MOBILE5a

Randall Guensler, Ph.D.
Georgia Institute of Technology

Robert W. Ireson, Ph.D.

Introduction

- Background on emission rate models
- Modeled relationships in MOBILE5a
- Model structure
- Appropriate input variables
- Running MOBILE5a
- MOBILE5a outputs
Emission Rate Models

- Used to estimate the emission rates associated with onroad vehicle activities
  - USEPA: MOBILE5a (MOBILE5b)
  - CARB: EMFAC7G
- Emission rate model outputs are used as input to local air quality impact assessment dispersion models and regional emission inventory models
MOBILE5a Emission Rates

- Emission rates reported in grams/vehicle mile of travel
- Carbon monoxide, hydrocarbons, oxides of nitrogen
- Eight vehicle classes modeled: from light-duty automobiles to heavy-duty trucks
- Model is based upon tracking and modeling the performance of the last 25 vehicle model years

Basic MOBILE5a Modeling Premise

- Baseline (or basic) laboratory emission rates (BERs) are determined for the previous 25 vehicle model years
  - BERs are from the Federal Test Procedure (or other baseline emissions testing cycle corrected to the FTP)
- A series of correction factors are applied to the BERs to predict the emission rates under conditions that differ from the laboratory standard
  - Average speed, temperature, etc.
  - Almost all correction factors are assumed independent
Vehicle Class Emission Rates

- MOBILE5a predicts emission rates for 8 vehicle classes
  - Light-duty gasoline automobiles (LDGV)
  - Light-duty gasoline trucks, vans, and SUVs (LDGT)
    - Type 1 and Type 2 (LDGT1 and LDGT2)
  - Heavy-duty gasoline trucks and buses (HDGV)
  - Light-duty diesel automobiles (LDDV)
  - Light-duty diesel trucks, vans, and SUVs (LDDT)
  - Heavy-duty diesel trucks and buses (HDDV)
  - Motorcycles (MC)
MOBILE5a Light-Duty Truck Classes

- For certification, EPA divides light-duty trucks (LDTs) into two classes (light light-duty and heavy light-duty) based upon gross vehicle weight rating (GVWR)
- Each class is subdivided into two classes based upon loaded vehicle weight (LVW) see 40 CFR 86.094-2
- MOBILE5a Light-Duty Gasoline Truck 1 (LDGT1)
  - EPA LDGT1 (GVWR 0-6000 lb; LVW 0-3750 lb)
  - EPA LDGT2 (GVWR 0-6000 lb; LVW 3750+ lb)
- MOBILE5a Light-Duty Gasoline Truck 2 (LDGT1)
  - EPA LDGT3 (GVWR 6000-8500 lb; LVW 0-5750 lb)
  - EPA LDGT4 (GVWR 6000-8500 lb; LVW 5750+ lb)

Modeled MOBILE5a Relationships

- Registration and operating mix (vehicle class and MY)
  - Fleet mix (model years) in calendar year of evaluation
  - Deterioration as a function of age and mileage accrual
  - California program impacts
- Environment and vehicle operating conditions
  - Altitude and temperature
  - Average vehicle speed
  - Engine start impacts
  - Air conditioning usage, loaded vehicles, trailer towing
  - Humidity impacts on NOx
Modeled MOBILE5a Relationships

- **Fuel formulation**
  - Fuel volatility and diurnal temperature swing
  - Oxygenated fuels (MTBE and alcohol)
  - Reformulated gasoline
  - Gasoline detergent additive impacts

- **Inspection and maintenance program effectiveness**
  - Effectiveness rates for I/M program components
  - Tampering and anti-tampering program effects
  - Effects of technician training and RSD on I/M

- **Running evaporative losses and trip length impacts**
MOBILE5 1996 MY Passenger Car Carbon Monoxide Deterioration Rates

MOBILE5 1996 MY Passenger Car Hydrocarbon Deterioration Rates
MOBILE5 1996 MY Passenger Car
Oxides of Nitrogen Deterioration Rates

