# TREASURE VALLEY AIR QUALITY PLAN

**TREASURE VALLEY AIR QUALITY COUNCIL**

**February 2007**

# TABLE OF CONTENTS

**List of Tables** ..... **ii**
**List of Figures** ..... **ii**
**List of Appendices** ..... **iii**
**Acknowledgments** ..... **v**
**Acronyms Used** ..... **vi**
**Executive Summary** ..... **1**
Background Information ..... 1
Evaluation of Control Measures ..... 3
Required Actions and Other Measures ..... 5
Summary and Conclusions ..... 11
**1 Introduction** ..... **13**
1.1 Regional Air Quality Council Act and Treasure Valley Air Quality Council ..... 13
1.2 Treasure Valley Airshed ..... 16
1.3 Treasure Valley Population ..... 18
**2 Air Quality and Standards** ..... **23**
2.1 Air Contaminants ..... 24
2.2 Air Quality Standards ..... 33
2.3 Nonattainment of National Ambient Air Quality Standards ..... 35
2.4 Air Permitting for Industrial Sources ..... 36
**3 Treasure Valley Air Quality** ..... **39**
3.1 Historical and Current Air Quality Issues ..... 39
3.2 Future Air Quality Concerns ..... 42
**4 Predicted Future Air Emissions and Air Quality** ..... **47**
4.1 Demographic Changes ..... 47
4.2 2020 Air Emissions Inventory ..... 52
**5 Options for Maintaining and Improving Air Quality** ..... **57**
5.1 Overview ..... 57
5.2 Potential Education and Voluntary Control Measures ..... 59
5.3 Potential Mobile and Transportation Control Measures ..... 60
5.4 Potential Local Governance Control Measures ..... 63
5.5 Potential Control Measures for Specific Sources ..... 63
5.6 Future Federal Measures ..... 65
**6 Evaluation of Control Measures** ..... **67**
6.1 Voluntary/Good Citizenship Control Strategies ..... 67
6.2 Vehicle Emissions Controls ..... 73
6.3 Regional Planning and Coordination ..... 84
6.4 Stationary Sources ..... 88
**7 Conclusions and Recommendations** ..... **91**
7.1 Required Actions ..... 92
7.2 Control Measures Needing Further Study ..... 98
7.3 Federal Measures in Progress ..... 99
7.4 Summary ..... 100

# LIST OF TABLES


Table 1-1 U.S. Census Bureau population estimates ..... 20
Table 1-2 Official COMPASS population estimates for cities (corporate limits) and counties (March 1, 2006) ..... 21
Table 2-1 1999 annual emission inventories, Ada and Canyon Counties combined ..... 31
Table 2-2 1999 episode emission inventories, Ada and Canyon Counties combined, for the highest concentration day (Friday, December 24) ..... 32
Table 2-3 National Ambient Air Quality Standards (NAAQS) ..... 34
Table 4-1 2030 projected growth by county ..... 47
Table 4-2 Treasure Valley cattle numbers ..... 52
Table 4-3 Estimated 2020 emissions inventory for Ada and Canyon Counties ..... 54
Table 4-4 Estimated 2020 episodic emissions inventory ..... 55
Table 5-1 Screening criteria for potential measures to protect and maintain air quality ..... 58
Table 5-2 Potential voluntary and education control measures ..... 59
Table 5-3 Potential control measures for mobile and transportation sources ..... 61
Table 5-4 Potential control measures for local governments ..... 63
Table 5-5 Potential control measures for stationary sources ..... 64
Table 6-1 Ratings of the Air Quality Index and their descriptions ..... 69
Table 6-2 Ethanol emissions as compared with gasoline emissions ..... 83
Table 6-3 Change in biodiesel emissions ..... 84
Table 7-1 Summary of recommendations ..... 92


# LIST OF FIGURES


Figure 1-1 Treasure Valley cities and counties ..... 19
Figure 2-1 Sources of $PM_{10}$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.) ..... 25
Figure 2-2 Sources of $SO_x$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.) ..... 26
Figure 2-3 Sources of $NO_x$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.) ..... 27
Figure 2-4 Sources of CO in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.) ..... 28
Figure 2-5 Sources of VOCs in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.) ..... 29
Figure 3-1 Ada County 8-hour average CO concentrations (NAAQS compliance determined by second highest value during the year) ..... 40

Figure 3-2 Annual average $PM_{10}$ concentrations for Ada County ..... 41
Figure 3-3 24-hour $PM_{10}$ values and standard for Ada County ..... 42
Figure 3-4 Annual $PM_{2.5}$ values and standard ..... 43
Figure 3-5 24-hour standard for $PM_{2.5}$ ..... 44
Figure 3-6 8-hour standard for ozone ..... 45
Figure 4-1 Household growth based on current growth trends ..... 49
Figure 4-2 Household growth based on the "Community Choices" scenario of *Communities in Motion* ..... 50
Figure 6-1 Types of mandated reductions designed to meet stringent pollution standards ..... 74
Figure 6-2 Treasure Valley (Ada and Canyon Counties) daily vehicle miles of travel (VMT) as a function of growth scenarios ..... 86

## LIST OF APPENDICES

Appendix A—Summary of Public and Agency Comments ..... 101
Appendix B—List of Studies and Reports on Air Quality in the Treasure Valley ..... 103

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# ACRONYMS USED

| | | | |
|---|---|---|---|
| **µg/m$^3$** | micrograms per cubic meter | **$NH_3$** | ammonia |
| **ACHD** | Ada County Highway District | **$NO_2$** | nitrogen dioxide |
| **AQI** | Air Quality Index | **$NO_x$** | nitrogen oxide |
| **B20** | 20% biodiesel, 80% petroleum diesel | **$O_3$** | ozone |
| **BACT** | Best Available Control Technology | **OBD** | on-board diagnostic |
| **CNG** | compressed natural gas | **PBR** | Permit by Rule |
| **CO** | carbon monoxide | **$PM_{10}$** | particles that are 10 micrometers or less in size |
| **COMPASS** | Community Planning Association of Southwest Idaho | **$PM_{2.5}$** | particles that are 2.5 micrometers or less in size |
| **DOCs** | diesel oxidation catalysts | **ppm** | parts per million |
| **E10** | 10% ethanol, 90% gasoline | **PTC** | Permit to Construct |
| **E85** | 85% ethanol, 15% gasoline | **RACM** | Reasonably Available Control Measures |
| **EPA** | U.S. Environmental Protection Agency | **RACT** | Reasonably Available Control Technology |
| **IDAPA** | Idaho Administrative Procedures Act | **SIP** | state implementation plan |
| **IDEQ** | Idaho Department of Environmental Quality | **$SO_2$** | sulfur dioxide |
| **ITD** | Idaho Transportation Department | **$SO_x$** | sulfur oxide |
| **kg** | kilogram | **tpy** | tons per year |
| **LAER** | lowest achievable emission rate | **ULSD** | ultra-low sulfur diesel |
| **LEV** | low-emission vehicle | **VMT** | vehicle miles of travel |
| **LNG** | liquefied natural gas | **VOCs** | volatile organic compounds |
| **LSD** | low sulfur diesel | **VRT** | Valley Regional Transit |
| **mg/m$^3$** | milligrams per cubic meter | **yr** | year |
| **NAAQS** | national ambient air quality standards | | |

# EXECUTIVE SUMMARY

On March 29, 2005, then Governor Dirk Kempthorne signed into law the Regional Air Quality Council Act (Title 39, Chapter 67, Idaho Code) (the "Act"). The Act establishes the Treasure Valley Air Quality Council (the "Council"). The mission of the Council is "to protect, preserve and, where necessary, improve the quality of the air in the Treasure Valley while accommodating private, public and commercial interests."[1] It is the responsibility of the Council to develop and oversee implementation of a comprehensive Treasure Valley air quality plan (the "Plan").[2] This executive summary provides background information on the development of the Plan, highlights recommended air quality control measures, and summarizes implementation measures stated in the Plan.

## *Background Information*

The Act defines the "Treasure Valley" as the geographic boundaries encompassed by Ada and Canyon Counties.[3] It is these two counties that make up the vast majority of the local airshed, which is a geographical area having similar pollution levels due to shared weather patterns and encompassing topographical boundaries. Poor air quality events in the Treasure Valley typically occur during winter inversions and summer heat waves when the air becomes stagnant and resistant to mixing. The Plan focuses its recommendations on Ada and Canyon counties, recognizing that air contaminants are not confined to jurisdictional boundaries and the relevant airshed extends beyond their boundaries.

Because air quality is often tied to population growth, the Plan also addresses current and future population trends confronting the Treasure Valley. According to the latest U.S. census (Census 2000), the population in Ada and Canyon Counties has recently seen dramatic growth, increasing from 295,851 in 1990 to 432,345 in 2000. Current estimates for both counties continue to show phenomenal growth, with the 2006 population estimated at 559,095. The U.S. Census Bureau forecasts suggest that this level of growth will continue and the Treasure Valley airshed will contain approximately one million people by 2030. In light of this growth and its impact on air quality, the

[1] Idaho Code § 39-6701
[2] Idaho Code § 39-6706
[3] Idaho Code § 39-6705(8)

Council's initial step in developing the Plan was to consider federal air quality standards and the Treasure Valley's historical and current compliance with those standards.

The federal Clean Air Act as implemented by the Environmental Protection Agency (EPA) establishes ambient air quality standards for six primary pollutants: particulate matter ($PM_{10}$ and $PM_{2.5}$), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$ or $NO_x$), carbon monoxide (CO), ozone ($O_3$), and lead. Historically, air quality issues confronting the Treasure Valley were associated with elevated CO and $PM_{10}$ levels. In recent years, concentrations of these pollutants have decreased to acceptable levels, largely due to the improved efficiency of vehicle engines, establishment of an emissions testing program targeted at these pollutants, and implementation of local restrictions associated with wood and open burning. Although the Treasure Valley has been successful in reducing CO and $PM_{10}$, rapid growth in the number vehicles and the miles traveled have initiated concern over two different pollutants, fine particulate matter ($PM_{2.5}$) and ozone. Unlike $PM_{10}$ and CO, these pollutants are more difficult to control due to the complexity and number of chemical agents (precursors) involved in their formation. In the Treasure Valley airshed, precursor chemicals involved in the formation of $PM_{2.5}$ and ozone are $NO_x$ and volatile organic compounds (VOCs). These precursors are often released as either byproducts of combustion or from evaporation of fuels and solvents. To evaluate control measures that target $PM_{2.5}$ and ozone, the Council reviewed many strategies that reduce precursor chemical emissions, including strategies associated with regional growth and transportation.

