Harmony Road Area Transportation Improvements Project Environmental Impact Statement Existing Conditions Report

Air Quality

Prepared for

Federal Highway Administration
Oregon Department of Transportation
Clackamas County, Oregon

Prepared by

Michael Minor & Associates, Inc
4923 SE 36th Avenue
Portland, OR 97202

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Contact:

Clackamas County Department of Transportation and Development
Ron Weinman, Principal Transportation Planner
9101 SE Sunnybrook Blvd.
Clackamas, OR 97015
Phone: 503.353.4533
ronw@co.clackamas.or.us
Fax: 503.353.4559

Federal Highway Administration
Jeff Graham, Operation Engineer
530 Center Street, NE Suite 100
Salem, OR 97301
Phone: 1.503.587.4727 (Salem, OR)
jeffrey.graham@fhwa.dot.gov
Fax: 1.503.399.5838

Project Web Site: www.HarmonyRoadProject.org

EXISTING CONDITIONS REPORT AUTHORS

Identified in the following table are the authors who participated in preparing this Air Quality Existing Conditions Report and the authors' titles, name of their affiliated organizations, education, experience, and project role.

Technical Report Authors, Experience, and Education

Author Title Organization	Education Experience	Project Role
Michael Minor President Michael Minor & Associates, Inc.	B.A. Physics B.A. Mathematics 18 Years of Experience	Task Manager, Data Collection, Report Author

TABLE OF CONTENTS

INTRODUCTION

Report Purpose

The purpose of this Existing Conditions Report is to identify and describe the existing Air Quality conditions of the project area for the Harmony Road Area Transportation Improvements Project, and set the stage for evaluating potential impacts associated with this proposed project.

The specific characteristics and issues described in this Report include those that were identified during early coordination and scoping.

The information contained in this Report is limited to data, information issues and values that have a bearing on possible impacts, mitigation measures and on the selection of an alternative. The amount of data and analysis is commensurate with the importance of the impact.

Tables, figures and photographs are used to enhance the reader's understanding of the area. To protect natural and cultural resources, sensitive locations and features are not specifically labeled on figures and are described in the text in a manner that will not disclose their exact location.

This Air Quality Existing Conditions Report will be provided to designers and the project team to aid them in developing project alternatives that avoid or minimize impacts to the environment.

Project Description

The proposed Harmony Road Area Transportation Improvements project is located in Clackamas County, Oregon, generally northwest of the intersection of Interstate 205 (I-205) and Highway 224. A more extensive project description is available in the Harmony Road Area Transportation Improvements EIS Existing Conditions Report, which summarizes the findings from all of the discipline specific Existing Conditions Reports for this project.

Discipline

Air quality in the study area is regulated by two agencies: the Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (ODEQ). The EPA sets air quality standards and has oversight authority over ODEQ.

There are several different pollutants that are directly related to transportation projects. Of the variety of pollutants emitted by motor vehicles, carbon monoxide, Particulate Matter (PM) and ozone are of interest for this project. These three pollutants are discussed in detail in the following sections.

Particulate Matter consists of fine particles of smoke, dust, pollen or other materials that remain suspended in the atmosphere for a substantial period of time. It is measured in three forms; total suspended particulate (TSP), PM10 and PM2.5. PM10 is reparable or fine Particulate Matter with a diameter smaller than 10 micrometers and PM2.5 has a diameter smaller than 2.5 micrometers. EPA established ambient air standards for PM10 that replace the TSP standards.

Studies have shown that the burning of wood in stoves and fireplaces accounts for more than 80% of the PM10 concentrations. Diesel engines are another source of PM. However, their contribution to PM10 levels is much less than that of woodstoves and fireplaces, except at highly congested urban intersections.

PM with a diameter of 10 microns or less remains suspended in the air for long periods of time and is readily inhalable deep into the smaller airways of human lungs. Ambient concentrations approaching or exceeding the National Ambient Air Quality Standards (NAAQS) contribute to impaired respiratory functioning.

Ozone is a pungent-smelling, colorless gas produced in the atmosphere when nitrogen oxides and some Hydrocarbons chemically react under the effect of strong sunlight. Unlike carbon monoxide, however, Ozone and the other reaction products do not reach their peak levels closest to the source of emissions, but rather at downwind locations affected by the urban plume after the primary pollutants have had time to mix and react under sunlight. It is a pulmonary irritant that affects lung tissues and respiratory functions. Ozone impairs the normal function of the lung and, at concentrations between 0.15 and 0.25 ppm, causes lung tightness, coughing and wheezing.

Carbon monoxide (CO) is a colorless, odorless, toxic gas commonly formed when carbon-containing fuel is not burned completely. Motor vehicles are the major source of carbon monoxide in the Pacific Northwest with seasonal contributions from wood burning stoves, fireplaces and land clearing fires. It chemically combines with the hemoglobin in the red blood cells to decrease the oxygen-carrying capacity of the blood. CO also weakens the contractions of the heart, thus reducing the amount of blood pumped throughout the body. People with heart disease and pregnant women are particularly at risk to the effects of carbon monoxide.

