MOVES2010a MODEL : METROPOLITAN PLANNING ORGANIZATION TRANSITION, CHALLENGES, AND NEEDS

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OUTLINE

- National Ambient Air Quality Standards (NAAQS)
- State Implementation Plan (SIP)
- Conformity
- Environmental Protection Agency (EPA) On-Road Models
- MOVES2010a
- Metropolitan Planning Organization (MPO)
- MOVES2010a Input Development Tool
- Results and Discussions

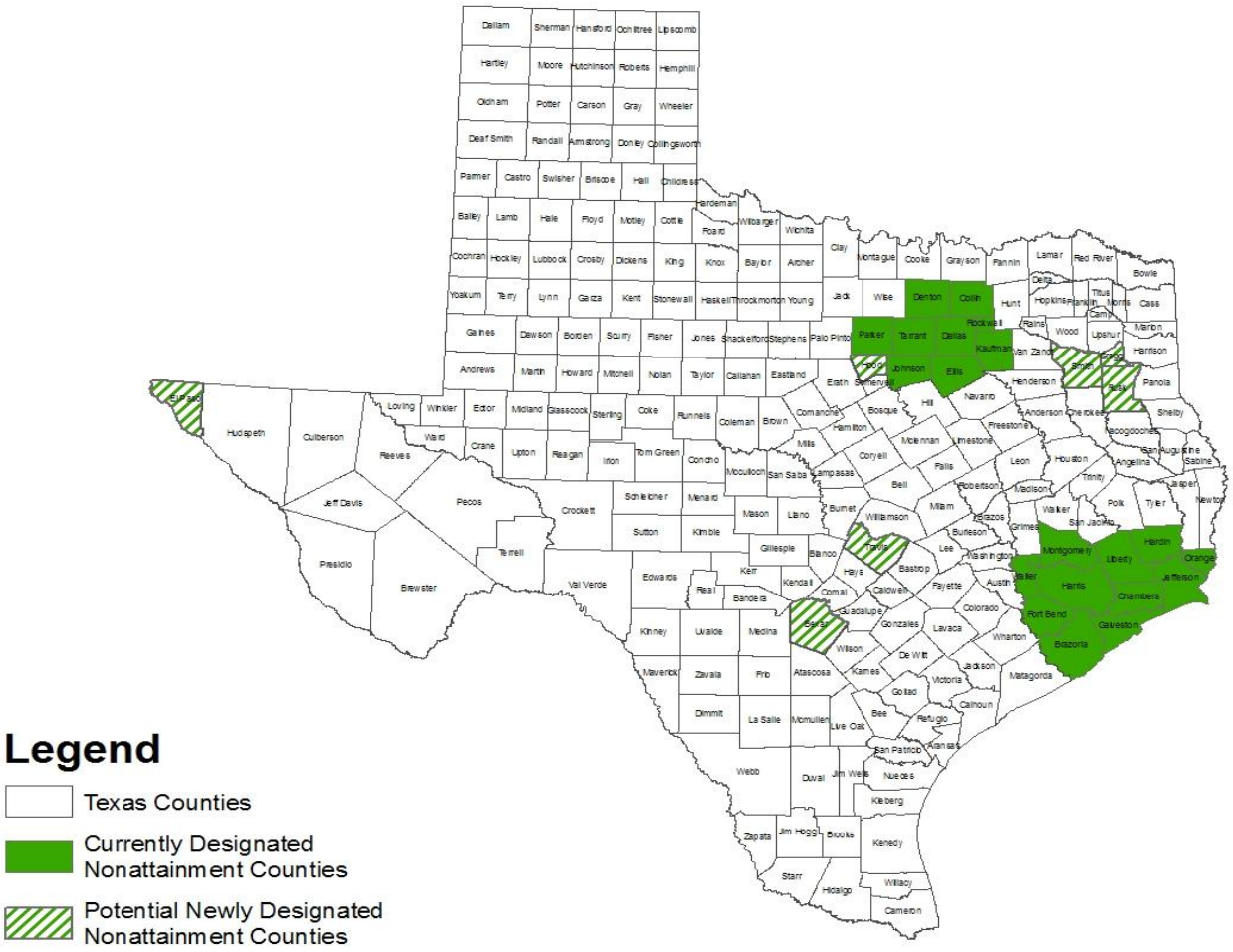
National Ambient Air Quality Standards

Criteria Pollutants

- Carbon Monoxide (CO)
- Lead (Pb)
- Nitrogen Dioxide (NO_2)
- Ozone (O_3)
- Particulate Matter (PM_{10} & $PM_{2.5}$)
- Sulfur Dioxide (SO_2)

National Ambient Air Quality Standards

Nonattainment Areas in Texas



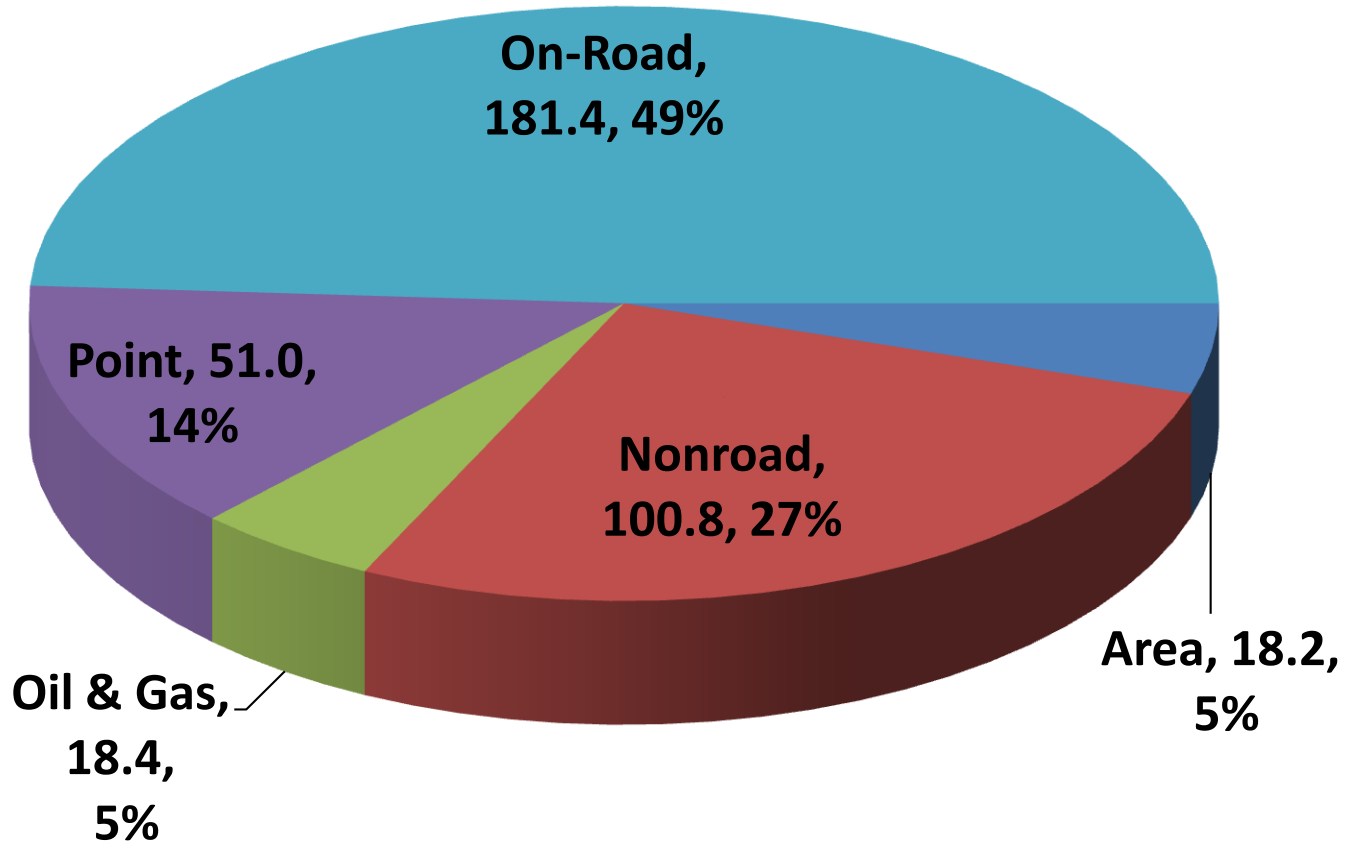
State Implementation Plan

Requirements

- Emissions Inventories and Analyses
  - Quantify Regional Pollutant Emissions
  - Conduct Supporting Technical Research
  - Coordinate with State Model Development
- Emissions Reduction Control Strategies
  - Identify and Quantify Strategies
  - Implement Local Air Quality Projects
  - Monitor SIP Commitments
- Establish Motor Vehicle Emission Budgets