At present, several strategies addressing regional growth and transportation have been initiated in the Treasure Valley. These include *Communities in Motion* and *Blueprint for Good Growth*. These strategies and their relationships to air quality are discussed in the Plan. Along with residential growth, it is anticipated that the Treasure Valley will experience an increase in industrial and commercial development. One important aspect to managing air quality related to this growth is development of an accurate emissions inventory. The Plan evaluates the Treasure Valley's current emissions inventory and makes recommendations to improve the accuracy and use of that inventory in the future.

## *Evaluation of Control Measures*

In the process of identifying appropriate control measures to manage air quality in the Treasure Valley, the Council quickly learned that air quality issues are complex, involving aspects that range from public health and quality of life to social and economic implications. The Council followed a systematic approach that used a screening tool based on a control measure's degree of emission reduction and the complexity of its implementation. After all control measures were screened, a priority list was generated, and those control measures deemed worthy of further investigation were more thoroughly discussed. The following control measures were carefully considered by the Council and are addressed in detail in the Plan.

### Voluntary/Good Citizenship Control Strategies

The Council evaluated public education control measures that are designed to enhance awareness of how individual and business-related actions affect the quality of air in the Treasure Valley. The Idaho Department of Environmental Quality (IDEQ) administers certain public education-related initiatives in the Treasure Valley, including the "Treasure the Valley's Air" initiative and "Air Quality Alert" program. Both programs are aimed at providing ongoing public education about air quality and health risks associated with exposure to air pollution. The Council has identified additional strategies to further public education related to air quality, including strengthening and enhancing voluntary employer-based trip-reduction and alternative transportation programs and expanding homeowner woodstove education initiatives. Both measures are detailed in the Plan. The Council feels strongly that public education control measures are necessary to affect behavioral changes related to air quality and that a long-term source of funding is necessary to effectively coordinate and implement public education activities.

### Vehicle Emissions Controls

In its examination of control measures related to vehicle emissions, the Council focused on those technologies that target reduction of the two major contributors to the formation of ozone and fine particulate matter, $NO_x$ and VOCs. Each technology was evaluated based on its effectiveness, limitations, and costs. The technologies investigated were dynamometer testing, on-board diagnostic (OBD) testing, tailpipe

testing, and remote sensing. As a result of this evaluation, the Council concluded that a cost-effective emissions testing program must consider the age of the vehicle, the frequency of the emissions test, and a mechanism to identify gross polluters. The Council also determined that an emissions-control program throughout the Treasure Valley must be mandatory, and recommendations to implement such a program have been made in the Plan.

## Low-Emission Vehicle II Program

A low-emission vehicle (LEV) II program is based on requiring automobiles to be equipped with improved emissions-control technology that reduces vehicle emissions to below EPA pollution concentration standards. State implementation of an LEV II program is voluntary, but is being considered or has been adopted by other states, including our neighbors in the Pacific Northwest. The Council recognizes that air quality benefits could be realized by implementing this program but concludes that further investigation is needed, particularly in the area of the costs and benefits of the program, prior to making any final recommendation.

## Regional Planning and Coordination

Regional planning and coordination were considered by the Council as a broad-based control measure focusing on many different aspects of air quality. Implementation of this control measure involves better coordination by numerous interested entities. This coordination is essential to consistently implementing the pollution-control measures outlined in this Plan. Recommendations made in the Plan identify improvements and changes in the following areas in an effort to gain better regional planning and coordination related to air quality.

### *Improved Land-use Planning and Development*

Consistency among the various local and regional land-use and transportation plans is essential to reducing total vehicle miles traveled and mobile source emissions. Several efforts, such as *Communities in Motion*, its “Community Choices” scenario, and *Blueprint for Good Growth*, are currently underway that, if adopted and implemented, will produce significant air quality benefits. The Plan recommends that these comprehensive and coordinated efforts be funded and implemented.

***Implementation of Uniform Dust Management Ordinances***

Fugitive (transient) dust is not a significant source of $NO_x$ or VOCs, but is the subject of many air quality complaints in the Treasure Valley. Embracing this issue, the Plan recommends that a uniform set of ordinances be developed, in consultation with a broad-based stakeholder group. These ordinances can then be uniformly adopted and enforced by local governments throughout the Treasure Valley.

***Continued Evaluation of Stationary Sources***

Stationary sources, such as those found in industry and agriculture, are already extensively regulated by IDEQ and EPA. However, the Plan recommends that stationary sources in the Treasure Valley continue to be evaluated to determine whether further regulation is warranted in terms of the costs and benefits of additional emissions-control measures.

***Implementation of Stage 1 Vapor Recovery at Retail Gas Stations***

Stage 1 vapor recovery is a control measure that can be applied to recover vapors when tankers dispense fuel at retail gasoline stations. The Council determined that stage 1 vapor recovery likely represents the greatest single opportunity for VOC reductions in the Treasure Valley and would produce significant benefits in terms of reduced ozone and $PM_{2.5}$ precursor compounds. The Plan recommends implementation of this control measure.

***Implementation of an Emissions Trading Program***

An emissions trading program may be useful if an area is designated as nonattainment under the Clean Air Act. For now, the Council recommends further study to evaluate opportunities for establishing such a program in the Treasure Valley.

## *Required Actions and Other Measures*

After carefully considering the cost, regulatory complexity, degree of emissions reduction, and ease of implementation, the Council selected the following actions to be taken by governmental and nongovernmental entities. The Council has identified the governmental entities responsible for those actions. Nongovernmental entities, including industry, employers, the business community, and all citizens, play an essential role in the success of each of the selected actions. The Council has also identified the control

measures needing further study and the federal measures that are currently in progress and may affect the Council's recommendations.

## Required Actions

1. **Enhance public education and awareness and establish an air quality recognition and award program.**

   A. Enhance education and awareness.

      i. IDEQ

         Implement an enhanced and coordinated education and awareness program and fund the program initially through a legislative appropriation and then through allocation of a portion of the vehicle emissions testing fee.

      ii. IDEQ, ITD, ACHD, VRT

         Strengthen and expand the existing "Treasure the Valley's Air" education and awareness program, and then operate the program in cooperation with existing Commuteride, ride-share, and other alternative transportation programs.

      iii. IDEQ

         Submit an annual air quality education and awareness plan to the Council for approval prior to receipt of the recommended funding.

      iv. IDEQ

         Strengthen the woodstove education and awareness program.

   B. Establish a "Treasure the Valley's Air" recognition and award program.

      i. Council, Governor's Office

         Establish an annual "Treasure the Valley's Air" award and present it to businesses, public agencies, or other entities who voluntarily implement

actions to reduce air pollution, such as reducing employee vehicle trips by 10% annually, creating and implementing ongoing efforts to educate employees on how they can reduce air emissions, or participating in valley-wide promotions such as “May in Motion.”

**2. Establish a vehicle emissions testing program in Ada and Canyon Counties.**

A. Idaho Legislature

Establish a vehicle emissions testing program in both Ada and Canyon Counties. A legislative task force should be created to assist the Council with the analysis and development of the legislation and ordinances necessary to establish the program. The Council strongly recommends that the program include the following elements:

i. One entity should oversee the vehicle emissions testing program for both counties.

ii. All vehicles 1996 or newer should be OBD tested every other year, with the exception that new vehicles should not be tested until they are five years old.

iii. A remote sensing program should be implemented to identify gross polluters for all model year vehicles.

iv. A portion of the fee generated by the emissions testing program should be used to fund the comprehensive air quality education and awareness program.

The legislative task force, working with the Council, should also address and resolve the following issues regarding the vehicle emissions testing program:

i. Whether tailpipe testing should be eliminated or phased out, and if so, the impact on existing emission test station operators.

ii. The most effective method for verifying that designated vehicles have met the emissions testing requirement.

iii. The most effective method for collecting the vehicle emissions testing fee on an annual basis from all registered vehicles.

iv. The best financial structure for the program, including the desired amount of the emissions testing fee, cost to administer the program, and amount to be designated for air quality education and awareness.

v. Any other issues related to the establishment of an effective vehicle emissions testing program.

**3. Implement stage 1 vapor recovery at retail gas stations.**

A. IDEQ

Adopt rules through the negotiated rulemaking process requiring stage 1 vapor recovery to be installed and operational at all retail gasoline stations in Ada and Canyon Counties by December 31, 2011. The negotiated rules should establish incentives, low-interest loans, or other funding mechanisms to assist station owners with the expense of installing the required equipment. As part of the rulemaking process, IDEQ and interested parties should also consider whether any possible exemptions to the rules should exist.

**4. Adopt uniform ordinances for local air quality problems.**

A. Ada and Canyon Counties and all municipalities

Adopt uniform ordinances to address open burning, burning bans, and fugitive dust control from road building, dirt hauling, construction, and related activities.

**5. Commit to integrate regional land-use and transportation planning (*Communities in Motion*) into local plans and implement such plans.**

A. Ada and Canyon Counties, all highway districts, all municipalities, and COMPASS

Implement the goals, objectives, and policies set forth in *Communities in Motion* and *Blueprint for Good Growth,* and take the following actions:

i. Adopt comprehensive plans and land-use development ordinances throughout the Treasure Valley that are consistent with the "Community Choices" scenario and that emphasize regional land-use and transportation planning goals.

ii. Only approve those development applications that are consistent with the "Community Choices" scenario.

iii. Promote redevelopment and infill projects.

iv. Encourage transit-oriented developments.

v. Develop funding to implement both transit and roadway improvements.

vi. Develop local funding options for regional transportation systems through Valley Regional Transit.

vii. Increase access to a regional public transportation system.

viii. Encourage development that promotes walking and biking trips.

ix. Promote economic development to create jobs in locations that reduce commute distances.

x. Allow commercial, service, and recreation uses in close proximity to residential areas to combine trips and/or reduce vehicle miles traveled.

xi. Expand on traditional employment options through the development of ordinances that allow live-work units, home occupations, and home-based businesses.

xii. Connect stub streets to allow greater pedestrian, bicycle, and vehicle circulation within neighborhoods, reducing the need to travel along the arterial street system.

xiii. Adopt ordinances that have minimum densities consistent with the "Community Choices" scenario.

**6. Improve regional air quality data and coordination.**

A. IDEQ and Council

Complete a more robust and technically sound analysis of future air emissions in cooperation with interested stakeholders.

