Final Air Quality / Climate Change / Greenhouse Gas Emissions Impact Assessment Methodology Memorandum

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Region 4

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1. Introduction

This technical memorandum fulfills a requirement of the Federal Highway Administration (FHWA) 2005 legislation titled Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (23 U.S. Code §139). Section 6002 of the legislation, titled Efficient Environmental Reviews for Project Decisionmaking, requires regulatory agencies to collaborate in establishing the research methodologies used to evaluate transportation project alternatives.

The purpose of this Air Quality / Climate Change / Greenhouse Gas Emissions Impact Assessment Methodology memorandum is to describe the methods that will be used to collect data and evaluate the project's impacts to air quality / climate changes / greenhouse gas emissions. This memorandum, for the US 97 Bend North Corridor Project, will also document consultation with the Oregon Department of Transportation (ODOT) and the participating agencies on the approach taken to research each environmental discipline before conducting the research.

1.1 Project Description

US 97 is a strategic north-south state facility that runs through the central portion of the state and is a complement to the I-5 corridor. It is classified as a statewide facility and freight route along its entire length, and as an expressway through the study area. US 97 is a critical link in moving goods and people through Central Oregon. US 20 is similarly designated as a statewide freight route and expressway through the study area.

Through the study area, US 97 also serves as a way for people to get to and from home and work, and it is a connection to area shopping and dining. In addition, the tremendous population growth in Bend and Central Oregon has placed many demands on US 97: an increase in congestion, disruptions in traffic flow, an increase in traffic delays and an increase in the number of crashes. The purpose of the US 97 Bend North Corridor Project (the project) is to reduce traffic congestion, improve traffic flow and improve public safety on the segment of US 97 between the Deschutes Market Road / Tumalo Junction interchange and the Bend Parkway / Empire Avenue interchange.

By Summer 2009, four Build Alternatives were identified for detailed environmental study: three distinct east corridor alternatives (East 1, East 2, and East 3) and one west corridor alternative (West 1). These alternatives are described below. As of Fall 2009, the project team is investigating down-scaled versions of these alternatives to determine if lower cost solutions address the project purpose and need. If any down-scaled versions are forwarded for detailed environmental study, subsequent project documentation will be provided. All methodology included in this memorandum is expected to apply to any transportation alternative developed for the US 97 Bend North Corridor project.

1.1.1 *East Corridor Alternatives*

With the east corridor alternatives US 97 would be realigned east of the existing highway adjacent to the Burlington Northern Santa Fe Railroad. The following is a summary of the key features of all of the east corridor alternatives:

- Slip ramp provided to access Robal Road from northbound US 97.
- Existing US 97 becomes a local route, 3rd Street.
- US 97 and US 20 are connected just north of Empire Avenue. Direct connections from northbound US 97 to westbound US 20 and eastbound US 20 to southbound US 97.
- US 97 / Empire Avenue interchange uses a single point interchange to handle traffic more efficiently.

The east corridor alternatives differ in the location of the project's northern interchange and the type of interchange.

- **East 1:** Partial northern US 97 interchange located just north of Fort Thompson Lane. Exit for southbound US 97 traffic to 3rd Street and an entrance for traffic on northbound 3rd Street on US 97.
- **East 2:** Partial northern US 97 interchange located near Bowery Lane. Exit for southbound US 97 traffic to 3rd Street and an entrance for traffic on northbound 3rd Street on US 97.
- **East 3:** Partial northern US 97 interchange located in the Clausen/Grandview area. Exit for southbound US 97 traffic to 3rd Street and an entrance for traffic on northbound 3rd Street on US 97.

1.1.2 *West Corridor Alternative*

With the west corridor alternative US 97 would be realigned to the west of the existing highway. The following is a summary of the key features of West 1:

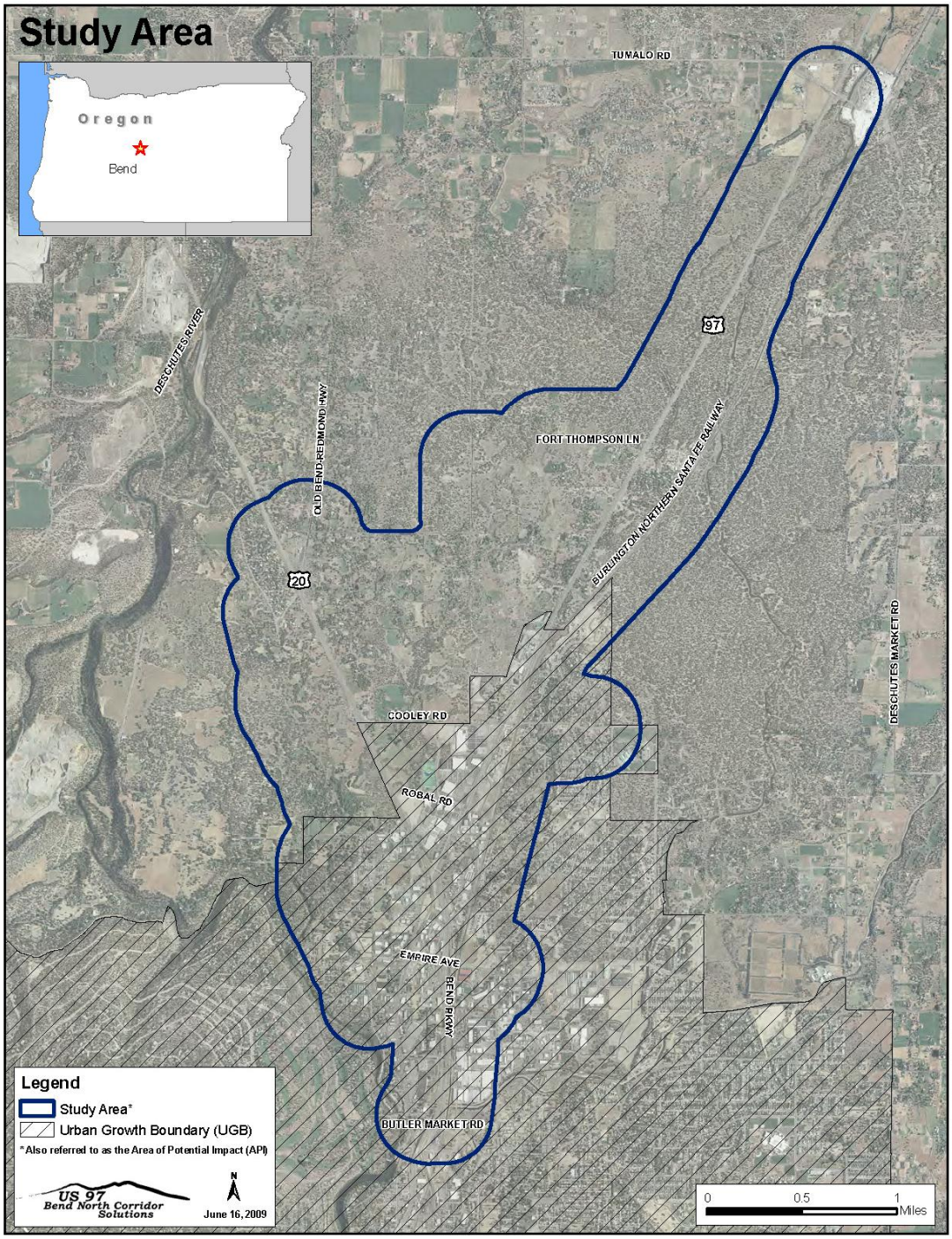
- US 97 and US 20 traffic are combined into a common roadway corridor between Empire Avenue and Cooley Road.
- US 97 and US 20 interchange is located near Cooley Road.
- Collector / distributor roads provide access at Robal Road, 3rd Street and Empire Avenue from the highways.
- Partial northern US 97 interchange is located near Bowery Lane. Exit for southbound US 97 traffic to 3rd Street and entrance for traffic on northbound 3rd Street on US 97.
- Existing US 97 becomes a local route, 3rd Street.
- Empire Avenue interchange is reconfigured in a split diamond interchange design, which will function as collector / distributor roads from 3rd Street / US 20 and which will include signals on the ramps at Empire Avenue and 3rd Street.

1.2 Area of Potential Impact

The project's study area is the area within which potential environmental, social and economic impacts from the project may directly occur. It is also called the Area of Potential Impact (API). The study area extends along US 97 from the Deschutes Market Road / Tumalo Junction interchange to approximately Butler Market Road, and along US 20 from approximately Old Bend-Redmond Highway to Butler Market Road. It also encompasses the area between US 97

and US 20 south of Fort Thompson Road. The study area extends about one-quarter mile on either side of the combined preliminary project footprint for the project alternatives. The preliminary project footprint is the estimated maximum extent of potential ground disturbing activities. The API is shown in Exhibit 1, which also shows the location of the City of Bend's Urban Growth Boundary (UGB).

