MOVES2010A MODEL: METROPOLITAN PLANNING ORGANIZATION TRANSITION, CHALLENGES, AND NEEDS

22nd CRC REAL WORLD EMISSIONS WORKSHOP
San Diego, California
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OUTLINE

- EPA On-Road Models
  - Historical Perspective
- Transition
  - Status
  - Rates Vs Inventory Method
  - Daily Vs Annual VMT
- Challenges
- Needs

EPA ON-ROAD MODELS

Historical Perspective

EPA On-Road	Model Release Date/Year
MOBILE1	1978
MOBILE2	1981
MOBILE3	1984
MOBILE4	1989
MOBILE5	1993
MOBILE6	2002
MOBILE6.2	September 2003
MOVES2010	March 2010
MOVES2010a	September 2010
MOVES2010b	Anticipated Spring 2012
MOVES2013	2013

TRANSITION

MPO Status

EPA Converter From MOBILE6 to MOVES

- **Average Speed Distribution**
- **Vehicle Miles of Travel**
- **Registration Distribution**
- **Met Data**

Consultants

In-House

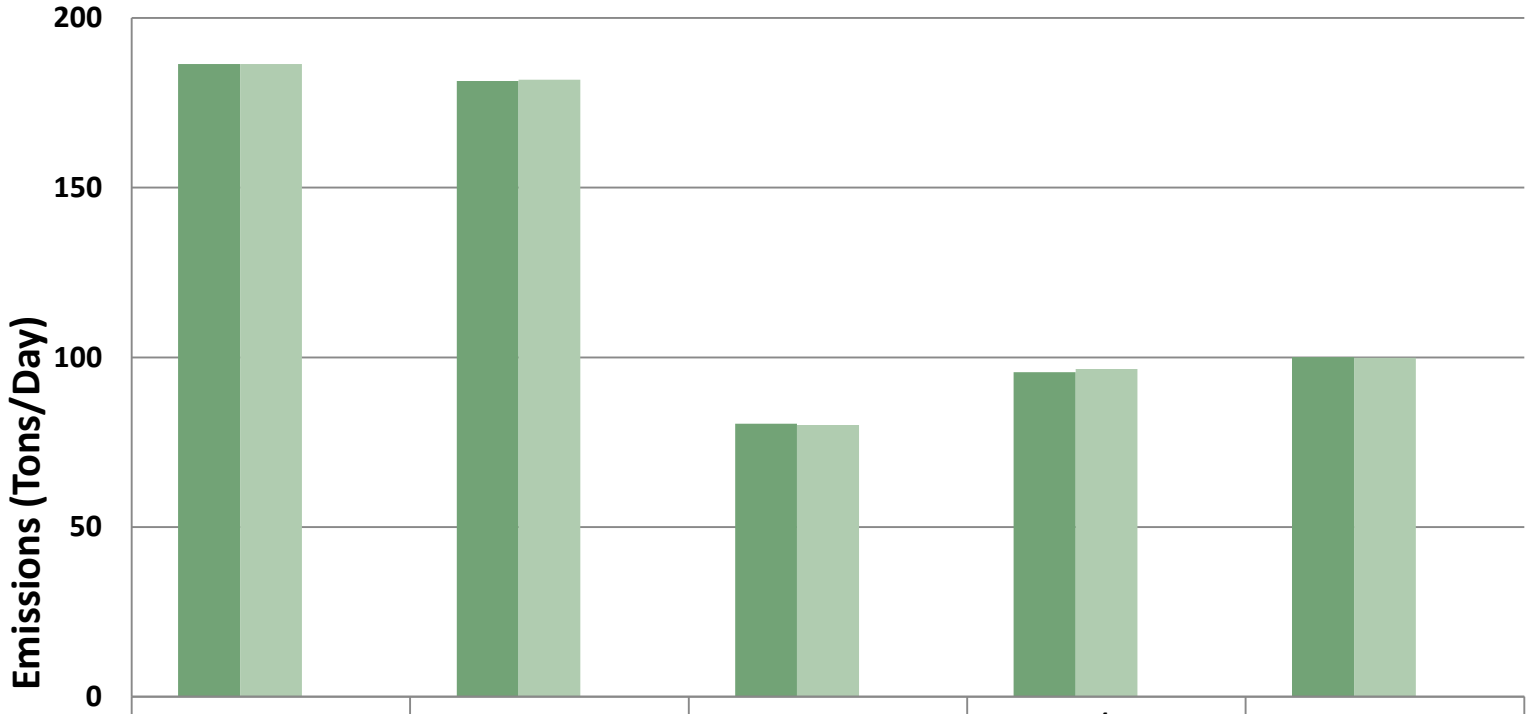
TRANSITION - MOVES2010a

Rate vs. Inventory Mode Inputs

MOVES Inputs	Rate Mode	Inventory Mode
Avgspeeddistribution		✓
dayvmtfraction		✓
fuelformulation	✓	✓
fuelsupply	✓	✓
hourvmtfraction		✓
hpmsvtypeyear		✓
imcoverage	✓	✓
monthvmtfraction		✓
roadtype	✓	✓
roadtypedistribution		✓
sourcetypeagedistribution	✓	✓
sourcetypeyear		✓
zonemonthhour	✓	✓