Mobile Source Air Toxics

Mobile source air toxics (MSATS) consist of a wide variety of pollutants emitted by gasoline and diesel powered motor vehicles; particularly formaldehyde, benzene and heavy metals. Health effects include potential cancer risks and pollution of ground water supplies. Useful mitigation measures have been undertaken on a regional basis, such as the phase-out of lead in gasoline, the introduction of low-sulfur diesel fuel and the installation of particulate traps on diesel buses. The particulate matter emissions from diesel engines have been shown to contain several types of MSATS.

Additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than the No-Build Alternative. In general, when a highway is widened and, as a result, moved closer to receptors (pedestrians on project sidewalks and residences on the corridor), the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative. However, any increase could be offset due to increases in speeds and reductions in congestion, which are associated with lower MSAT emissions. On a regional basis, however, EPA's vehicle and fuel regulations coupled with fleet turnover will over time cause substantial MSAT reductions, that in almost all cases will cause region-wide MSAT levels to be significantly lower than today.

METHODS AND STUDY AREA

Study Area

The study area for the air quality analysis for the Harmony Road project will be determined when the alternative screening process is completed. EPA modeling guidance requires that intersections within the project boundaries that have, or will have, Levels of Service (LOS) of D or worse should be examined and the three intersections with the highest volumes and the three intersections with the worst LOS should be modeled for air quality impacts. Level of Service is a rating system for signalized intersection operations, with LOS "A" having the shortest delay and LOS "F" having the longest. In addition, intersections within 1,000 feet of the LOS D or worse intersections that may be affected by the project must also be included in the model.

Methods and Procedures

ODEQ operates air quality monitoring stations to obtain data on actual ambient air quality concentrations. Information from these stations assists in providing background level concentrations in the project vicinity. For more detailed information on the methods and procedures for analyzing potential impacts to air quality, please refer to the Air Quality Methods and Data Report.

EXISTING CONDITIONS

Overview

The Oregon Department of Environmental Quality (ODEQ) has monitored carbon monoxide at several locations in the greater Portland area. There are no CO monitors close enough to the Harmony Road corridor to provide valid information about existing concentrations. The nearest monitor is located at SE Lafayette St. and SE 58th Avenue, about 7 miles to the northwest.

Existing Conditions

The Portland area (including the project location) was classified as a non-attainment area for ground level ozone and CO, meaning that the area has historically exceeded EPA 8-hour standards for CO (9 ppm during any given 8-hour period) and ozone (0.12 ppm in a 1-hour period). CO and ozone levels are considered to be in compliance with the standard if they do not exceed the standard more than once per year on average. During the 1970s, the Portland area exceeded the standards for CO on one day out of every three, and ozone levels were often as high as 50 percent over the federal standard.

Programs and regulations put into effect to control air pollutant emissions have been effective and air quality in the area has improved. The Portland area, including the project area, is now in compliance with the air quality standards. In April of 1997, the EPA re-designated the area as a maintenance area for both pollutants. As part of the re-designation process, DEQ developed ozone and CO maintenance plans

containing strategies to be implemented over the next 10 years to control air pollution and maintain compliance with the standards. The maintenance plans have been incorporated into the Federal Clean Air Act State Implementation Plan (SIP), the statewide air quality plan.

FINDINGS

Air Quality Constraints

In general, air quality is worse at intersections with LOS of "D" or worse. Any project related improvements that will improve intersection performance and keep traffic moving will also likely improve local air quality.

Area of Potential Impact (API)

An Area of Potential Impact (API) for Air Quality will be defined for the project and developed once the alternatives analysis process is completed.

Regulatory Requirements

The Harmony Road Improvement Project is located in the Clackamas Oregon region, which has been a non-attainment area for CO and ozone. Projects located in nonattainment or maintenance areas for a given pollutant must comply with provisions of the 1990 Clean Air Act Amendments. They must also comply with state and federal regulations that require a determination of conformity with the State Implementation Plan (SIP). Areas of the country exceeding the NAAQS for a given pollutant are classified as non-attainment. This project is included is the 2006-2009 State Transportation Improvement Program (STIP) which has been found to be in conformity with the State Implementation Plan (SIP). The project will be funded with a combination of local and federal funds.

The air quality analysis will also be prepared in compliance with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state planning and land use policies and design standards.

REFERENCES

EPA (US Environmental Protection Agency), *Guideline for Modeling Carbon Monoxide from Roadway Intersections*. Report Number EPA-454/R-92-005. Research Triangle Park, North Carolina, November 1992.

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EPA (US Environmental Protection Agency) 2002. *Latest Findings on National Air Quality 2001 Status and Trends.* Report Number EPA-454/K-02-001.

EPA (US Environmental Protection Agency) 2003. *User's Guide to MOBILE6.1 and MOBILE6.2*. Report Number EPA-420/R-03-010. Ann Arbor, MI., August 2003.

GLOSSARY OF ACRONYMS, ABBREVIATIONS AND TERMS

Carbon Monoxide	CO
Environmental Protection Agency	EPA
Federal Highway Administration	FHWA
Levels of Service	LOS
Mobile source air toxics	MSATS
National Ambient Air Quality Standards	NAAQS
National Environmental Policy Act	NEPA
Oregon Department of Environmental Quality	ODEQ
Particulate Matter	PM
Parts per Million	ppm
State Implementation Plan	SIP
State Transportation Improvement Program	STIP
Total suspended particulate	TSP