Exhibit 1. US 97 Bend North Corridor Project Area of Potential Impact



2. Relevant Laws and Regulations

All environmental analysis and reporting for the project will comply with the National Environmental Policy Act (NEPA) and the FHWA's Technical Advisory T6640.8A (October 30, 1987). In addition, the air quality analysis will comply with the following laws and regulations:

- Clean Air Act (CAA): This comprehensive public law forms the basis for a broad range of regulations that control allowable emissions and concentrations of air pollutants in the environment.
- 40 CFR 50. EPA. "National Primary and Secondary Air Quality Standards." *U.S. Code of Federal Regulations*. The federal government has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution. The NAAQS are shown in Exhibit 2.

  Geographic areas where concentrations of a pollutant exceed the ambient air quality standards are classified as nonattainment (do not attain standards) areas. Previously designated nonattainment areas now in compliance with air quality standards are classified as maintenance areas. Areas that meet the standards are classified as attainment (attain standards) areas. The project is in an attainment area for all NAAQS.
- Oregon Administrative Rule (OAR) 340 Division 202. Department of Environmental Quality (DEQ). "Ambient Air Quality Standards and PSD Increments." In addition to the NAAQS, DEQ has established State Ambient Air Quality Standards (SAAQS) that are at least as stringent as the NAAQS. These standards are listed in Exhibit 2.
- OAR 340 Division 252. DEQ. "Transportation Conformity." The transportation conformity regulations establish criteria and procedures for determining conformity with State Implementation Plans (SIPs). This rule covers transportation plans, programs, and projects in Oregon that are developed, funded, or approved by the United States Department of Transportation (DOT) and by metropolitan planning organizations (MPOs) or other recipients of funds under Title 23 of the U.S.C. or the Federal Transit Laws.

Exhibit 2. Applicable Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	State Standard
Particulate Matter	3-year Average of Annual Arithmetic Mean	-	50 µg/m^3
Less than 10 microns	24 Hour	150 µg/m^3	150 µg/m^3
Particulate Matter Less than 2.5 microns	3-year Average of Annual Arithmetic Mean 3-year Average of 98th Percentile of 24 Hour concentration	15 µg/m^3 35 µg/m^3	15 µg/m^3 -
Ozone (O_3)	8 Hour*	0.075 ppm	-
	1 Hour**	-	0.12 ppm
Carbon Monoxide (CO)	8 Hour	9 ppm	9 ppm
	1 Hour	35 ppm	35 ppm
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm	0.02 ppm
	24 Hour	0.14 ppm	0.10 ppm
	3 Hour	0.5 ppm	0.5 ppm

Pollutant	Averaging Time	Federal Standard	State Standard
Nitrogen Dioxide (NO_x)	Annual Arithmetic Mean	0.053 ppm	0.053 ppm
Lead (Pb)	Rolling 3-month average	0.15 µg/m^3	0.15 µg/m^3
Notes: µg/m3 = micrograms per cubic meter of air; ppm = parts per million * The 8-hour ozone standard is a 3 year 4th high rolling average. ** DEQ is proposing to revise the state 1-hour standard to match the 8 hour federal standard.			

3. Coordination with ODOT and Other Agencies

ODOT air quality staff will be contacted for template language on climate change and greenhouse gas.

4. Data Sources and Data Collection Methods

The following data sources will be used:

- ODOT will supply the traffic engineering report for review.
- Traffic data for the API will be provided by ODOT and will include average daily traffic (ADT) volumes, vehicle miles traveled (VMT), and vehicular speeds for existing year, year of project completion and the project design year for all alternatives studied. If available, vehicular capacity (v/c) and level of service (LOS) information from the traffic engineering report will also be used. Please note that v/c and LOS information would only be added if this information was also needed as part of the typical traffic analysis that is done for this type of project.
- Air monitoring data from the nearest monitors located within close proximity to the API will be collected. Consultant shall summarize from Oregon DEQ records the data for pollutants of concern (CO, NOx, and VOC), being monitored within the project area. If sufficient monitoring data is not available, a general discussion of the data and attainment status.

Where appropriate, data collection and use will be coordinated with other relevant disciplines.

5. Analysis Methods

The following is a summary of the methods that will be used to assess the project's adverse and beneficial direct, indirect and cumulative impacts to air quality / climate change / greenhouse gas. The general approach for mitigation is also documented.

5.1 Direct Impact Analysis Approach

5.1.1 *Temporary Construction Impacts*

The air quality / climate change / greenhouse gas emissions report will include a general discussion of air pollutant emissions expected during construction of the project.