TRANSITION - MOVES2010a

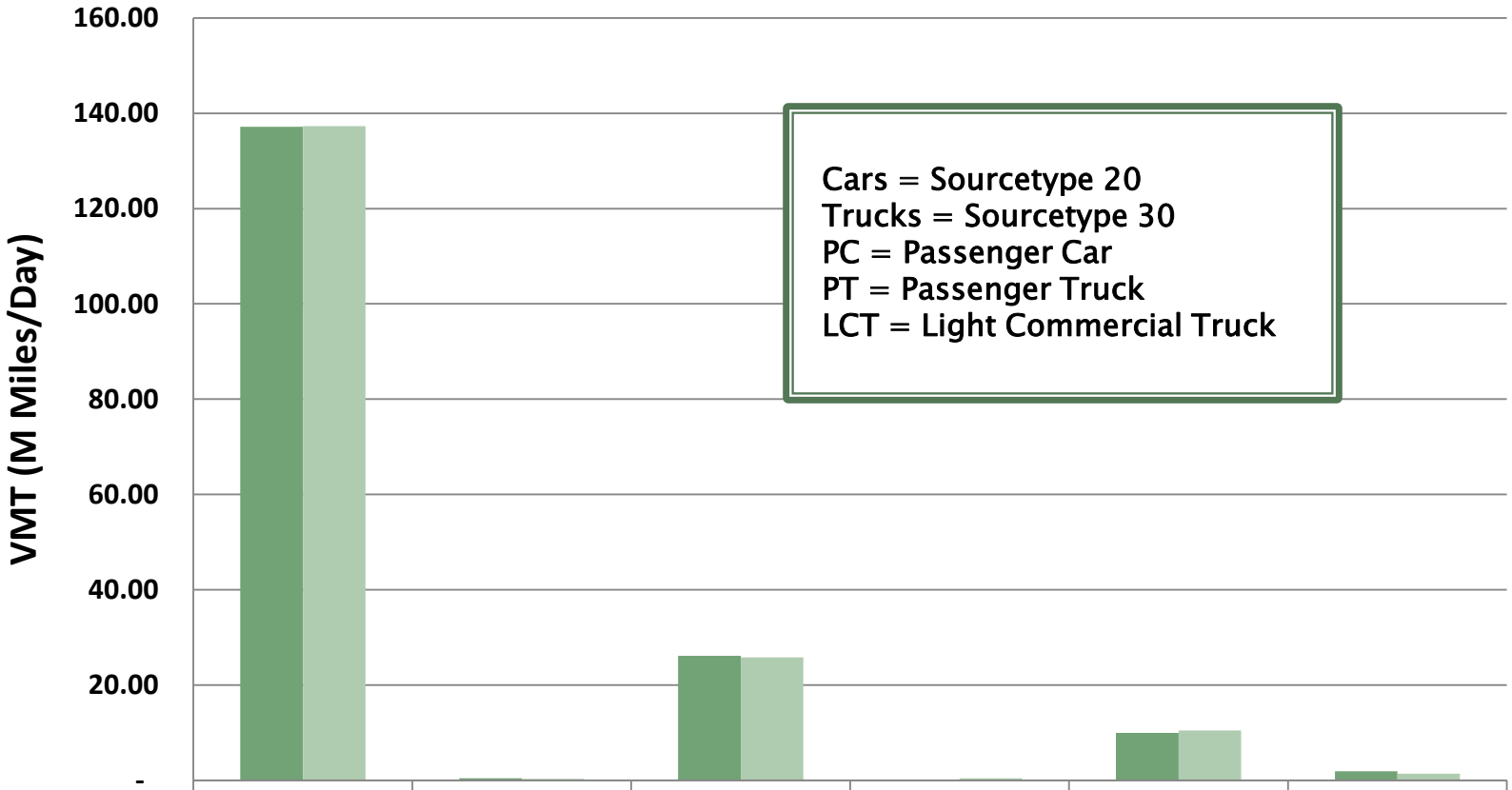
2012 Emissions Rate Vs Inventory Mode Results



	VMT (M. Miles)	NOx (Tons/day)	VOC (Tons/day)	CO (10^1 Tons/day)	CO2 (10^3Tons/day)
Rate	186.4	181.4	80.5	95.6	100.0
Inventory	186.4	181.8	80.1	96.6	99.8
Abs % Diff	0.00%	0.21%	0.49%	1.08%	0.21%

TRANSITION - MOVES2010a

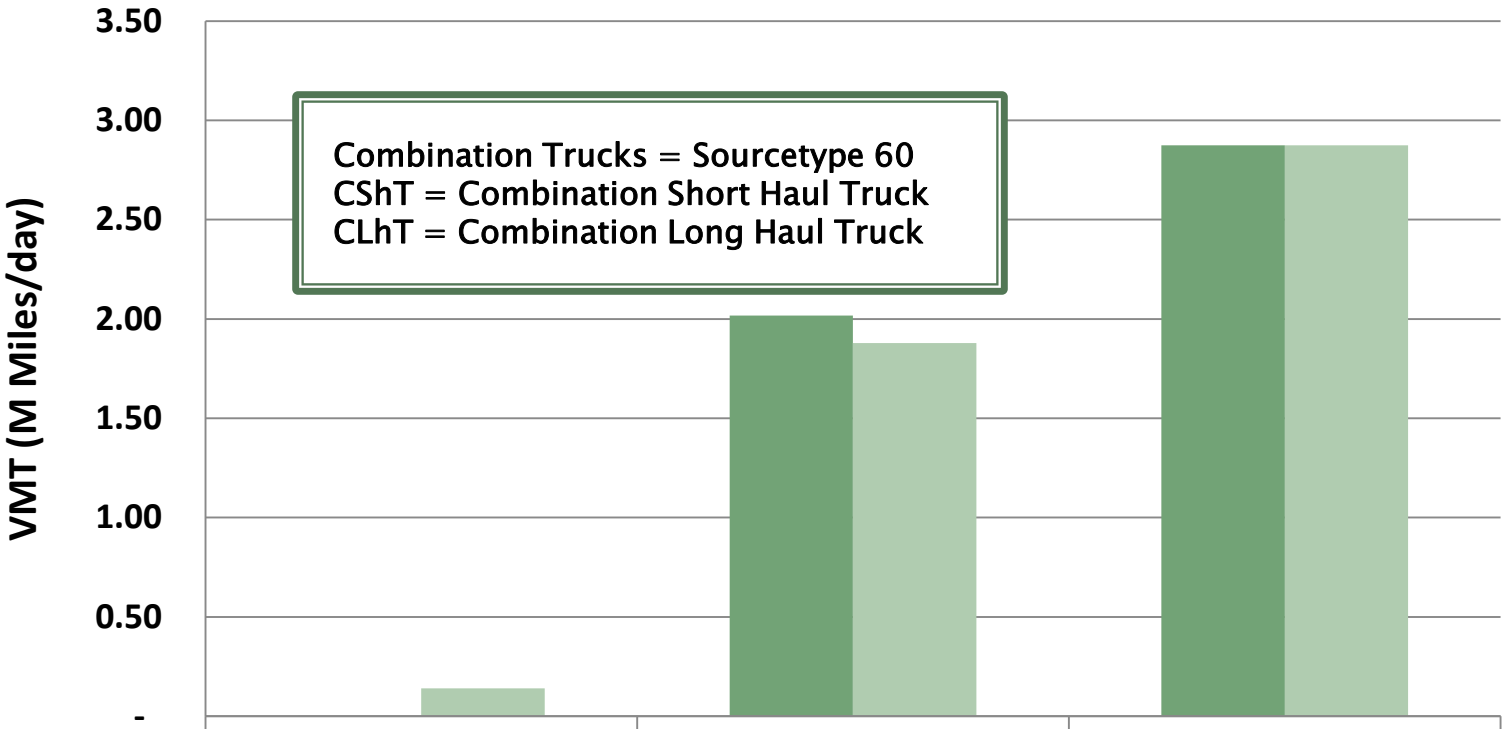
2012 VMT: Light Duty Vehicles



	PC_Gas	PC_Diesel	PT_Gas	PT_Diesel	LCT_Gas	LCT_Diesel
Rate	137.14	0.46	26.16	0.09	9.97	1.93
Inventory	137.29	0.30	25.83	0.42	10.47	1.43