B. Council

Continue to evaluate options for improving communication and coordination between the various groups working on air quality management.

## Control Measures Needing Further Study

The Council has identified at least five potential control measures warranting further evaluation to determine whether they should be incorporated into future revisions of the Plan:

1. Establishment of more stringent stationary source requirements.
2. Adoption of a low-emission vehicle (LEV) II program.
3. Establishment of an emissions trading program.
4. Investigation of how best management practices, incentives, and other measures can be implemented to improve air quality related to agricultural activities.
5. Further analysis of alternative fuels use.

## Federal Measures in Progress

EPA has proposed or adopted several regulations that will reduce emissions from mobile, small engine, and stationary sources. Federal regulations pertaining to diesel-

powered mobile vehicles and small engines will offer measurable reductions in emissions from those sources. The Council concluded that further investigation is needed as to how these new regulations will affect emissions before recommendations can be made.

## *Summary and Conclusions*

Actions described in this Plan are intended to keep air quality in the Treasure Valley below federal air quality standards and are expected to reduce emissions of $NO_x$, VOCs, and $PM_{2.5}$. No air quality plan is static. It is anticipated that this Plan will continue to change and evolve as necessary.

This executive summary identifies only the key aspects of the Plan. Other control measures and supporting information are discussed in the complete document. To acquire a better perspective and comprehensive understanding of the Council's recommendations, the Plan should be read in its entirety.

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# 1 INTRODUCTION

## *1.1 Regional Air Quality Council Act and Treasure Valley Air Quality Council*

On March 29, 2005, Governor Dirk Kempthorne signed into law the Regional Air Quality Council Act (Title 39, Chapter 67, Idaho Code) (the "Act"). The intent of the Act is to preserve and protect the air quality of the State of Idaho.[4]

The Act establishes the Treasure Valley Air Quality Council (the "Council"). The mission of the Council is "to protect, preserve and, where necessary, improve the quality of the air in the Treasure Valley while accommodating private, public and commercial interests."[5] It is the responsibility of the Council to develop and oversee implementation of a Treasure Valley air quality plan (the "Plan").[6]

The Council, with the assistance of the Idaho Department of Environmental Quality (IDEQ) and other state and local agencies, as needed, has the following responsibilities:

1. Compile historical data on air quality in the Treasure Valley.

2. Establish a nonvoting Citizens Committee.

3. Assess present and projected emissions related to the Treasure Valley.

4. Examine air quality conditions in and around the Treasure Valley and obtain a scientifically sound baseline study for planning future actions by federal, state, and local governments and by the private sector.

5. Describe the actions to be taken by governmental entities and nongovernmental entities to protect, preserve, and when necessary, improve air quality in the Treasure Valley.

6. Develop, and submit to the Idaho Legislature for approval, a comprehensive air quality management plan for Ada and Canyon Counties.

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[4] Idaho Code *§ 39-6701*
[5] *Ibid.*
[6] Idaho Code *§ 39-6706*

7. Recommend, as appropriate, the adoption of statutes, ordinances, policies, and rules needed for governmental agencies to implement the Plan.

8. Oversee and promote implementation of the Plan by serving in an advisory capacity to those local, state, and federal agencies with responsibilities affecting air quality.

9. Conduct a public awareness campaign to educate the general public on methods and responsibilities to protect the airshed.

10. Consult with the public and keep the public informed of the activities of the Council through public forums and written reports.

11. Perform these duties continuously until dissolution.

12. Prior to automatic dissolution of the Council within seven years of the Plan being adopted by the Idaho Legislature, assist local, state, and federal agencies in the establishment of a multiagency oversight capability to succeed the Council.

The Council, as appointed by Governor Kempthorne, consists of the following individuals:

| Name[a] | Position Expires | Original Appointment | Council Position |
|---|---|---|---|
| Pete O'Neill | Nov 1, 2008 | Nov 3, 2005 | Chairman/Environmental interests |
| Matt Beebe | Nov 1, 2007 | Nov 3, 2005 | Canyon County Commissioner |
| Tammy DeWeerd | Nov 1, 2007 | Nov 3, 2005 | Mayor, City of Meridian |
| Beth Elroy | Nov 1, 2008 | Nov 3, 2005 | Manufacturing interests |
| Michael Gifford | Nov 1, 2008 | Nov 3, 2005 | Commercial interests |
| Gary Multanen | Nov 1, 2009 | Nov 3, 2005 | Commercial interests |
| John McCreedy | Nov 1, 2008 | Nov 3, 2005 | Agricultural interests |
| Garret Nancolas | Nov 1, 2007 | Nov 3, 2005 | Mayor, City of Caldwell |
| Alan Prouty | Nov 1, 2009 | Nov 3, 2005 | Food processing interests |
| Dr. Dale Stephenson | Nov 1, 2009 | Jan 31, 2006 | At-Large representative |
| Rick Stott | Nov 1, 2007 | Nov 3, 2005 | Agricultural interests |
| Patricia McGavran | Nov 1, 2009 | Nov 2, 2006 | At-Large representative |
| Rick Yzaguirre | Nov 1, 2007 | Nov 3, 2005 | Ada County Commissioner |

[a] There is currently one vacancy on the Council.

The Citizens Committee, as created by the Council, consists of the following individuals:

Jon Barrett
John Blakeslee
Jon Cecil
Sandy Dyer
Craig Draper
Jane Gabbert
Lynn Green
Dr. John Hammel
Russ Hendricks
Jerry Hild
Charles Johnson
Pat Johnson
Mike Kaplan
Tim Kessinger
Kent Lauer
Steve McCowan
Michael McEvoy
Mark Miller
Rich Montoya
Jeff Mooney
Terry Moore
Bev Nichol
Bob Naerebout
Robert Reisig
Gene Reynolds
Ann Sarsen
Dan Romero
Suzanne Schaefer
Alan Shealy
Deanna Smith
Meg Stephenson
Hobart (Hobie) Swan
John Taylor
Gene Theios
John Weber
Stephen Weiss
Edward White
Lonnie White

The Council met regularly in open session beginning December 15, 2005. On June 30, 2006, the Council completed a draft of the Plan and made it available to all appropriate and interested local, state, and federal agencies and to any interested person. The Council issued a final draft of the Plan on December 29, 2006, and conducted public hearings in Ada and Canyon Counties on January 29 and 31, 2007.

The Council received numerous public and agency comments, including those from COMPASS, ACHD, the American Lung Association, VRT, and the Ada County Air Quality Board. Appendix A includes a summary of public and agency comments submitted. The Council carefully reviewed and considered these comments, revised the Plan, and delivered the final Plan to the Idaho Legislature in February 2007.

## *1.2 Treasure Valley Airshed*

The Act defines the "Treasure Valley" as "the geographic boundaries encompassed by Ada and Canyon Counties."[7] Air contaminants, however, do not confine themselves to jurisdictional boundaries. An airshed is an area covered by a volume of air that has similar characteristics and is separated from other volumes of air by weather patterns or topography. Air pollution that is emitted in one area will spread and become distributed across the airshed. For this reason, air pollution levels are generally similar across a given airshed. The boundaries of an airshed can be difficult to determine due to changing conditions. Based on their dimensional aspects, ridges and mountains prevent the circulation of air and hold pollution within their boundaries. Weather conditions change daily, and features that obstruct the movement of air on some days may represent no barrier at all when a weather front pushes through. Under normal circumstances, air near the ground heats up during the day. As the air is heated, it becomes lighter and begins to rise, causing air that is relatively cooler and heavier to rush in and take its place near the ground. This phenomenon is known as air circulation or mixing.

This constant circulation mixes air contaminants with cleaner air and helps flush pollution. When air is calm or stagnant and void of circulation, pollution tends to stay near where it was emitted, allowing concentrations to increase. Horizontal layers of different temperatures in the air can create a "lid" that holds pollution in a given layer.

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[7] Idaho Code *§ 39-6705(8)*

This “lid” is called the mixing height, or the elevation up to which pollutants are mixed by air circulation. Low mixing heights keep the air beneath stagnant and pollutants trapped near the ground. Mixing heights play a role in defining the boundaries of local airsheds and are typically based on meteorological data from time periods when air is least able to mix and air pollution levels are expected to be highest.

Managing air quality in the Treasure Valley presents unique challenges due to geography and meteorological conditions and its status as the largest and most populated urban area in Idaho. The Treasure Valley is situated in southwestern Idaho in a shallow geological basin in the Snake River Plain. A series of river benches and mountain ranges create a barrier to air flow into and from this basin. All of Ada and Canyon Counties are contained within this basin, as are portions of other counties. Air quality monitoring and meteorological data indicate that the entire Treasure Valley basin shares a single airshed. Pollution levels are often consistent across this basin. Based on historical meteorological and air quality data, it has been shown that, most of the time, the Treasure Valley can absorb the pollution released into its airshed. However, the same data have also shown times when the capacity of the airshed to disperse air pollution is significantly reduced. These are known as episodic events, and they occur when the air in the Treasure Valley basin becomes stagnant and resistant to mixing with air from other areas.

Temperature inversions play a key role in reducing the mixing height within an airshed and are common during the winter, particularly in late December and early January. An inversion occurs when heavy, cold air is trapped near the ground beneath warmer, lighter air. This condition suppresses the movement of air, allowing pollution to build up over several days.

Air pollution concerns facing the Treasure Valley are complex. Some of the difficulty is due to numerous small sources of pollution, especially motor vehicles. Adding to the complexity, some substances can chemically react in the air to create more hazardous secondary pollutants. These secondary pollutants, and the precursors that create them, can migrate over long distances and contribute to pollution problems across a wide area. As urban areas across the Treasure Valley becomes less separate and distinct, cooperative planning for transportation and future growth across the entire region is critical to the protection and preservation of air quality within the airshed.