Annual Miles Traveled by Vehicle Age
Accumulated VMT by Vehicle Age

Fleet Turnover Impacts

<table>
<thead>
<tr>
<th><strong>Component</strong></th>
<th>1990</th>
<th>1994</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LDGV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>4.52</td>
<td>2.40</td>
<td>-2.12</td>
<td>-46.9</td>
</tr>
<tr>
<td>Exhaust</td>
<td>2.34</td>
<td>1.66</td>
<td>-0.68</td>
<td>-29.1</td>
</tr>
<tr>
<td>Evap.</td>
<td>1.03</td>
<td>0.32</td>
<td>-0.71</td>
<td>-68.9</td>
</tr>
<tr>
<td>Refuel</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Running</td>
<td>1.07</td>
<td>0.34</td>
<td>-0.73</td>
<td>-68.2</td>
</tr>
<tr>
<td>Resting</td>
<td>0.08</td>
<td>0.07</td>
<td>-0.01</td>
<td>-12.5</td>
</tr>
<tr>
<td>Exh. CO</td>
<td>32.11</td>
<td>21.10</td>
<td>-11.01</td>
<td>-34.3</td>
</tr>
<tr>
<td>Exh. NOx</td>
<td>1.83</td>
<td>1.67</td>
<td>-0.16</td>
<td>-8.7</td>
</tr>
<tr>
<td><strong>Component</strong></td>
<td>1990</td>
<td>1994</td>
<td>Change</td>
<td>% Change</td>
</tr>
<tr>
<td>Hot-Soak</td>
<td>3.76</td>
<td>1.11</td>
<td>-2.65</td>
<td>-70.5</td>
</tr>
<tr>
<td>Wt-Diurnal</td>
<td>15.51</td>
<td>4.61</td>
<td>-10.90</td>
<td>-70.3</td>
</tr>
<tr>
<td>Multiple</td>
<td>32.61</td>
<td>12.74</td>
<td>-19.87</td>
<td>-60.9</td>
</tr>
<tr>
<td>Crankcase</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.01</td>
<td>-50.0</td>
</tr>
<tr>
<td>Refuel</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Resting</td>
<td>0.09</td>
<td>0.08</td>
<td>-0.01</td>
<td>-11.1</td>
</tr>
<tr>
<td><strong>LDDV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>0.73</td>
<td>0.76</td>
<td>0.03</td>
<td>4.1</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.73</td>
<td>0.76</td>
<td>0.03</td>
<td>4.1</td>
</tr>
<tr>
<td>Exh. CO</td>
<td>1.68</td>
<td>1.74</td>
<td>0.06</td>
<td>3.6</td>
</tr>
</tbody>
</table>

© Guensler
Trans/AQ 1998
Temperature Effects
Carbon Monoxide Exhaust

Temperature (Degrees F)

TCF

0 20 40 60 80 100

© Guensler
Trans/AQ 1998

Temperature Effects
Hydrocarbon Exhaust

Temperature (Degrees F)

TCF

0 20 40 60 80 100

© Guensler
Trans/AQ 1998
Average Vehicle Speeds

- Speed Correction Factors
- EPA and CARB tested 540 vehicles across 12 test cycles with different average speeds
- EPA staff developed a statistical relationship between emission rates and average speeds
- A number of technology groups were employed in the modeling effort (between 13 and 26)
Low Speed 2 Cycle
Speed vs. Time Trace

637 Second Duration
3.6 mph Average Speed

Highway Fuel Economy Test
Speed vs. Time Trace

765 Second Duration
48.3 mph Average Speed
1998 Fleet Speed Correction Factor
Oxides of Nitrogen Exhaust

Uncertainty in CO SCF (g/mile)
1987+ Fuel-Injected Vehicles
Engine Start Definitions

- Cold Start Mode defined by Between-Start Soak Time
  - Catalytic converter equipped vehicle: 1+ hour
  - Non-catalytic converter equipped vehicle: 4+ hours
  - Engines started in less time are in hot start mode
- Baseline engine start mode assumptions:
  - 20.6% of light-duty vehicle VMT is in cold start mode
  - 27.3% of light-duty vehicle VMT is in hot start mode
- Increasing VMT fractions in cold or hot start mode increases estimated onroad emissions, decreasing VMT fractions in cold or hot start mode decreases estimated onroad emissions