TRANSITION - MOVES2010a

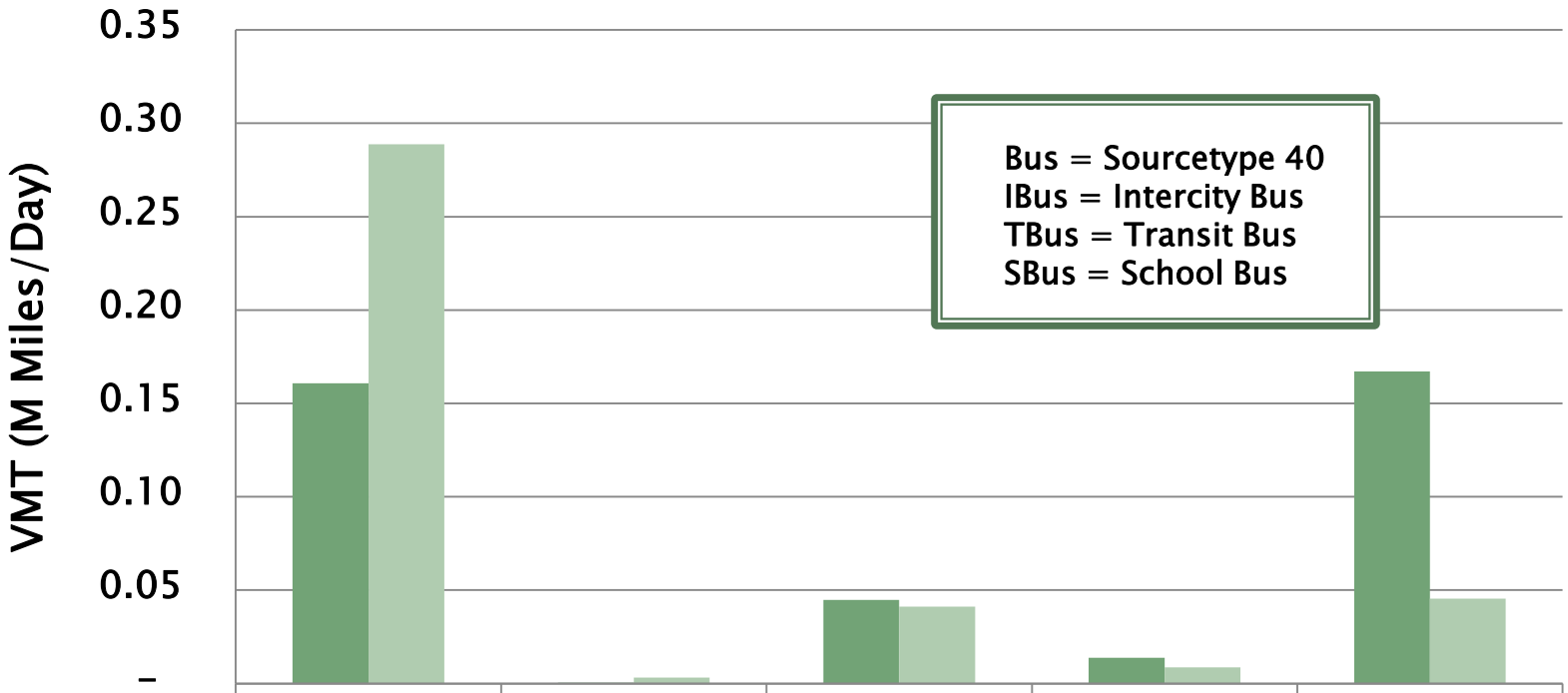
2012 VMT: Combination Trucks



	CShT_Gas	CShT_Diesel	CLhT_Diesel
Rate	0.00	2.02	2.88
Inventory	0.14	1.88	2.87

TRANSITION - MOVES2010a

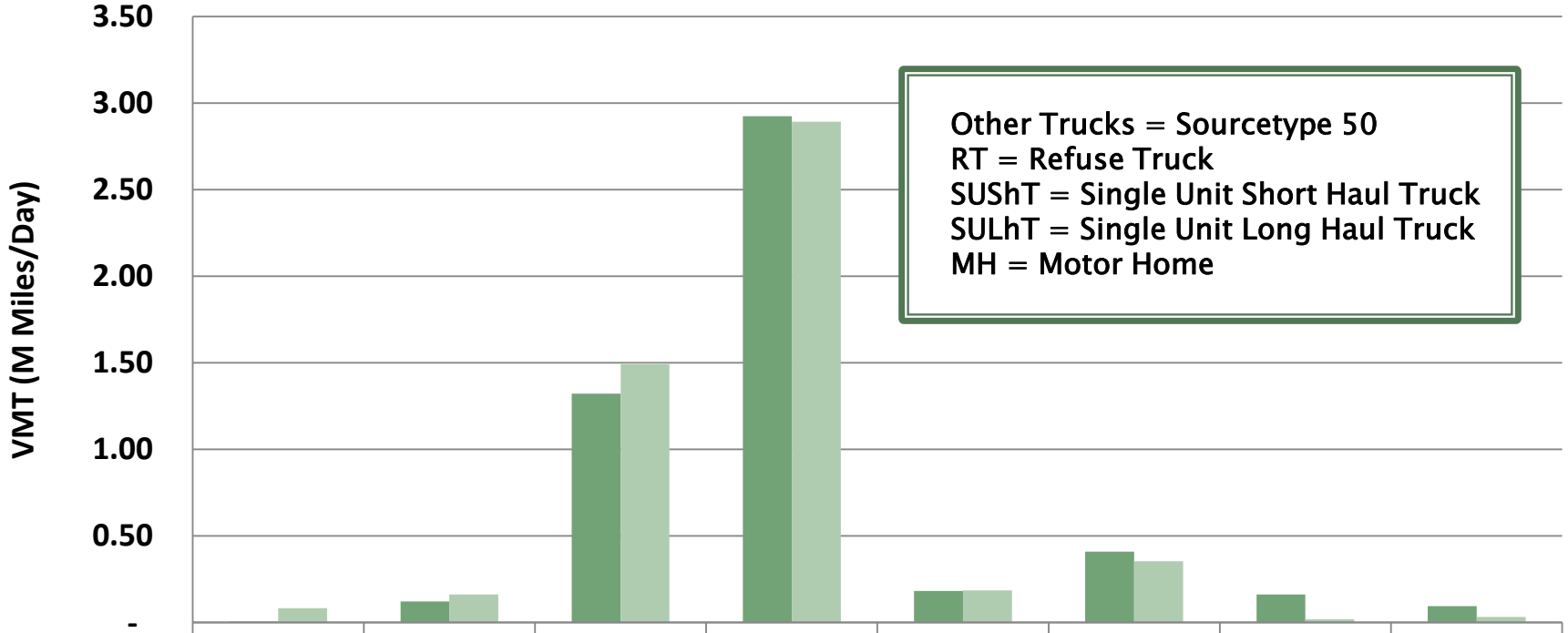
2012 VMT: Bus



	IBus_Diesel	TBus_Gas	TBus_Diesel	SBus_Gas	SBus_Diesel