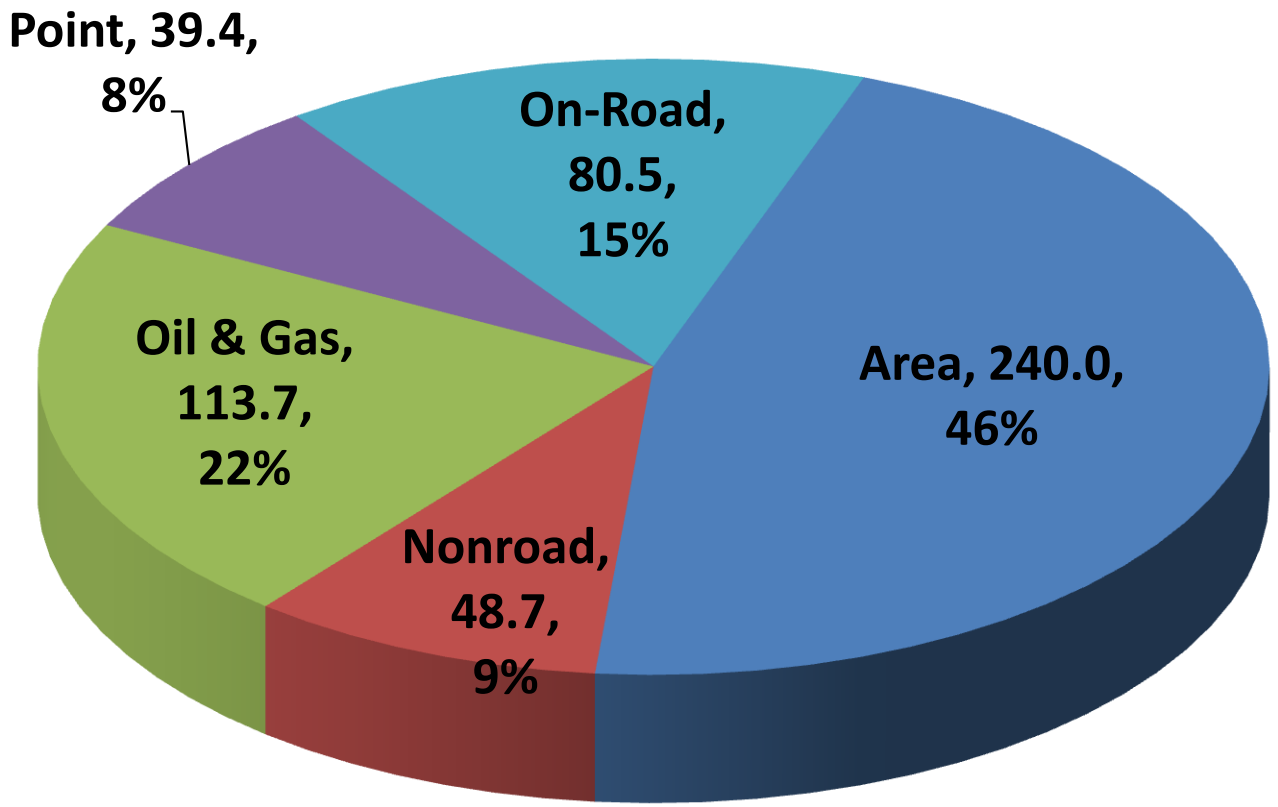
State Implementation Plan

Emission Inventories (NO_X)



State Implementation Plan

Emission Inventories (VOC)



State Implementation Plan

Level of Commitments

Transportation Control Measure (TCM)	**Commitments are identified in the SIP and are used in AQ Conformity analysis.**
Voluntary Mobile Emission Reduction Measures (VMEP)	**Commitments are identified in the SIP and can be used in AQ Conformity analysis.**
Transportation Emission Reduction Measures (TERM)	**Utilized in AQ Conformity analysis as additional credits.**
Weight of Evidence (WOE)	**May be documented but not credited in the SIP.**

Transportation Conformity

Purpose

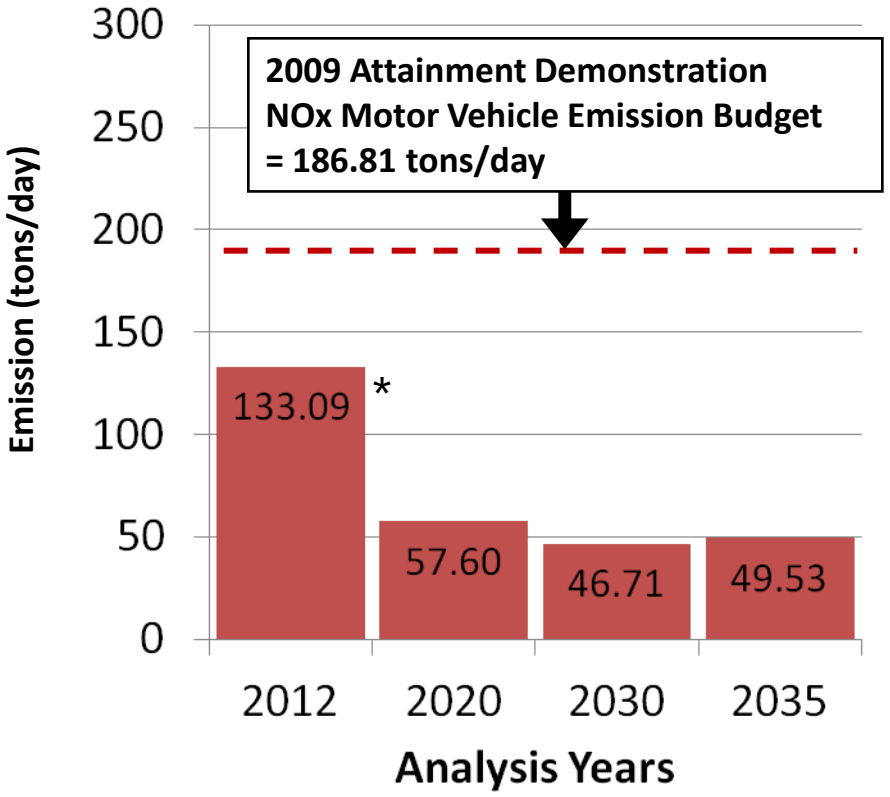
- Demonstrates that Projected Emissions from Transportation Projects are Within Emission Limits (Motor Vehicle Emissions Budgets) Established in the State Implementation Plan

- Transportation Projects that are Consistent with Air Quality Planning Goals are Eligible for Approval and Federal Funding

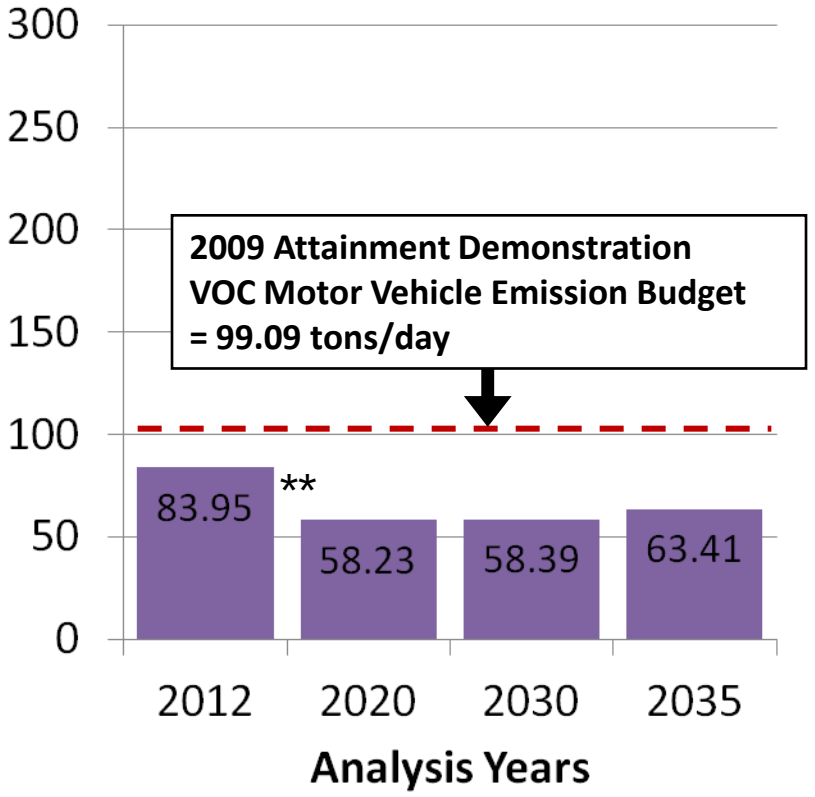
Transportation Conformity

Motor Vehicle Emission Budget Test

Emissions of Nitrogen Oxides (NOx)



