	Data Source
Travel	1	Age Distribution	sourceTypeAgeDistribution	County	based on VIN
	2	Average Speed Distribution	avgSpeedDistribution	County	based on TDM's post-processor outputs + school bus/refuse truck data from Fairfax Co. + Transit bus from WMATA
	3	Road Type Distribution	roadTypeDistribution	County	based on TDM's post-processor outputs
	4	Source Type Population	sourceTypeYear	County	based on CLRP Vehicle Projection & VIN
	5	Vehicle Type VMT	HPMSVTypeYear	County	based on TDM's post-processor outputs
			monthVMTFraction	Region	based on Regional Data
			dayVMTFraction	Region	based on Regional Data
			hourVMTFraction	Region	based on Regional Data
Non-travel	6	Fuel	FuelSupply	State	from state air agency (state-wide data)
	7		FuelFormulation	State	from state air agency (state-wide data)
	8	I/M Programs	IMCoverage	State	from state air agency (state-wide data)
	9	Meteorology Data	zoneMonthHour	Region	from DEP (region-wide data)
	10	AVFT	AVFT	State	from state air agency (state-wide data)
	11	State II Program	Countyyear	State	from state air agency (state-wide data)

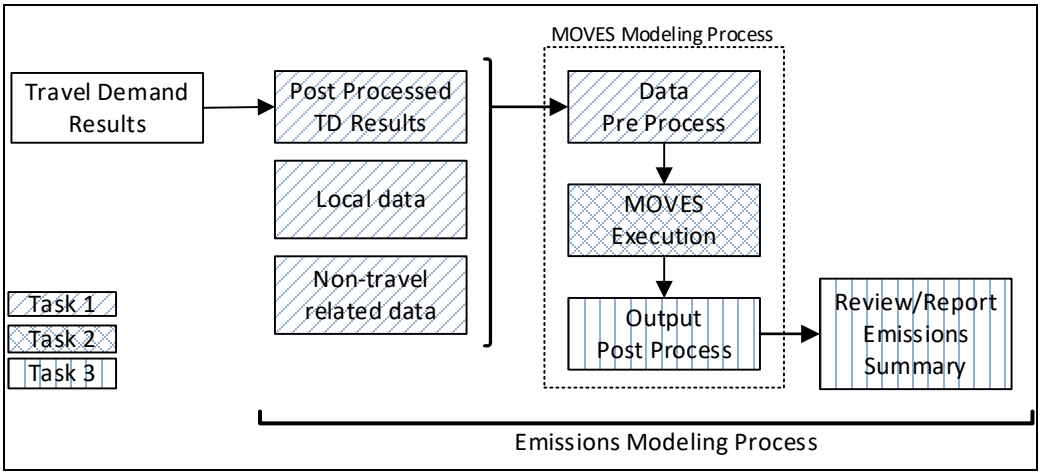

Figure 1. Emissions Modeling Process

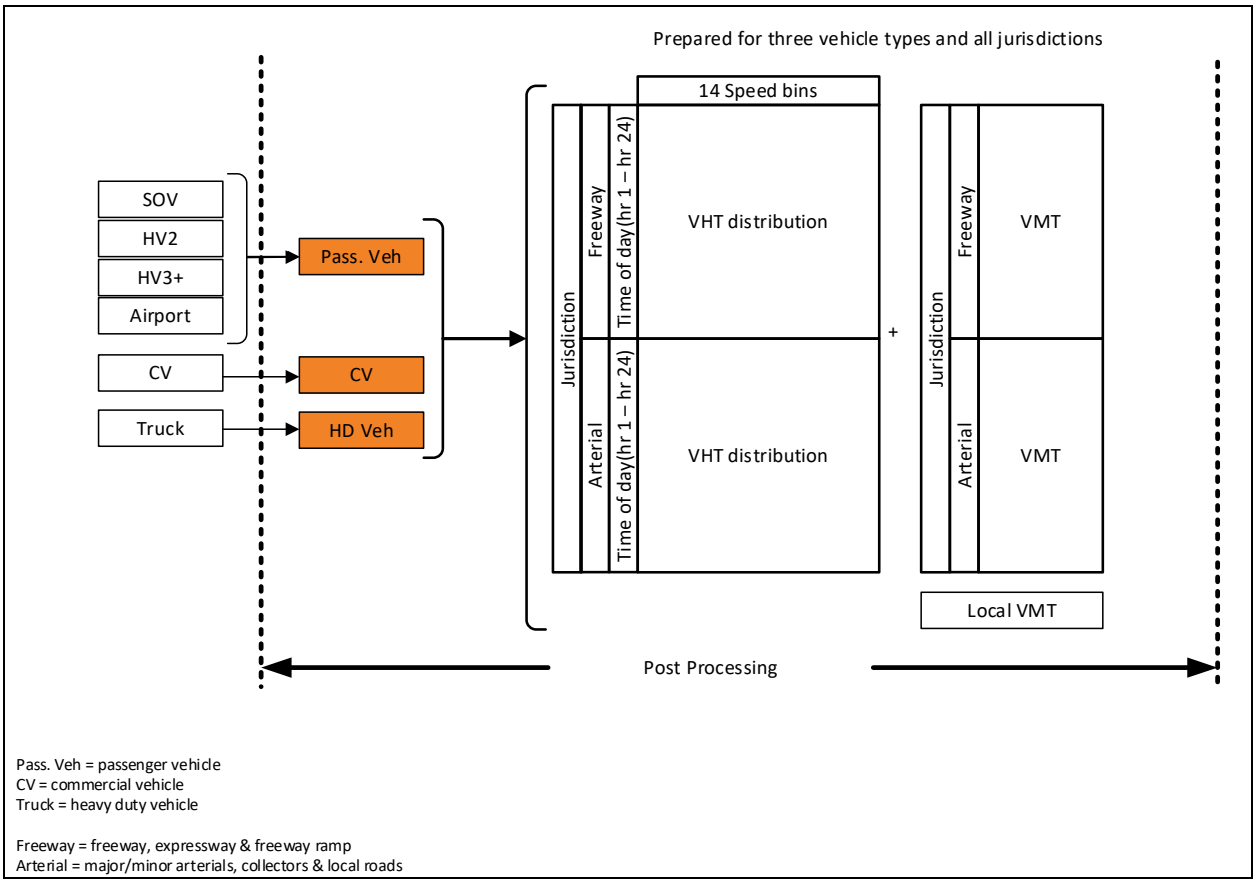

Figure 2. Postprocessing of Travel Demand Results

3.0. TRAVEL RELATED INPUTS

A. Age Distribution

Every three years since 2005, Departments of Motor Vehicles of the District of Columbia, Maryland, and Virginia have been supplying MWCOG/TPB with vehicle registration data for use in Air Quality Conformity (AQC) Determinations and State Implementation Plan (SIP) updates. The vehicle registration data, collected by Departments of Motor Vehicles in each state, are a snapshot of vehicle registrations of the year the data were collected, which contain a broad range of attributes of the vehicles registered in the jurisdictions of the Metropolitan Washington DC non-attainment area. The latest data, 2023 VIN are used in the development of future year vehicle population profiles (i.e., vehicle age and vehicle type distribution) for all analysis years in the air quality conformity analysis for Visualize 2050.