Rate	0.16	0.00	0.04	0.01	0.17
Inventory	0.29	0.00	0.04	0.01	0.05

TRANSITION - MOVES2010a

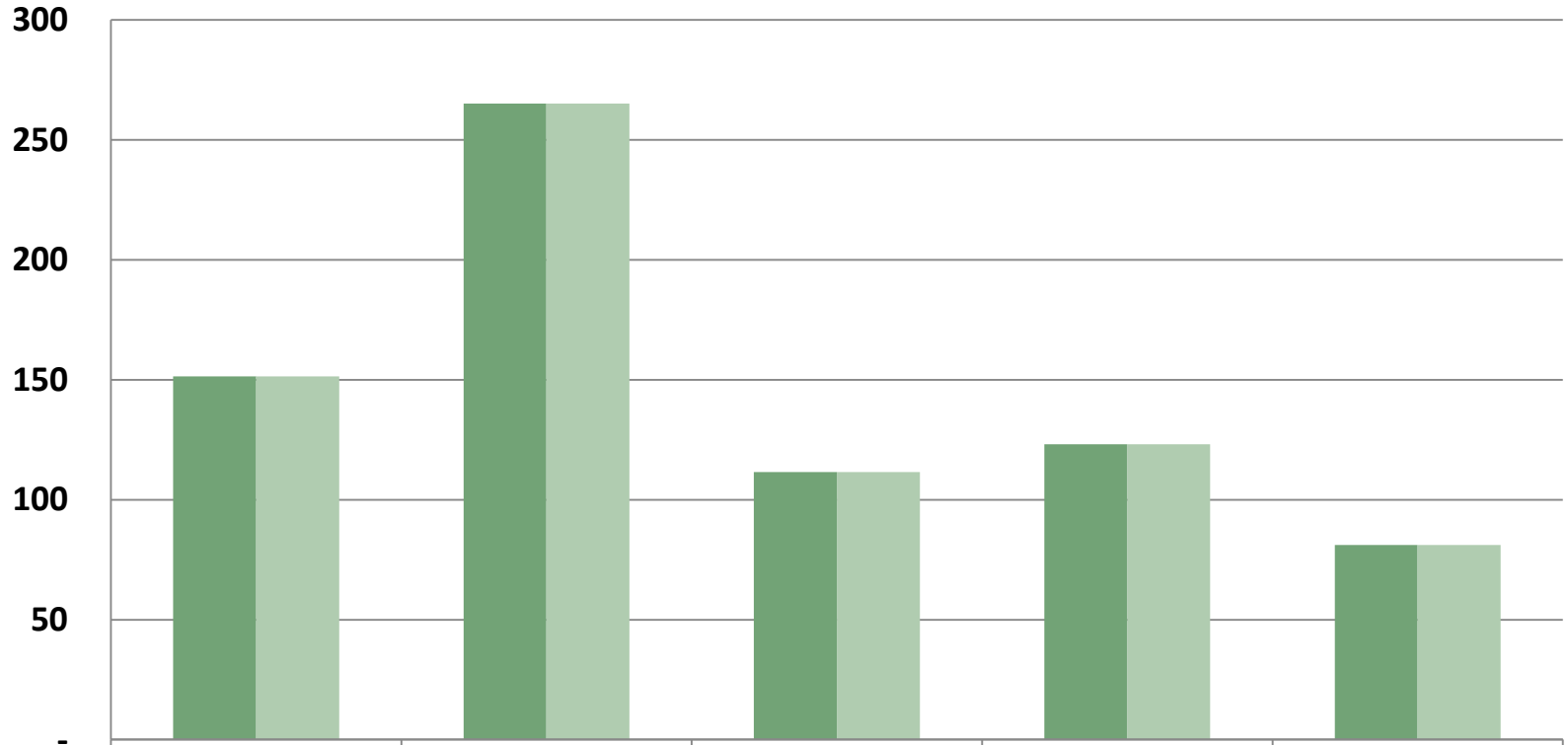
2012 VMT: Other Trucks



	RT_Gas	RT_Diesel	SUShT_Gas	SUShT_Diesel	SULhT_Gas	SULhT_Diesel	MH_Gas	MH_Diesel
Rate	0.01	0.12	1.32	2.93	0.18	0.41	0.16	0.09
Inventory	0.08	0.16	1.49	2.89	0.19	0.35	0.02	0.03