Emissions of Volatile Organic Compounds (VOC)



*Includes reductions from RTC initiatives of 4.38 tons/day

**Includes reductions from RTC initiatives of 3.59 tons/day

Transportation Conformity

Factors Influencing Conformity Demonstrations

- Transportation Funding
  - TCMs/VMEPs
- Vehicle Mile of Travel
  - Landuse/Demographics
  - Calibration/Validation
  - HPMS Data
- Emission Factors
  - EPA Models
  - Model Inputs

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	Fall/Winter of 2011
MOVES2013	Sometime in 2013

MOVES2010a

County Data Manager Inputs

- Roadtypedistribution
- Population
- Hourvmtfraction
- Hpmsvtypeyear
- Met Data
- Sourcetype Age Distribution
- Fuel Formulation
- Fuelsupply
- IMcoverage
- Monthvmtfraction
- Dayvmtfraction
- Avgspeed Distribution
- Rampfraction

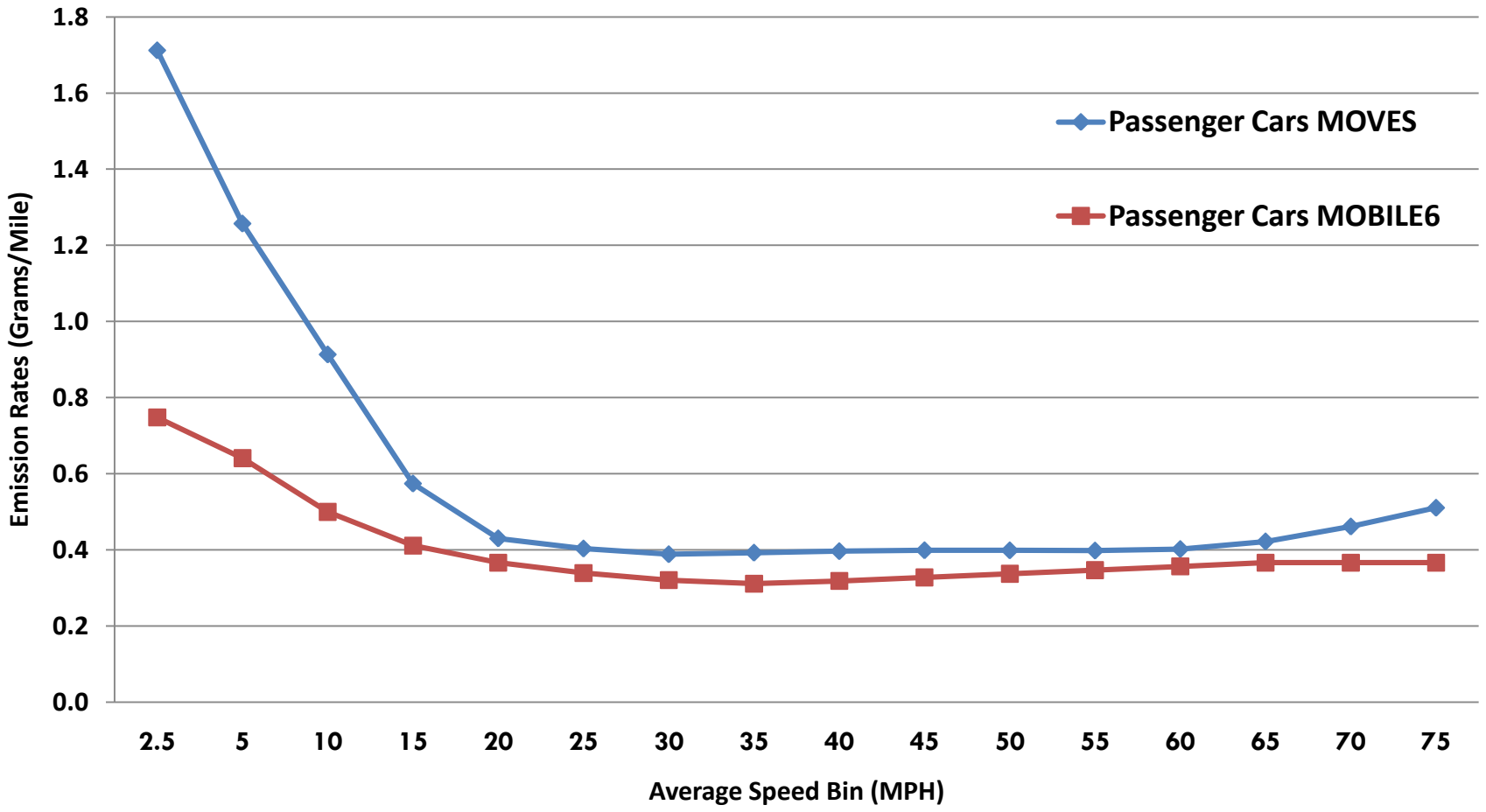
MOVES2010a

Input Sources

Inputs	Source
Met , Fuel, & IM	State Air Agency, EPA
Vehicle Population & Age Distribution	Vehicle Registration
Roadtype , Monthtype and Daytype Distribution	Traffic Counts, Telematics, Travel Model
Average Speed Distribution, Ramp Fraction	Travel Model, ITS Data, Telematics
Vehicle Miles of Travel	HPMS, Travel Model
Vehicle Miles of Travel-Mix	Classification Counts