Prior to using the VIN data as input to MOVES, the 'raw' vehicle registration data are decoded using a commercial decoding software program[2]. Following EPA's guidelines, the data are decoded in two steps in order: (1) the 'raw' data are decoded to a Mobile 6.2 format; and (2) the Mobile 6.2 format vehicle population distributions are converted to a MOVES format using an EPA converter[3]. Thus, 16 Mobile vehicle types and 25 vehicle age categories are mapped into MOVES' 13 vehicle and 31 vehicle age categories. The vehicle population mapping process is shown in greater detail in Table AS1 in the Appendix Supplement section. The vehicle population of the 2023 VIN data was reviewed by the

[2] VinPower, Copyright; ESP Data Solutions Inc., Product version 4.0.0.42
[3] RegistrationDistributionConverter_Veh16.xls, https://www.epa.gov/moves/tools-develop-or-convert-moves-inputs#fleet

MWCOG/TPB technical committee prior to becoming approved for transportation planning applications. The VIN data were approved by MWCOG/TPB to be used for Visualize 2050 when the air quality conformity analysis scope of work was approved, in May 2024.

B. Average Speed Distribution

The MWCOG/TPB regional travel demand model calculates link-level traffic volumes, not average link-level speed estimates. Vehicle Hours of Travel (VHT) distributions were selected as a suitable proxy for average speed distribution. MWCOG/TPB's regional travel demand model results are first processed to derive VHT distributions by six vehicle categories:

- Single Occupancy Vehicles (SOV);
- High Occupancy Vehicles 2 (HOV2);
- High Occupancy Vehicles 3+ (HOV3 or more);
- Commercial Vehicles;
- Trucks; and
- Airport Passenger Trips.