TRANSITION - MOVES2010a

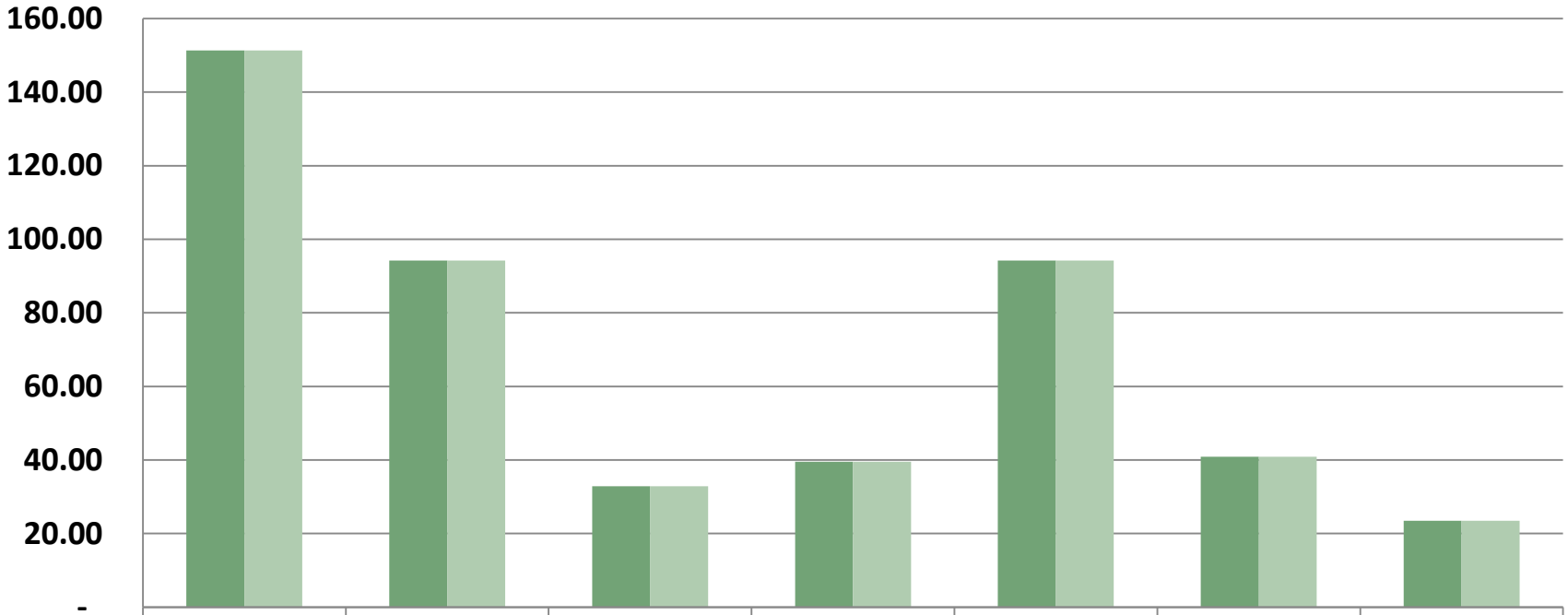
2006 VMT & Emissions: Daily Vs Annual



	VMT (M Miles/day)	NOx (tons/day)	VOC (tons/day)	CO (10^1 tons/day)	CO2 (10^3 tons/day)
Daily_Inv	151.36	265.12	111.55	123.17	81.10
Annual_Inv	151.36	265.12	111.55	123.17	81.10

TRANSITION - MOVES2010a

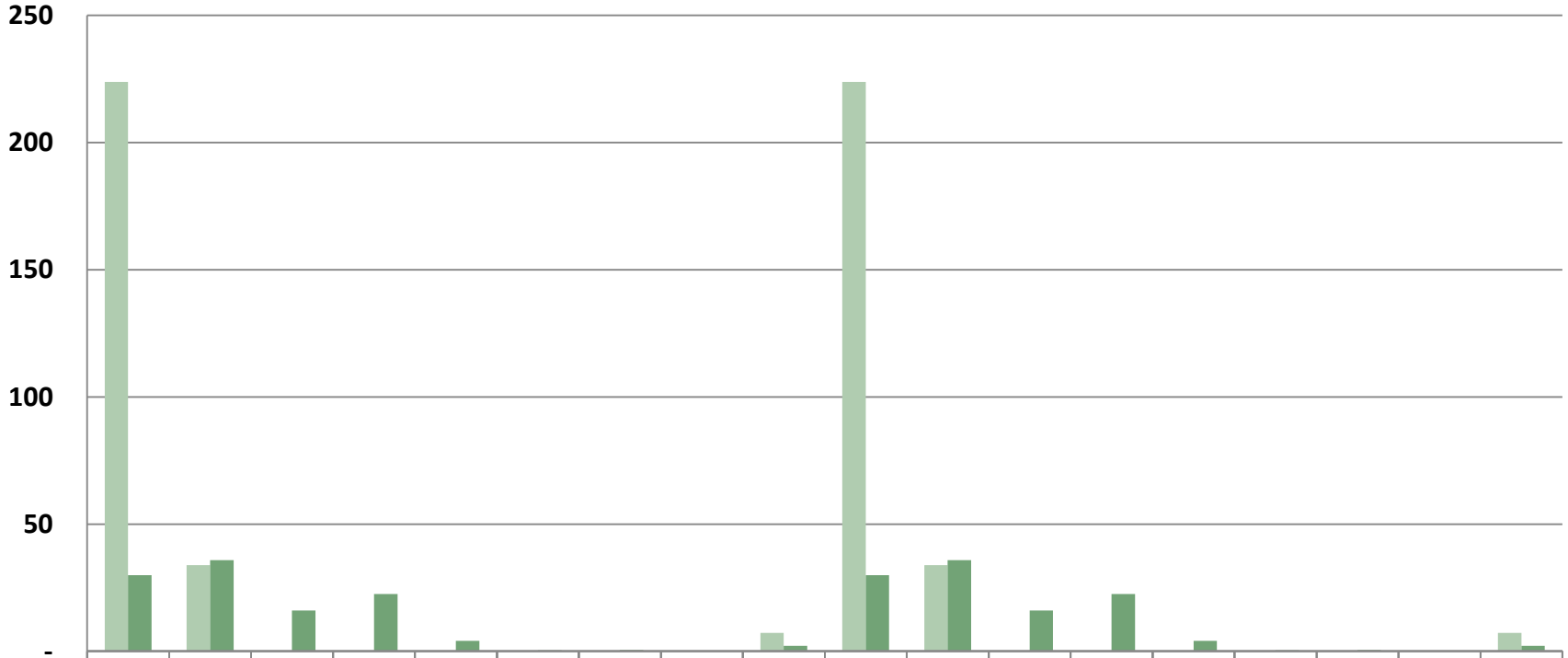
2006 Activity: Daily Vs Annual



	Distance traveled (10^6)	Source Hours (10^6)	Extended Idle Hours (10^3)	Source Hours Operating (10^5)	Source Hours Parked (10^6)	Population (10^5)	Starts (10^6)
Daily_Inv	151.36	94.22	32.87	39.49	94.22	40.91	23.50
Ann_Inv	151.36	94.22	32.87	39.49	94.22	40.91	23.50