MOVES2010a

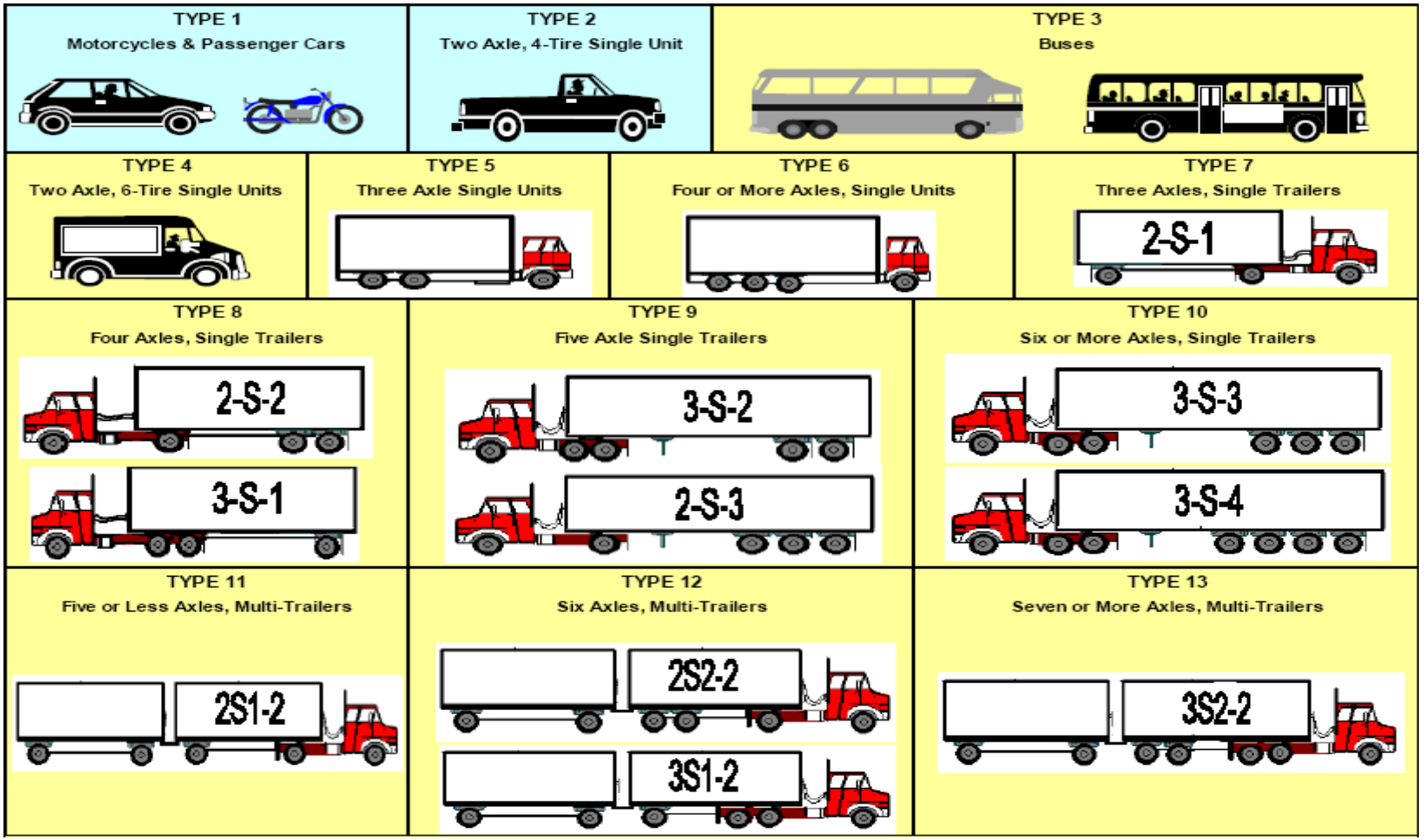
Light Duty NO_X Emission Factors



MOVES2010a

Classification Counts: VMT Mix

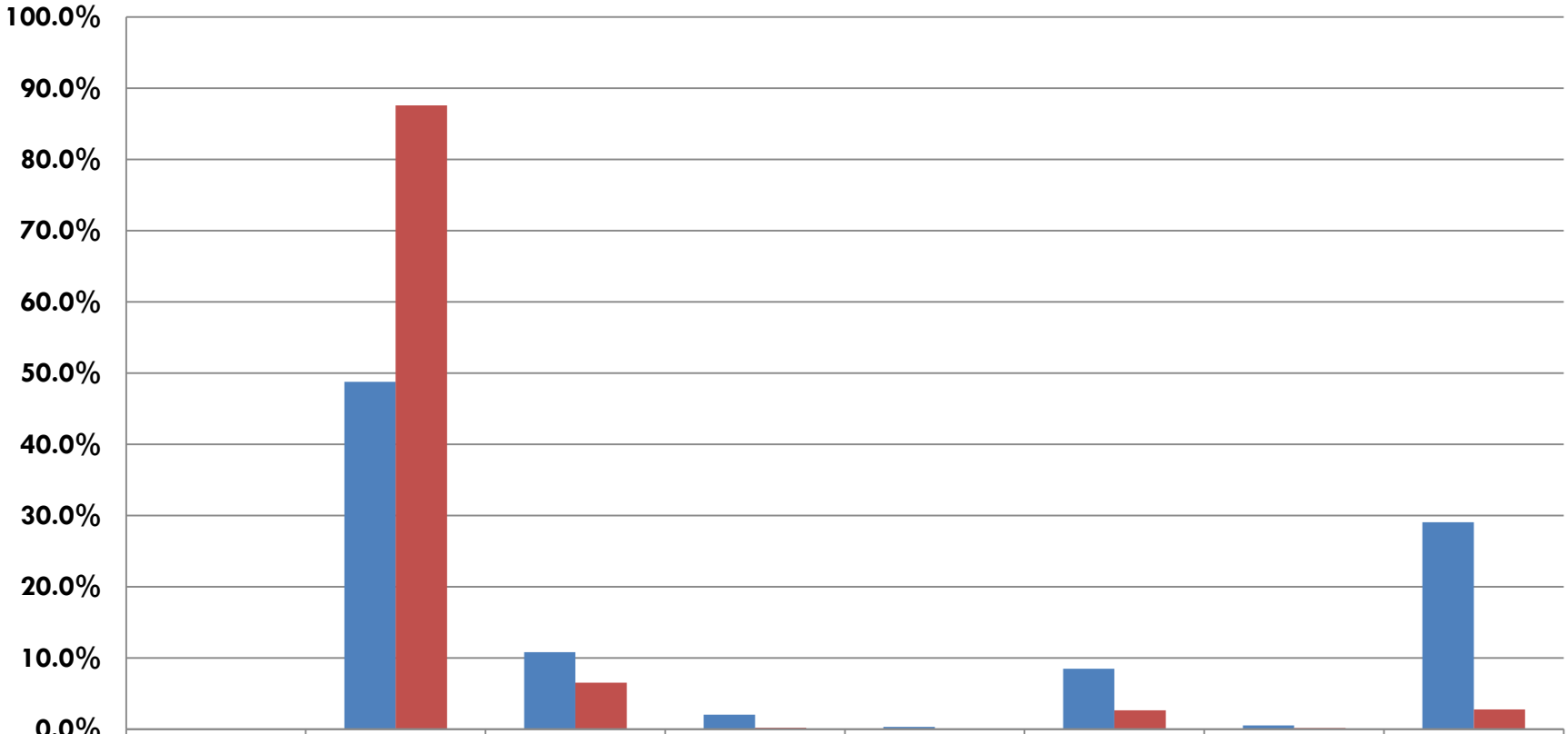
16



Source - Texas Department of Transportation

MOVES2010a

VMT Mix & Emissions



	Motorcycle	Passenger Car and Trucks	Light Commercial Truck	Buses	Refuse Truck	Single Unit Trucks	Motor Home	Combination Trucks
NOx	0.0%	48.8%	10.8%	2.0%	0.3%	8.5%	0.5%	29.0%
VMT	0.1%	87.6%	6.5%	0.2%	0.1%	2.6%	0.1%	2.7%

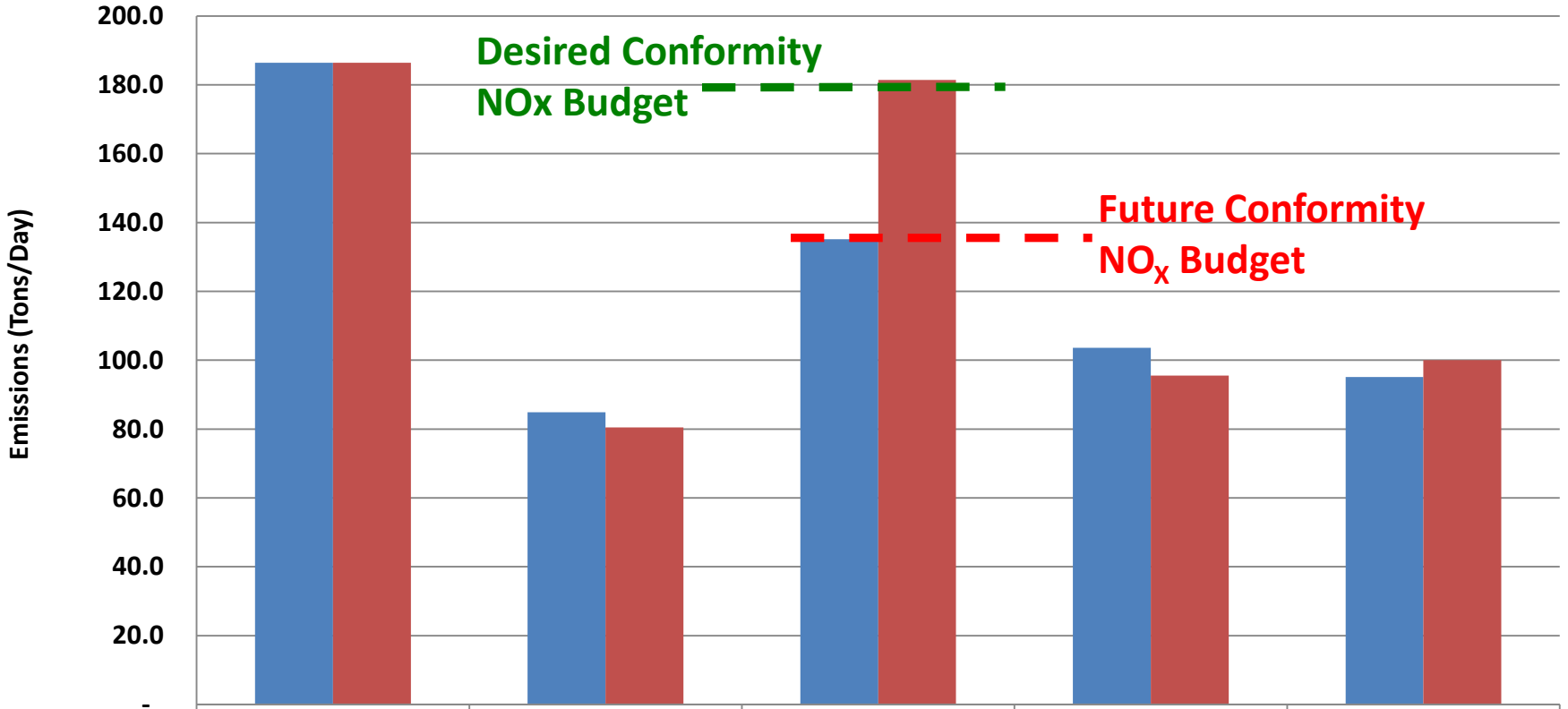
MOVES2010a

Challenges

- Longer Run Time: Resource Intensive
- Transportation Conformity: Higher Emissions With MOVES2010a
- Acquire and Develop Local Data for MOVES2010a
- Reliance on Default Data
- Error Reporting
- SIP Revisions