Engine Start Impacts

- Start modes significantly impact predicted emissions
- Baseline engine start mode assumptions (20.6%, 27.3%) yield significantly higher predictions that hot stabilized mode
  - Carbon monoxide exhaust (+25%)
  - Hydrocarbon exhaust (+25%)
  - NOx exhaust (+12%)
- Further doubling VMT in cold and hot start modes:
  - Carbon monoxide exhaust (+28%)
  - Hydrocarbon exhaust (+27%)
  - NOx exhaust (+6%)
Engine Start Issues

- Engines reach hot stabilized mode in 1 to 3 minutes
  - The Bag 1 and 3 cycles are 505 seconds, but vehicles reach catalyst light-off much more quickly
  - Do not base cold and hot start VMT fractions upon first 505 seconds of vehicle operation
- The internal calculation methodology for cold and hot start impacts is theoretically flawed
  - Assumed driving cycle activity
  - Internal weighting multiplication, etc.
- Use EPA default cold/hot start fractions, or other fractions if supportable (may not improve accuracy)

MOBILE5 A/C Usage
Passenger Car Correction Factors

© Guensler  Trans/AQ 1998
MOBILE5 Extra Load and Towing
Passenger Car Correction Factors

Diurnal Temperature Swing

- **Increase maximum temperature from 90°F to 100°F for the 1994 Fleet**
  - No impacts on exhaust CO, HC, or NOx (provided that the user does not request the model to predict ambient based upon min/max temperatures)
  - No impacts on running or resting VOC losses
  - Diurnal and multi-day diurnal emissions double
    - Increasing total evaporative emissions by 65%
    - Increasing total HC emissions by 20%
MOBILE5 Passenger Car Fuel Effects

![Graph showing fuel effects for baseline, oxygenated fuel, and reformulated gasoline for VOC, CO, and NOx emissions.]

© Guenzler  Trans/AQ 1998

Inspection and Maintenance Program

- Effectiveness Rates for I/M Program Components
- Tampering and Anti-tampering Program Effects
- Effects of Technician Training and RSD on I/M

- Program impacts are very complex and impacts are a function of various program components:
  - Test frequency
  - Test methods
  - Centralized/decentralized
  - Etc

© Guenzler  Trans/AQ 1998
MOBILE5a Program

- **Program is in FORTRAN code**
  - MOBILE5a requires careful preparation of input data files to maintain proper FORTRAN input data formats
  - Third-party graphic user interfaces are available
- **Model input is provided in a single control file**
- **Four data input sections in the control file**
  - Program control flag section
  - One-time data section
  - Local area parameter section
  - Scenario description record section

MOBILE5a Control Flags

- **18 control flags are employed to set the model run**
  - Determine which pollutants will be analyzed
  - Select evaporative emissions components to report
  - Determine the input and output formats
  - Identify the default values (internal data built into MOBILE) to be used and local data that should be read from the input file one-time data and scenario records

© Guensler
Trans/AQ 1998
Page 42

© Guensler
Trans/AQ 1998
Page 43
Control Flags I

- #1 PROMPT
  - The first control flag determines whether the user will be prompted for all of the data input
  - Avoid setting the prompt option for manual input, structure the input data in a proper FORTRAN format file instead
- #2 PROJID
  - The user can enter up to 80 characters to describe the scenario being modeled

Control Flags II

- #3 TAMPLG (Tampering Flag)
  - Allows user to provide a string of tampering rates in the one-time data section (rather than using default rates)
  - Eight tampering categories by four vehicle classes
- #4 SPDFLG (Speed Flag)
  - Allows user to provide a single average vehicle speed for all vehicles or a string of eight average vehicle speeds (by vehicle class) in the one-time data section
  - Also allows users to input a trip length distribution for use in running evaporative loss calculations (also a function of average vehicle speed)
Control Flags III

