Emission Inventories Development Using MOVES Model: A Dallas-Fort Worth, Texas Area Case Study

19th International Emission Inventory Conference

San Antonio, Texas

September 29, 2010

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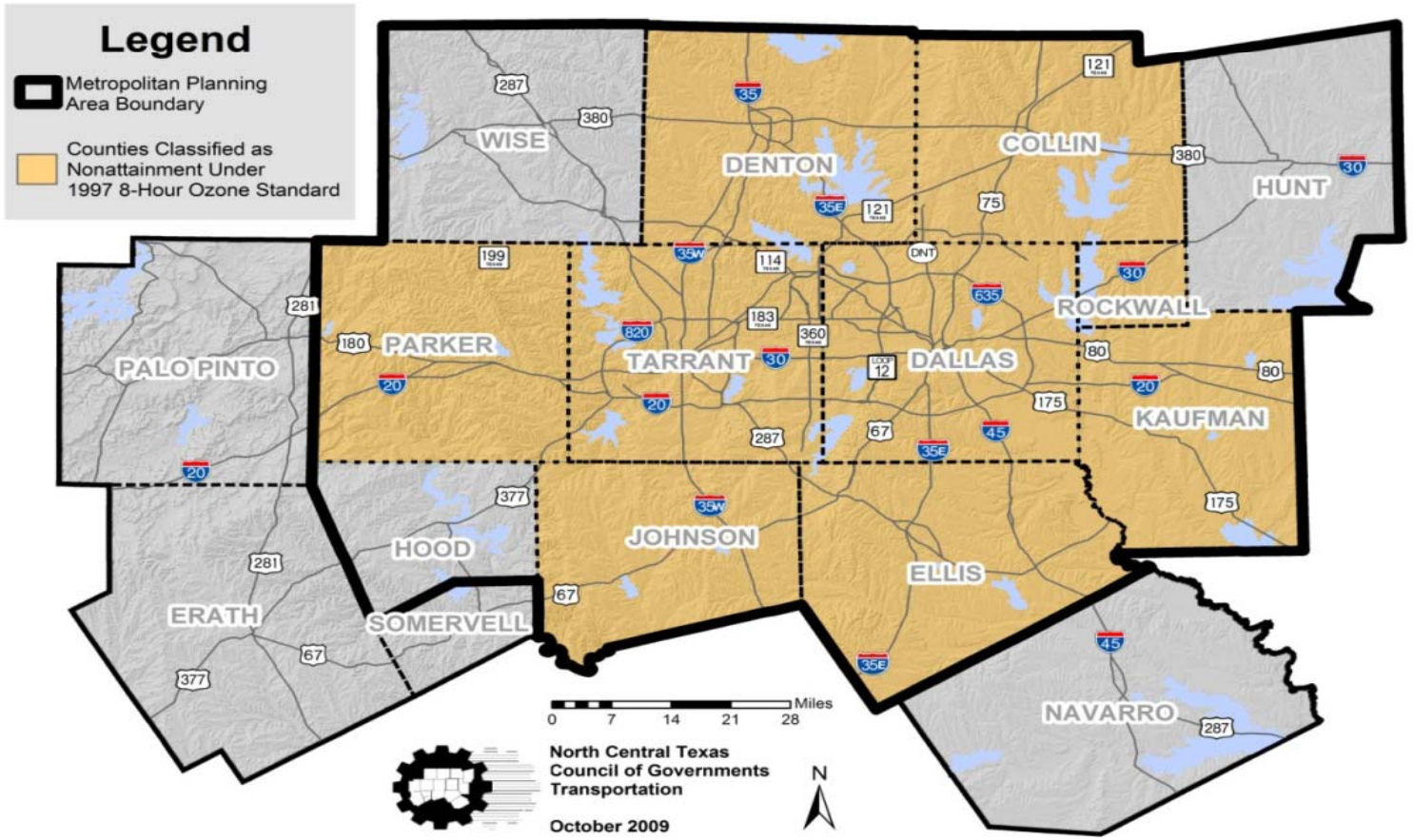
North Central Texas Council of Governments

Session 6: Mobile Sources

MOVES2010 Vs MOBILE6: Outline

I. **MOVES2010 and MOBILE6 Runs**
   A. 2009 Dallas County
   B. 2006 and 2012 Regional
II. **Results/Comparison**
III. **Challenges**
IV. **Future Efforts**

MOVES2010 Vs MOBILE6: DFW Region



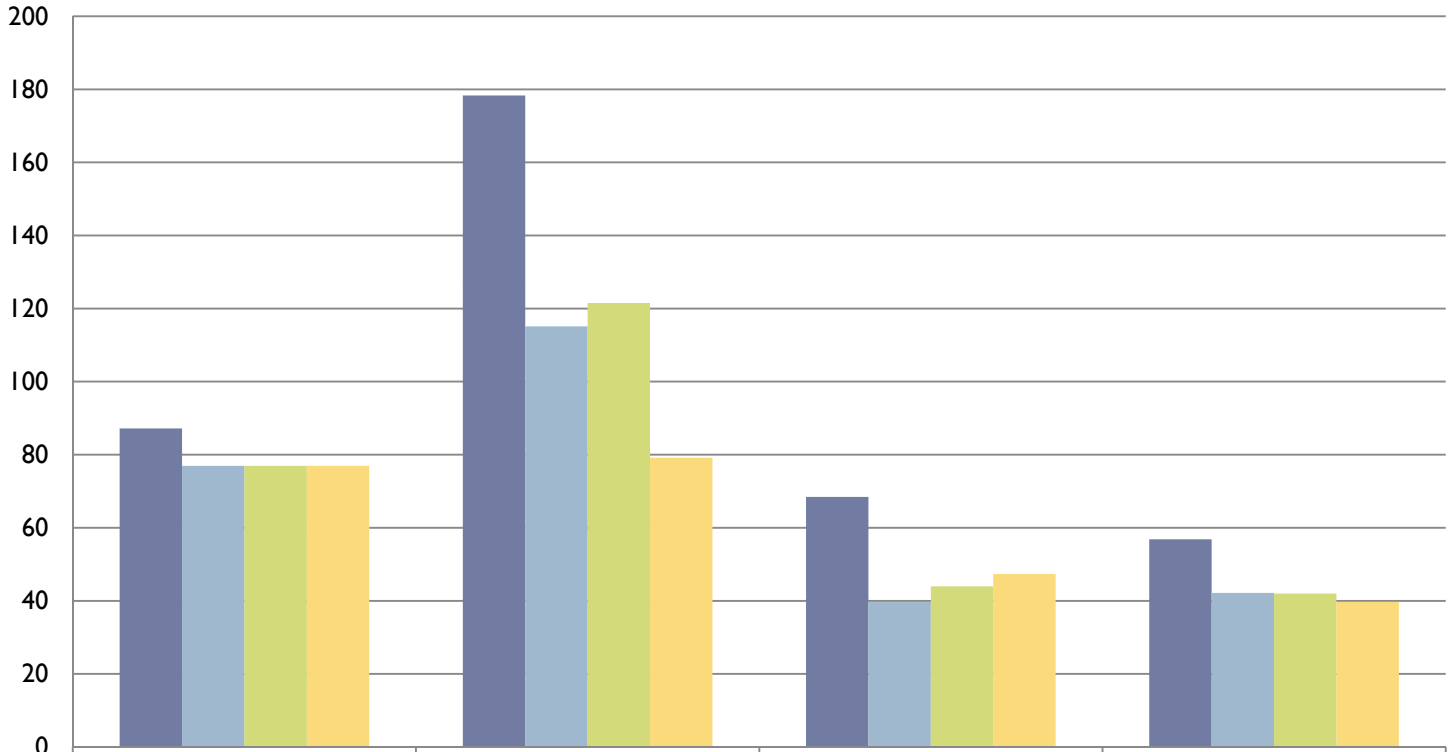
MOVES2010 Vs MOBILE6: Vehicle Class

MOBILE6.2 Vehicle Type		MOVES2010 Source Use Type	
Vehicle Type	**Description (gas and diesel combined)**	**Source Use Type**	**Description (gas and diesel combined)**
LDV	Light-Duty Vehicles (Passenger Cars)	21	Passenger Car
LDT1	Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)	31 and 32	Passenger Truck and Light Commercial Truck
LDT2	Light-Duty Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)		
LDT3	Light-Duty Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)		
LDT4	Light-Duty Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW)		
HDV2B	Class 2b Heavy-Duty Vehicles (8,501-10,000 lbs. GVWR)	51, 52, 53, and 54	Refuse Truck, Single Unit Short-Haul Truck , Single Unit Long-Haul Truck , and Motor Home
HDV3	Class 3 Heavy-Duty Vehicles (10,001-14,000 lbs. GVWR)		
HDV4	Class 4 Heavy-Duty Vehicles (14,001-16,000 lbs. GVWR)		
HDV5	Class 5 Heavy-Duty Vehicles (16,001-19,500 lbs. GVWR)		
HDV6	Class 6 Heavy-Duty Vehicles (19,501-26,000 lbs. GVWR)	61 and 62	Combination Short-Haul Truck and Combination Long-Haul Truck
HDV7	Class 7 Heavy-Duty Vehicles (26,001-33,000 lbs. GVWR)		
HDV8A	Class 8a Heavy-Duty Vehicles (33,001-60,000 lbs. GVWR)		
HDV8B	Class 8b Heavy-Duty Vehicles (>60,000 lbs. GVWR)		
HDBS	School Buses	41, 42, and 43	Intercity Bus, Transit Bus , and School Bus
HDBT	Transit and Urban Buses		
MC	Motorcycles (All)	11	Motorcycle