MOVES2010a

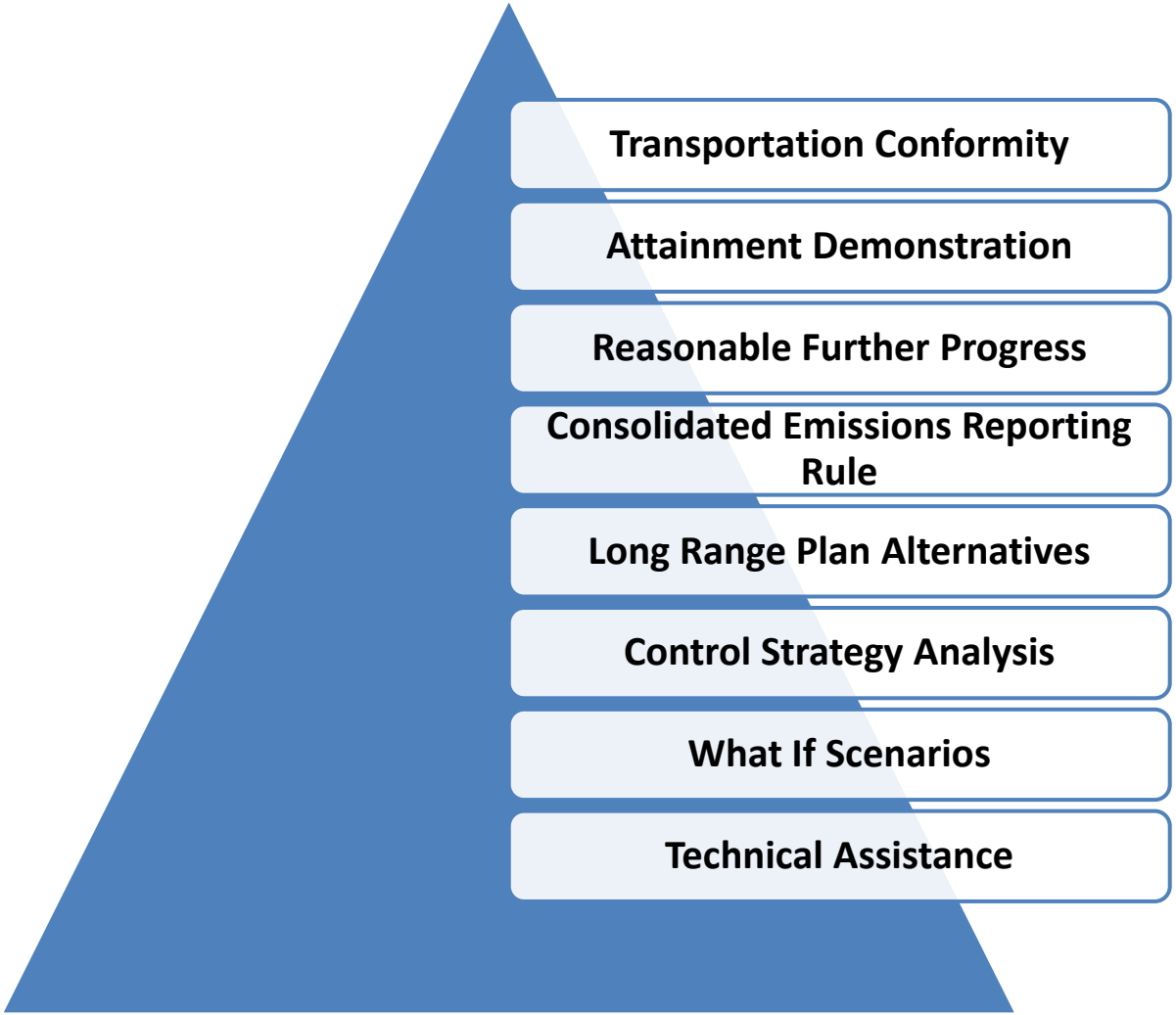
Impacts on Conformity Demonstrations



	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

METROPOLITAN PLANNING ORGANIZATION

MOVES2010a Use



METROPOLITAN PLANNING ORGANIZATION

Resources

Specialization	Percent of MPOs with this Specialty on Staff	Median Staff Size of MPOs with this Specialization
GIS	44.4%	9
Travel Demand Modeling	38.7%	12
Transit	36.3%	10
Bicycle and Pedestrian	30.6%	8.5
Public Involvement	25.0%	12
Traffic Operations	20.2%	10
Intergovernmental Relations	16.1%	8.5
Air Quality	15.3%	15
Safety	12.9%	10
Transportation Disadvantaged	12.1%	11
Freight	11.3%	15.5
Socio-cultural Impacts	4.0%	12

Source: FHWA, “Staffing and Administrative Capacity of MPO’s”