- #5 VMFLAG (VMT Flag)
  - Allows user to provide a string of vehicle miles traveled (VMT) mix by vehicle class in the one-time data section or scenario records (or default rates)
  - Used to develop a weighted fleet emission rate

- #6 MYMRFGLG (Model Year Flag)
  - Allows user to provide strings for model year registration mix by vehicle class and annual mileage accrual rates by vehicle class and model year in the one-time data section (or default rates)

Control Flags IV

- #7 NEWFLG (New Emission Rate Flag)
  - Users can input basic exhaust and evaporative emission rates by vehicle class and model year in one-time data
  - Important for projecting future technology impacts
  - Typically requires EPA approval for use in analyses

- #8 IMFFLAG (Inspection and Maintenance Flag)
  - Allows users to model the effects of inspection and maintenance programs
  - Complex implementation issues arise in one-time data section (see guidance documents) and may require multiple runs to model I&M programs
Control Flags V

- **#9 ALHFLG (A/C, Load, Humidity Flag)**
  - Toggles additional correction factors on or off for light-duty vehicle exhaust emissions
  - Air conditioning, extra vehicle loads, towing, humidity
  - Data strings are input in the scenario record section
- **#10 ATPFLG (Anti-Tampering Flag)**
  - Allows modeling of anti-tampering programs
  - Data strings are input in one-time data section
  - Also can include pressure/purge test impacts

Control Flags VI

- **#11 RLFLAG (Refueling Flag)**
  - Allows user to include refueling emissions in the gram/mile emission rate
  - Recommendation: (RLFLAG=5) refueling emissions are not included in vehicle emission rates (they are accounted for in the stationary source inventory)
- **#12 LOCFLG (Local Parameter Flag)**
  - Controls the use of the local area record (which contains 6 to 10 variables used by MOBILE5a)
  - Use one local area record for all runs or a new local area record for each run
Control Flags VII

- #13 TEMFLG (Temperature Flag)
  - Determines the temperature that will be used in calculating exhaust and evaporative emission rates
  - User can select to use the ambient temperature value or have the model calculate a value from maximum and minimum daily temperatures

MOBILE5 Output Control Flags

- 5 additional flags control the output file format
  - OUTFMT - Output format
    - 80 to 122 column, or table by model year
  - PRTFLG - Pollutant print flag (CO, HC, NOx, or all)
  - IDFLG - Idle flag
    - Idle rates are still not correct (omit idle rates)
  - NMHFLG - Non-methane HC flag (select HC components to print: THC, VOC, etc.)
  - HCFLAG - HC flag (print HC by emissions component: exhaust, running evaporative, diurnal, etc.)
One-Time Data Section

- Users define parameters that are different from the default values internal to MOBILE5a which are to be used for all scenario runs
  - Annual mileage accumulation rates, registration distribution values, average speeds, etc.
- The amount of one-time data depends upon the flag values selected in the input file control section
- Strings of one-time data are entered in the order and format expected by the program, based upon the control flags selected (see manual)

Optional One-Time Data Records

- Tampering rates by component
- VMT mix by vehicle type
- Mileage accumulation rates by age and vehicle type
- Basic exhaust emission rates
  - Equation components (complex - see manual)
- Evaporative test procedure phase-in compliance data
- I/M program data
  - Effects of technician training and RSD on I/M
  - Alternate effectiveness rates for I/M components
- Impacts of anti-tampering program information
Optional One-Time Data Records

- Pressure and purge test parameters
- Phase II vapor recovery and onboard vapor recovery system impacts and interactions
- Local area parameter record
  - Placed in one-time data if applied to all scenarios
  - Followed immediately by applicable data records on oxygenated fuel program
- Alternative trip length distributions