Through postprocessing, six VHT distributions are first classified by three vehicle types, Mobile's 14 speed bins, hour of the day, and two facility types (i.e., freeway and arterial); and later reclassified into MOVES's 16 speed bins, hour of the day, day of the week (i.e., weekdays and weekend days), and four facility types for Ozone non-attainment jurisdictions in MWCOG/TPB planning area. Six vehicle types from the travel demand model are reclassified into three vehicle types as follows:

- Passenger Vehicles (PVs) = SOV + HOV2 + HOV3 or more + Airport Passenger Trips;
- Commercial Vehicles (CVs) = Commercial Vehicles; and
- Heavy Duty Vehicles (HDVs) = Trucks.

MOVES requires: (1) 16 speed bins from 2.5 mph to 75 mph in increments of 5 mph; and (2) four road types, which are a combination of two facility types (i.e., restricted and unrestricted) and two environmental settings (i.e., urban and rural settings). The restricted facilities include freeways, expressways and freeway ramps, while the unrestricted facilities include major/minor arterials, collectors, and local roads. The following assumptions are used to develop average speed distributions fulfilling MOVES requirements stated above:

1. VHT Distribution to Restricted Facilities:

    a. All vehicle types:
        - Weekday VHT Distribution:
            - All Day: Hourly distribution for all vehicles
        - Weekend VHT Distribution:
            - 11:00 am – 7:00 pm: Distribution across the 13 MOVES vehicle type categories reflecting the 3:00 pm hour on a weekday
            - 7:01 pm – 10:59 am: Distribution across the 13 MOVES vehicle type categories reflecting the 12:00 am hour on a weekday

2. VHT Distribution to Unrestricted Facilities:

    a. All vehicle types exclusive of refuse trucks, school buses and transit buses:
        - Weekday VHT Distribution:
            - All Day: Hourly distribution for all vehicles

- Weekend VHT Distribution:
  - 11:00 am – 7:00 pm: Distribution reflecting the 3:00 pm hour on a weekday
  - 7:01 pm – 10:59 am: Distribution reflecting the 12:00 am hour on a weekday

b. Refuse trucks: Refuse trucks operate on a 3-phase cycle: Phase 1 is the period of driving from the dispatch garage to trash collection sites; Phase 2 is the period of the actual trash/recycle collection; Phase 3 is the period of driving back to transfer stations. Using local data from Fairfax County, VA, the average speed of Phases 1 and 3 were assumed to be in the range of 22.5-27.5 miles per hour (i.e., MOVES Speed Bin 6), and the average speed of Phase 2 was assumed to be in the range of 2.5-7.5 miles per hour (i.e., MOVES Speed Bin 2). Based on the above assumptions the refuse truck vehicle type VHT distributions were as follows:

- Weekday VHT Distribution (see Table 2):
  - 5:00 am–5:00 pm (Trash Collection): VHT hourly distributions according to Phases 1, 2 and 3.
  - 5:01 pm–5:00 am (On Road Phase): VHT hourly distribution consists of Phase 2.
- Weekend VHT Distribution:
  - All Day: VHT distribution made up of Phase 1 and Phase 3 (on road phases)

c. School buses:
- Weekday VHT Distribution:
  - 6:00 am – 6:00 pm: VHT distribution (see Table 3)
  - 6:00 pm – 6:00 am: VHT distribution of heavy-duty vehicles

- Weekend VHT Distribution:
  - 11:00 am–7:00 pm: VHT Distribution of heavy-duty vehicles at 3:00 pm on a weekday
  - 7:00 pm – 11:00 am: VHT Distribution of heavy-duty vehicles at 12:00 am on a weekday

d. Transit buses:
- Weekday VHT Distributions (see Table 4):
  - 6:00 – 9:00 am: Per WMATA's bus speed distribution of the AM peak period
  - 9:00 am–3:00 pm: Per WMATA's bus speed distribution of the off-peak period
  - 3:00 - 6:00 pm: Per WMATA's bus speed distribution of the PM peak period
  - 6:00pm-6:00 am: Per WMATA's bus speed distribution of the off-peak period

- Weekend VHT Distribution (see Table 4):
  - All Day: Per WMATA's bus speed distribution of the off-peak period.