TRANSITION - MOVES2010a

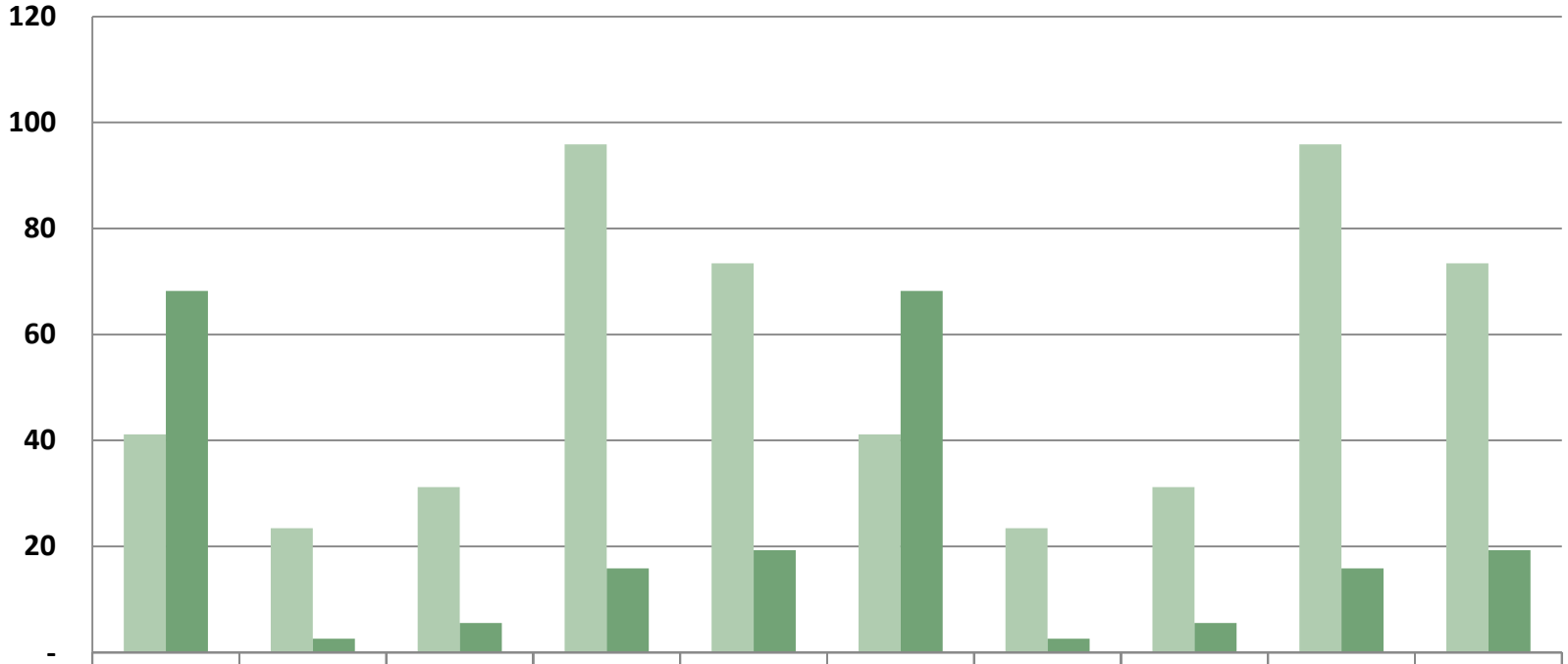
2006 Emissions by Emission Type: Daily Vs Annual



	Annual_Inv									Daily_Inv								
	Run_ Exh	Start_ Exh	Evap_ Perm	Evap_ Fuel_ Vap_ Vent	Evap_ Fuel_ Leaks	Crank case_ Run_ Exh	Crank case_ Start_ Exh	Crank case_ Ext_Id le	Ext_Id le_Ex h	Run_ Exh	Start_ Exh	Evap_ Perm	Evap_ Fuel_ Vap_ Vent	Evap_ Fuel_ Leaks	Crank case_ Run_ Exh	Crank case_ Start_ Exh	Crank case_ Ext_Id le	Ext_Id le_Ex h
NOx (tons/day)	223.8	33.88	-	-	-	0.06	0.00	0.00	7.28	223.8	33.88	-	-	-	0.06	0.00	0.00	7.28
VOC (tons/day)	29.98	35.88	15.97	22.54	4.12	0.43	0.47	0.04	2.11	29.98	35.88	15.97	22.54	4.12	0.43	0.47	0.04	2.11

TRANSITION - MOVES2010a

2006 Emissions by Roadtype: Daily Vs Annual



	Annual_Inv					Daily_Inv				
	Off-Network	Rural Restricted Access	Rural Unrestricted Access	Urban Restricted Access	Urban Unrestricted Access	Off-Network	Rural Restricted Access	Rural Unrestricted Access	Urban Restricted Access	Urban Unrestricted Access
NOx (tons/day)	41.17	23.45	31.19	95.89	73.41	41.17	23.45	31.19	95.89	73.41
VOC (tons/day)	68.24	2.62	5.57	15.84	19.28	68.23	2.62	5.57	15.84	19.28

