

# Transportation Air Quality Sketch Planning Tool

TWG Biannual Meeting  
1 September 2016  
San Antonio

# Sketch Planning Tool: Vision/Goal

---

- Develop a transportation air quality sketch planning tool
  - Travel Demand Model (TDM) Based Component
    - Use TDM outputs to estimate network emissions for different scenarios
  - Non-TDM Component
    - Capability to estimate emissions benefits of projects/strategies that cannot be modeled by the TDM (for example idle reduction strategies, etc.)

# TDM-Based: Overview

- Aimed at indicating directional changes in emissions for sketch planning purposes
- Does not replicate conformity process
- Several simplifying assumptions made in analysis
- Results are not to be used for conformity and other regulatory purposes

**Transportation Air Quality Sketch Planning Tool**

El Paso MPO | Texas A&M Transportation Institute

### Introduction

This Transportation Air Quality Sketch Planning Tool was developed for the El Paso MPO. It allows for the assessment of the emissions impacts of transportation projects and strategies, at the network level (based on outputs of the Travel Demand Model), and for individual projects or initiatives, based on predefined user inputs.

The tool has two main components:

- [Module 1 - TDM-Based Emissions Analysis \(For Regional Emissions\)](#)  
This module allows the user to estimate and compare emissions for a "build" and "no-build" scenario using the outputs of El Paso's regional Travel Demand Model (TDM).
- [Module 2 - Non-TDM Analysis \(For Assessment of Emissions Reduction Strategies\)](#)  
This module allows for the assessment of various transportation strategies that are not directly reflected in the outputs of the TDM.

The calculations in both modules are made on the basis of built-in emissions rates obtained from the MOVES2014 emissions model, and consistent with latest planning assumptions in the region. Analysis years available in this tool include 2012, 2020, 2030, and 2040.

Click on the links above to navigate to the desired module of the sketch planning tool.

**Note: This is a sketch planning tool for planning purposes only. Results are not to be used for conformity or other regulatory purposes, or for comparison with emissions inventories, budgets, or emissions analyses from other sources.**

# TDM-Based: Implementation

---

- Import function to import TDM output files
- Built-in calculation methods and emissions rate lookup tables (ERLT)
- Graphical and tabular summary outputs of results.
- User can link output data to GIS for mapping/spatial analysis

# TDM-Based: Features

**Transportation Air Quality Sketch Planning Tool**

**TDM-Based Analysis**

This analysis module will estimate emissions at the link-level based on imported TDM Outputs. To conduct an analysis, users are required to upload the network files, along with flow files for the four time periods for build and no-build scenarios. The user then defines the other analysis parameters (such as time period of interest, pollutants desired, analysis year, and season). Following this, click on the "run calculations" button. The results will be displayed on separate output sheets, including link-level emissions, and comparisons by traffic-analysis zones and by district/region.

**Step 1: Load Baseline Files**

Name:

**Step 2: Load Scenario Files**

Name:

**Step 3: Select Analysis Parameters**

**Time Period(s)**

AM  PM  Mid-Day  Night  All Day

**Pollutant(s)**

CO  CO2  NOx  PM10  PM25  VOC

**Select Analysis Year**

2020

**Season**

Summer  Winter

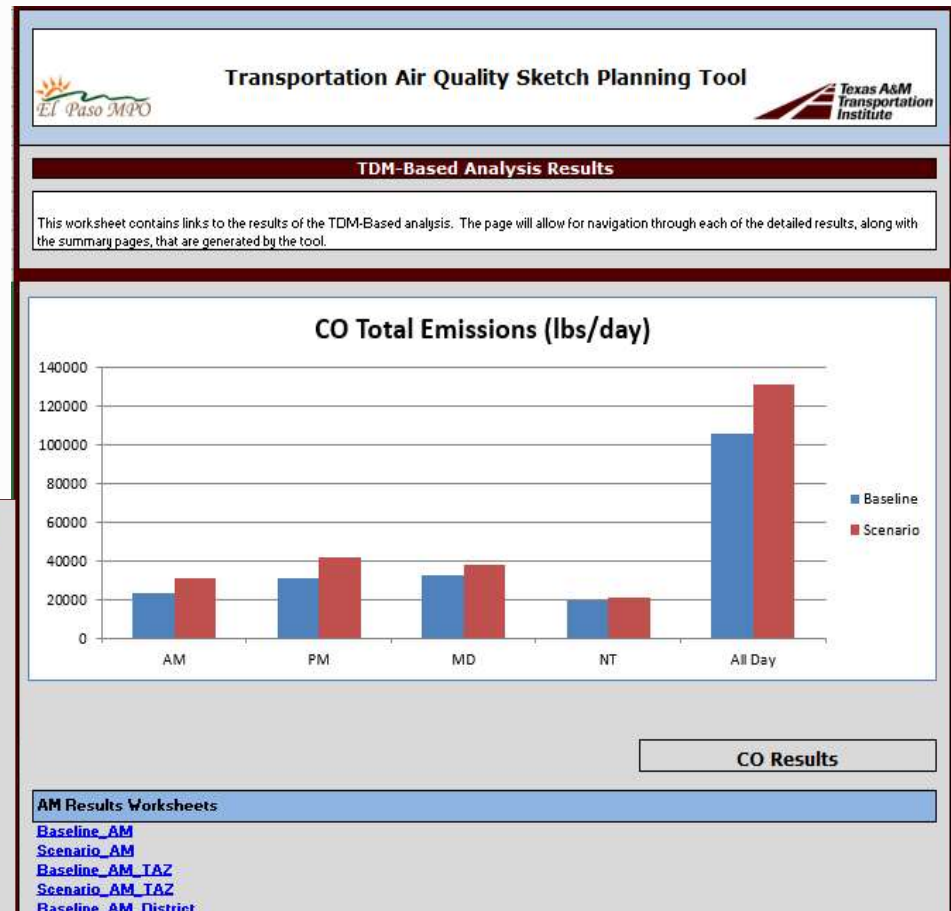
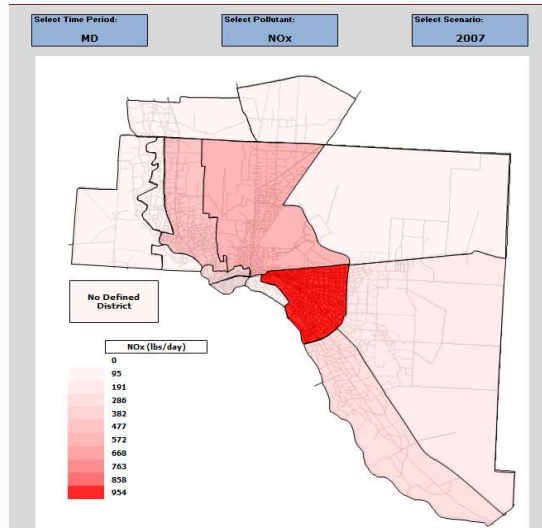
**Step 4: Run Calculations**

Menu | **TDM Based Analysis** | Non-TDM Based Analysis

- User uploads network and flow files
  - 4 time periods
  - Compares two scenarios (build and no-build scenarios)
- Selects analysis parameters
  - Analysis years (2012,2020,2030,2040)
  - Pollutants
  - Time period
  - Season (Winter/Summer)

# TDM-Based: Outputs

- Includes
  - graphical results
  - navigation page linked to detailed results
  - map output
- Outputs – are in lbs/day



# Non-TDM: Overview

- Methodologies consistent with MOSERS manual, with a few simplifying assumptions/adjustments
- Results and methods can provide a starting point for CMAQ analyses or other documentation

**Transportation Air Quality Sketch Planning Tool**

**Introduction**

This Transportation Air Quality Sketch Planning Tool was developed for the El Paso MPO. It allows for the assessment of the emissions impacts of transportation projects and strategies, at the network level (based on outputs of the Travel Demand Model), and for individual projects or initiatives, based on predefined user inputs.

The tool has two main components:

[Module 1 - TDM-Based Emissions Analysis \(For Regional Emissions\)](#)  
This module allows the user to estimate and compare emissions for a "build" and "no-build" scenario using the outputs of El Paso's regional Travel Demand Model (TDM).

[Module 2 - Non-TDM Analysis \(For Assessment of Emissions Reduction Strategies\)](#)  
This module allows for the assessment of various transportation strategies that are not directly reflected in the outputs of the TDM.