MOVES2010 Vs MOBILE6: Emission Process

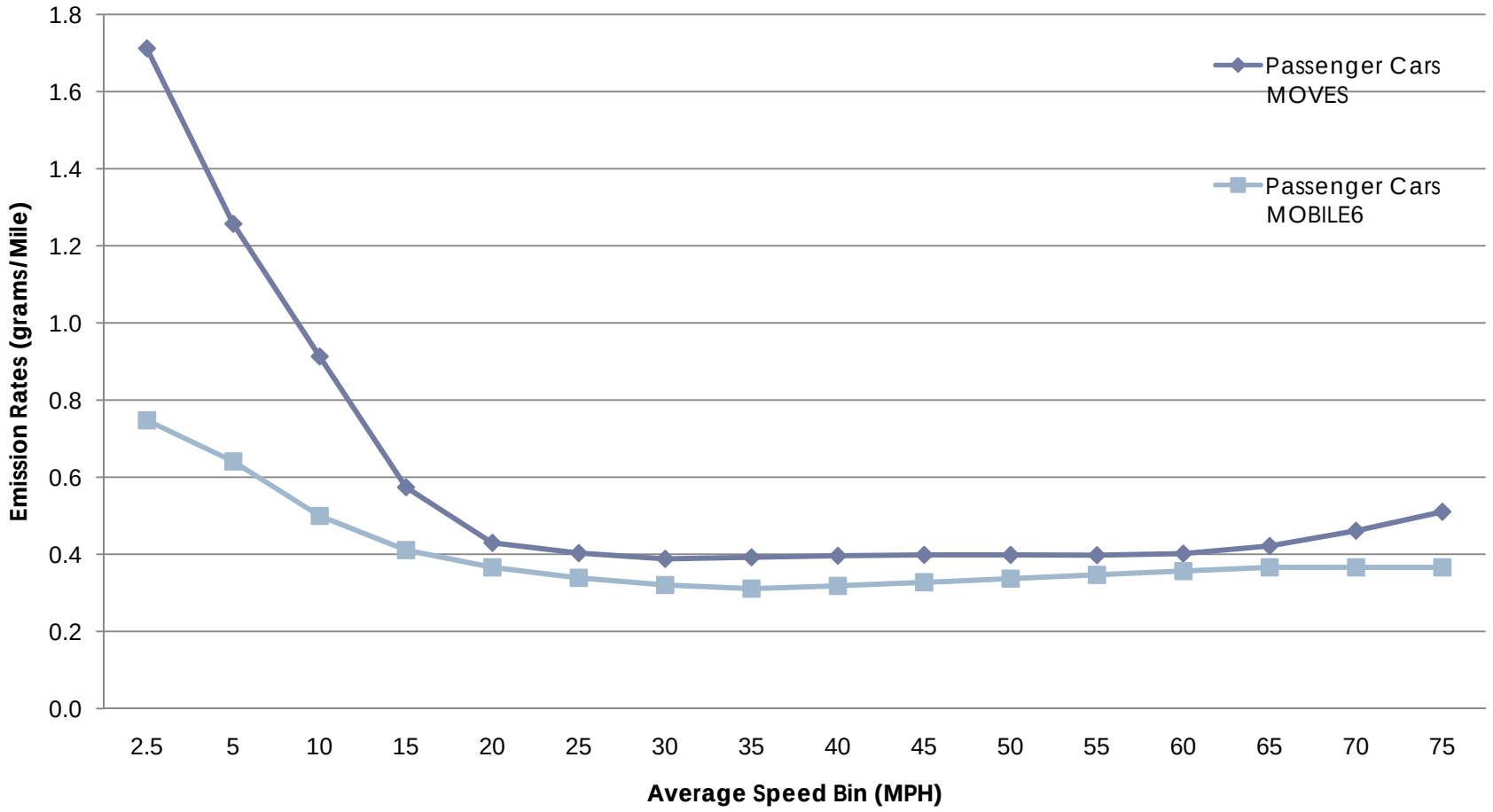
			MOVES2010			MOBILE6.2
ProcessID	ProcessName	ShortName	Rate/Distance	Rate/Vehicle	Rate/Profile	Rate/Distance
1	Running Exhaust	Running Exh	Grams/Mile			Grams/Mile
2	Start Exhaust	Start Exh		Grams/Vehicle		Grams/Mile
11	Evap Permeation	Evap Permeation	Grams/Mile	Grams/Vehicle		Grams/Mile
12	Evap Fuel Vapor Venting	Evap Fuel Vent	Grams/Mile		Grams/Vehicle	Grams/Mile
13	Evap Fuel Leaks	Evap Fuel Leak	Grams/Mile	Grams/Vehicle		Grams/Mile
15	Crankcase Running Exhaust	Crank Run Exh	Grams/Mile			Grams/Mile
16	Crankcase Start Exhaust	Crank Start Exh		Grams/Vehicle		NA
17	Crankcase Extended Idle Exhaust	Crank Ext Idle				NA
18	Refueling Displacement Vapor Loss	Refuel Disp Vap				Grams/Mile
90	Extended Idle Exhaust	Ext Idle Exh		Grams/Vehicle		NA

MOVES2010 Vs MOBILE6: 2009 Dallas County Emissions Summary

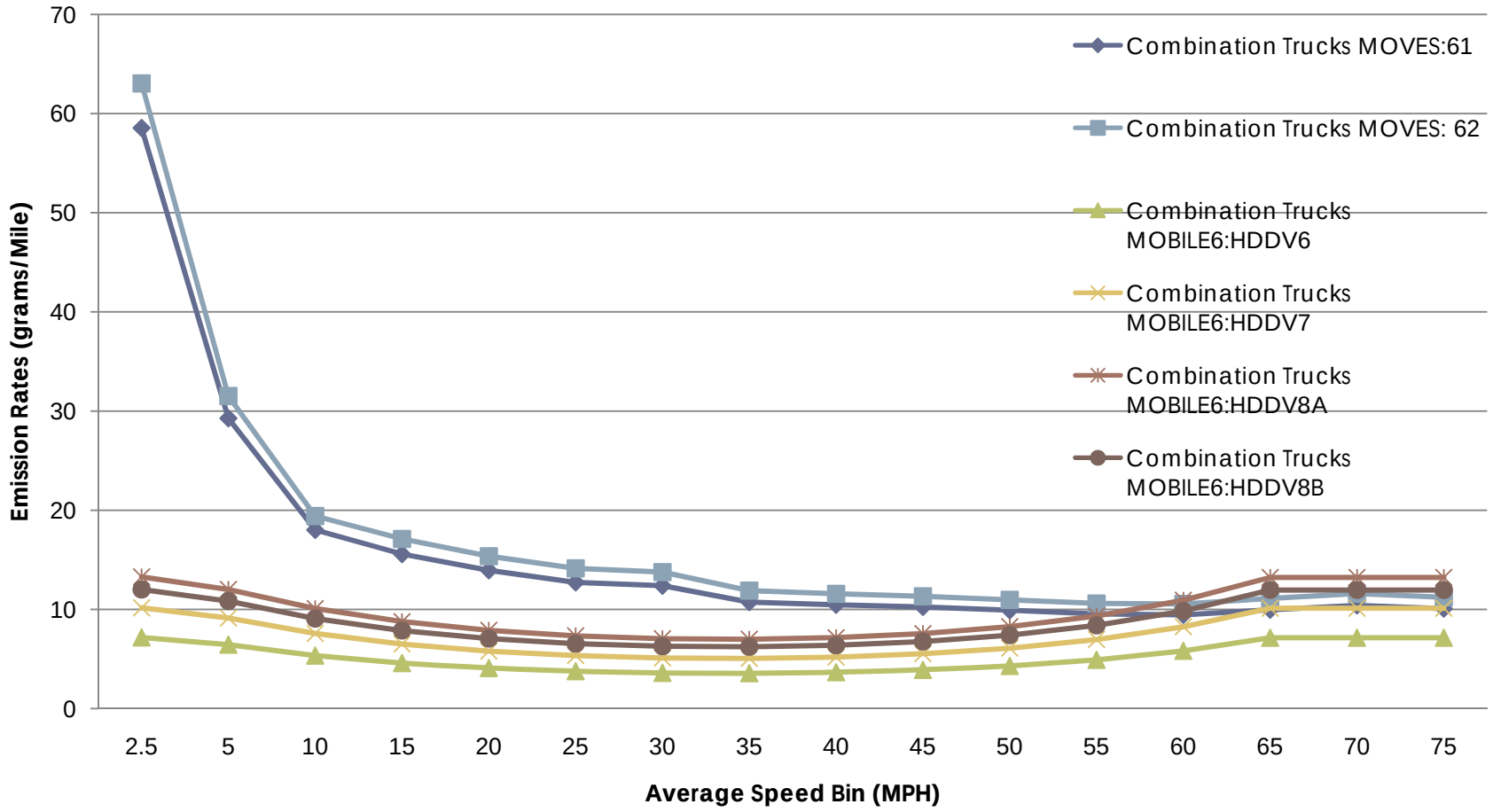


	VMT (10^6 Miles)	NOx (tons/day)	VOC (tons/day)	CO2 (10^ 3 tons/day)
MOVES DEFAULT	87.2	178.3	68.4	56.8
MOVES CONVERTER	76.9	115.1	39.7	42.2
MOVES LOCAL	76.9	121.5	44.0	42.0
MOBILE6.2	76.9	79.2	47.4	39.7