5.1.2 *Long-Term Impacts*

The project is located in an attainment area for all criteria pollutants; therefore CO, PM_{10} and $PM_{2.5}$ hot spot analyses are not required. Likewise, air quality conformity regulations would not apply to the project. The report will rely on reporting Oregon DEQ air quality monitoring data to

represent existing air quality in the API, and / or previous analyses for similar projects, or other supporting information. A comparative discussion of existing and projected traffic data for each alternative and its impact on the project as it relates to air quality will be conducted. The comparative discussion will be based on ADTs, VMTs, and vehicular speeds for all alternatives and analysis years of study. If available, v/c and LOS information from the traffic engineering report will be used. The comparative analysis will be based on existing year, year of project completion and the project design year for all alternatives studied. The report will include a statement indicating whether or not concentrations of pollutants are expected to be below the NAAQS.

A Mobile Source Air Toxics Analysis will be conducted using FHWA's Interim Guidance on Air Toxics Analysis in NEPA Documents dated February 3, 2006. It is assumed that the projected design year traffic will not meet or exceed 140,000 ADT, therefore a qualitative assessment of the emissions projection will be conducted.

5.2 Indirect Impact Analysis Approach

Indirect impacts are those caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. They may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air quality. The air quality / climate change / greenhouse gas report will qualitatively describe indirect impacts. The indirect impacts analysis will use a boundary no larger than the geographic boundary for cumulative impacts (below).

5.3 Cumulative Impact Analysis Approach

Coordination with ODOT will occur to determine if the project would have a cumulative impact on air quality / climate change / greenhouse gases when combined with past, present and reasonably foreseeable future actions. If it is determined that cumulative impacts would occur the following approach would be followed.

First, a cumulative impacts geographic boundary will be identified for the resource. The determination of the geographic boundary will consider the geographic extent of direct and indirect project impacts as well as corresponding natural boundaries of the resource. Justification for the geographic boundary will be provided for each resource.

Next, a temporal boundary will be identified for the resource. This temporal boundary defines the historic timeframe for the resource, and will be the beginning point for the historic context discussion. The historic context discussion will be a qualitative discussion of how the resource came to be in its current condition. A general discussion of past and present actions that have influenced the current condition of the resource will be included. Specific past and present projects will not be identified, but general actions (e.g. expansion of urban areas, development of national highway system, conversion of agricultural lands, etc) will be discussed.

Third, a list of reasonably foreseeable future projects (both public and private) will be developed for the cumulative impacts geographic boundary for all resources combined. This list will include projects currently identified in city, county and regional adopted plans, and therefore "reasonably foreseeable", that could potentially combine with direct or indirect impacts of the US 97 Bend North Corridor project to produce cumulative impacts. An end date for the list of

projects will be identified (e.g. extent of timeframe for adopted plans), and will not extend past the design horizon for the project. Private development projects will be identified through coordination with planners at the city and county (e.g. review of pre-application materials). Additionally, the Juniper Ridge development will be included in the list of projects. Rationale for projects included in the list will be provided.

Lastly, a methodology for identifying and analyzing cumulative impacts for each resource will be presented. The cumulative impacts analysis will be done qualitatively, but, when possible, quantitative information will supplement the discussion. Technical report authors will coordinate with ODOT on the proposed methodology.

ODOT template language on climate change and green house gas emissions will be included in this section.

5.4 Mitigation Approach

Construction mitigation measures that may be required will be qualitatively discussed.

6. References

40 CFR 50. Environmental Protection Agency. "National Primary and Secondary Air Quality Standards." U.S. Code of Federal Regulations.

40 CFR 86. Environmental Protection Agency. "Control of Emissions from New and In-Use Highway Vehicles and Engines." *U.S. Code of Federal Regulations*.

FHWA (Federal Highway Administration). Interim guidance on air toxic analysis in NEPA documents. February 3, 2006.

Oregon Administrative Rule (OAR) 340 Division 202. Oregon Department of Environmental Quality. "Ambient Air Quality Standards and PSD Increments." *Oregon Administrative* Rules.

Oregon Administrative Rule (OAR) 340 Division 252. Oregon Department of Environmental Quality. "Transportation Conformity." *Oregon Administrative Rules*.

ODOT, 2008. "Oregon Department of Transportation Air Quality Manual."

Appendix A Correspondence with ODOT Discipline Reviewer

Ginette Lalonde (Parsons Brinckerhoff) contacted ODOT Air Quality Specialist, Marina Orlando, in person on June 11, 2009 to discuss the methodology proposed in this memorandum. Ms. Orlando directed Ginette to the ODOT Air Quality website for example documents and a copy of the Oregon Department of Transportation Air Quality Manual. Ms. Orlando also provided review comments on the methodology, which were incorporated.

Appendix B Coordination with Participating Agencies

ODOT distributed the Draft Final Impact Assessment Methodology Memoranda to participating agencies for review on August 25, 2009. The 30-day review period ended on September 23, 2009. ODOT received no substantive comments that required changes to this memorandum from the participating agencies.