In the Treasure Valley, the Boise Front, a mountain range roughly 1,800 meters high (about 6,000 feet), extends generally east-west and creates a barrier to air flow on the northeastern edge of the valley. To the south. a series of river benches, the Snake River, and the Owyhee Mountains all impact air flow. The path taken by the Snake River outlines the southern boundary of both Ada and Canyon Counties. In the Treasure Valley, mixing heights are typically lowest and pollution levels are highest during the winter. Using radar soundings and weather balloons to determine temperature differences in the layers of air, climatologists have documented that the average mixing height in the Treasure Valley area during winter months is 300 meters (about 1,000 feet) or less above the surface of the valley. Using an average valley elevation of 750 meters (about 2,500 feet) plus the mixing height of 300 meters, an elevation of 1,100 meters (about 3,500 feet) above sea level has been determined as the elevation of the Treasure Valley's local winter airshed barrier. A plane at 1,100 meters overlaid across the topographical features of the valley would show an airshed that includes Ada, Canyon, Owyhee, Elmore, Gem, and Payette Counties, as well as portions of Oregon. A slight elevation increase extends across the Ada/Elmore County boundary to the east. This slight rise, along with the distance between populated areas where pollutants may be emitted, typically prevents any significant exchange of air pollutants with Elmore County, particularly on stagnant days.

Sources in eastern Oregon may contribute to air pollution in the Treasure Valley. However, the ability to regulate those sources or involve Oregon communities is limited. From a practical standpoint, even though air contaminants are not confined to jurisdictional boundaries, the Idaho Legislature elected to define the Treasure Valley as Ada and Canyon Counties. Therefore, this Plan focuses on those counties, while recognizing that the relevant airshed extends beyond their boundaries.

## *1.3 Treasure Valley Population*

According to the latest U.S. census (Census 2000), Idaho's population increased by 287,204 for a total of 1,293,953 people, making it the 39th most-populated state in the union. Ada and Canyon Counties, the most populated areas of the Treasure Valley, experienced a population increase of 136,494 people between 1990 and 2000, representative of almost half of the state's growth in that same period. There are six incorporated cities in Ada County (Boise, Garden City, Kuna, Meridian, Eagle, and Star)

and eight incorporated cities in Canyon County (Nampa, Middleton, Caldwell, Notus, Parma, Greenleaf, Wilder, and Melba). Figure 1-1 shows the location of cities and counties within the Treasure Valley. Phenomenal growth in the area continues and is forecasted to continue into the foreseeable future. Tables 1-1 and 1-2 display the area's growth between the 1990 and 2000 censuses and the growth since 2000, respectively. For a more detailed discussion of the impact of projected population growth on air quality, see chapter 4.

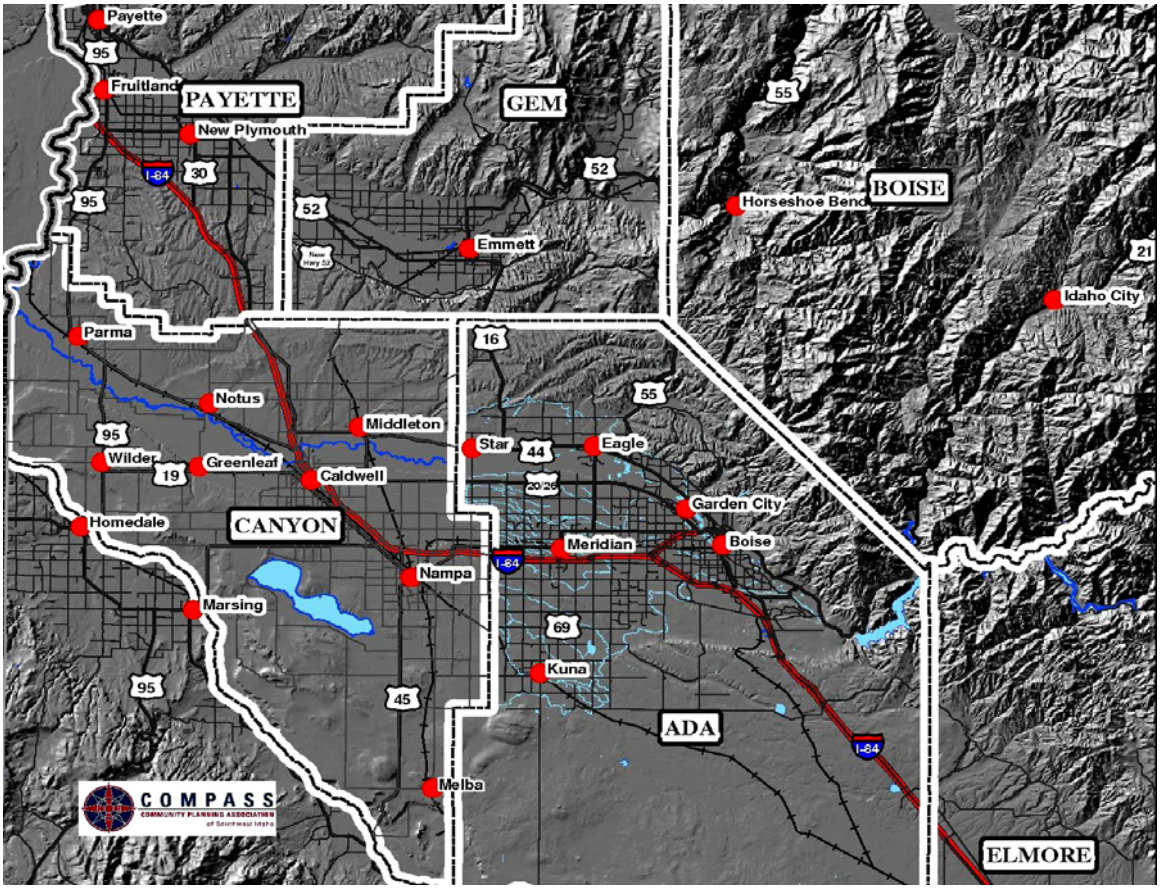


**Figure 1-1 Treasure Valley cities and counties**

**Table 1-1 U.S. Census Bureau population estimates**

| | Population | | | Share of Region | |
|---|---|---|---|---|---|
| | **1990** | **2000** | **Change** | **1990 (%)** | **2000 (%)** |
| **Ada** | | | | | |
| Boise City | 125,738 | 185,787 | 60,049 | 42.5 | 43.0 |
| Eagle | 3,327 | 11,085 | 7,758 | 1.1 | 2.6 |
| Garden City | 6,369 | 10,624 | 4,255 | 2.2 | 2.5 |
| Kuna | 1,955 | 5,382 | 3,427 | 0.7 | 1.2 |
| Meridian | 9,596 | 34,919 | 25,323 | 3.2 | 8.1 |
| Star | 648 | 1,795 | 1,147 | 0.2 | 0.4 |
| Unincorporated | 58,142 | 51,312 | –6,830[a] | 19.7 | 11.9 |
| Total county | 205,775 | 300,904 | 95,129 | 70.0 | 70 |
| **Canyon** | | | | | |
| Caldwell | 18,586 | 25,967 | 7,381 | 6.3 | 6.0 |
| Greenleaf | 648 | 862 | 214 | 0.2 | 0.2 |
| Melba | 252 | 439 | 187 | 0.1 | 0.1 |
| Middleton | 1,851 | 2,978 | 1,127 | 0.6 | 0.7 |
| Nampa | 28,365 | 51,867 | 23,502 | 9.6 | 12.0 |
| Notus | 380 | 458 | 78 | 0.1 | 0.1 |
| Parma | 1,597 | 1,771 | 174 | 0.5 | 0.4 |
| Wilder | 1,232 | 1,462 | 230 | 0.4 | 0.3 |
| Unincorporated | 37,165 | 45,637 | 8,472 | 12.6 | 10.6 |
| Total county | 90,076 | 131,441 | 41,365 | 30 | 30 |
| **Total for both counties** | **295,851** | **432,345** | **136,494** | | |

[a] Decrease due to annexation

Source: COMPASS (www.compassidaho.org/demo/)

**Table 1-2 Official COMPASS population estimates for cities (corporate limits) and counties (March 1, 2006)**

| | 2000 Population[a] | Increase | Pop. as of Apr 1, 2006 | Percent of County (%) | 2000 (%) | 2006 (%) |
|---|---|---|---|---|---|---|
| **Ada** | | | | | | |
| Boise City | 194,753 | 16,720 | 211,473 | 55.2 | 45.0 | 37.8 |
| Eagle | 12,571 | 7,560 | 20,131 | 5.3 | 2.9 | 3.6 |
| Garden City | 10,624 | 1,450 | 12,074 | 3.1 | 2.5 | 2.2 |
| Kuna | 6,227 | 6,420 | 12,647 | 3.3 | 1.4 | 2.3 |
| Meridian | 37,405 | 29,160 | 66,565 | 17.4 | 8.7 | 11.9 |
| Star | 1,994 | 2,600 | 4,594 | 1.2 | 0.5 | 0.8 |
| Unincorporated | 37,330 | 18,500 | 55,830 | 14.6 | 8.6 | 10.0 |
| Total County | 300,904 | 82,410 | 383,314 | | 70 | 69 |
| **Canyon** | | | | | | |
| Caldwell | 27,118 | 10,910 | 38,028 | 21.6 | 6.3 | 6.8 |
| Greenleaf[b] | 862 | 50 | 912 | 0.5 | 0.2 | 0.2 |
| Melba | 461 | 100 | 561 | 0.3 | 0.1 | 0.1 |
| Middleton | 3,015 | 1,560 | 4,575 | 2.6 | 0.7 | 0.8 |
| Nampa | 53,766 | 22,670 | 76,436 | 43.5 | 12.4 | 13.7 |
| Notus | 458 | 100 | 558 | 0.3 | 0.1 | 0.1 |
| Parma | 1,771 | 150 | 1,921 | 1.1 | 0.4 | 0.3 |
| Wilder | 1,462 | 120 | 1,582 | 0.9 | 0.3 | 0.3 |
| Unincorporated | 42,528 | 8,680 | 51,208 | 29.1 | 9.8 | 9.2 |
| Total County | 131,441 | 44,340 | 175,781 | | 30 | 31 |
| **Both Counties** | **432,345** | **126,750** | **559,095** | | | |

[a] Based on 2006 city limit boundaries

[b] No permit data for Greenleaf received during 2002–2003

Source: COMPASS (www.compassidaho.org/demo/)

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# 2 AIR QUALITY AND STANDARDS[8]

To better understand air quality and air quality regulations, it is useful to have a basic understanding of air contaminants, how they are created, and how they behave in the atmosphere.

The air we breathe contains contaminants generated by a wide variety of human activities such as use of cars and trucks; burning of coal, oil, and other fossil fuels; development and construction; manufacturing and use of chemicals; and agriculture. Air pollution can even come from smaller, everyday activities such as dry cleaning, refueling cars, mowing, and degreasing and painting operations. Collectively, these activities add gases and particles to the air we breathe. Many air pollutants, such as those that form urban smog and toxic compounds, remain in the environment for long periods and are carried by the wind hundreds of miles from their origin. When these gases and particles accumulate in the air in high enough concentrations, they can be harmful to human health as well as the environment. As the population of cities and counties in the Treasure Valley continues to grow, similar growth will be seen in the number of pollution-emitting sources such as cars, trucks, and industrial and commercial operations.