MOVES2010 Vs MOBILE6:
Gasoline Passenger Vehicles NO_x Emission Rates



MOVES2010 Vs MOBILE6:
Diesel Heavy-Duty Truck NO_x Emission Rates



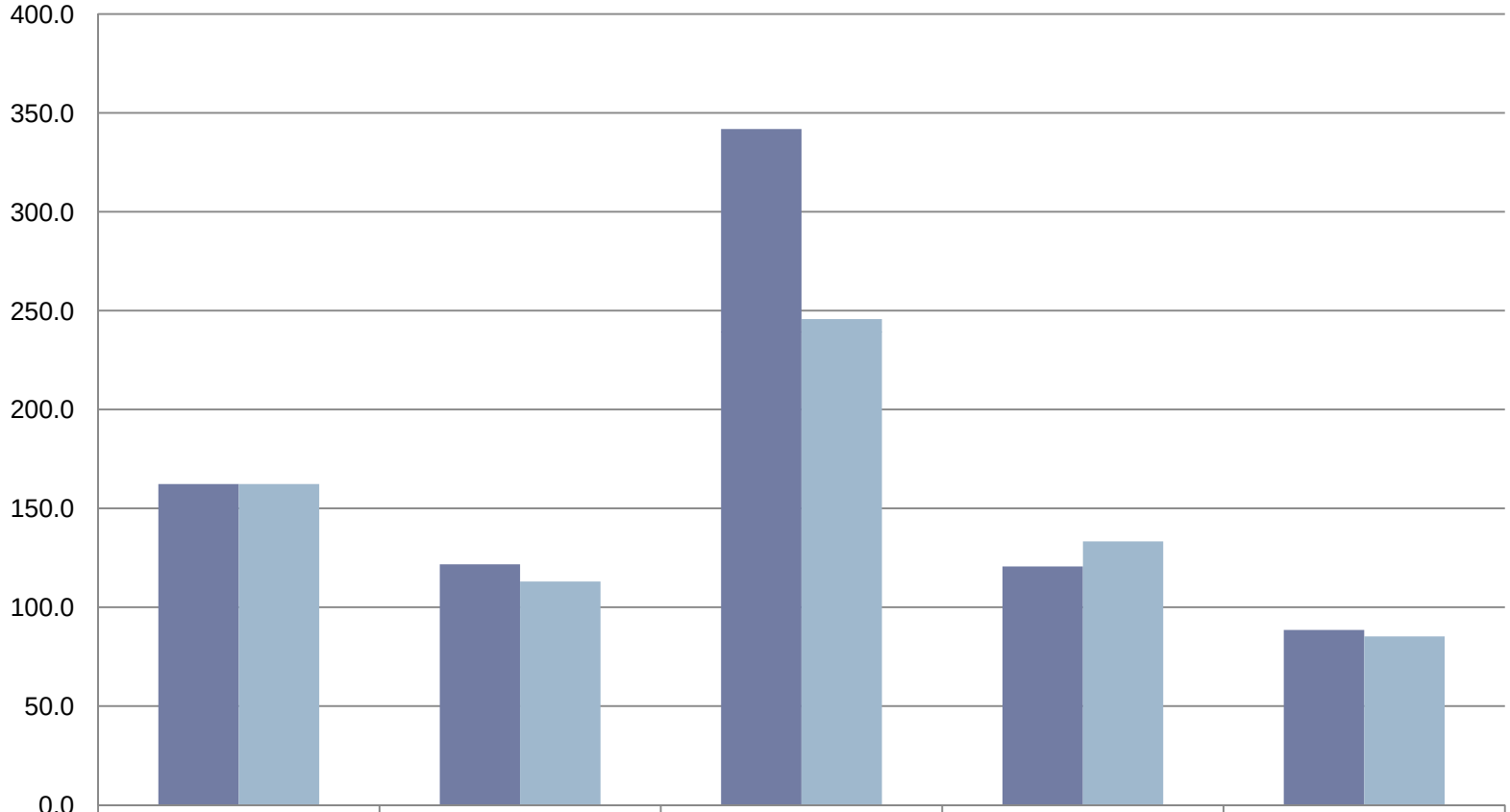
MOVES2010 and MOBILE6: Comparison Runs

- 2006 and 2012 Analysis Years
- 12 North Central Texas Counties
- Summer Weekday VMT
- Pollutants NO_X, VOC, CO, and CO_2
- All Emission Processes Except Refueling
- Link Based MOBILE6.2 Emissions
- Aggregate MOVES2010 Emissions

MOVES2010 Vs MOBILE6: MOVES Parameters

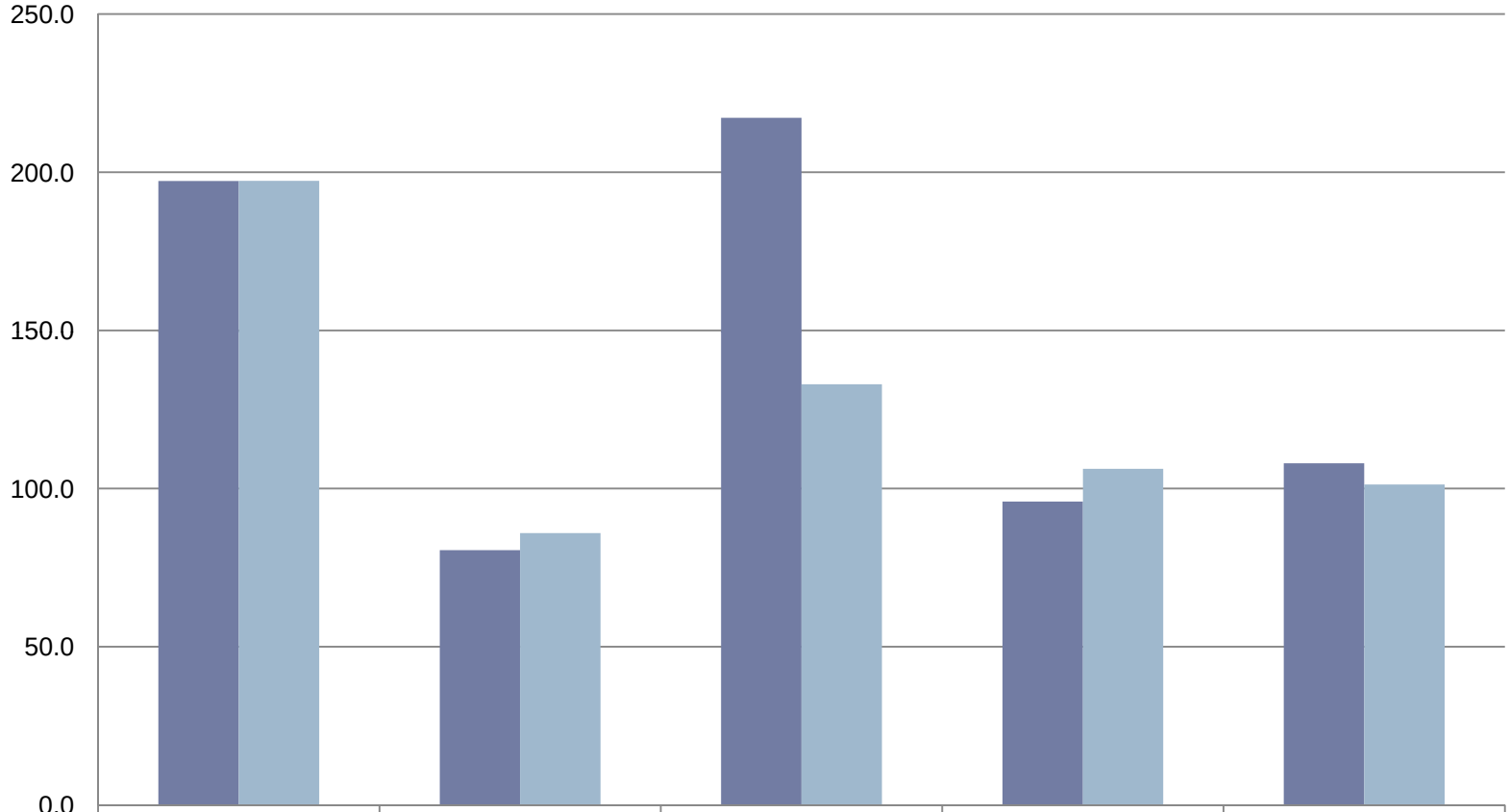
Parameters	Data Source
Roadtypedistribution	Local
Population	Local + Default
Hourvmtfraction	Local
Hpmsvtypeyear	Local
Met Data	Local
Age Distribution	Local + Default
Fuel Formulation	Local
Fuelsupply	Local
IMcoverage	Local
Monthvmtfraction	Modeled For Summer (June)
Dayvmtfraction	Modeled For Weekday
Avgspeed Distribution	Local
Rampfraction	Local

MOVES2010 Vs MOBILE6: 2006 Emissions Comparison



	VMT (10^6 miles/day)	VOC (tons/day)	NOx (tons/day)	CO (10^1 tons/day)	CO2 (10^3 tons/day)
MOVES2010	162.3	121.7	341.8	120.6	88.5
MOBILE6.2	162.3	113.0	245.7	133.3	85.2

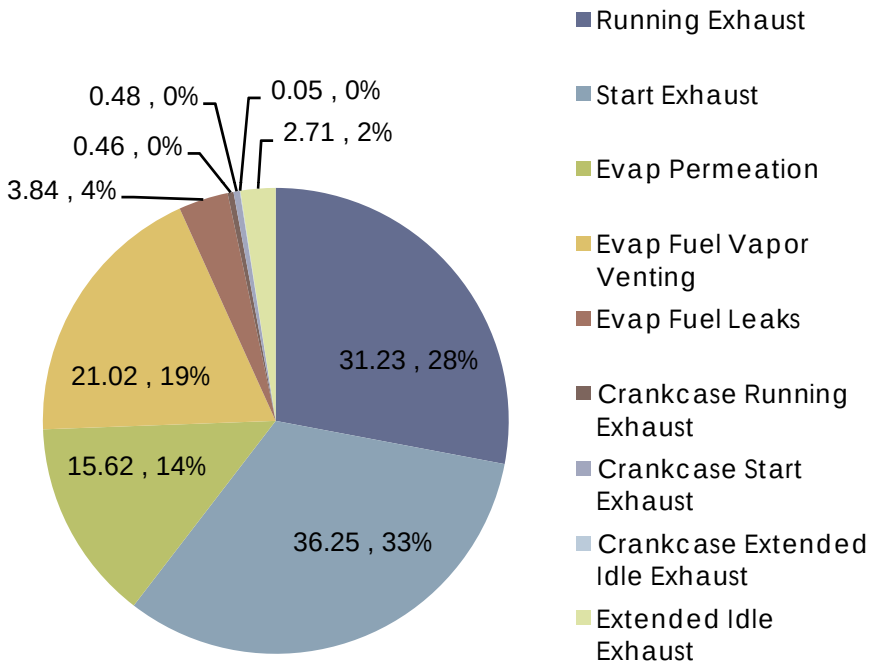
MOVES2010 Vs MOBILE6: 2012 Emissions Comparison