~~The calculations in both modules are made on the basis of built-in emissions rates obtained from the MOVES2014 emissions model, and consistent with latest planning assumptions in the region. Analysis years available in this tool include 2012, 2020, 2030, and 2040.~~

Click on the links above to navigate to the desired module of the sketch planning tool.

**Note: This is a sketch planning tool for planning purposes only. Results are not to be used for conformity or other regulatory purposes, or for comparison with emissions inventories, budgets, or emissions analyses from other sources.**

# Non-TDM: Implementation

---

- Provides emissions estimation for selected Transportation Emission Reduction Measures
- Separate calculation sheet and associated ERLTs for estimation of emissions benefits
- Calculations can be performed by users for strategies of interest based on a distinct set of user inputs.



# Non-TDM Module – Features

- This module allows for strategy-specific analysis of idling reduction, vehicle replacement, or VMT reduction strategies
  - Methodologies are consistent with MOSERS manual
  - Emissions rates are built into the tool
  - Simplifying assumptions made
    - Non-inclusion of start-up emissions
  - User input required for expected emissions reductions for vehicle replacement strategies

**Transportation Air Quality Sketch Planning Tool**

**Off-Network Strategy Analysis**

The Travel Demand Model (TDM) -based component of this tool allows for assessment of transportation strategies that are not directly reflected in the outputs of the TDM. This includes strategies that target vehicle idling, or vehicle replacement strategies. This module of the analysis tool allows for simplified calculations based on emissions rate by vehicle type for selected analysis years, combined with user-input data on expected benefits.

The strategies contained in this section are meant to complement a more detailed web-based analysis tool available at: <http://cleanairforel Paso.org/tools-for-planning-professionals/>

Heavy Duty Truck Replacement
  LD Vehicle Replacement
  School Bus Replacement
  Transit Bus Replacement  
 HD Truck Idle Reduction
  School Zone Idle Reduction
  Bicycle and Pedestrian Facilities

**Strategy: Heavy-Duty Truck Replacement**

This calculation is based on user input data regarding the number of vehicles in the target fleet, average daily VMT per vehicle, average operating speed, and desired analysis year. Users are also required to enter the percentage reduction in emissions expected for each pollutant based on the emissions characteristics. This computation is intended for assessing the replacement of vehicles with newer model year vehicles or alternative fueled vehicles. It can also be used for assessing retrofits or engine repowering by entering the applicable emissions reductions expected for various pollutants

Inputs	
Total target fleet (vehicles)	
Analysis year	
Average daily VMT per vehicle (miles)	
Average operating speed of vehicles (mph)	
Seasonal emissions rates to use	
Emissions Reduction Expected (Percentage)	
Oxides of Nitrogen (NOx) Emissions	
Volatile Organic Compounds (VOCs) Emissions	
Carbon Monoxide (CO) Emissions	
Particulate Matter (PM10) Emissions	
Particulate Matter (PM2.5) Emissions	
Carbon Dioxide (CO2) Emissions	

Output - Emissions Reduction (lbs/day)	
Oxides of Nitrogen (NOx)	#N/A
Volatile Organic Compounds (VOCs)	#N/A
Carbon Monoxide (CO)	#N/A

# Contacts

---



Joe Zietsman  
[zietsman@tamu.edu](mailto:zietsman@tamu.edu)  
979- 458-3476

Tara Ramani  
[T-ramani@tti.tamu.edu](mailto:T-ramani@tti.tamu.edu)  
979-845-9888

Madhu Venugopal  
[M-venugopal@tti.tamu.edu](mailto:M-venugopal@tti.tamu.edu)  
817-462-0523

Jeremy Johnson  
[J-johnson@tti.tamu.edu](mailto:J-johnson@tti.tamu.edu)  
979-862-7253



Michael Medina  
[ExecutiveDirector@elpasompo.org](mailto:ExecutiveDirector@elpasompo.org)  
915-212-0258

Claudia Valles  
[cvalles@elpasompo.org](mailto:cvalles@elpasompo.org)  
915-212-7112

Salvador Gonzalez-Ayala  
[sgonzalez@elpasompo.org](mailto:sgonzalez@elpasompo.org)  
915-212-7105

Sonia Perez-Ortiz  
[sperez@elpasompo.org](mailto:sperez@elpasompo.org)  
915-212-7104