Having good air quality is important to us all. The average adult breathes over 3,000 gallons of air every day. Children breathe even more air per pound of body weight and are more susceptible to air pollution. People exposed to high levels of air pollutants may experience burning eyes, irritated throats, or breathing difficulties. People with heart disease or lung disease, such as asthma or emphysema, may be very sensitive to air pollution. Inhalation of air pollutants has been associated with increased symptoms of many kinds of lung disease, aggravation of asthma, and increases in hospital admissions and emergency room visits. Exposure to certain air pollution can also cause cancer and long-term damage to the respiratory, nervous, and reproductive systems. Pollutants can impair the body's immune system defenses, making people more susceptible to illness, especially respiratory illness like bronchitis and pneumonia. Treating health problems associated with exposure to air pollution can be very expensive.

[8] Much of the discussion on air quality contaminants comes from the Environmental Protection Agency's website (www.epa.gov) unless specifically noted otherwise.

## 2.1 Air Contaminants

Common air contaminants, their formation, and their sources are described below.[9]

### 2.1.1 Particulates

Particulate pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. The Environmental Protection Agency, or EPA, groups particle pollution into two categories:

- Coarse particles, such as those found near roadways and dusty industries, range in diameter from 2.5 to 10 micrometers. Coarse particles are included within the EPA classification of $PM_{10}$, which refers to particles that are 10 micrometers or less in size.
- Fine particles, such as those found in smoke and haze, have diameters smaller than 2.5 micrometers. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries, and automobiles react in the air. These particles are referred to by EPA as $PM_{2.5}$.

Airborne particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from sources such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form from complicated reactions in the atmosphere. Chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industries, and automobiles can combine with ammonia or volatile organic compounds (VOCs) generated from other sources to form particles. These particles, known as secondary particles, make up most of the fine particle pollution in the country.

EPA regulates inhalable particles (fine and coarse) but not particles larger than 10 micrometers (sand and large dust). Fine particles ($PM_{2.5}$) are the major cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas.

[9] A list of studies and reports on air quality in the Treasure Valley is included in Appendix B.

As mentioned earlier, particle pollution contains microscopic solids or liquid droplets that are so small that they can cause serious health problems. The size of particles is directly linked to their potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. For the Treasure Valley, most $PM_{10}$ comes from either road dust generated by mobile sources on paved or unpaved roads or agricultural activities. Figure 2-1 identifies the main sources of $PM_{10}$ in the Treasure Valley.

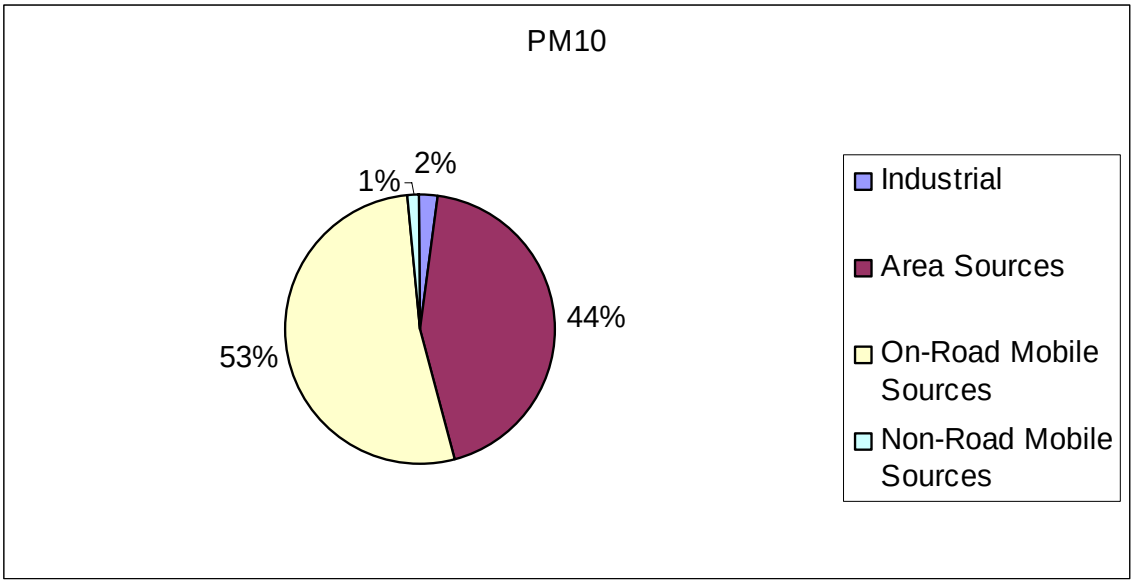


**Figure 2-1 Sources of $PM_{10}$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.)**

### 2.1.2 Sulfur Dioxide

Sulfur dioxide, or $SO_2$, belongs to the family of sulfur oxide gases ($SO_x$). These gases dissolve easily in water. Sulfur is prevalent in all raw materials, including crude oil, coal, and ore that contains common metals such as aluminum, copper, zinc, lead, and iron. $SO_x$ gases are formed when fuel that contains sulfur, such as coal or oil, is burned, gasoline is extracted from oil, or metals are extracted from ore. $SO_x$ dissolves in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

Nationally, over 65% of $SO_x$ released to the air, or more than 13 million tons per year, comes from electric utilities, especially those that burn coal. Other sources of $SO_x$ are industrial facilities that derive their products from raw materials, such as metallic ore, coal, and crude oil, or that burn coal or oil to produce heat. Examples are petroleum refineries, cement manufacturing facilities, and metal processing facilities. Also, locomotives, large ships, and some nonroad diesel equipment burn high sulfur fuel and release large quantities of $SO_x$ emissions to the air. For the Treasure Valley, most of the sulfur oxides released come from industrial sources, primarily from the combustion of solid (coal) or liquid (oil) fuels. Figure 2-2 identifies $SO_x$ sources in the Treasure Valley.

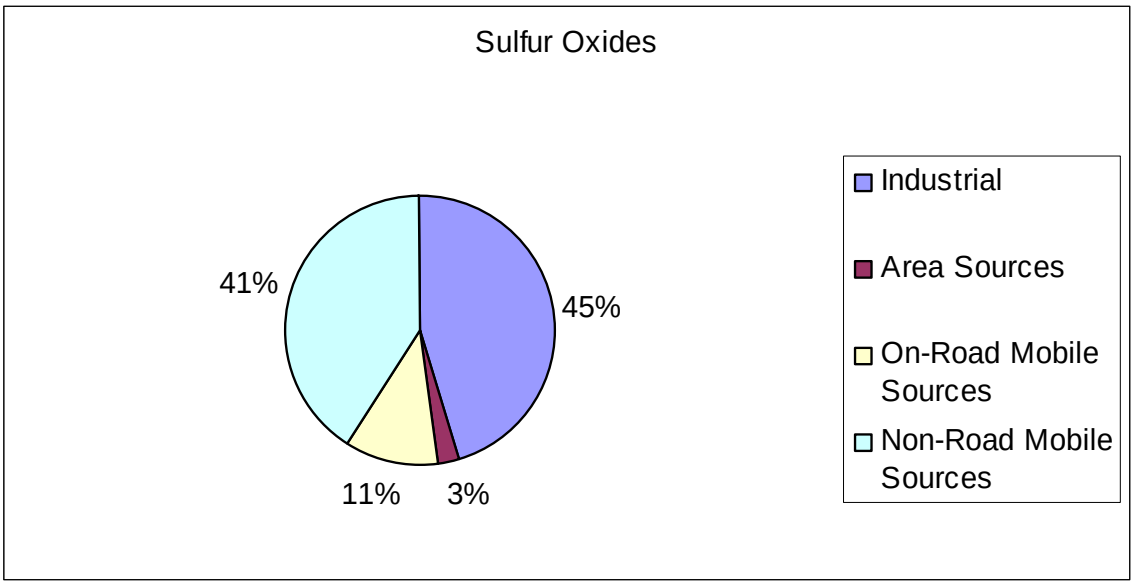


**Figure 2-2 Sources of $SO_x$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.)**

### 2.1.3 Nitrogen Oxides

Nitrogen oxides**,** or $NO_x$, are a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide ($NO_2$) along with particles in the air can often be seen as a reddish-brown layer over many urban areas. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary man-made sources of $NO_x$ are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. $NO_x$ can also be formed naturally. For the Treasure Valley, mobile sources (on-road and off-road) are the source for the vast majority of $NO_x$ emissions (Figure 2-3). Common off-road sources include commercial and industrial equipment, construction equipment, and agricultural machinery. Figure 2-3 identifies sources of $NO_x$ in the Treasure Valley.

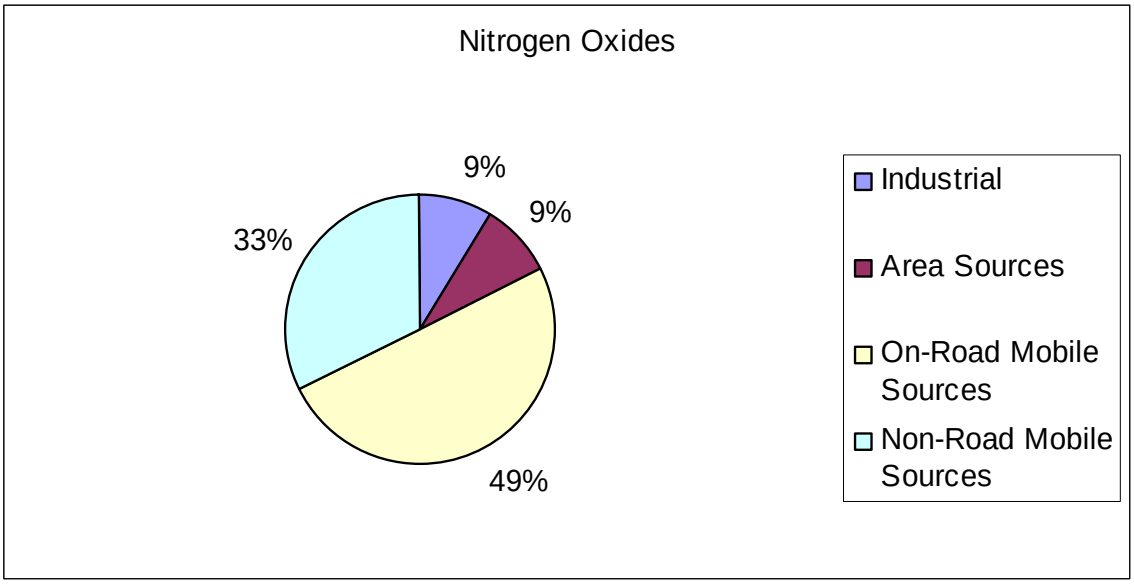


**Figure 2-3** **Sources of $NO_x$ in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.)**

### 2.1.4 Carbon Monoxide

Carbon monoxide, or CO, is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56% of all CO emissions nationwide. Other nonroad engines and vehicles (such as construction equipment and boats) contribute about 22% of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85% to 95% of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. Air pollution becomes trapped near the ground beneath a layer of warm air. As for $NO_x$ emissions, on-road and off-road mobile sources account for the majority of emissions; however, the majority of off-road mobile emissions come from the use of lawn and garden equipment. Figure 2-4 identifies sources of CO in the Treasure Valley.