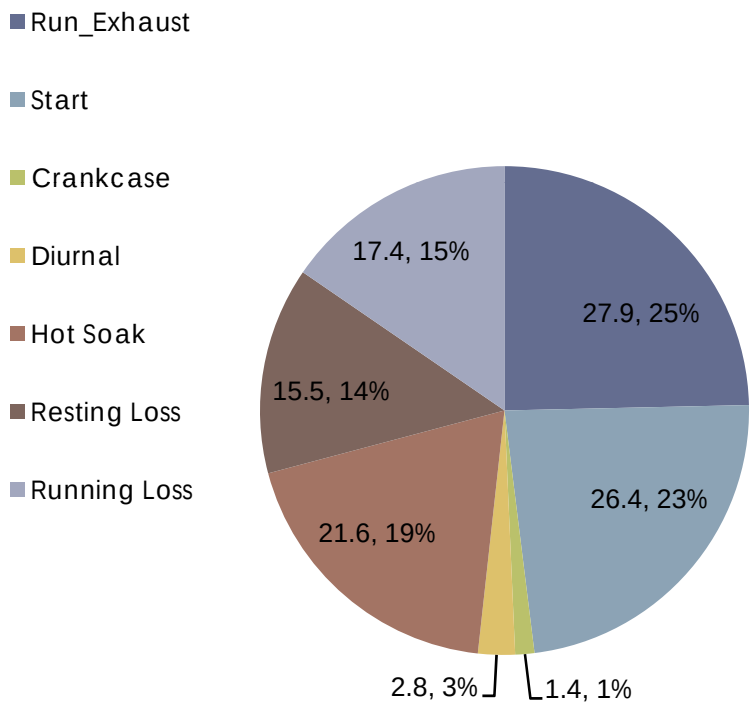
	VMT (10^6 miles/day)	VOC (tons/day)	NOx (tons/day)	CO (10^1 tons/day)	CO2 (10^3 tons/day)
MOVES2010	197.2	80.5	217.2	95.9	108.0
MOBILE6.2	197.2	85.9	133.0	106.3	101.3

MOVES2010 Vs MOBILE6: 2006 Emissions Comparison

MOVES2010 VOC (121.7 tons/day)

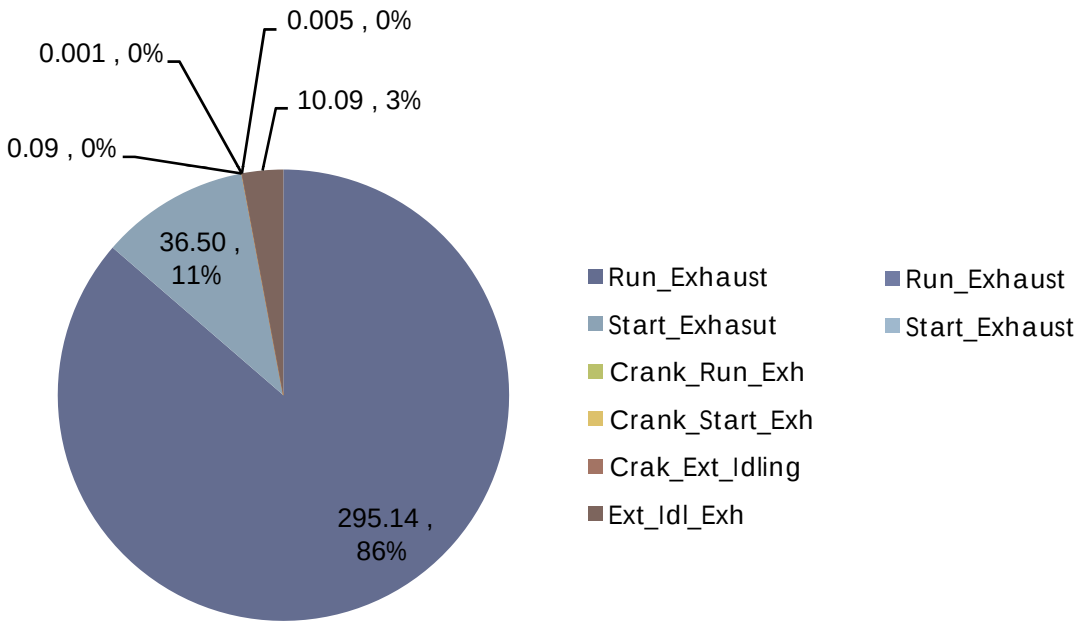


MOBILE6 VOC (113 tons/day)

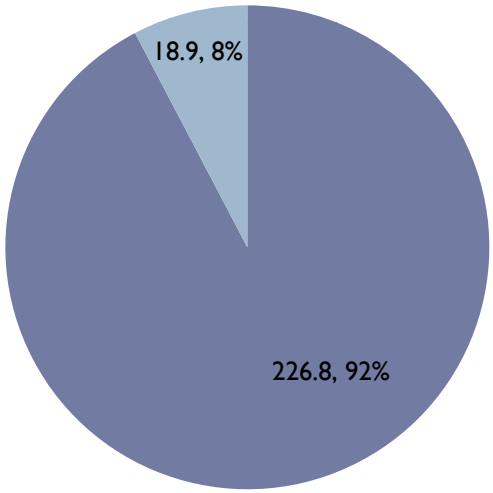


MOVES2010 Vs MOBILE6: 2006 Emissions Comparison

MOVES2010 NO_x (341.8 tons/day)

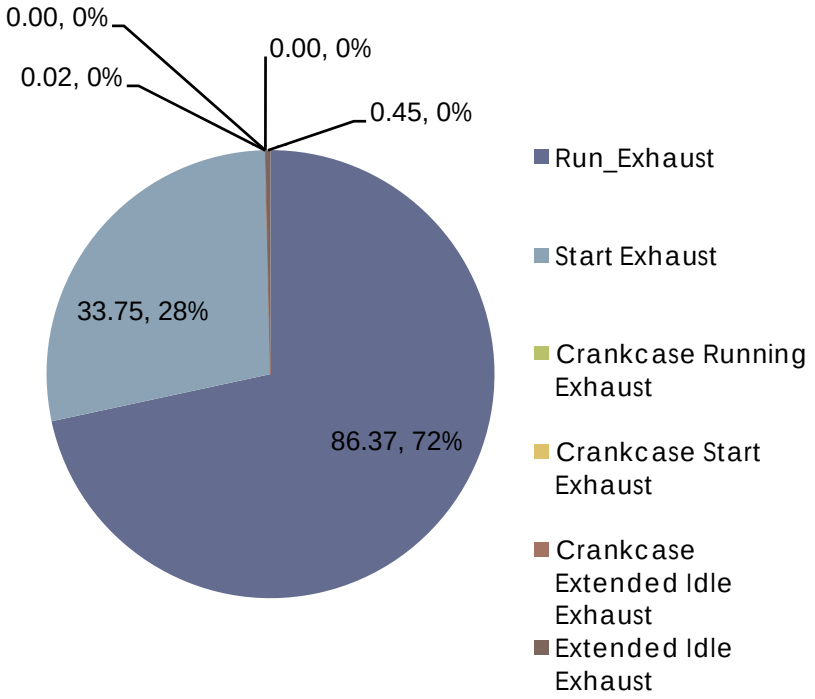


MOBILE6.2 NO_x (245.7 tons/day)

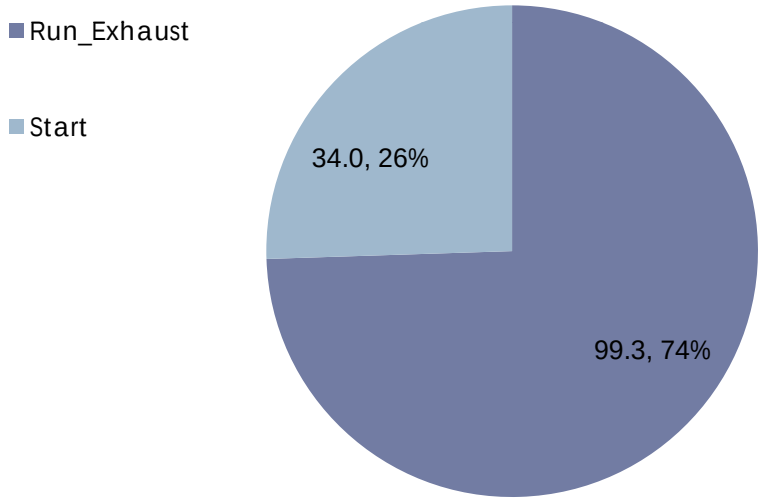


MOVES2010 Vs MOBILE6: 2006 Emissions Comparison

MOVES2010 CO(102.6 x10^1 tons/day)

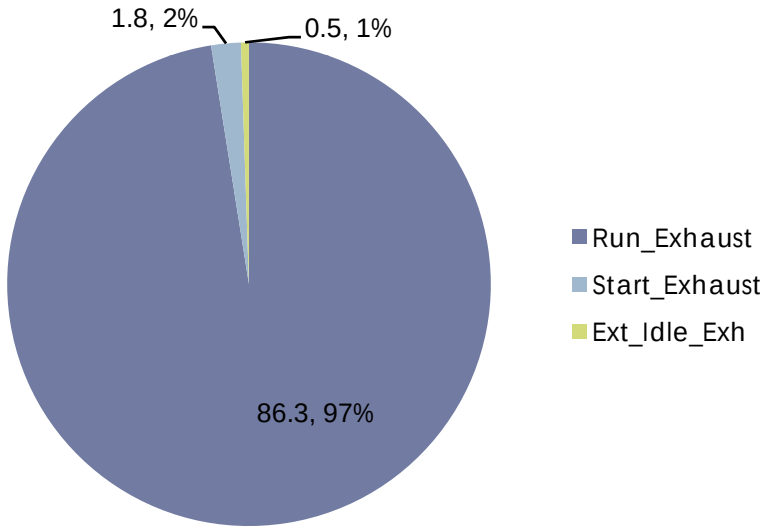


MOBILE6 CO (133.3x 10^1 tons/day)