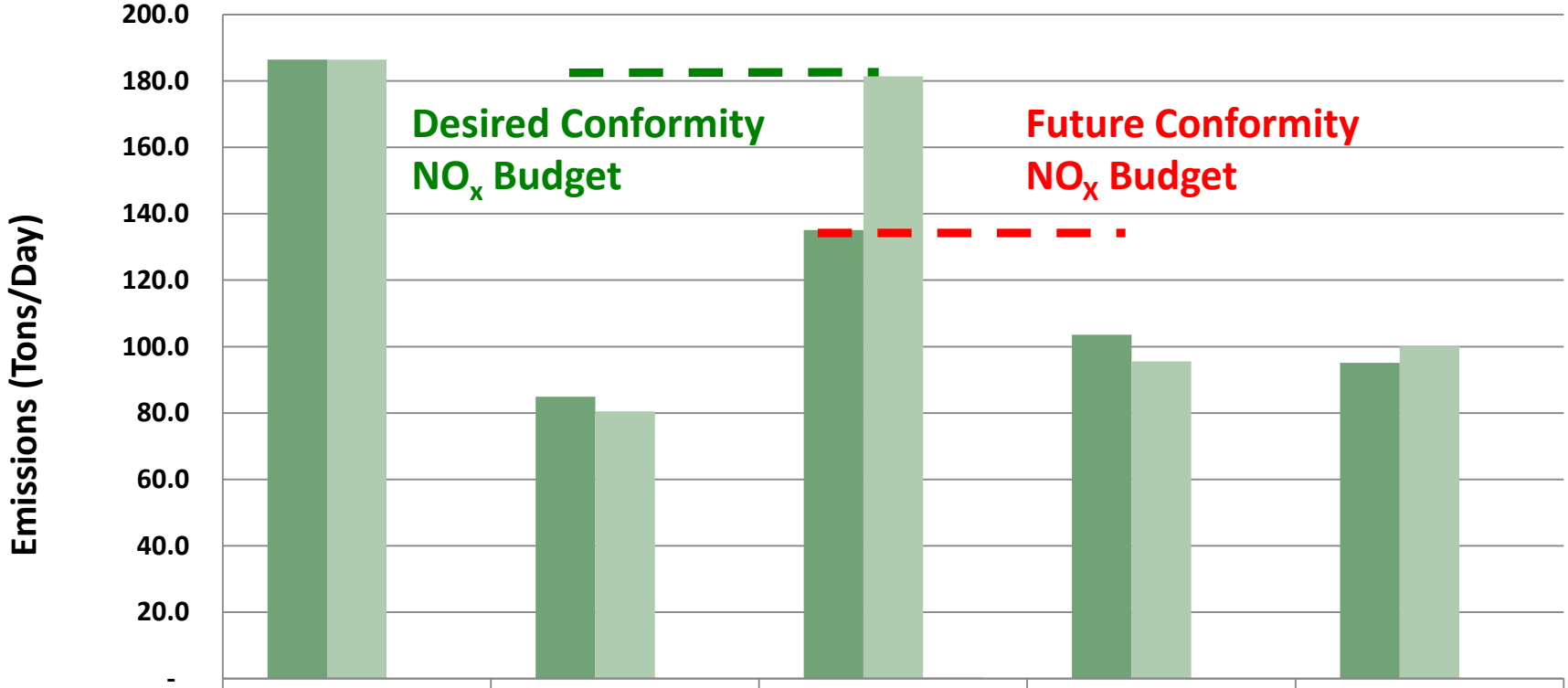
CHALLENGES

MOVES Input Source

MOBILE6 Inputs	MOVES Inputs	NCTCOG Source
SPEED VMT	avgspeeddistribution	Travel Model
Not Required	dayvmtfraction	EPA Converter Methodology
FUEL PROGRAM /OXYGENATED FUELS /FUEL RVP	fuelformulation	State Air Agency
	fuelsupply	State Air Agency
VMT BY HOUR	hourvmtfraction	Travel Model
Not Required	hpmsvtypeyear	Travel Model
I/M DESCRIPT FILE	imcoverage	State Air Agency
Not Required	monthvmtfraction	EPA Converter Methodology
Not Required	roadtype	Travel Model
VMT BY FACILITY	roadtypedistribution	Product of Multiple Data Sets
REG DIST	sourcetypeagedistribution	TXDOT Registration Data + EPA Defaults
Not Required	sourcetypeyear	TXDOT Registration Data
HOURLY TEMPERATURES /RELATIVE HUMIDITY /BAROMETRIC PRES	zonemonthhour	State Air Agency
WE DA TRI LEN DI (Trip Length Distribution)	*Not Required*	Travel Model

CHALLENGES

Transportation Conformity Demonstration



	VMT (M. Miles)	VOC (Tons/day)	NOx (Tons/day)	CO (10^1 Tons/day)	CO2 (10^3Tons/day)
MOBILE6.2	186.4	84.9	135.1	103.6	95.2
MOVES2010a	186.4	80.5	181.4	95.6	100.0
Absolute % Diff	0%	5%	34%	8%	5%

CHALLENGES

Transportation Control Measures (Example)

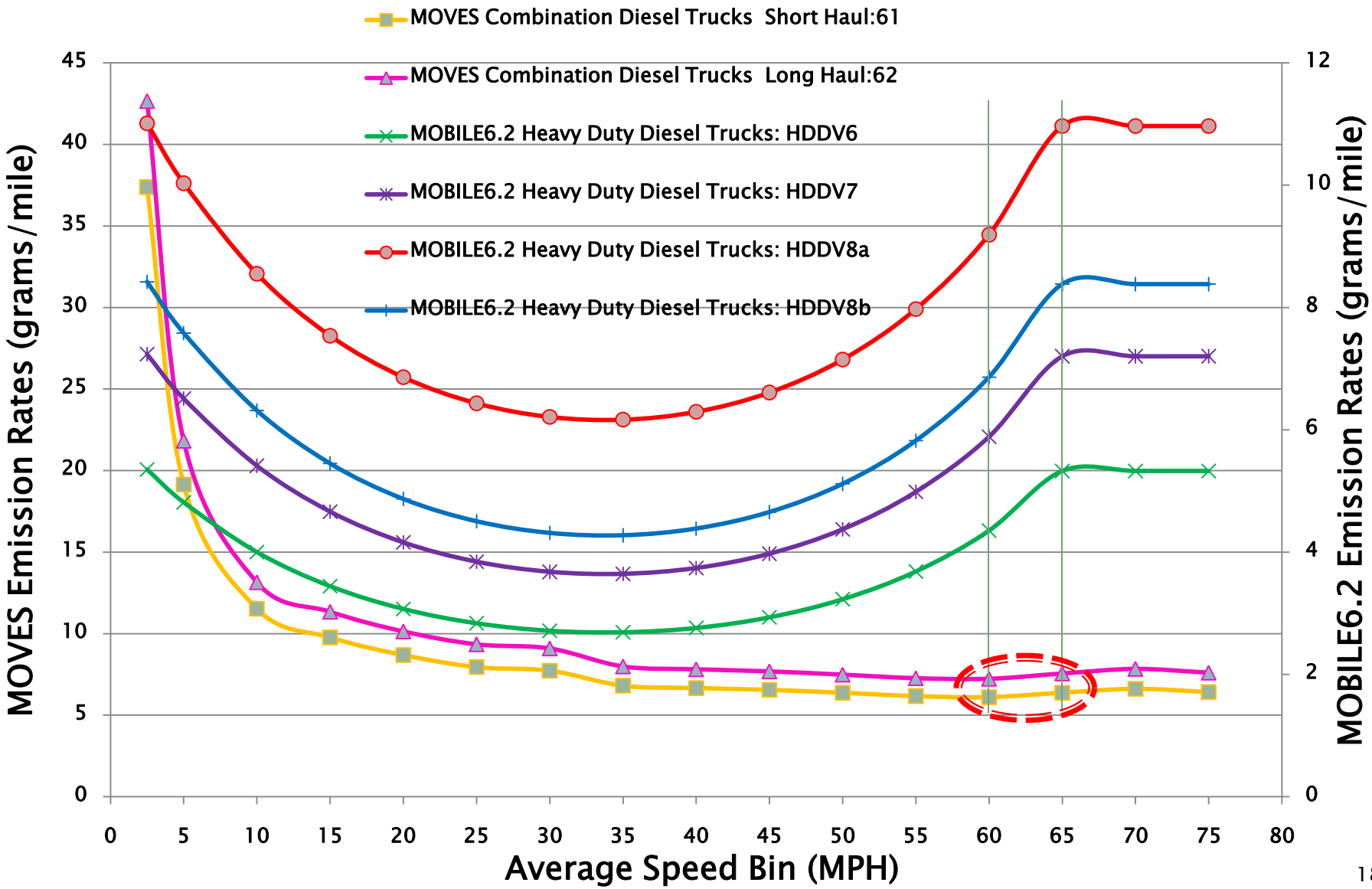
Environmental Speed Limits (ESL) are a Control Strategy in the 1-Hour State Implementation Plan (SIP)

