

Updating MOSERS Guide

- The new MOSERS will consist of 3 modules
 - Module 1 – Background Material
 - Module 2 – Strategies and Equations
 - Module 3 – Spreadsheet tool for estimating changes in activity parameters (speed, traffic volume. Delay, etc.)

Module 1 – Background Material

- Provides an overview of relevant topics
 - Basics of Air Quality
 - Overview of Transportation Conformity
 - Emission Modeling
 - Emission Reduction Strategies
 - Utilization of MOSERS
 - Methodologies and Information Sources
 - Analytical Approaches
 - MOSERS Documentation

Module 2

- Generic equations for evaluating mobile source emission reduction strategies (MOSERS)

3.1 System/Service Expansion

Increase ridership by providing new rail system services and/or expanding bus services.

Description
Expansion of a transit system or service can include the addition of rail services through increased frequency or route extension. Bus or paratransit services can be expanded with new vehicles and/or route extensions.

Application
Large cities or communities with enough population density to support reasonably frequent transit service.

Variables (unit)	Definitions
EF_s (g/mi)	Speed-based running exhaust emission factor for affected roadway before implementation (NO _x , VOC, or CO)
EF_{BUS} (g/mi)	Speed-based running exhaust emission factor for transit vehicle (NO _x , VOC, or CO)
$F_{T,SOV}$ (%)	Percentage of people using a transit vehicle that previously were vehicle driven
N_{RT}	New transit ridership
TEF_{AUTO} (g/mi)	Auto trip-end emission factor (NO _x , VOC, and CO)
TEF_{BUS} (g/trip)	Bus (or other transit vehicle) trip-end emission factor (NO _x , VOC, or CO)
TL_W (mi)	Average auto trip length
VMT_{BUS}	Vehicle miles traveled (VMT) by transit vehicle
VMT_s	Reduction in daily automobile VMT
VT_{BUS}	Daily vehicle trips by bus or other transit vehicle

Equation

Daily Emission Reduction = A + B - C - D (g/day)

A = $VT_R * TEF_{AUTO}$
Reduction in auto start emissions from trips reduced

B = $VMT_R * EF_s$
Reduction in auto running exhaust emissions from VMT reductions

C = $VT_{BUS} * TEF_{BUS}$
Increase in emissions from additional bus starts

D = $VMT_{BUS} * EF_{BUS}$
Increase in emissions from additional bus running exhaust emissions

$VT_R = N_{RT} * F_{T,SOV}$
Number of new transit riders multiplied by the percentage of riders shifting from single-occupant auto use


$VMT_R = VT_R * TL_W$
Number of vehicle trips reduced multiplied by the average auto trip length

Source: Texas A&M Transportation Institute

Module 3 – Vehicle Activity Calculations

- A spreadsheet tool to estimate the changes in vehicle activity parameters used in Module 2 equations

Mobile Source Emission Reduction Strategies (MOSERS)



**Texas A&M
Transportation
Institute**

Project Description: _____

Scenario Year:

Scenario: New Signal

Inputs

Area Type	Rural
Facility Type - Street 1	Principal Arterials
Total Number of Lanes - Street 1	2
Facility Type - Street 2	Major Collector
Total Number of Lanes - Street 2	1
Peak Hour Volume - Street 1 (Both directions)	1,500
Peak Hour Volume - Street 2 (Both directions)	500
Off-Peak Hour Volume - Street 1 (Both directions)	554
Off-Peak Hour Volume - Street 2 (Both directions)	354
Percent Trucks (Street 1)	5%
Percent Trucks (Street 2)	7%
Proposed Intersection Signal Cycle Length (sec)	100

Default Data

Peak Hour Intersection Delay Before Improvement (s/veh)	50
Off-Peak Hour Intersection Delay Before Improvement (s/veh)	25
Peak Hour in a Day	6
Off-Peak Hour in a Day	18
Effective Green to Cycle Length Ratio of Subject Approaches	0.613
Effective Green to Cycle Length Ratio of Conflict Approaches	0.448
Incremental Delay Upstream Filtering or Metering Adjustment Factor for Isolated Intersection	1
Incremental Delay Adjustment for the Actuated Control	0.5
Capacity at Intersection - Subject Approaches (Both Directions)	2,036
Capacity at Intersection - Conflict Approaches (Both Directions)	1,488

Calculated Data

Menu

Instructions

Signal Coordination

New Signal

Intersection Improvements

Activities Since September

(1)

- Module 2- Four additional strategies identified and equations are being developed for them
 - Truck Lane restriction
 - Parking Cash-Out Programs
 - Pay-As-You-Drive (PAYD) Insurance Programs
 - SmartWay Transport Partnership

Activities Since September

(2)

- Module 3
 - Two new strategies added (bringing the total to 5 strategies)
 - Signal coordination
 - New signal
 - Intersection improvements
 - New transit service (new)
 - Transit operational improvement (new)
 - Equations were refined to better reflect Texas