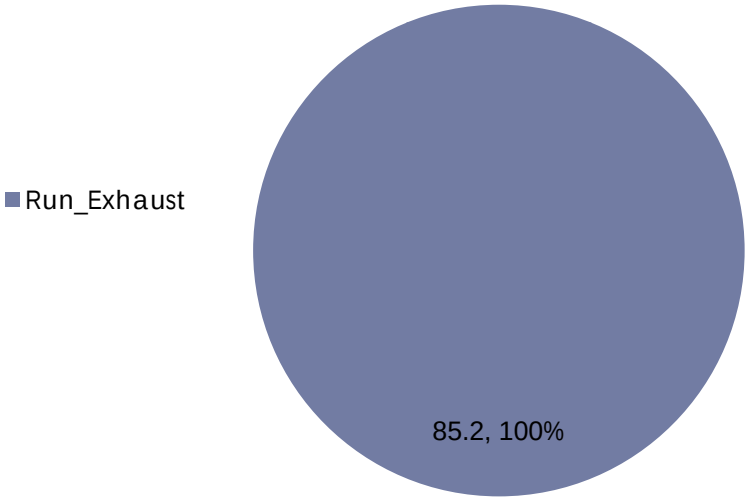


MOVES2010 Vs MOBILE6: 2006 Emissions Comparison

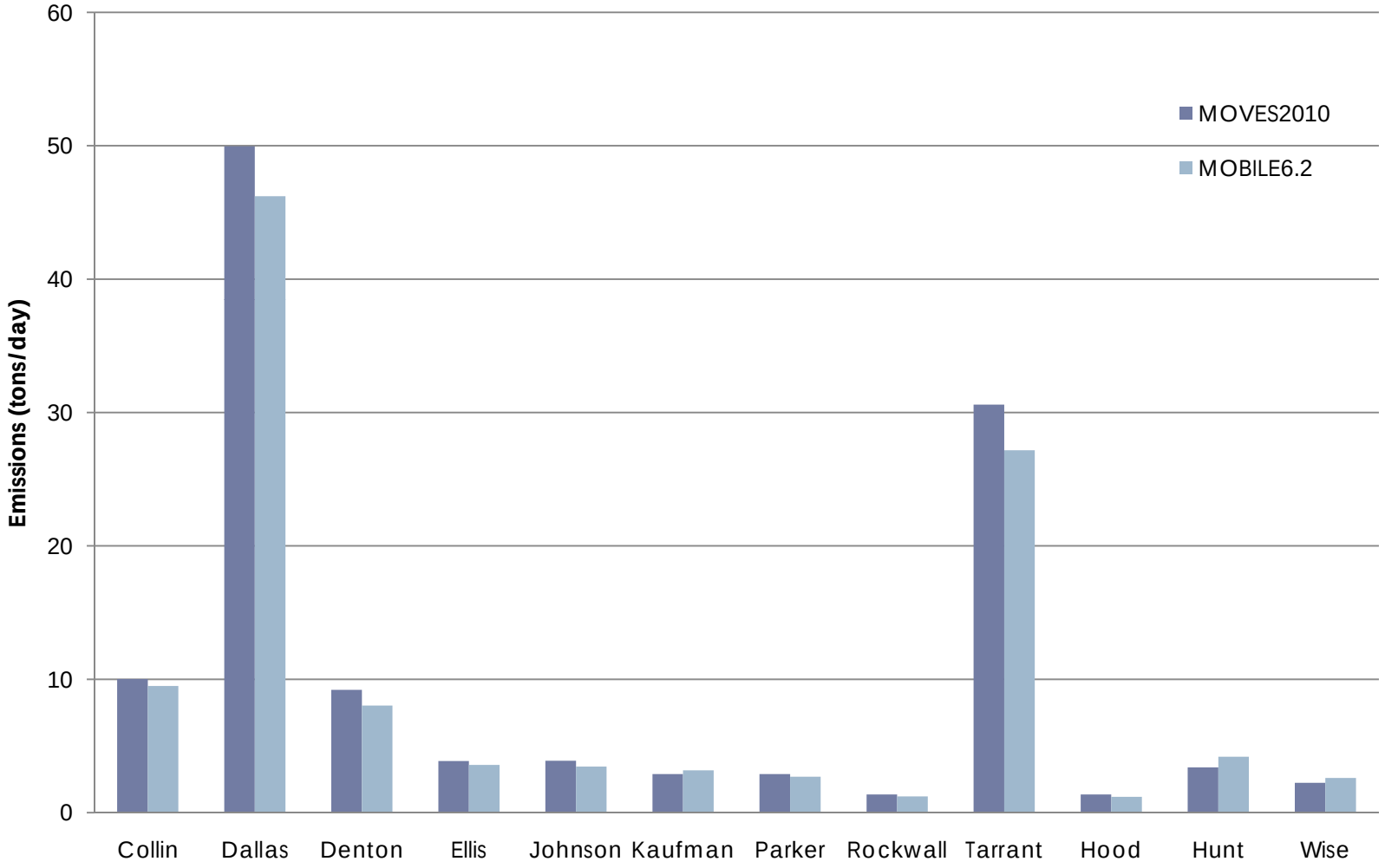
MOVES2010 CO2 (88.5 x 10^3 tons/day)



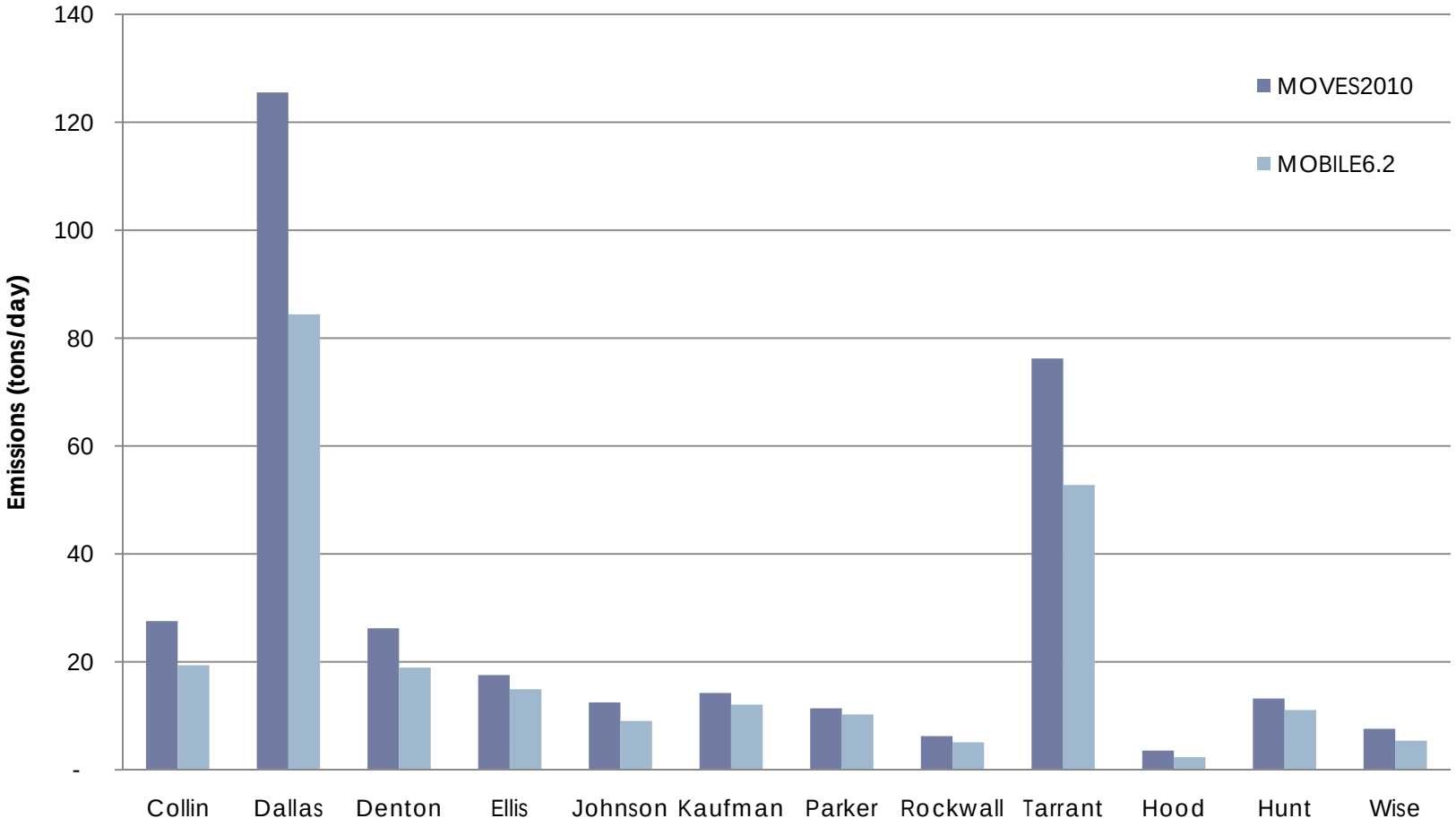
MOBILE6 CO2 (85.2 x10^3 tons/day)