Local Area Program (LAP) Record

- Appears in one time data section if applied to all scenarios (if LOCFLG=2) or each scenario record (if LOCFLG=1)
  - Scenario name
  - Fuel Volatility Class (A to E)
  - Minimum and maximum daily temperature
  - Pre-control gasoline Reid vapor pressure (RVP), post control RVP, and starting year for RVP control
  - Oxygenated fuel flag, diesel sale fractions flag, reformulated gasoline flag, gasoline detergent additive flag* (1 = No, 2 = Yes)

*All four are optional fields
Scenario Description Record Section

- MOBILE5a emission rates are predicted for individual scenarios and the scenario section provides detailed data for each scenario being developed
- Mandatory for all MOBILE5 runs
- There are 1 to 10 records in this section, depending on:
  - The control section flags selected
  - The options selected in the local area parameter record
  - The "region" variable in the scenario descriptive record

Scenario Data

- Region (low altitude, high altitude, low or high altitude with California program)
- Calendar year of evaluation (60 - 99, 00 - 20)
- Average speed (2.5 to 65.0 mph)
- Ambient temperature (0 - 110 degrees F)
- Fraction of VMT in cold and hot start mode
  - Fraction of non-catalytic-converter-equipped vehicle VMT in cold start
  - Fraction of catalytic-converter-equipped vehicle VMT in hot start
  - Fraction of catalytic-converter-equipped vehicle VMT in cold start
- Month of evaluation (1 or 7, January or July)
  - Accounts for new vehicle penetration into the fleet
  - January/June trigger winter/summer fuels effects (when RFGFGLG is on)
Scenario Section Supplemental Data

- California low emission vehicle (LEV) information (optional, required only if REGION = 3 or 4)
- Local area parameter record (if applied to each scenario rather than all scenarios, i.e. not already provided in the one-time section)
  - Oxygenated fuel program parameters, if selected in the local area parameter section
  - Gasoline detergent parameters, if selected in the local area parameter section
  - Diesel sales fraction data, if selected in the local area parameter section (cannot be used in one-time data)

Scenario Section Supplemental Data

- Vehicle Miles Traveled (VMT) Mix Record
  - Used in the one time data section if one VMT mix is to be used in all scenarios (VMFLAG = 3) or in each scenario section if different VMT mixes are to be applied to each scenario (VMFLAG = 2)
- Alternate Trip Length Distribution Record (optional, required only if SPDFLAG = 3)
- Additional Exhaust Emission Correction Factors Record (optional, required only if ALHFLG = 2 or 3, and may contain 6 to 10 input values)
Scenario Section Supplemental Data

- Trip length distribution data
  - Used in the one time data section (if SPDFLG = 3) or each scenario section (if SPDFLG = 4)
  - Percentage of total vehicle miles traveled (VMT) accumulated in 6 different trip duration groups:
    - Under 10 minutes
    - 11 to 20 minutes
    - 21 to 30 minutes
    - 31 to 40 minutes
    - 41 to 50 minutes
    - 51 minutes and larger

Additional Exhaust Emissions Correction Factors

- Exhaust emission factors are adjusted for:
  - Air conditioning (A/C) usage.
  - Extra loading conditions.
  - Trailer towing.
  - Humidity correction factor (applicable only to exhaust NOx emissions and MC)
Input for Additional Corrections

- If ALHFLG = 2, six input values are required:
  - Fraction of A/C-equipped LDGVs and LDGTs using their A/C (0.0-1.0)
  - Fractions (3) of LDGV, LDGT1, and LDGT2 carrying additional 500lb load (0.0-1.0)
  - Trailer towing fraction (1) for LDGV, LDGT1, LDGT2
  - Absolute humidity level (20 - 140 grain of water per pound of dry air) to correct exhaust NOx

Input for Additional Corrections

- If ALHFLG = 3, ten input values are required:
  - Fraction of A/C-equipped LDGVs and LDGTs using their A/C (0.0-1.0)
  - Fractions (3) of LDGV, LDGT1, and LDGT2 carrying additional 500lb load (0.0-1.0)
  - Trailer towing fractions (3) for LDGV, LDGT1, LDGT2
  - Absolute humidity level (20 - 140 grain of water per pound of dry air) to correct exhaust NOx
  - Dry and wet bulb temperatures (0 to 111 degrees F)
Oxygenated Fuels Descriptive Record

