

## Appendix G. Emissions Analysis

Emissions modeling for the Triangle 2045 MTP conformity determination for the 1997 ozone standard used MOVES2014a. Listed below are the inputs for the emission modeling.

### MOVES2014a inputs

- Daily VMT (TDM) for years 2025, 2035, 2040, 2045
- VMT Mix (Fraction of VMT on Facility Type by Vehicle Type) based on 2017 NCDOT HPMS Travel Activity by Vehicle Type data projected for future years (2020 and beyond) according to EPA guidance.
- SourceTypeAgeDistributon (Vehicle Age Distribution in the consensus plan) is based on 2017 NCDOT vehicle registration data.
- RoadTypeDistribution, HPMSvTypeYear, and HourVMTFraction are generated in the VMT converter.
- Dayvmtfraction and monthvmtfraction are defaults exported from MOVES database.
- AvgSpeedDistribution generated using TDM speeds and MOVES tools and EPA guidance.
- Meteorology - Temperature and Relative Humidity is 2005 monthly average 24-hour temperature and relative humidity profiles from the Raleigh-Durham Airport (KRDU).
- I/M Compliance Factor Coverage – uses MOVES guidance with a 96% compliance rate and a 5% waiver rate and exempting the 3 latest model year vehicles. Based in NC I/M program coverage effective December 1, 2018, I/M parameters only applied to Durham, Franklin, Johnston and Wake counties.
- Fuel Supply and Fuel Formulation use the MOVES2014a default data.
- SourceTypePopulation is based on 2017 DMV Registration Data projected to 2025, 2035, 2040, and 2045 using future human population projections from the Triangle Regional Model v6 (TRMv6) travel demand model.

The table on the following page lists the emissions analysis results by location, pollutant and year. Durham County, Orange County, Wake County and the four townships of Chatham County within the maintenance area are completely within the modeled area. The other four counties: Johnston, Franklin, Granville and Person have portions that are modeled and portions that are analyzed with the non-modeled analysis.

### NO<sub>x</sub> MVEB Comparisons for Transportation Conformity

Budget Area	Year	NO <sub>x</sub> Emissions, Triangle Regional Model Area (kg/day)	NO <sub>x</sub> Emissions, Non-modeled Analysis Area (kg/day)	Total NO <sub>x</sub> Emissions, Budget Area (kg/day)	2017 Motor Vehicle Emissions Budget (kg/day)	Comparison to Budget (negative indicates under budget) - kg/day
Chatham <sup>1</sup>	2025	712	N/A	712	2,112	-1,400
	2035	317	N/A	317	2,112	-1,795
	2040	280	N/A	280	2,112	-1,832
	2045	286	N/A	286	2,112	-1,826
Durham <sup>2</sup>	2025	2,354	N/A	2,354	12,610	-10,256
	2035	1,296	N/A	1,296	12,610	-11,314
	2040	1,226	N/A	1,226	12,610	-11,384
	2045	1,261	N/A	1,261	12,610	-11,349
Franklin <sup>3</sup>	2025	553	81	634	2,645	-2,011
	2035	235	30	265	2,645	-2,380
	2040	207	26	233	2,645	-2,412
	2045	208	23	231	2,645	-2,414
Granville <sup>3</sup>	2025	836	476	1,312	3,278	-1,966
	2035	505	229	734	3,278	-2,544
	2040	484	207	691	3,278	-2,587
	2045	495	205	700	3,278	-2,578
Johnston <sup>3</sup>	2025	2,899	426	3,325	11,838	-8,513
	2035	1,921	257	2,178	11,838	-9,660
	2040	1,866	248	2,114	11,838	-9,724
	2045	1,935	245	2,180	11,838	-9,658
Orange <sup>2</sup>	2025	2,345	N/A	2,345	7,364	-5,019
	2035	1,457	N/A	1,457	7,364	-5,907
	2040	1,414	N/A	1,414	7,364	-5,950
	2045	1,448	N/A	1,448	7,364	-5,916
Person <sup>3</sup>	2025	344	187	531	1,674	-1,143
	2035	122	73	195	1,674	-1,479
	2040	98	63	161	1,674	-1,513
	2045	92	62	154	1,674	-1,520
Wake <sup>2</sup>	2025	6,538	N/A	6,538	38,441	-31,903
	2035	3,966	N/A	3,966	38,441	-34,475
	2040	3,848	N/A	3,848	38,441	-34,593
	2045	4,052	N/A	4,052	38,441	-34,389

<sup>1</sup>Nonattainment area portion of Chatham County falls completely within Triangle Regional Model domain.

<sup>2</sup>Entire county falls within Triangle Regional Model Domain

<sup>3</sup>Entire county within nonattainment area - VMT and speed data for portion outside of Triangle Regional Model domain (Non-modeled Analysis Area) provided by NC DOT