Table 2. Average Weekday VHT Distribution for Refuse Trucks (source: Fairfax Co, VA)[4]

Speed Bins	Speed Range	5:00 AM - 5:00 PM	5:01 PM - 4:59 AM
1	< 2.5 mph	0.00%	0.00%
2	2.5 - 7.5 mph	62.65%	0.00%
3	7.5 - 12.5 mph	0.00%	0.00%
4	12.5 - 17.5 mph	0.00%	0.00%
5	17.5 -22.5 mph	0.00%	0.00%
6	22.5 - 27.5 mph	37.35%	100.00%
7	27.5 - 32.5 mph	0.00%	0.00%
8	32.5 - 37.5 mph	0.00%	0.00%
9	37.5 - 42.5 mph	0.00%	0.00%
10	42.5 - 47.5 mph	0.00%	0.00%
11	47.5 - 52.5 mph	0.00%	0.00%
12	52.5 - 57.5 mph	0.00%	0.00%
13	57.5 - 62.5 mph	0.00%	0.00%
14	62.5 - 67.5 mph	0.00%	0.00%
15	67.5 - 72.5 mph	0.00%	0.00%
16	72.5 mph <	0.00%	0.00%

Table 3. VHT Distribution of School Buses (6:00 am – 6:00 pm) (source: Fairfax Co, VA)

		Bus Trip (%)											
Speed Bin	Speed Range	1	2	3	4	5	6	7	8	9	10	11	Wgt. Avg.
1	< 2.5 mph	0.35	24.30	17.58	14.65	7.90	16.11	6.55	18.30	25.76	16.18	17.67	19.21
2	2.5 - 7.5 mph	10.87	11.57	6.45	11.04	29.89	20.20	44.83	11.01	9.68	6.49	9.12	14.39
3	7.5 - 12.5 mph	10.90	9.35	12.89	6.50	26.31	17.69	3.34	9.12	9.52	6.69	8.69	10.92
4	12.5 - 17.5 mph	8.81	9.18	8.59	9.45	6.00	11.13	23.76	10.12	9.98	8.46	10.32	10.37
5	17.5 -22.5 mph	5.01	10.15	5.18	14.04	3.04	5.94	4.09	10.36	7.57	9.74	12.02	8.30
6	22.5 - 27.5 mph	8.91	8.55	11.62	12.59	6.18	5.30	3.54	7.29	7.11	8.87	11.73	8.13
7	27.5 - 32.5 mph	8.79	7.97	14.36	11.28	5.86	13.33	6.35	9.43	5.37	10.06	10.20	9.41
8	32.5 - 37.5 mph	5.33	9.10	5.86	13.43	7.62	3.32	6.36	13.79	8.68	12.04	6.81	7.81
9	37.5 - 42.5 mph	3.43	6.89	8.69	7.02	4.80	3.76	1.07	7.94	9.79	13.81	8.16	7.22
10	42.5 - 47.5 mph	1.72	2.44	8.79	0.00	2.40	2.87	0.00	1.31	5.83	5.15	4.75	3.42
11	47.5 - 52.5 mph	0.68	0.00	0.00	0.00	0.00	0.36	0.00	0.67	0.31	32.27	0.36	0.59
12	52.5 - 57.5 mph	0.34	0.50	0.00	0.00	0.00	0.00	0.00	0.67	0.41	0.24	0.18	0.23
13	57.5 - 62.5 mph	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	62.5 - 67.5 mph	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	67.5 - 72.5 mph	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	72.5 mph <	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[4] Sivasailam, Daivamani, et al., "Vehicle Hours of Travel (VHT) Distribution for Refuse Truck," (MOVES Task Force Meeting, Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, September 21, 2010), available under V:\MOVES\Memos_MOVES_Task_Force\2010.09.21\3.Item 3a.pdf

Table 4. VHT Distribution of Transit Buses
(Source: Washington Metropolitan Area Transit Authority (WMATA))

Speed Bin	Speed Range	6:00 am - 9:00 am	3:00 pm - 6:00 pm	9:01 am - 2:59 pm/ 5:01 pm - 5:59 pm
1	< 2.5 mph	9.94	9.10	7.92
2	2.5 - 7.5 mph	13.79	18.95	14.49
3	7.5 - 12.5 mph	34.07	37.86	31.36
4	12.5 - 17.5 mph	28.52	23.97	29.17
5	17.5 -22.5 mph	10.02	5.92	10.77
6	22.5 - 27.5 mph	1.88	1.84	3.91
7	27.5 - 32.5 mph	0.92	0.85	1.04
8	32.5 - 37.5 mph	0.34	0.60	0.72
9	37.5 - 42.5 mph	0.14	0.50	0.35
10	42.5 - 47.5 mph	0.05	0.15	0.15
11	47.5 - 52.5 mph	0.31	0.28	0.06
12	52.5 - 57.5 mph	0.00	0.00	0.06
13	57.5 - 62.5 mph	0.00	0.00	0.00
14	62.5 - 67.5 mph	0.00	0.00	0.00
15	67.5 - 72.5 mph	0.00	0.00	0.00
16	72.5 mph <	0.00	0.00	0.00