- **Optional record, required only if OXYFLG= 2**
  - Ether blends market share (0.0 - 1.0)
  - Alcohol blends market share (0.0 - 1.0)
  - Average oxygen content of ether blend fuels, by weight (0.000 - 0.027)
  - Average oxygen content of alcohol blend fuels, by weight (0.000 - 0.035)
  - RVP waiver switch to indicate when the oxygenated fuels are allowed to exceed regulated RVP limit by 1.0 psi (1 = No, 2 = Yes)

Running MOBILE5a

- Prepare a batch file or input file for MOBILE5a
- In DOS, go to the directory containing MOBILE5a and type MOBILE5a
- The program will ask you if you want to run in interactive mode (not recommended, choose “N”)
- The program will ask you if you want to run in batch file mode (choose “Y” or “N”)
  - If yes, enter the name of the batch file
  - If no, enter the name of your input file then output file
- The model runs quickly and returns the text “INERR=0” indicating no errors were encountered
MOBILE5a Outputs

- Project ID
- Warnings
- Input data feedback (calendar year, temperatures, etc.)
- Emission rates (grams/mile)
  - Columns by vehicle class
  - Final column is the fleet average
  - Rows by pollutant total (HC, CO, NOx) and source component (exhaust, running losses, resting losses, etc.)
- Multiple scenarios print in sequence
- [Import the output file into Word, format text in courier 8 point font, print page in landscape format]
Onroad Fleet Operating Mix

- Emission rates differ significantly for onroad subfleets:
  - Light-duty vehicles and trucks versus heavy-duty trucks
  - Fuel type (gasoline versus diesel)
  - Vehicle age and onboard technologies
    - A variety of technology factors are correlated with vehicle model year as new technologies are introduced
- Local subfleet distributions significantly affect emissions from all activities
- Super-emitter fleet fraction is critical, but influences are typically included through MY defaults

Registration of High CO Emitters
(Orange > 3%, Light Green < 1%)
(Dark Green = Insufficient Data)
Model Year Distribution
1996 Georgia Registration Database

Remote Sensing/License Plate Studies
Deterioration As a Function of Vehicle Age and Mileage Accrual

- Vehicle age comes from registration mix and vehicle turnover studies
- Accrued vehicle mileage
  - Inspection and maintenance program records
  - Registration data (when VMT are reported)
  - Survey data
  - Gasoline consumption and onroad fraction estimates

Temperature and Humidity

Ambient, minimum, and maximum temperatures
Humidity and wet/dry bulb temperatures
- National Weather Service data
- EPA Regional modeling representative
- California (Caltrans) - lowest January mean minimum temperature over a 3-year period:
  - Morning 06:00 - 10:00 5°F
  - Afternoon 10:00 - 17:00 10°F
  - Evening 17:00 - 21:00 5°F
  - Nocturnal 21:00 - 06:00 0°F
Average Vehicle Speeds

- Travel demand model outputs often do not provide accurate estimates of onroad average vehicle speeds
  - Average speeds are a reflection of the imbedded route assignment assumptions in the demand model
- Most regions use travel demand model outputs coupled with post-processing routines
- Field surveys are also employed
- Simulation modeling can be employed
- Estimating average speeds is an art and a science
- New techniques will allow users to predict average speeds as a function of highway capacity manual data

Engine Start Fractions

- Use EPA default engine start fractions can be used for all analyses
- You are allowed to demonstrate that you have better data and may use these data in your analyses... however, there are significant accuracy problems associated with modifying the start distribution fractions
  - Revisions will result in higher or lower emissions rates, which may help or hinder approval of a project, but the accuracy issue will persist
Accessory Usage

Air Conditioning Usage
Loaded Vehicles
Trailer Towing

- Field surveys
  - Video studies
  - Remote sensing
  - Field interviews
- Engineering judgement