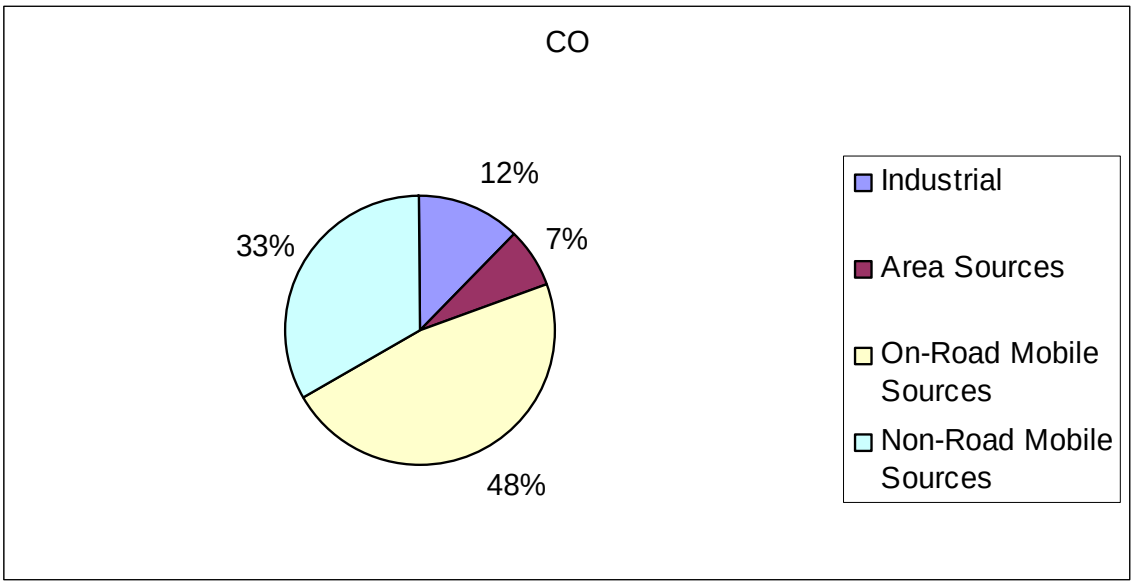


**Figure 2-4 Sources of CO in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.)**

### 2.1.5 Ozone and Volatile Organic Compounds

Ozone ($O_3$) is a gas composed of three oxygen atoms. It is not usually emitted directly into the air, but at ground level, $O_3$ is created by a chemical reaction between nitrogen oxides ($NO_x$) and volatile organic compounds (VOCs) in the presence of sunlight. Ozone has the same chemical structure whether it occurs miles above the earth or at ground level; it can be "good" or "bad," depending on its location in the atmosphere. "Good" ozone occurs naturally in the stratosphere approximately 10 to 30 miles above the earth's surface where it forms a layer that protects life on earth from the sun's harmful rays. In the earth's lower atmosphere, ground-level ozone has the potential to be harmful to human health and is considered "bad."

Motor vehicle exhaust, industrial emissions, gasoline vapors, and chemical solvents, as well as natural sources, emit $NO_x$ and VOC that help to form ozone. Area sources include biogenic sources (trees and vegetation) and commercial/retail locations (such as retail gas stations, fast-food restaurants, and print shops). Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air. As a result, it is known as a summertime air pollutant. Many urban areas have high levels of "bad" ozone, but even rural areas are subject to increased ozone levels because wind carries ozone and other pollutants hundreds of miles from their original sources. Figure 2-5 identifies the main sources of VOCs in the Treasure Valley.

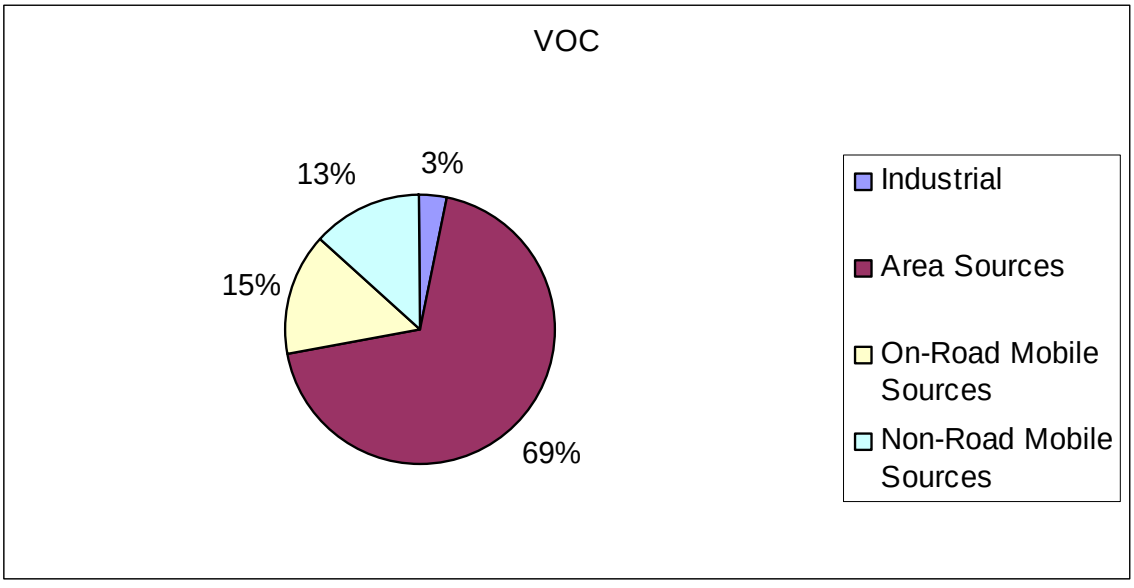


**Figure 2-5 Sources of VOCs in Ada and Canyon Counties (ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.)**

### 2.1.6 Ammonia

Ammonia ($NH_3$) is a gas that comes from both man-made and natural sources. Ammonia is produced by natural biological decomposition processes.[10,11] Man-made sources include chemical- and food-processing industries, agricultural sources such as dairies and beef cattle feedlots, and other smaller sources. Except at very high concentrations, ammonia is primarily an eye and nasal irritant. However, ammonia can combine with nitric acid and sulfuric acid to form fine particles, such as $PM_{2.5}$.

### 2.1.7 Hazardous/Toxic Air Pollutants

Other air contaminants, which come from a variety of sources, are referred to as either hazardous or toxic air pollutants**.** These pollutants are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Some of these toxic air pollutants are benzene, which is found in gasoline; perchlorethlyene, which is emitted from some dry-cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Other listed air toxics include mercury, chromium, and lead compounds.

### 2.1.8 Emissions Inventory

Emissions from all types of sources (industry, commercial, mobile and area sources) are compiled into a document referred to as an emissions inventory. Emissions inventories can be prepared for various purposes. The most common compilation is an annual emissions inventory in which emissions for a specific calendar year are presented (see Table 2-1). Emissions inventories can also be prepared for specific air quality events such as episodic exceedances of an air quality standard. Table 2-2 shows an emissions inventory for an episodic event.

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[10] Godish, Thad. 1991. *Air Quality*. Lewis Publishers, Chelsa, MI. p. 40.

[11] Finlayson-Pitts, Barbara, and James Pitts. *Atmospheric Chemistry*. Wiley Interscience, NY. p. 547.

