FDM 22-35-1 Introduction

February 15, 1988

Prediction techniques are the tools used to determine the CO concentrations of a project and how it affects the air quality of the environment. The two prediction techniques as presented in this section include:

1. TEXIN Computer Modeling Method: This Texas Intersection Model is a computer modeling method for producing a detailed project level analysis. It is used only on simple signalized intersections.
2. CALINE3 Computer Modeling Method: The California Line Source Dispersion Model is a computer modeling method which also produces a detailed project level analysis. It is used on roadways with free flow traffic conditions as well as complex geometric configurations, including signalized intersections.

Information needed to apply these prediction techniques includes the geometrics of the project and the vehicle volumes and speeds. Whichever prediction technique is used, consideration must be given to any carbon monoxide concentrations from all roadways whether they are the project roadway, a bisecting cross street, or a street at the terminus of the project.

A brief description of the mechanics of these prediction techniques is provided in FDM 22-35-5 and FDM 22-35-10.

FDM 22-35-5 Texin Computer Program

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TEXIN, the Texas Intersection Model, is an air quality model developed by the Texas State Department of Highways & Public Transportation. It incorporates the MOBILE2 and CALINE3 computer programs, as well as traffic and excess emissions techniques to calculate CO concentrations near simple signalized intersections. The model requires only minimal geometric, meteorological and traffic related input data. However, the model should be used only for simple signals, traffic and roads, and in flat, unobstructed terrain.

Data Requirements

A guide to the input parameters of TEXIN is presented in Attachment 5.1. Typical values used for CO calculations are also included. For more complete information on TEXIN, contact a Department of Transportation (DOT) Region Office or NTIS (1-703-487-4650) for a User's Manual.[1]

LIST OF ATTACHMENTS

Attachment 5.1 Description of General Input Values for TEXIN Model

FDM 22-35-10 Caline3 Computer Program

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CALINE3 is a third generation line source air quality model developed by the California Department of Transportation. It is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway.

The purpose of the model is to assess air quality impacts near transportation facilities in what is known as the microscale region. Given source strength, meteorology, site geometry, and site characteristics, the model can reliably predict pollutant concentrations for receptors located within 500 feet of the roadway. At present, the model is suitable for modeling inert pollutants only (e.g., carbon monoxide, particulates).

As a predictive tool, CALINE3 is well balanced in terms of accuracy of state-of-the-art emissions and traffic models. CALINE3 is capable of modeling multiple roadway segments for at-grade, cut, fill or bridge sections.

Data Requirements

The CALINE3 User's Manual[2] [available through the Department of Transportation (DOT) Region Offices] provides a complete description of the input variables, the internal workings of the model, and a discussion of the

[1] "Estimates of Air Pollution Near Signalized Intersections," U.S. Department of Transportation, April 1983, FHWA/RD-83/009.
[2] "CALINE3 - A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets," California Department of Transportation, Interim Report, November 1979, FHWA/CA/TL-79/23.

sensitivity analysis. Attachment 10.1 describes the data used in CALINE3 calculations and presents typical values used in the input. The user manual and computer program is also available through NTIS (1-703-487-4650).

LIST OF ATTACHMENTS

Attachment 10.1 Description of General Input Values for CALINE3 Model