Fuel Properties

Fuel volatility and reformulated fuel properties
Oxygenated fuel composition (MTBE vs. alcohol)
Oxygenated fuel sales data
Detergent data

- Contact your EPA and DOE Regional offices
- The modeling contact at the EPA regional office can provide the appropriate input stream for the fuels programs in place or being proposed
- Consult your MOBILE5a manual and work with EPA staff (EPA and FHWA staff must approve all analyses)
Inspection and Maintenance Programs

Effectiveness Rates for I/M Program Components
Tampering and Anti-tampering Program Effects
Effects of Technician Training and RSD on I/M

• Contact your EPA Regional office
• The modeling contact at the regional office can provide the appropriate input stream for the inspection and maintenance program you are proposing
• Consult your MOBILE5a manual and work with EPA staff (EPA and FHWA staff must approve all analyses)

Trip Length Distributions

• Travel demand model trip tables
• Regional demand modeling survey data
Conclusions

- The MOBILE5 model is not difficult to use
- The EPA regional modeling contact will provide appropriate MOBILE5 input files for the region to properly represent the fleet, meteorology, and current air pollution control measures measures
- Emission rates are quite sensitive to input data
- Exercise care in developing model control files
  - Use the manual and consult the regional experts
- MOBILE6 will provide some significant changes to be aware of (deterioration rates, starts, correction factors)
# Microscale Air Quality Impact Assessment for Transportation Projects

Sponsored by the Transportation Research Board
Committee on Transportation and Air Quality (A1F03)
Sunday January 10, 1999

<table>
<thead>
<tr>
<th>Morning Sessions</th>
<th>Afternoon Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulatory Requirements of NEPA and Conformity</strong></td>
<td><strong>MOBILE5a</strong></td>
</tr>
<tr>
<td>Lucy Garliauskas</td>
<td>Robert G. Ireson, Ph.D.</td>
</tr>
<tr>
<td>FHWA, Office of Environment and Planning</td>
<td>Air Quality Management Consulting</td>
</tr>
<tr>
<td>HEP-40, Room 3240</td>
<td>161 Vista Grande</td>
</tr>
<tr>
<td>400 Seventh Street SW</td>
<td>Greenbrae, CA 94904</td>
</tr>
<tr>
<td>Washington, D.C. 20950</td>
<td><a href="mailto:rireson@ix.netcom.com">rireson@ix.netcom.com</a></td>
</tr>
<tr>
<td><a href="mailto:lucy.garliauskas@fhwa.dot.gov">lucy.garliauskas@fhwa.dot.gov</a></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Vehicle Activity Modeling and Monitoring</strong></th>
<th><strong>CALINE4 and CAL3QHC Overview</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon Washington, Ph.D.</td>
<td>Roger Wayson, Ph.D.</td>
</tr>
<tr>
<td>School of Civil and Environmental Engineering</td>
<td>Civil &amp; Environmental Engineering</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>P. O. Box 162450</td>
</tr>
<tr>
<td>Atlanta, GA 30332-0355</td>
<td>University of Central Florida</td>
</tr>
<tr>
<td><a href="mailto:simon.washington@ce.gatech.edu">simon.washington@ce.gatech.edu</a></td>
<td>Orlando, FL 32816-2450</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:wayson@mail.ucf.edu">wayson@mail.ucf.edu</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Motor Vehicle Emissions</strong></th>
<th><strong>Documentation of Microscale Modeling Analyses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Randall Guensler, Ph.D.</td>
<td>Tom Wholley</td>
</tr>
<tr>
<td>School of Civil and Environmental Engineering</td>
<td>Vanasse Hangen Brustlin, Inc.</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>101 Walnut Street</td>
</tr>
<tr>
<td>Atlanta, GA 30332-0355</td>
<td>P. O. Box 9151</td>
</tr>
<tr>
<td><a href="mailto:randall.guensler@ce.gatech.edu">randall.guensler@ce.gatech.edu</a></td>
<td>Watertown, MA 02272</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:TWholley@vhb.com">TWholley@vhb.com</a></td>
</tr>
</tbody>
</table>