Expert Panel: Mobile Sources

12th Modeling Conference on Air Quality Modeling

Moderated by Chris Owen

US EPA/OAQPS/AQAD

Air Quality Modeling Group

Background

- January, 2017 update to the Guideline specified AERMOD and the preferred model for mobile sources, replacing CALINE3
  - Replacement was based on 2013 ORD paper comparing AERMOD, R-LINE, ADMS, and CALINE
  - AERMOD, R-LINE, and ADMS all had similar performance, CALINE3 and CALINE4 were the worst performing models
- Spring, 2017, EPA entered into agreement with FHWA to integrate R-LINE into AERMOD
  - R-LINE, developed by ORD, is a steady-state Gaussian model designed to simulate line type source emissions by numerically integrating point source emissions
  - Includes meander, similar to VOLUME sources, but inputs easy to use like the LINE source
  - Includes formulations for barriers and depressed roadways, which are important near-road features

Background

- Two R-LINE sources added to AERMOD version 19191
  - "RLINE" source option added as BETA
    - New dispersion characterization of line source beyond the current point, volume and area source types within AERMOD dispersion model
    - Inputs identical to the existing "LINE" source to facilitate comparisons
  - "RLINEXT" source option added as ALPHA
    - New parameterizations for solid barriers and depressed roadway treatment in RLINE
- Limitations of current RLINE implementation
  - Both sources limited to FLAT terrain
  - More R&D needed for both the barrier and depressed roadway algorithms
    - Field studies for model evaluation
    - Two barriers configuration and barriers edge effects parameterizations needed
  - URBAN option added to both RLINE and RLINEXT sources, but it is ALPHA

Panel Members

- **David Heist** (EPA ORD).
- **Dr. Michelle G. Snyder** (Wood Environment & Infrastructure Solutions LLC)
- **Christopher Voigt** (Virginia Department of Transportation Environmental Division)

Charge Questions

1. AERMOD version 19191 includes two new source types based on ORD's R-LINE model. The RLINE source is a BETA option that brings a new dispersion formulation into AERMOD. The RLINEXT is an ALPHA option based on the RLINE source, but also includes algorithms for depressed roadways and solid barriers and an ALPHA URBAN option to account for urban meteorology.

   Please share your thoughts and opinions on EPA's addition of the RLINE sources to AERMOD. In particular, which of the ALPHA options should EPA focus their development efforts for improving the RLINE options in AERMOD for regulatory purposes?

2. Please discuss what is the most important development area with regard to the treatment of mobile sources in the AERMOD model that the EPA has not already identified or discussed?

3. Do you envision priorities related to mobile source modeling issues changing in the near future (5 years)? If so, what shifts do you foresee will take place and what do you believe are or will be the drivers for those shifts?