All Speed Limits Continue to be an Indirect Strategy in the 8-Hour SIP and Transportation Conformity

Speed Increases Above 35 mph Have Varying NOx Emissions Amongst Models

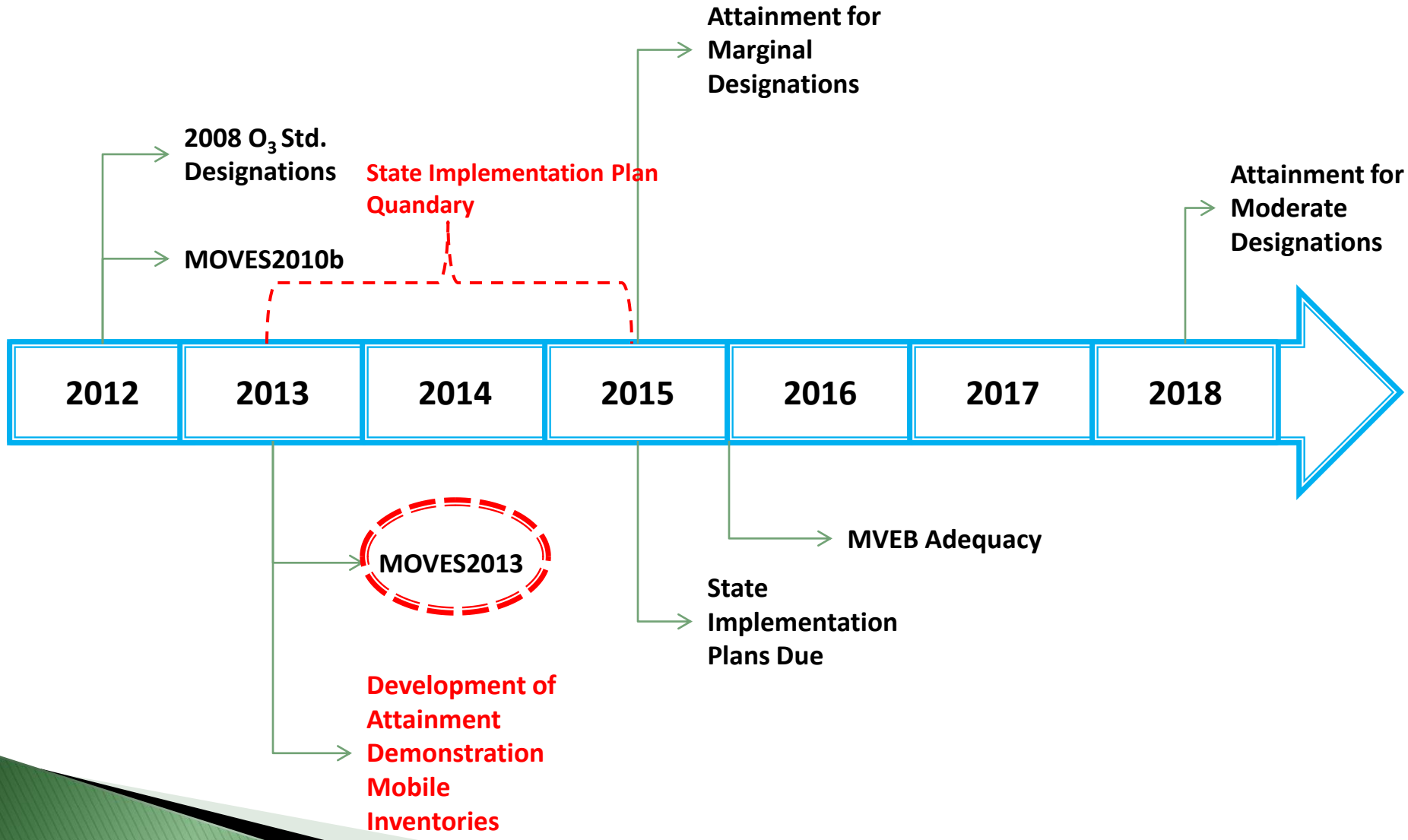
CHALLENGES

MOVES2010a Vs MOBILE6.2 Vehicle Rates



CHALLENGES

MOVES2013 Release Date



NEEDS

Helpful Features

Data Development Guidelines and Sources

MOVES2010a RunSpec Creation Module

MYSQL Queries/Bypass County Data Manager

Run Check

Early Knowledge of Emissions Differences Between MOVES2010 & MOVES2013

QUESTIONS?

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