C. Road Type Distribution

Road type distribution develops Vehicle Miles Traveled (VMT) distribution by MOVES 13 vehicle types and four facility types. The method of developing VMT distribution is as follows:

1. Through postprocessing of travel demand results, jurisdictional VMT distributions of six vehicle types are reclassified to VMT distributions by three vehicle types as follows:

    - Passenger Vehicles (PVs) = SOV + HOV2 + HOV3 or more + Airport Passenger Trips;
    - Commercial Vehicles (CVs) = Commercial Vehicles; and
    - Heavy Duty Vehicles (HDVs) = Trucks.

2. VMT percentages by three vehicle types are allocated to MOVES vehicle types as follows:

    - Passenger Vehicles (PVs): VMT percentages by facility type are applied to motorcycles, passenger cars and passenger trucks;
    - Commercial Vehicles (CVs): VMT percentages by facility type are applied to commercial trucks;
    - Heavy Duty Vehicles (HDVs): VMT percentages by facility type are applied to single unit short-haul and long-haul trucks, and combination short-haul and long-haul trucks;
    - Refuse Trucks and Motor Homes: MOVES default percentage values;
    - School, Transit and Intercity Buses: Local network percentages from local data sources (i.e., local bus operators); and
    - Urban and rural percentage split factors are used to further allocate facility type VMT between urban and rural facilities. These factors vary by jurisdiction, and are based on the latest Highway Performance Monitoring System (HPMS) VMT data provided by the three state transportation agencies. Figure 3 illustrates the process of allocating VMT by vehicle type, facility type, and urban/rural split.