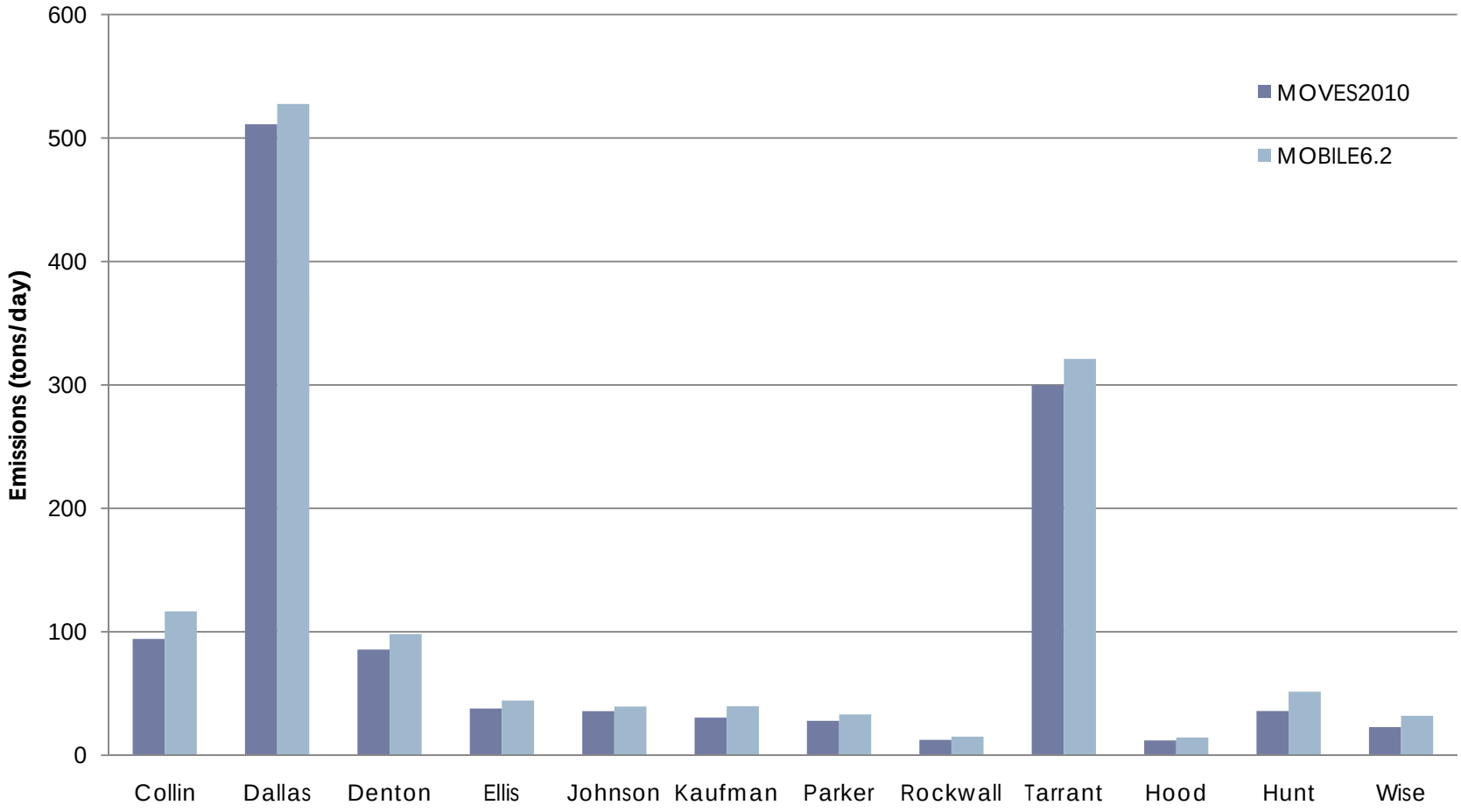
MOVES2010 Vs MOBILE6: 2006 VOC Emissions Comparison



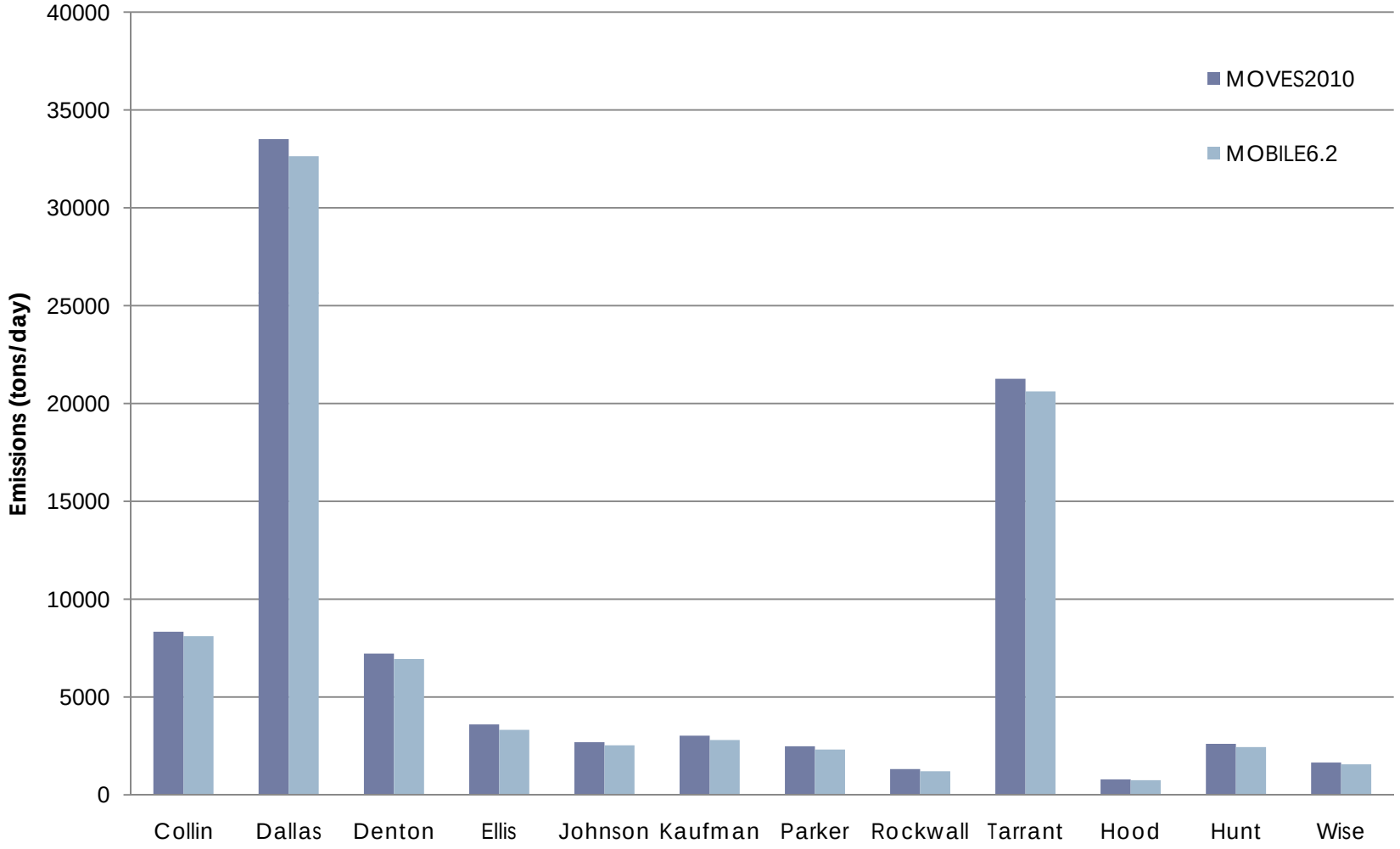
MOVES2010 Vs MOBILE6: 2006 NOx Emissions Comparison



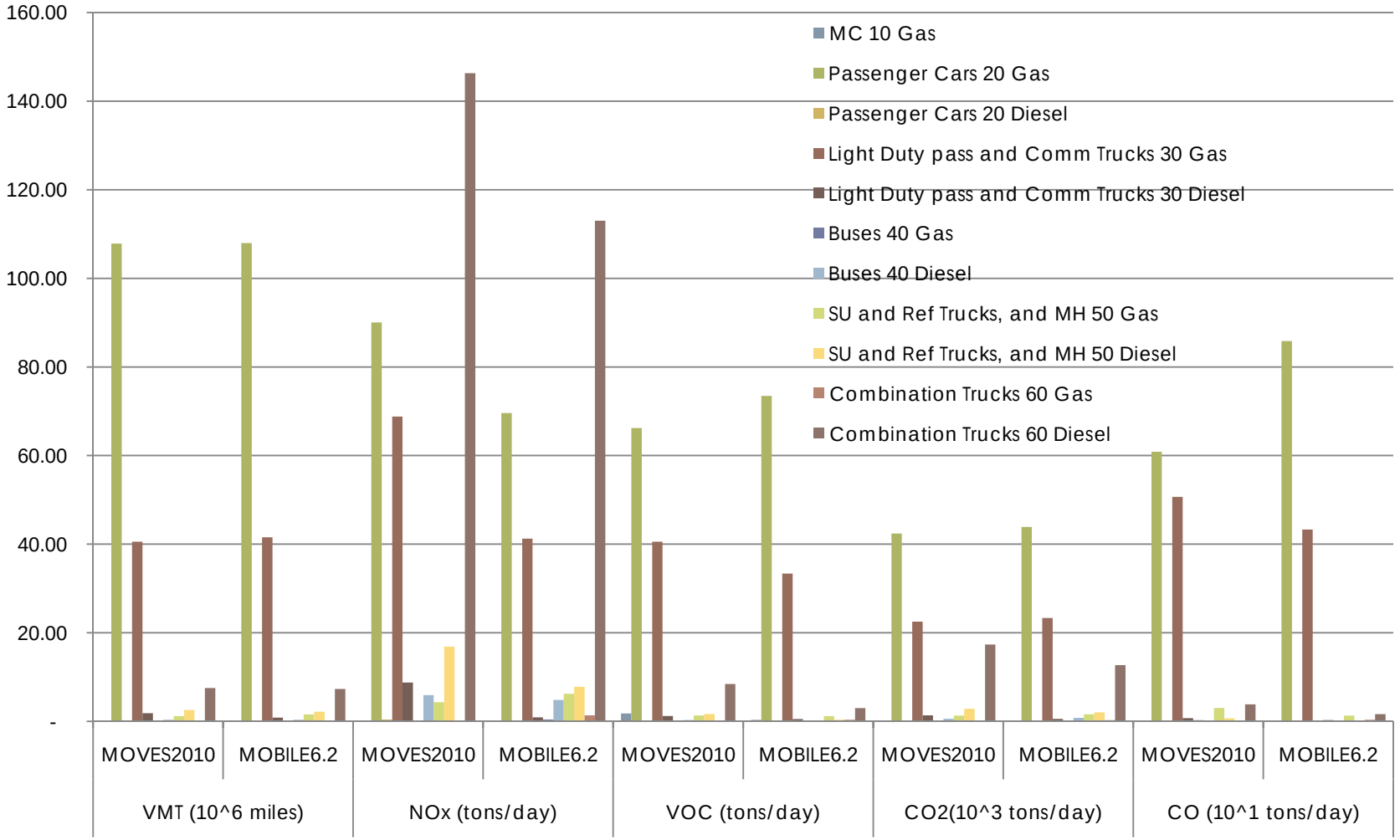
MOVES2010 Vs MOBILE6: 2006 CO Emissions Comparison



