

DEQ In-Progress & Planned Studies (02/22/06)

In progress:

Ozone Precursor Study:

1. Provide a baseline of scientifically monitored levels of oxides of nitrogen (NO_x) and volatile organic compounds (VOC).
2. Allow comparison of monitored levels of ozone (O₃) to monitored levels of NO_x, VOC and meteorological data in the same location to analyze in what way and to what degree each constituent is contributing to O₃ levels.
3. Use the information gathered in objectives 1 and 2 to better understand the interactions between ozone precursor compounds.
4. Identify the control strategies that will lead to reductions in “controlling” precursor emissions “reductions” in ozone levels.

Description: We will have three monitoring sites for the ozone study. The monitoring period will be May-September 2006 and the final report will be generated by the end of the year. This is a Congestion Mitigation/Air Quality grant in the amount of \$400,000.

Travel Demand Management:

1. Develop a software link between the outputs of the Traffic Demand Model (run by COMPASS) and the Sparse Matrix Operating Kernel Emissions (SMOKE) inventory data preprocessor. This will allow roadway emissions down to the link level to be included in airshed modeling (CMAQ).
2. Software link will alleviate the need to outsource the modeling for future updates of the Treasure Valley PM10 Maintenance Plan as required by EPA in 2013 and 2023; as well as for other projects.
3. Assist in the development of motor vehicle emissions budgets as part of maintenance plans (transportation conformity).
4. Software will allow the state to evaluate and review the cost effectiveness of various control measures for PM10, VOCs, and NO_x through airshed modeling in an effort to avoid future ozone and PM2.5 problems.

Description: We will have a software tool which allows detailed transportation data to be utilized in airshed modeling at less cost. The software is scheduled for completion before December 31, 2006. This is a Congestion Mitigation/Air Quality grant in the amount of \$25,000.

Treasure Valley Air Toxics Study

1. Provide a baseline of scientifically monitored levels of urban air toxics (UAT) at five locations in the Treasure Valley for a period of one year.
2. Characterize spatial and temporal levels of volatile organic compounds (VOC), carbonyl compounds (aldehydes) and certain metals.
3. Use the information gathered in objectives 1 and 2 to better understand the relative human exposure and health risk to UATs (cancer and non-cancer).
4. Use the information gathered in objectives 1 and 2 to reconcile air toxic model predictions (EPA’s NATA and DEQ airshed models).
5. Through a coalition created by Treasure the Valley’s Air Use the information gathered in objectives 1, 2 and 3 to develop regulatory mechanisms and/or voluntary community programs which lead to reductions in human exposure or risk.

Description: We will have five monitoring sites for the air toxics study. The monitoring period will be January through December 2007, and the final report will be generated by January 2009. This is a Community Scale Assessment Air Toxics Grant.

Planned:

PM2.5 Precursor Study:

1. Provide a baseline of scientifically monitored levels of aerosol nitrates (NO₃), sulfates (SO₄), ammonia (NH₃), and carbon compounds (EC/OC).
2. Allow comparison of monitored levels of fine particulate matter (PM_{2.5}) to monitored levels of NO₃, SO₄, NH₃, EC/OC and monitoring data in the same location to analyze in what way and to what degree each constituent is contributing to PM_{2.5} levels.
3. Use the information gathered in objectives 1 and 2 to better understand the sources of and the interactions between pollutant precursors.
4. Identify control strategies that will lead to reductions in “controlling” precursor emissions and reductions in PM_{2.5} levels.

Description: We will have one monitoring site for the PM_{2.5} study. The monitoring period will be December 2006 through January 2007, and the final report will be generated by July 1, 2007. This is a Congestion Mitigation/Air Quality grant in the amount of \$320,000.

Treasure Valley Air Quality Study:

1. Characterize both ozone and fine particulate (PM_{2.5}) related air quality throughout the Treasure Valley by evaluating overall trends, contributing emission sources including precursor chemicals, meteorology, precursor emission sources, and potential ozone transport.
2. Indicate specific programs and projects that will minimize oxides of nitrogen (NO_x) and/or volatile organic compound (VOC) formation, which increases both ozone and PM_{2.5} pollution in the Treasure Valley.

Description: The result of this study will be the first complete picture of the air quality problem in the valley and the resulting report can be used by both local and state decision-makers to determine what kind of control measures will be effective in reducing the ozone and PM_{2.5} pollution problems that we face. The study will begin in December 2007 and the final report will be completed by May 2009. This is a Congestion Mitigation/Air Quality grant in the amount of \$400,000.

**Additional discussion regarding the Treasure Valley AQ Study:

A further outcome of this study will be the determination of whether the Treasure Valley is NO_x or VOC “limited”. Depending on the relative concentrations of NO_x and VOC and the specific types of VOC present in the atmosphere the rate of ozone formation can be most sensitive to changes in VOC alone or to changes in NO_x alone, or a mixture of both¹. Whichever pollutant is found to be less abundant is then considered to be the “limiting” element of the chemical reaction (i.e. if there is less VOC when it is used up in the reaction there will be nothing left for the more abundant NO_x to react with-causing the ozone reaction to cease). Although understanding the limiting effects on our ozone problem is very important it is not possible to determine the best course of action to take to mitigate ozone pollution if we do not also understand how PM_{2.5} also interacts and reacts in our atmosphere. In order to be successful with the goal of using scenarios to determine effective control measures we have to be sure that any control measure proposed to decrease ozone pollution will not, inadvertently, increase PM_{2.5} pollution. The Treasure Valley Air Quality Study proposal includes a similar analysis of PM_{2.5} in order to ensure this will not be a confounding problem in the future.

¹ Preliminary Assessment of Ozone Air Quality Issues in the Minneapolis/St. Paul Region, STI, Report#STI-901104/90115-2239-RFR2, pp. 4-1. October 2002.