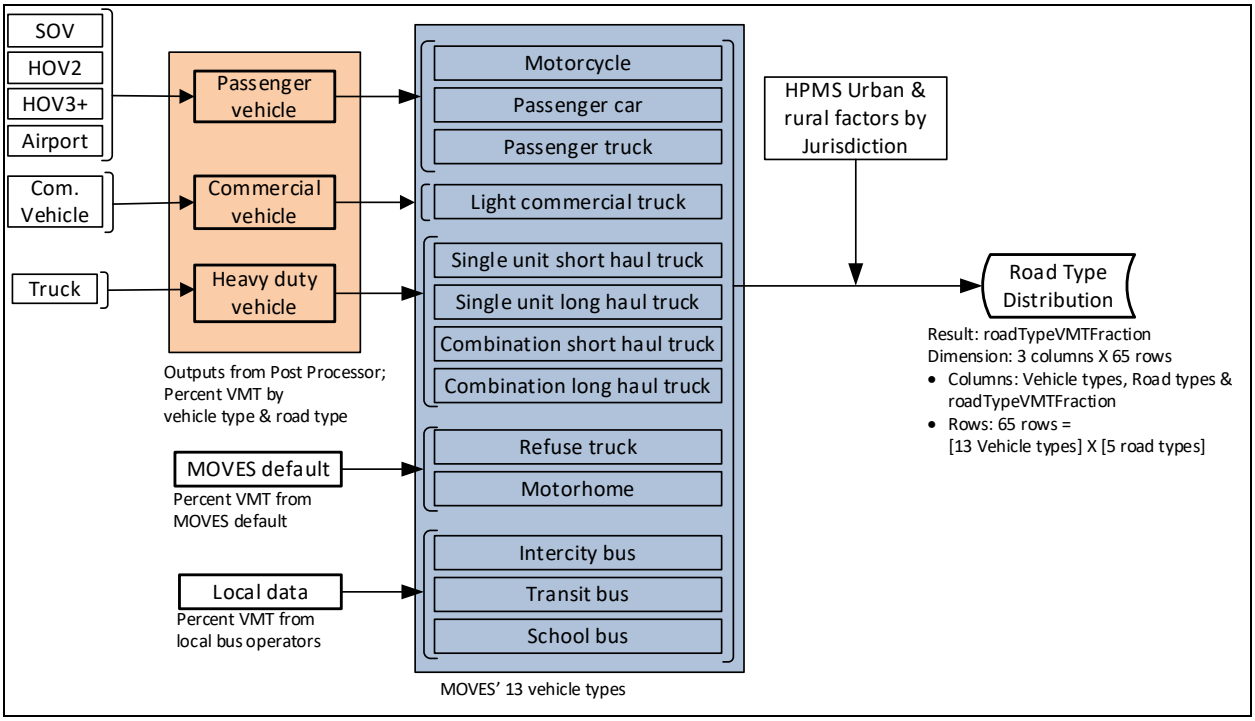

Figure 3. Road Type Distribution Development Process

D. Source Type Population

Source type population, or vehicle population, is acquired from the vehicle registration data. The VIN decoding software outputs vehicle population totals by Mobile 6.2 vehicle types. The vehicle population from the VIN data is then used to estimate vehicle population for each analysis year. Methods of estimating vehicle population vary by analysis year and availability of VIN data.

For example:

- Case 1: If a VIN data year is the same as an analysis year, vehicle population total of the VIN data is used without any change;
- Case 2: If an analysis year is historical and is between any two VIN data years, vehicle population total of the analysis year is calculated using an interpolation method based on the two sets of VIN data; and
- Case 3: If an analysis year is a future year, regression analysis is used to project future vehicle population totals based on available VIN data (collected from 1975 to 2023), which draws the 'best fitting' line among scattered VIN data points[5].

Table 5 exhibits vehicle population forecasts based on this method using 2023 VIN data. Vehicle profiles of the 2023 VIN data are used to develop future year vehicle profiles by jurisdiction. Vehicle profiles are prepared in a Mobile format first, and then are converted into a MOVES vehicle type using a vehicle mapping table provided by EPA (see Table AS1 in the Appendix).

[5] Daniel Son and Jinchul Park to Files, "Vehicle Population Projection with 2023 Vehicle Registration Data," Draft memorandum, January 14, 2025, V:\MOVES\VIN_Data\2023_VIN\Document\Memo_23VIN\Memo&Tables\Memo_VehPop_Projection_2023VIN.pdf

Table 5. Vehicle Population Forecasts (Source Type Population) based on 2023 VIN

State	Jurisdiction	2025	2026	2030	2040	2045	2050
DC	District of Columbia	317,074	319,976	331,581	360,596	375,103	389,610
Maryland	Calvert County	98,159	99,671	105,716	120,829	128,386	135,942
	Charles County	157,088	159,348	168,391	190,996	202,299	213,602
	Frederick County	258,124	261,782	276,413	312,989	331,277	349,565
	Montgomery County	827,680	835,889	868,729	950,827	991,876	1,032,925
	Prince George's County	689,867	695,395	717,506	772,784	800,423	828,062
Virginia	City of Alexandria	132,778	133,804	137,905	148,158	153,285	158,412
	Arlington County	151,844	152,706	156,156	164,779	169,091	173,403
	Fairfax County	1,025,358	1,037,182	1,084,477	1,202,716	1,261,835	1,320,955
	Loudoun County	359,934	367,295	396,738	470,345	507,149	543,952
	Prince William County	478,922	487,399	521,305	606,069	648,451	690,833
Total		4,496,829	4,550,446	4,764,916	5,301,089	5,569,175	5,837,262
	2020 VIN Forecast	4,555,464	4,611,187	4,834,076	5,391,299	5,669,910	5,948,521
	2023 VIN / 2020 VIN	98.7%	98.7%	98.6%	98.3%	98.2%	98.1%

E. Vehicle Type VMT and VMT Percent by Hour, Day, and Month

MOVES4.0.1, the MOVES version applied for Visualize 2050, requires annual VMT by five Highway Performance Monitoring System (HPMS) vehicle types. These are:

- Motorcycle (sourceTypeID = 10);
- Light duty vehicle (sourceTypeID = 25);
- Buses (sourceTypeID = 40);
- Single unit trucks (sourceTypeID = 50); and
- Combination trucks (sourceTypeID =60).

Average annual weekday VMT estimates include on-network data from the travel demand model outputs as well as local road VMT estimates, which are added in exogenously. Auto access VMT for transit riders, estimated from postprocessing, is added to the VMT of Light Duty Vehicles (sourceTypeID = 25). Modeled VMT is divided into three vehicle types: passenger vehicles, commercial vehicles, and heavy-duty vehicles. Local road VMT is developed by using a combination of observed and simulated data in the postprocessing shown in Figure 4.