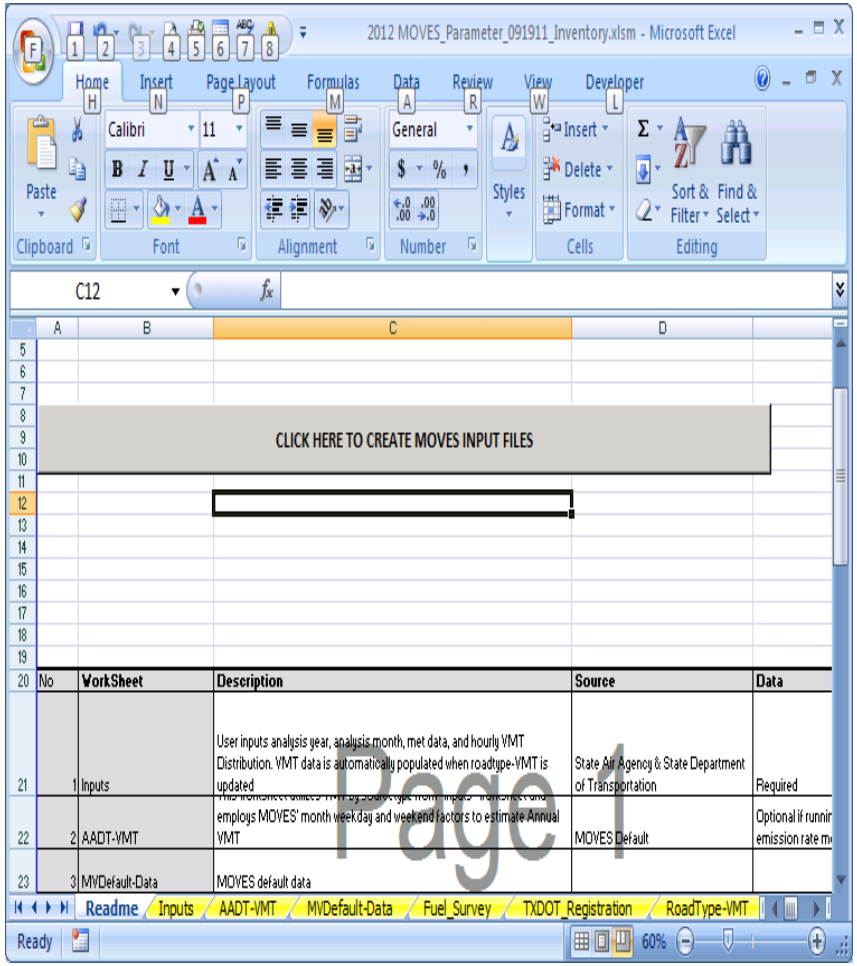
METROPOLITAN PLANNING ORGANIZATION

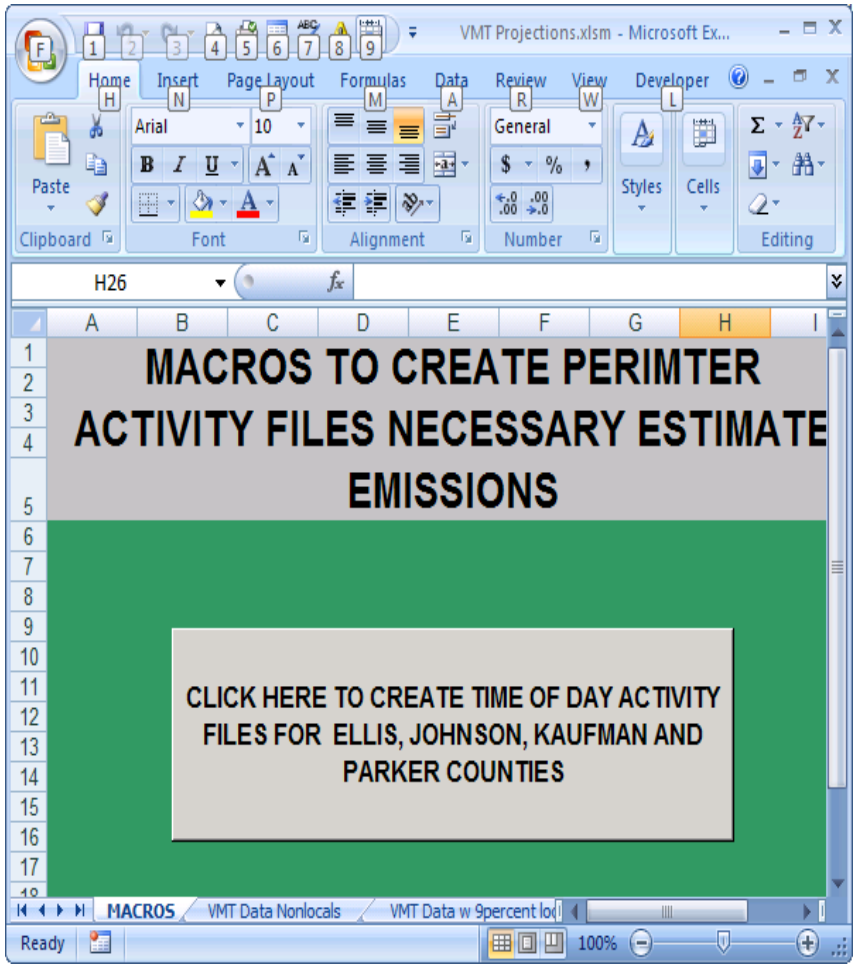
Classification for MOVES2010a Inputs

- Attainment Vs Nonattainment Vs Maintenance
- Travel Model Vs Non Travel Model
- Top Down Vs Bottom Up
- Purpose of Inventory
- MOVES2010a Experience Level