**Table 2-1 1999 annual emission inventories, Ada and Canyon Counties combined**

| Source Category | $PM_{10}$ | | $NO_x$ | | $SO_x$ | | $NH_3$ | | VOC | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total |
| **Industrial point sources** | 1,173 | 2.3 | 1,796 | 9.0 | 1,715 | 45.2 | 405 | 5.9 | 1,164 | 3.4 | 1,984 | 1.4 |
| **Area Sources** | 21,775 | 43.6 | 1,734 | 8.7 | 103 | 2.7 | 6,260 | 91.3 | 23,313 | 68.4 | 11,798 | 8.3 |
| Residential wood combustion | 526 | 1.1 | 48 | 0.2 | 7 | 0.2 | 0 | 0.0 | 2,209 | 6.5 | 3,831 | 2.7 |
| Other fuel combustion | 147 | 0.3 | 871 | 4.4 | 61 | 1.6 | 7 | 0.1 | 41 | 0.1 | 482 | 0.3 |
| Open burning | 2,094 | 4.2 | 254 | 1.3 | 35 | 0.9 | 0 | 0.0 | 1,754 | 5.1 | 7,485 | 5.2 |
| Agricultural activities | 15,746 | 31.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Other fugitive dust | 3,262 | 6.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Ammonia sources | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6,253 | 91.2 | 0 | 0.0 | 0 | 0.0 |
| Biogenic emissions | 0 | 0.0 | 561 | 2.8 | 0 | 0.0 | 0 | 0.0 | 11,090 | 32.5 | 0 | 0.0 |
| VOC sources | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 8,219 | 24.1 | 0 | 0.0 |
| **On-road mobile sources** | 26,357 | 52.8 | 9,932 | 49.7 | 418 | 11.0 | 184 | 2.7 | 5,052 | 14.8 | 75,303 | 52.7 |
| Vehicle emissions (exhaust, tire wear, & brake wear) | 382 | 0.8 | 9,932 | 49.7 | 418 | 11.0 | 184 | 2.7 | 5,052 | 14.8 | 75,303 | 52.7 |
| Fugitive road dust | 25,975 | 52.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Nonroad mobile sources | 635 | 1.3 | 6,505 | 32.6 | 1,559 | 41.1 | 10 | 0.1 | 4,545 | 13.3 | 53,899 | 37.7 |
| Aircraft | 12 | 0.0 | 154 | 0.8 | 19 | 0.5 | 0 | 0.0 | 320 | 0.9 | 6,015 | 4.2 |
| Airport ground support equipment | 5 | 0.0 | 88 | 0.4 | 13 | 0.3 | 0 | 0.0 | 108 | 0.3 | 2,071 | 1.4 |
| Lawn & garden equipment | 110 | 0.2 | 470 | 2.4 | 100 | 2.6 | 1 | 0.0 | 2,555 | 7.5 | 28,008 | 19.6 |
| Recreational equipment | 4 | 0.0 | 25 | 0.1 | 5 | 0.1 | 0 | 0.0 | 179 | 0.5 | 2,376 | 1.7 |
| Commercial & industrial equipment | 101 | 0.2 | 1,103 | 5.5 | 269 | 7.1 | 3 | 0.0 | 475 | 1.4 | 10,831 | 7.6 |
| Construction & mining equipment | 213 | 0.4 | 1,903 | 9.5 | 591 | 15.6 | 2 | 0.0 | 367 | 1.1 | 2,383 | 1.7 |
| Agricultural equipment | 164 | 0.3 | 2,062 | 10.3 | 492 | 13.0 | 2 | 0.0 | 327 | 1.0 | 1,685 | 1.2 |
| Recreational marine vessels | 8 | 0.0 | 14 | 0.1 | 5 | 0.1 | 0 | 0.0 | 186 | 0.5 | 451 | 0.3 |
| Locomotives & railroad equipment | 18 | 0.0 | 686 | 3.4 | 65 | 1.7 | 0 | 0.0 | 30 | 0.1 | 79 | 0.1 |
| **Total** | **49,939** | | **19,967** | | **3,795** | | **6,859** | | **34,074** | | **142,984** | |

Source: ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.

**Table 2-2 1999 episode emission inventories, Ada and Canyon Counties combined, for the highest concentration day (Friday, December 24)**

| Source Category | $PM_{10}$ | | $NO_x$ | | $SO_x$ | | $NH_3$ | | VOC | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/ day | % of total | tons/ day | % of total | tons/ day | % of total | tons/ day | % of total | tons/ day | % of total | tons/ day | % of total |
| **Industrial point sources** | 2.19 | 3.0 | 7.38 | 18.3 | 10.01 | 80.3 | 1.77 | 10.6 | 1.94 | 3.7 | 16.70 | 5.3 |
| **Area sources** | 5.60 | 7.6 | 4.83 | 12.0 | 0.38 | 3.0 | 14.48 | 87.1 | 33.97 | 65.1 | 39.25 | 12.4 |
| Residential wood combustion | 5.06 | 6.9 | 0.46 | 1.1 | 0.07 | 0.6 | 0.00 | 0.0 | 21.71 | 41.6 | 36.88 | 11.6 |
| Other fuel combustion | 0.52 | 0.7 | 3.69 | 9.1 | 0.31 | 2.5 | 0.03 | 0.2 | 0.19 | 0.4 | 2.32 | 0.7 |
| Open burning | 0.02 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.01 | 0.0 | 0.05 | 0.0 |
| Agricultural activities | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| Other fugitive dust | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| Ammonia sources | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 14.45 | 86.9 | 0.00 | 0.0 | 0.00 | 0.0 |
| Biogenic emissions | 0.00 | 0.0 | 0.67 | 1.7 | 0.00 | 0.0 | 0.00 | 0.0 | 2.87 | 5.5 | 0.00 | 0.0 |
| VOC sources | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 9.19 | 17.6 | 0.00 | 0.0 |
| **On-road mobile sources** | 65.43 | 88.7 | 21.90 | 54.3 | 0.84 | 6.7 | 0.37 | 2.2 | 11.87 | 22.8 | 203.57 | 64.2 |
| Vehicle emissions (exhaust, tire wear, & brake wear) | 0.41 | 0.6 | 21.90 | 54.3 | 0.84 | 6.7 | 0.37 | 2.2 | 11.87 | 22.8 | 203.57 | 64.2 |
| Fugitive road dust | 65.02 | 88.2 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| Nonroad mobile sources | 0.51 | 0.7 | 6.26 | 15.5 | 1.24 | 9.9 | 0.01 | 0.1 | 4.39 | 8.4 | 57.80 | 18.2 |
| Aircraft | 0.03 | 0.0 | 0.42 | 1.0 | 0.05 | 0.4 | 0.00 | 0.0 | 0.88 | 1.7 | 16.48 | 5.2 |
| Airport ground support equipment | 0.01 | 0.0 | 0.27 | 0.7 | 0.01 | 0.1 | 0.00 | 0.0 | 0.30 | 0.6 | 5.54 | 1.7 |
| Lawn & garden equipment | 0.06 | 0.1 | 0.21 | 0.5 | 0.04 | 0.3 | 0.00 | 0.0 | 1.54 | 3.0 | 13.54 | 4.3 |
| Recreational equipment | 0.01 | 0.0 | 0.05 | 0.1 | 0.01 | 0.1 | 0.00 | 0.0 | 0.32 | 0.6 | 4.09 | 1.3 |
| Commercial & industrial equipment | 0.16 | 0.2 | 1.62 | 4.0 | 0.44 | 3.5 | 0.00 | 0.0 | 0.74 | 1.4 | 15.59 | 4.9 |
| Construction & mining equipment | 0.12 | 0.2 | 1.11 | 2.7 | 0.35 | 2.8 | 0.00 | 0.0 | 0.21 | 0.4 | 1.37 | 0.4 |
| Agricultural equipment | 0.05 | 0.1 | 0.69 | 1.7 | 0.17 | 1.3 | 0.00 | 0.0 | 0.12 | 0.2 | 0.54 | 0.2 |
| Recreational marine vessels | 0.01 | 0.0 | 0.02 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.19 | 0.4 | 0.46 | 0.1 |
| Locomotives & railroad equipment | 0.05 | 0.1 | 1.87 | 4.6 | 0.17 | 1.4 | 0.00 | 0.0 | 0.08 | 0.2 | 0.20 | 0.1 |
| Total | 73.74 | | 40.36 | | 12.46 | | 16.62 | | 52.16 | | 317.32 | |

Source: ENVIRON. *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*. 2002.

## *2.2 Air Quality Standards*

The Clean Air Act originally passed in 1970 and, as implemented by EPA, established ambient air quality criteria for six pollutants: PM, $SO_2$, $NO_2$ or $NO_x$, CO, $O_3$, and lead. For these criteria pollutants, EPA has established national ambient air quality standards (NAAQS). The primary NAAQS represent air quality conditions necessary to protect public health. EPA periodically reviews and makes changes to the standards. In recent years, EPA has developed a standard for particulates smaller than 10 micrometers in diameter ($PM_{10}$) and for those smaller than 2.5 micrometers in diameter ($PM_{2.5}$).

NAAQS are essentially the maximum acceptable ambient concentrations of criteria pollutants in the atmosphere. They are uniform targets against which the ambient air quality of all areas of the country is measured. In one sense, they are the foundation of the air quality program. Each state is to develop a strategy (known as a state implementation plan, or SIP) to achieve and maintain compliance with the NAAQS.

The current NAAQS are listed in Table 2-3. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air ($mg/m^3$), and micrograms per cubic meter of air ($\mu g/m^3$). On December 20, 2005, EPA published a proposal to tighten federal PM standards. EPA took final agency action on September 21, 2006, lowering the $PM_{2.5}$ 24-hour standard nearly 50%, from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. This new standard became effective December 18, 2006. By September 2007, IDEQ must submit to EPA its recommendations for attainment or nonattainment designation for Ada and Canyon Counties for the new $PM_{2.5}$ standard. This new standard heightens the need to take proactive measures to reduce the formation of $PM_{2.5}$ in the Treasure Valley airshed.

**Table 2-3 National Ambient Air Quality Standards (NAAQS)**

| Pollutant | Primary Standards | Averaging Times | Secondary Standards |
|---|---|---|---|
| Carbon monoxide | 9 ppm (10 mg/$m^3$) | 8-hour[a] | None |
| | 35 ppm (40 mg/$m^3$) | 1-hour[a] | None |
| Lead | 1.5 µg/$m^3$ | Quarterly average | Same as primary |
| Nitrogen dioxide | 0.053 ppm (100 µg/$m^3$) | Annual (arith. mean) | Same as primary |
| Particulate matter ($PM_{10}$) | 150 µg/$m^3$ | 24-hour[a] | |
| Particulate matter ($PM_{2.5}$) | 15.0 µg/$m^3$ | Annual[c] (arith. mean) | Same as primary |
| | 35 µg/$m^3$ | 24-hour[d] | |
| Ozone | 0.08 ppm | 8-hour[e] | Same as primary |
| Sulfur oxides | 0.03 ppm | Annual (arith. mean) | — |
| | 0.14 ppm | 24-hour[1] | — |
| | — | 3-hour[1] | 0.5 ppm (1,300 µg/$m^3$) |

[a] Not to be exceeded more than once per year.

[b] To attain this standard, the 3-year average of the weighted annual mean $PM_{10}$ concentration at each monitor within an area must not exceed 50 µg/$m^3$.

[c] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/$m^3$.

[d] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/$m^3$.

[e] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

Reference: Chapter 40, Code of Federal Register § 50.4-50.12.

Hazardous air pollutants are treated separately. The Clean Air Act not only established a list of hazardous air pollutants including benzene, vinyl chloride, mercury, and others, but it also created a special program to regulate industries that emit hazardous air pollutants. Unlike criteria pollutants subject to the standards in Table 2-3, no ambient air standards exist for hazardous air pollutants. The hazardous air pollutant program focuses on reducing emissions of hazardous air pollutants to the maximum achievable level.

## *2.3 Nonattainment of National Ambient Air Quality Standards*

For air quality purposes, areas of the country are designated as unclassifiable, attainment, or nonattainment. Areas for which ambient air quality monitoring shows exceedances of the NAAQS (Table 2-3) are designated as nonattainment. When an area (airshed) is designated as nonattainment, the SIP needs to be revised to include specific measures that will be implemented to achieve the NAAQS. The SIP must also contain contingency measures that will be implemented if reasonable progress is not made toward achieving the NAAQS.