The local road VMTs are added to VMT from the travel model to produce total VMT. The resulting total VMT of the three vehicle types is then classified by five MOVES vehicle types using observed jurisdictional Highway Performance Monitoring System (HPMS) VMT percentages. Figure 4 illustrates the process of developing VMT for five HPMS vehicle types.

An EPA converter, AAD VMT Calculator HPMS.XLS, is used to convert daily VMT into the required annual VMT necessary for MOVES. The converter uses annual average weekday VMT (AADVMT) at the HPMS level to calculate type of day (i.e., weekday or weekend day), monthly and yearly VMT in terms of HPMS and/or MOVES source types. It generates the HPMSVTypeYear, monthVMTFraction, and dayVMTFraction tables from AADVMT and monthly/weekend-day adjustment factors.

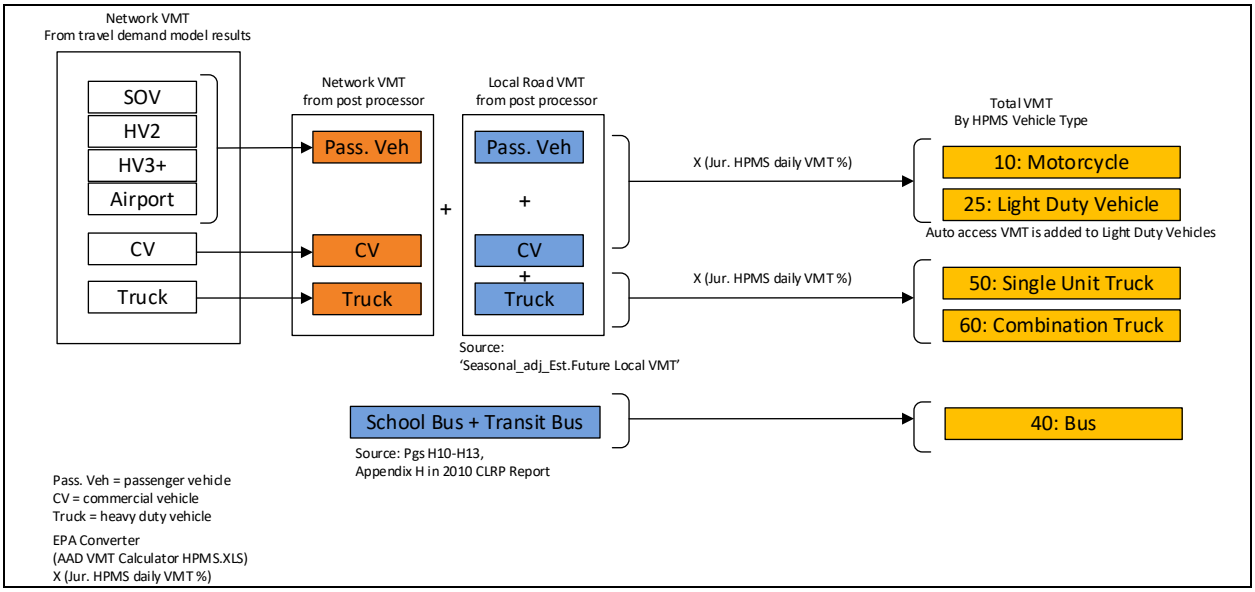

Figure 4. Annual VMT Calculation Process

F. Ramp Fraction

Ramp fraction data are no longer required for MOVES4.0.1, which was applied for Visualize 2050.

4.0 DEP Inputs – Visualize 2050

A. METEOROLOGY

Meteorological data used in the transportation conformity analysis for a particular pollutant must be the same data that were used in developing the most recent approved (or deemed adequate) motor vehicle emissions budgets (MVEBs) in an Attainment State Implementation Plan (SIP) or Maintenance SIP for that pollutant.

Meteorology data for July 2014 from Dulles Airport were used to develop the most recent approved MVEBs in the 2008 Ozone NAAQS Redesignation Request and Maintenance Plan. Therefore, these data were also used for developing emissions for all milestone years for the Visualize 2050 conformity analysis.

B. FUEL SUPPLY, FUEL FORMULATION, & FUEL USAGE FRACTION

MOVES4.0.1 inputs for fuel formulation, fuel supply, and fuel usage fraction were provided by the District of Columbia, Maryland, and Virginia for all milestone years.

C. INSPECTION/MAINTENANCE (I/M) PROGRAMS

Details of I/M programs for all milestone years were provided by the District of Columbia, Maryland, and Virginia in MOVES4.0.1 ready format.