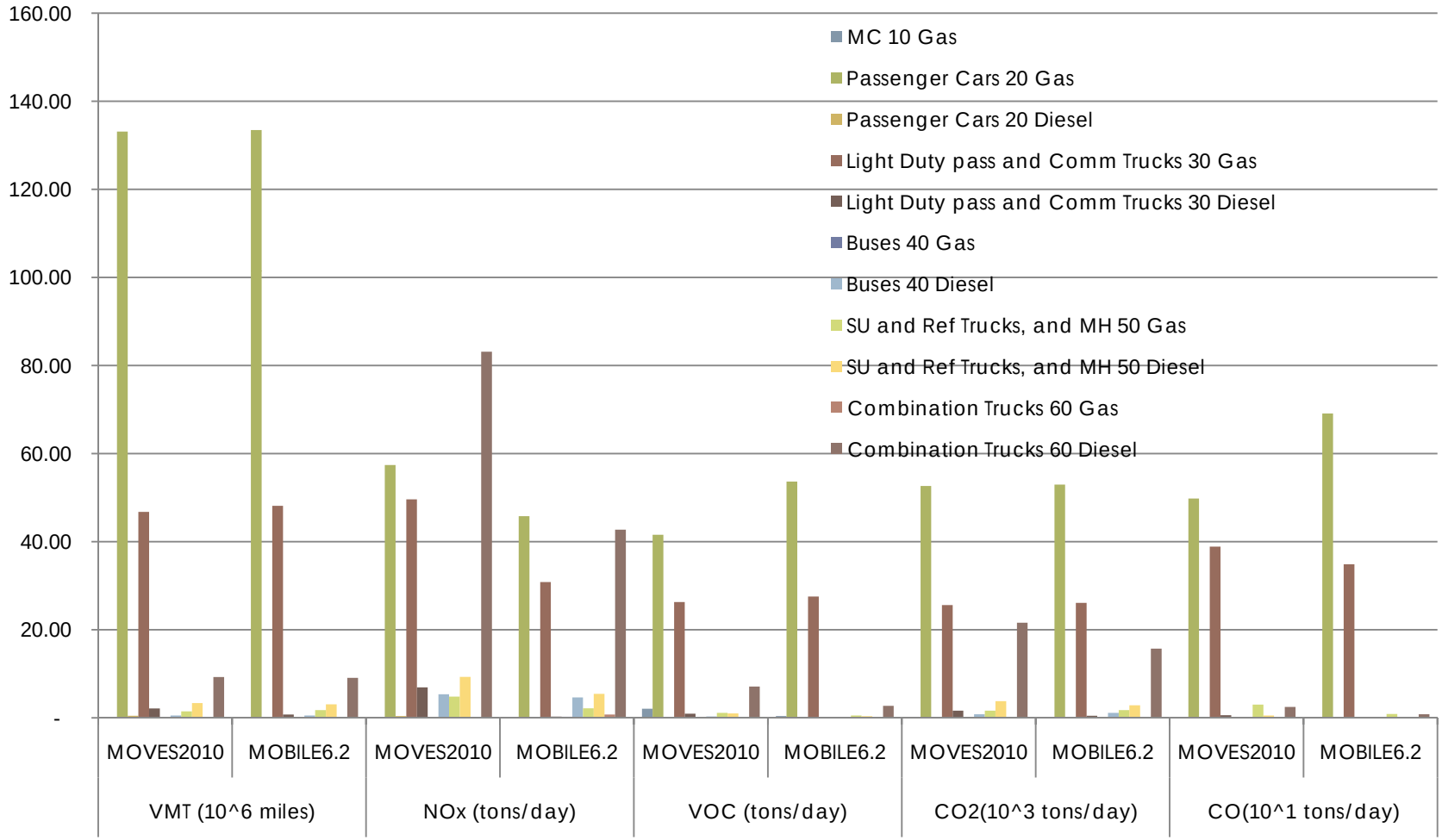
MOVES2010 Vs MOBILE6: 2006 CO_2 Emissions Comparison



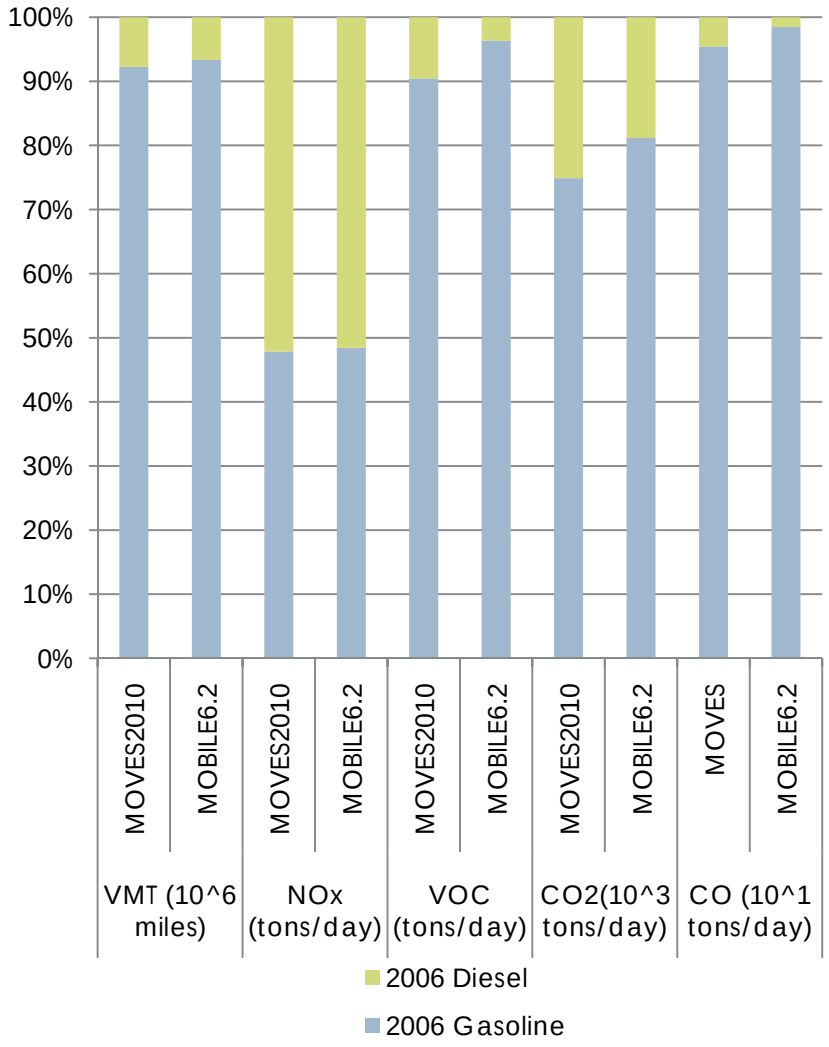
MOVES2010 Vs MOBILE6: 2006 Emissions by Vehicle Type