MOVES2010a INPUT DEVELOPMENT TOOL

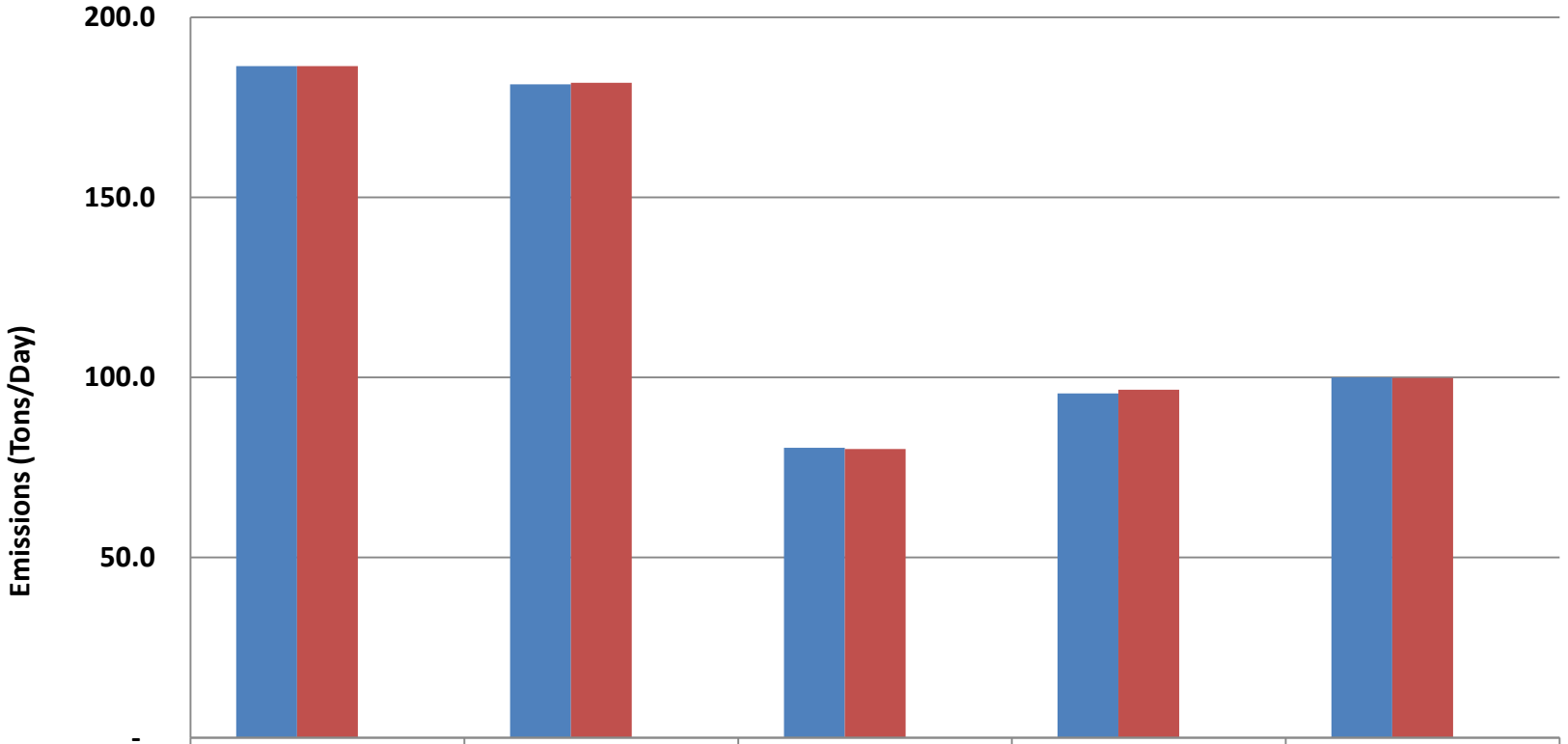
Sample Product Design





RESULTS & DISCUSSION

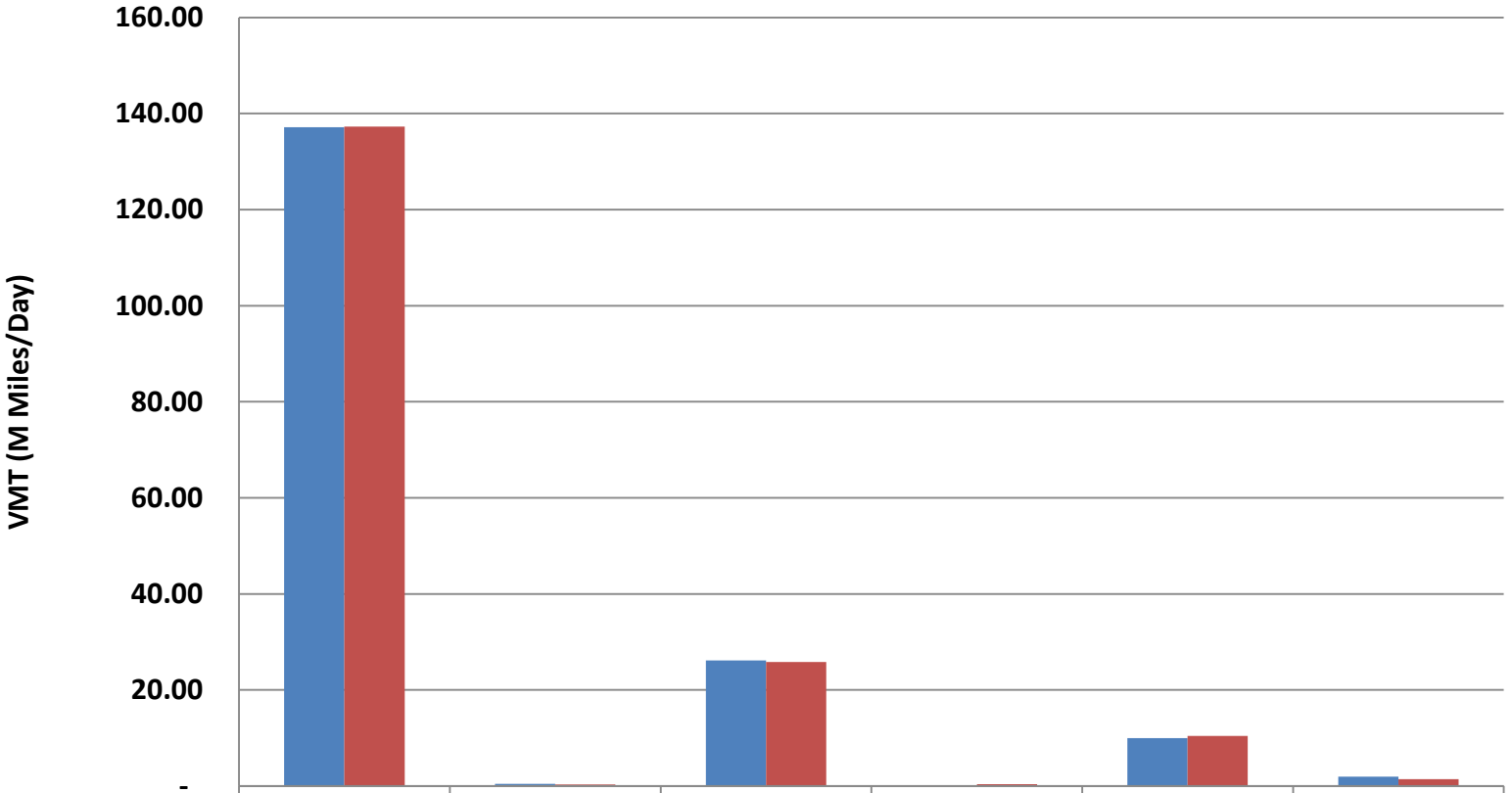
Emissions Rate Vs Inventory Method



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

RESULTS & DISCUSSION

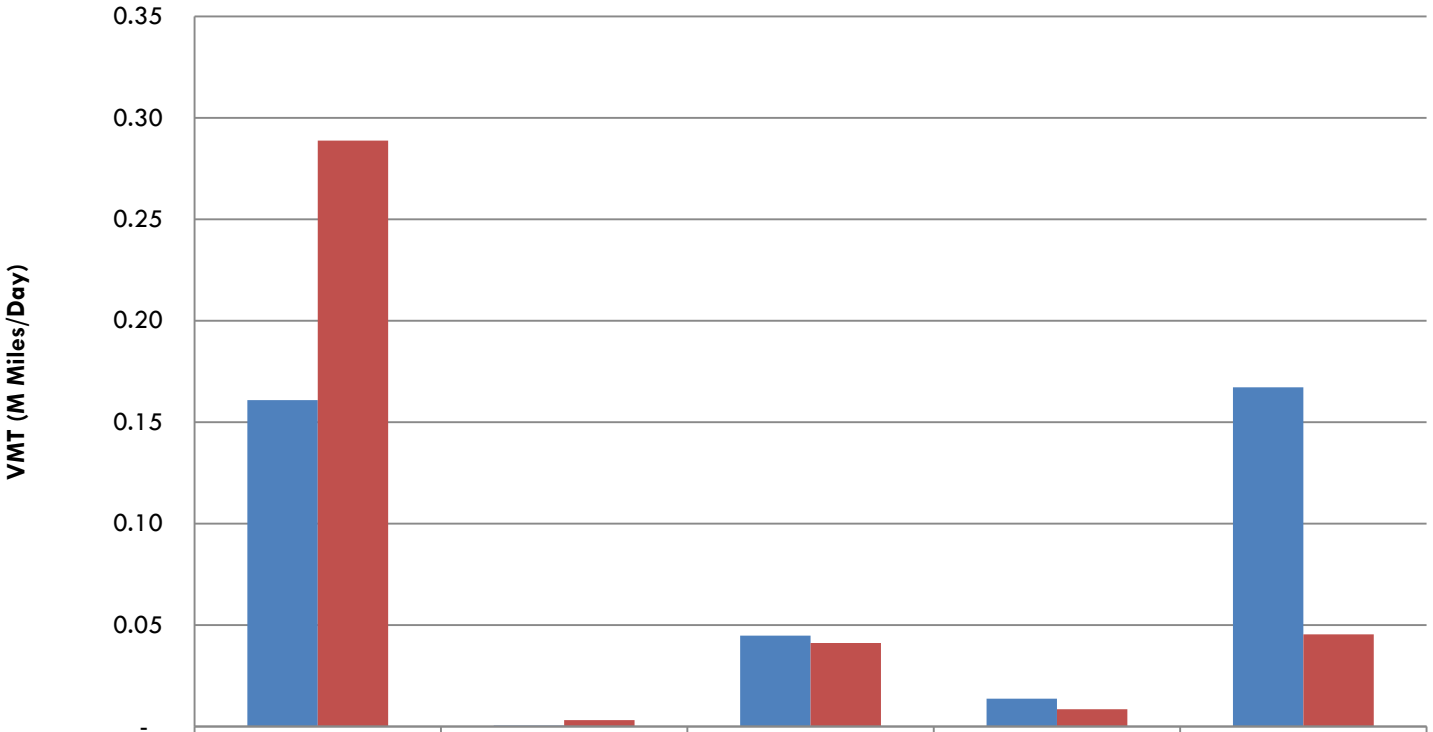
VMT: Sourcetype 20 and 30



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

RESULTS & DISCUSSION

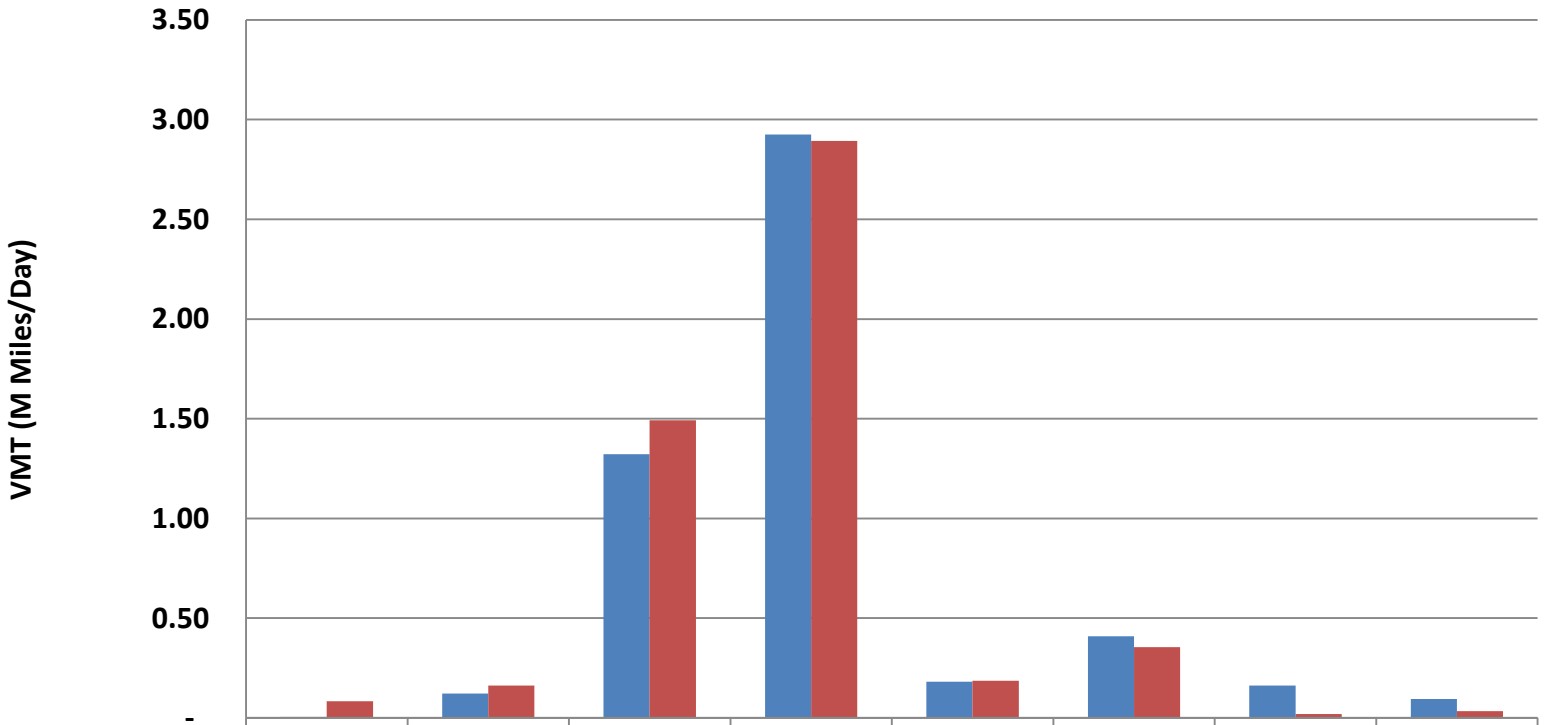
VMT: Sourcetype 40



	IBus_Diesel	TBus_Gas	TBus_Diesel	SBus_Gas	SBus_Diesel
Link_Based	0.16	0.00	0.04	0.01	0.17
MV_Inventory	0.29	0.00	0.04	0.01	0.05