D. STATE SPECIFIC CONTROL PROGRAMS

Three control programs were used for all milestone years:

1. Early NLEV Program: Data is provided in the database titled 'moves4_early_nlev'.
2. Cal-LEV Program (Maryland Only): Data is provided in the database titled 'moves4_caleviii2011'.

3. Stage II Program:

District of Columbia: MOVES4.0.1 defaults were used (Refueling Vapor Program Adjustment = 0.9, Refueling Spill Program Adjustment = 0.5)

Maryland & Virginia: Jurisdiction-specific data were used (Refueling Vapor Program Adjustment = 0, Refueling Spill Program Adjustment = 0)

E. AVFT Data

MOVES4.0.1 AVFT defaults were used for all jurisdictions.

APPENDIX SUPPLEMENT

TABLE AS1 - Population Mapping from MOBILE6.2 Vehicle Types to MOVES Source Types

MOBILE6.2 Vehicle		MOVES Source Type		
ID	Name	ID	Name	Fraction
1	LDGV	21	Passenger Car	1.00
2	LDGT1	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
3	LDGT2	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
4	LDGT3	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
5	LDGT4	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
6	HDGV2B	31	Passenger Truck	0.63
		32	Light Commercial Truck	0.37
7	HDGV3	31	Passenger Truck	0.63
		32	Light Commercial Truck	0.37
8	HDGV4	31	Passenger Truck	0.06
		32	Light Commercial Truck	0.94
9	HDGV5	31	Passenger Truck	0.06
		32	Light Commercial Truck	0.94
10	HDGV6	43	School Bus	0.04
		52	Single Unit Short-haul Truck	0.69
		53	Single Unit Long-haul Truck	0.03
		54	Motor Home	0.23
		61	Combination Short-haul Truck	0.01
11	HDGV7	43	School Bus	0.04
		52	Single Unit Short-haul Truck	0.69
		53	Single Unit Long-haul Truck	0.03
		54	Motor Home	0.23
		61	Combination Short-haul Truck	0.01
12	HDGV8A	52	Single Unit Short-haul Truck	0.90
		53	Single Unit Long-haul Truck	0.08
		61	Combination Short-haul Truck	0.02
13	HDGV8B	52	Single Unit Short-haul Truck	0.90
		53	Single Unit Long-haul Truck	0.08
		61	Combination Short-haul Truck	0.02
14	LDDV	21	Passenger Car	1.00

TABLE AS1 - Population Mapping from MOBILE6.2 Vehicle Types to MOVES Source Types (continued)

MOBILE6.2 Vehicle Type		MOVES Source Type		
ID	Name	ID	Name	Fraction
15	LDDT12	31	Passenger Truck	0.42
		32	Light Commercial Truck	0.58
16	HDDV2B	31	Passenger Truck	0.43
		32	Light Commercial Truck	0.57
17	HDDV3	31	Passenger Truck	0.43
		32	Light Commercial Truck	0.57
18	HDDV4	31	Passenger Truck	0.10
		32	Light Commercial Truck	0.90
19	HDDV5	31	Passenger Truck	0.10
		32	Light Commercial Truck	0.90
20	HDDV6	51	Refuse Truck	0.01
		52	Single Unit Short-haul Truck	0.72
		53	Single Unit Long-haul Truck	0.06
		54	Motor Home	0.07
		61	Combination Short-haul Truck	0.11
		62	Combination Long-haul Truck	0.03
21	HDDV7	51	Refuse Truck	0.01
		52	Single Unit Short-haul Truck	0.72
		53	Single Unit Long-haul Truck	0.06
		54	Motor Home	0.07
		61	Combination Short-haul Truck	0.11
		62	Combination Long-haul Truck	0.03
22	HDDV8A	51	Refuse Truck	0.02
		52	Single Unit Short-haul Truck	0.30
		53	Single Unit Long-haul Truck	0.02
		61	Combination Short-haul Truck	0.35
		62	Combination Long-haul Truck	0.31
23	HDDV8B	51	Refuse Truck	0.02
		52	Single Unit Short-haul Truck	0.30
		53	Single Unit Long-haul Truck	0.02
		61	Combination Short-haul Truck	0.35
		62	Combination Long-haul Truck	0.31
24	MC	11	Motorcycle	1.00
25	HDGB	43	School Bus	1.00
26	HDDBT	41	Intercity Bus	0.62
		42	Transit Bus	0.38
27	HDDBS	43	School Bus	1.00
28	LDDT34	31	Passenger Truck	0.42
		32	Light Commercial Truck	0.58