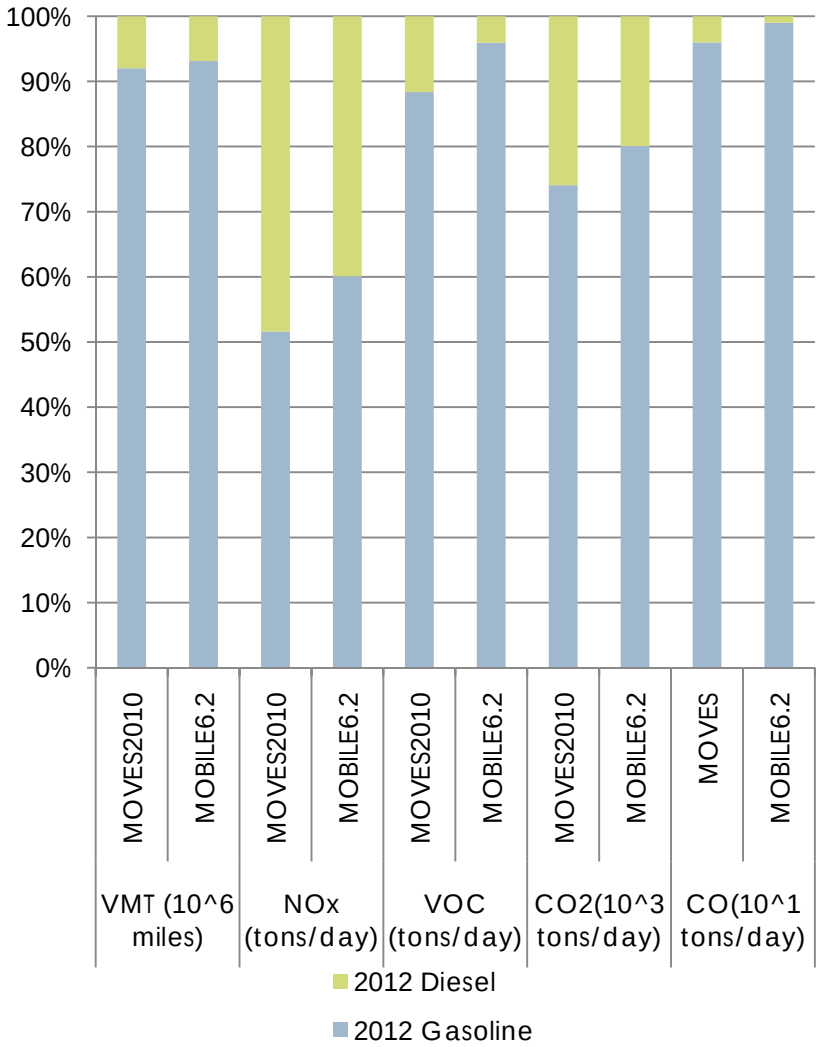


MOVES2010 Vs MOBILE6: 2012 Emissions by Vehicle Type

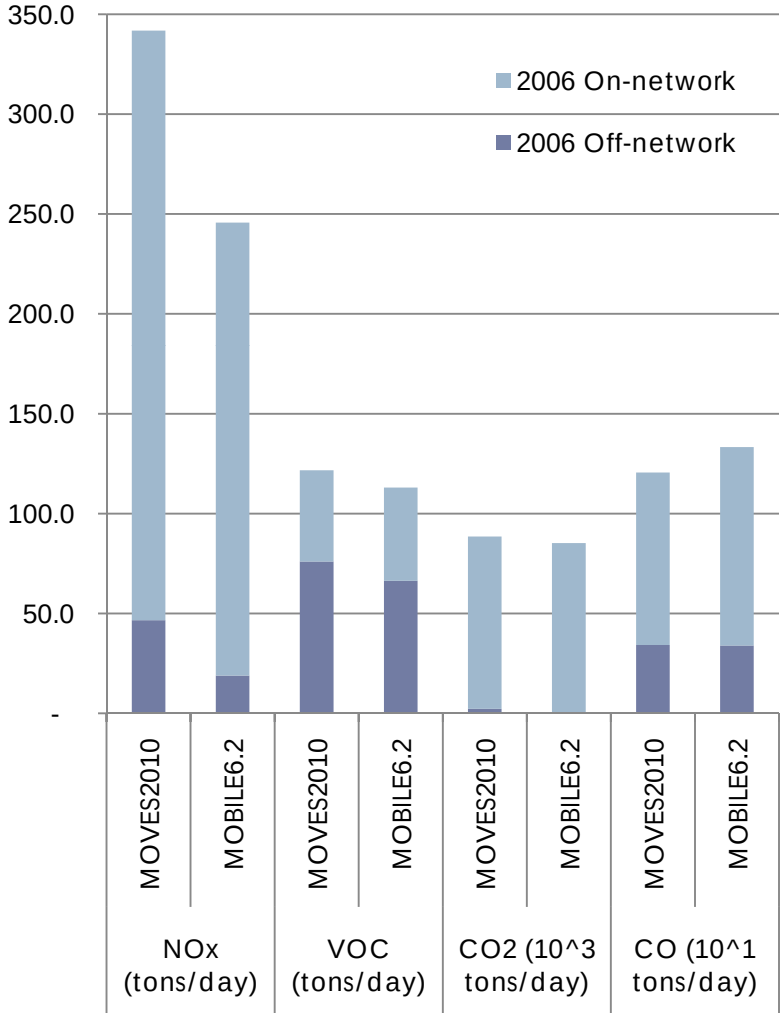


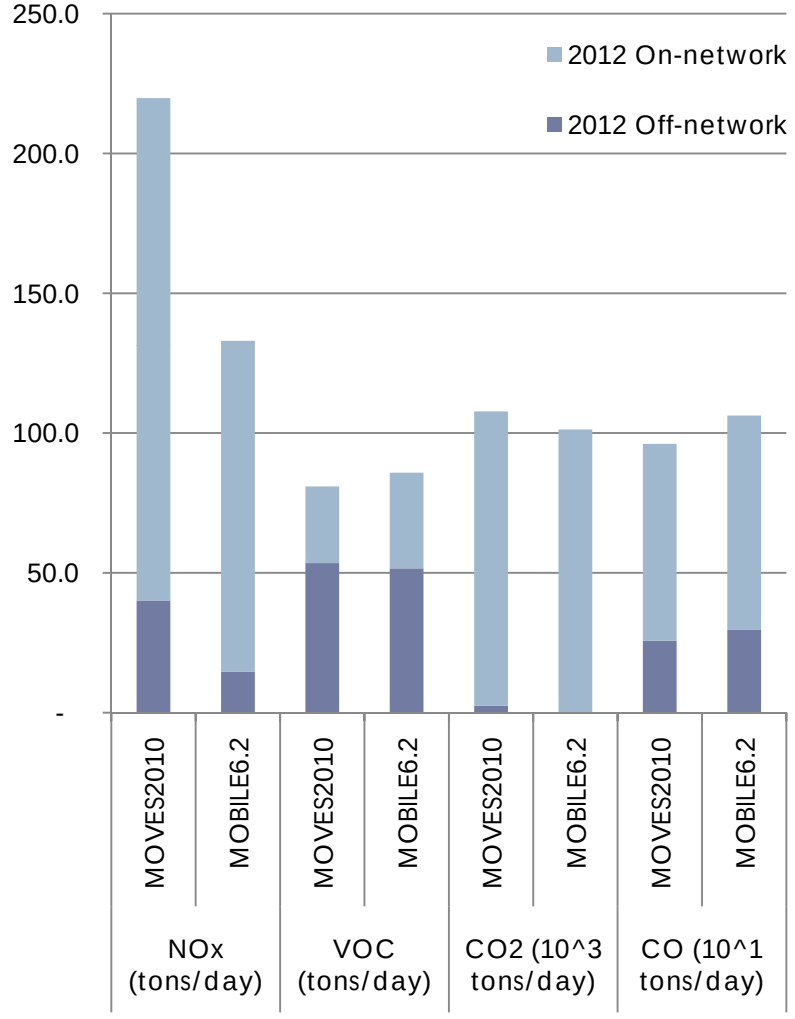
MOVES Vs MOBILE6: Fuel Type Emissions



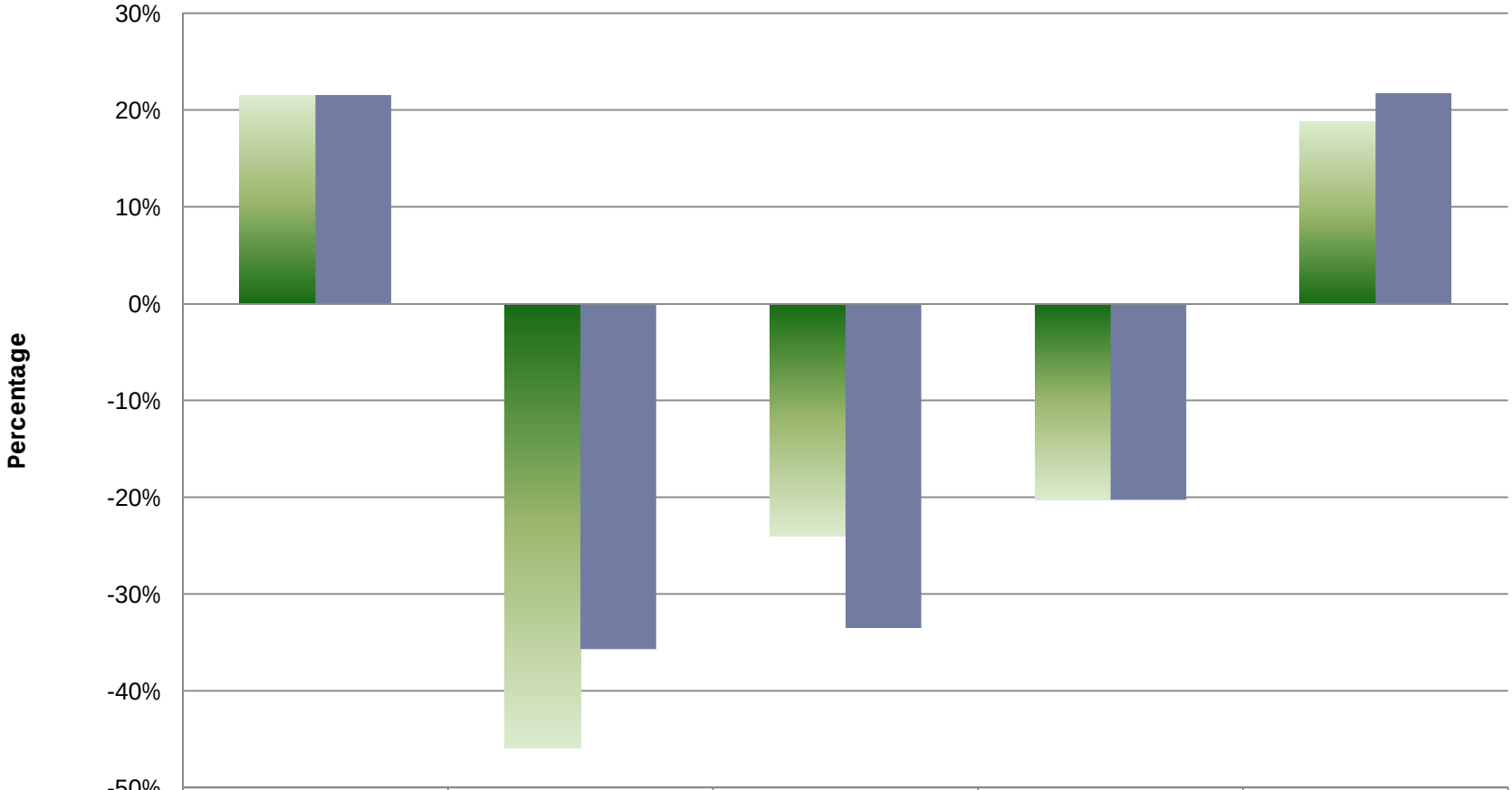


MOVES2010 Vs MOBILE6: Network and Off-Network Emissions





MOVES2010 Vs MOBILE6: Model Reductions



	VMT	NOx	VOC	CO	CO2
MOBILE6.2	22%	-46%	-24%	-20%	19%
MOVES2010	22%	-36%	-34%	-20%	22%

MOVES2010 Vs MOBILE6: Summary

- **NO_X Higher Emission**
  - Increase in NO_X by 39 percent for 2006 and 63 percent for 2012
  - Emission Rates
  - Emission Processes
- **VOC Emissions**
  - Increase in VOC by 8 percent for 2006 and decrease by 6 percent for 2012
- **CO Lower for Both Analysis Years**
  - Decrease in CO by 10 percent for 2006 and 2012
- **CO_2 Slightly Higher**
  - Increase in CO_2 by 4 percent for 2006 and 7 percent for 2012
  - Emission Rates Sensitive to the Speeds

MOVES2010 Vs MOBILE6: Challenges

- Longer Run Time : Resource Intensive
- Transportation Conformity: Higher Emissions With MOVES2010
- Gather and Development of Local Data for MOVES2010
- Reliance on Default Data
- Validating the Emission Estimates
- Error Reporting

MOVES2010 Vs MOBILE6: Future Efforts

Local, Vehicle Population and Activity Information

Estimate/ Allocation Stationary Vehicle Emissions

Incorporating MOVES2010 Emission Rates to Travel Demand Model (AQ Interface)

Test with MOVES2010a

Sensitivity Runs

Pursuing to Defer Grace Period Deadline (3-2012)

Contact Information

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