RESULTS & DISCUSSION

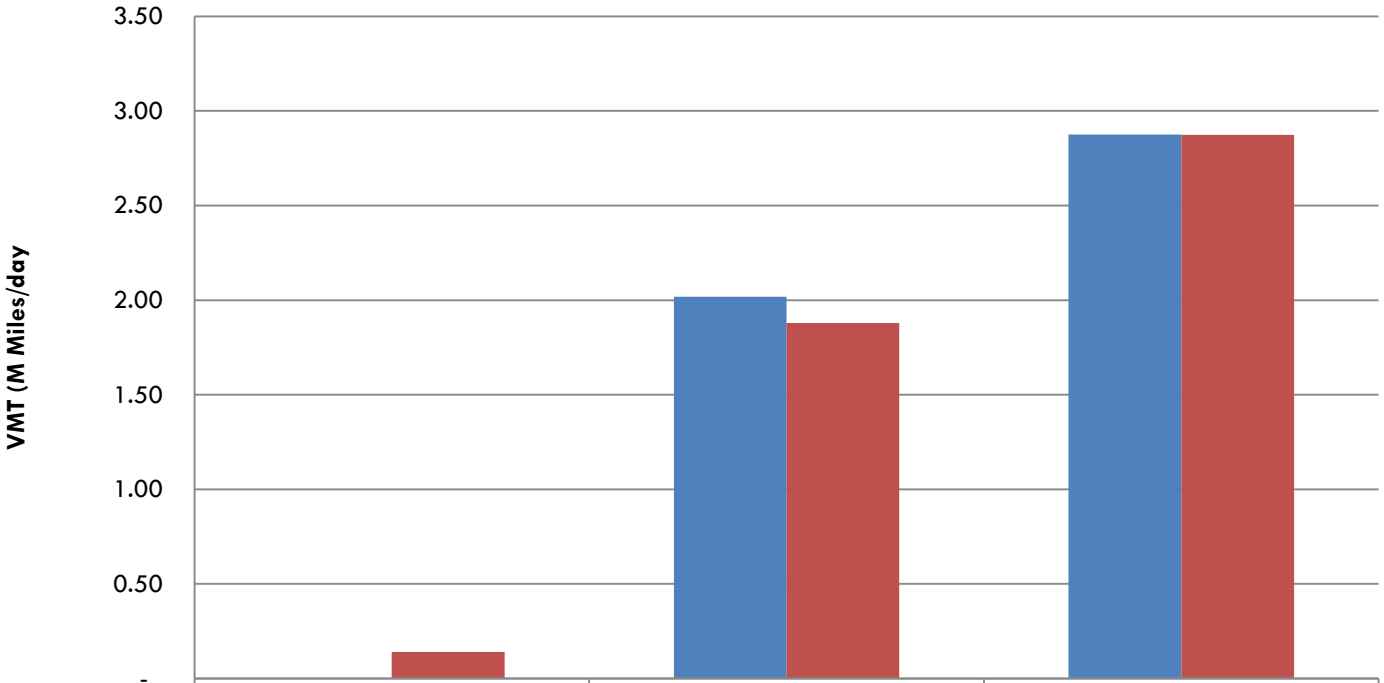
VMT: Sourcetype 50



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

RESULTS & DISCUSSION

VMT: Sourcetype 60



	CShT_Gas	CShT_Diesel	CLhT_Diesel
Link_Based	0.00	2.02	2.88
MV_Inventory	0.14	1.88	2.87

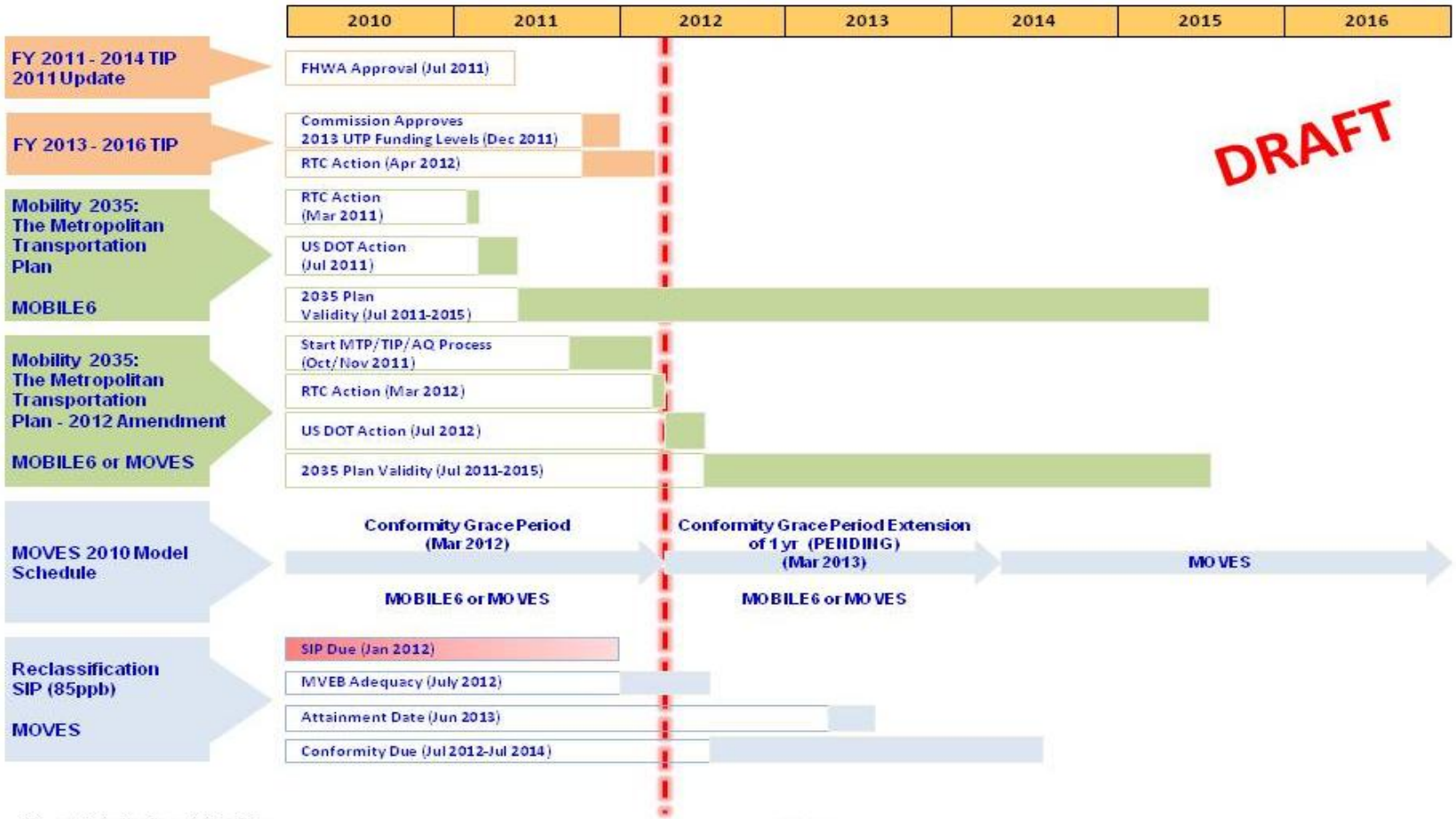
MOVES2010a INPUT DEVELOPMENT TOOL

Helpful Features

- Data Development Guidelines and Sources
- Ease of Data Entry
- National Defaults
- Quality Check
- MOVES2010a RunSpec Creation
- Bypass County Data Manager

CONCLUSION

Effective Planning



SIP – State Implementation Plan
MVEB – Motor Vehicle Emission Budgets
PPB – Parts Per Billion
*Newly Designated Counties

North Central Texas Council of Governments

Revised: August 28, 2011

Thank You

Any Questions ?