There are several implications if the Treasure Valley becomes a nonattainment area. First, a nonattainment designation is an official statement that the air quality is unhealthy. As discussed above, EPA is required under the Clean Air Act to establish the NAAQS at levels that will protect public health. Unhealthy air is likely to cause more asthma complications, increased emergency room visits, and other known health impacts on people. In addition to the direct impact on human health, unhealthy air has an economic cost in the form of more lost work days and higher medical costs. Further, unhealthy air may factor into whether families and businesses relocate to the Treasure Valley.

A nonattainment designation also triggers a number of additional legal requirements for state and local agencies and businesses:

1. **New emission standards for existing sources**. In nonattainment areas, existing sources of air pollution have to install what is known as Reasonably Available Control Technology (RACT). RACT is reasonably available pollution-control technology that takes technological and economic feasibility into account. Reasonably Available Control Measures (RACM) have to be applied to area and fugitive sources of emissions.

2. **Tighter permitting requirements**. In nonattainment areas, industries face tighter air quality permitting requirements for building new facilities or modifying existing facilities. Generally speaking, to construct or modify a large facility, companies must install pollution controls (known as lowest achievable emission rate, or LAER) that are as good as the best controls achieved anywhere. In addition, those companies need to show that their additional pollution is offset by

reduced pollution from other facilities. Often, these "offsets" are purchased on a pollution credits market or from an air pollution credit "bank."

Compliance with these requirements is expensive and time consuming. To avoid the requirement, companies may choose to construct their facilities in other areas or not to expand existing facilities.

3. **Additional requirements for planning and analysis**. The IDEQ would be required to draft and implement a specific plan to address nonattainment in the Treasure Valley. The plan, which would include the elements described above, must be enforceable and show what IDEQ and the regulated public would do to make progress toward (and ultimately attain) the NAAQS under deadlines set by EPA. Local planning and transportation agencies would have to show that transportation projects conformed to the air quality goals of IDEQ's plan. If transportation projects did not conform to these air quality goals, federal highway funds could be withheld for those projects. If reasonable progress was not achieved toward meeting the NAAQS, sanctions could be imposed, including even more stringent permitting requirements and possible withholding of federal highway funds.

In summary, an airshed that is designated as nonattainment results in new, costly requirements. These requirements divert both business and agency (such as IDEQ and COMPASS) resources from economic growth activities and collaborative air quality improvement measures. They also result in a new set of requirements on the regulated public.

## *2.4 Air Permitting for Industrial Sources*

Idaho's natural resources belong to all of us, and all citizens have a right to clean air, water, and land. The purpose of environmental permits is to protect public health and the environment. Permits establish the conditions under which facilities that generate pollution may operate. Permits represent a contract between businesses and the government that the facilities will comply with applicable state and federal pollution-control laws. A significant amount of IDEQ's air program resources are focused on regulating stationary sources.

Under the federal Clean Air Act and the *Rules for the Control of Air Pollution in Idaho*, any business or industry (source) in Idaho that emits or has the potential to emit pollutants into the air is required to have an air pollution-control permit. Permits are issued when new sources begin operation and when existing sources modify their facilities. IDEQ is the state agency delegated to issue air quality permits in Idaho. Permits require sources to comply with all health- and technology-based standards established by EPA and the *Rules for the Control of Air Pollution in Idaho*. If an applicant demonstrates compliance with all applicable federal and state air pollution laws and regulations, IDEQ is required by law to issue an air permit.

The permit and accompanying technical analysis include the following detailed information:

- What type(s) of pollutants may be released
- How much may be released
- How the facility will comply with air pollution-control rules
- How pollutants will be monitored

IDEQ issues four types of air quality permits: Permit to Construct (PTC), Tier I operating permit, Tier II operating permit, and Permit by Rule (PBR).

An air quality PTC is required prior to construction or modification of stationary sources, such as buildings, structures, and other installations that emit or may emit pollutants into the air. A PTC is also required for certain portable equipment such as generators, crushing equipment, asphalt plants, and concrete batch plants. For very large sources of pollution, the PTC process is extremely complex and rigorous.

A Tier I operating permit (also known as a Title V operating permit) is required by the federal Clean Air Act for major sources. Major sources are those sources that emit or may emit 100 or more tons per year of any regulated air pollutant, 10 or more tons per year of any one hazardous air pollutant, or 25 or more tons per year of any combination of hazardous air pollutants. Minor or area sources that are subject to New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants may also be required to obtain Tier I permits in the future, although they are only required to register with IDEQ at this time. The Tier I operating permit program is funded entirely by fees paid by Tier I permittees.

Certain facilities that emit air pollution in Idaho may choose to limit production and/or hours of operation, thus lowering their potential to emit pollutants below Tier I permit thresholds and qualifying them for Tier II operating permits. In other cases, IDEQ may require certain sources of air pollution to obtain Tier II permits. Fees for Tier II permits are lower and the reporting requirements less complex than those required for Tier I operating permits.

A PBR is a streamlined registration process that enables qualified applicants to bypass obtaining a PTC or Tier II operating permit before beginning operation. Currently, PBRs are available only to nonmetallic mineral-processing plants (portable rock-crushing facilities) and dairies. PBRs for other industries are being considered.

Violation of the permit provisions can result in enforcement action, including monetary penalties.

# 3 TREASURE VALLEY AIR QUALITY

## *3.1 Historical and Current Air Quality Issues*

### 3.1.1 Carbon Monoxide

Carbon monoxide, or CO, has been monitored in downtown Boise since 1977 and in downtown Nampa from December 1998 to January 2006. The primary source of CO in the Treasure Valley is motor vehicles (on-road and nonroad mobile sources), accounting for an estimated 90% of annual emissions and 83% of winter emissions.[12]

In the past, there were numerous violations of the 8-hour NAAQS for CO in Ada County, which resulted in a CO nonattainment designation in 1978. At that time, exceedances of the 8-hour CO NAAQS were measured up to 80 days per year, with 8-hour average concentrations reaching as high as two times the allowable amount.

CO levels in Ada County have dropped since the 1970s (Figure 3-1). The Ada County vehicle inspection and maintenance program, along with federal emissions standards for new vehicles, has radically decreased CO emissions from motor vehicles. Efforts to increase the use of alternative transportation, as well as improvements in traffic flow in downtown Boise, have reduced congestion and eliminated opportunities for CO pollution to build up in hotspot areas. The last exceedances of the NAAQS for CO were in January 1991.

[12] *Final Report: Development of Base and Future Year Emission Inventories for the Northern Ada County $PM_{10}$ Maintenance Plan*

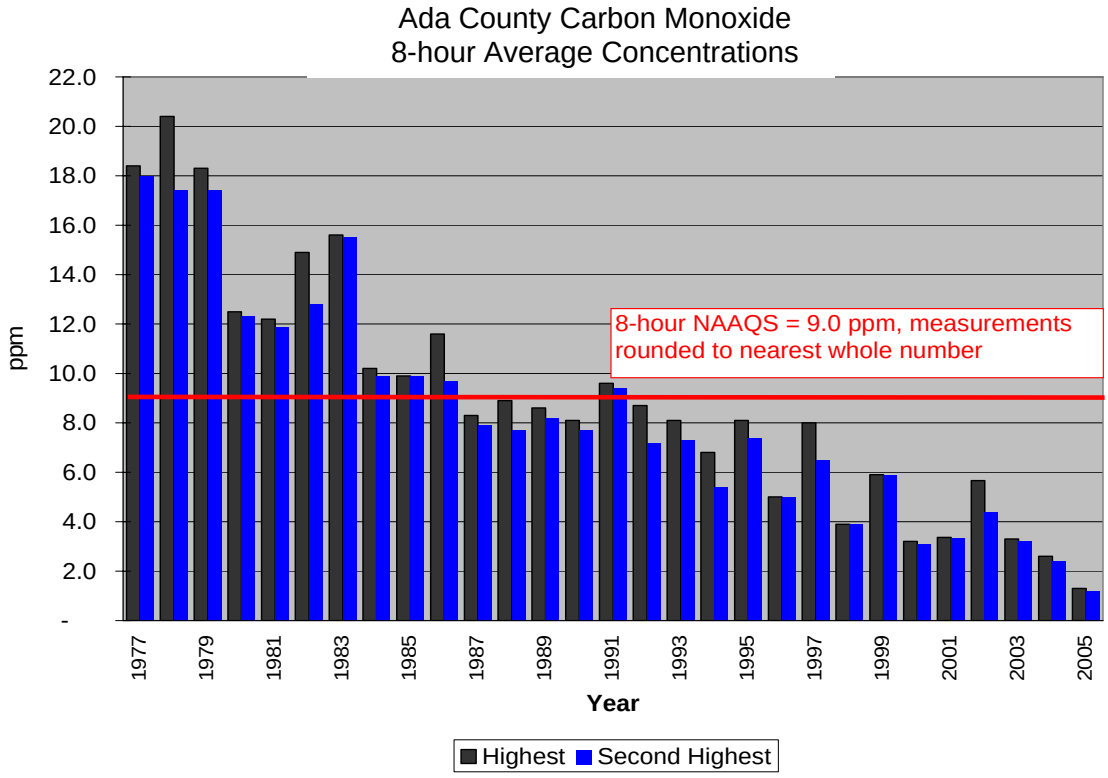


**Figure 3-1 Ada County 8-hour average CO concentrations (NAAQS compliance determined by second highest value during the year)**

### 3.1.2 Particulate Matter

Coarse particulate matter, or $PM_{10}$, in the Treasure Valley comes from many sources, including agricultural activities, smoke, and roadway dust. The federal standard for $PM_{10}$ (24-hour average) is 150 µg/$m^3$. Levels of $PM_{10}$ have been monitored in Ada County since 1986. Northern Ada County was designated a $PM_{10}$ nonattainment area in 1990. IDEQ research showed that the primary source of $PM_{10}$ in Ada County was smoke from wood burning. A number of measures were put in place to reduce $PM_{10}$ emissions:

- Restrictions on residential wood burning
- Enforcement of burning bans
- New emission limitations on existing and new industrial sources
- Measures regarding road sweeping and road paving

As of result of implementing these measures, no exceedances of the $PM_{10}$ standard have been measured since January 7, 1991. Monitoring data show that Ada County's $PM_{10}$ levels have improved over the last decade (Figures 3-2 and 3-3). Ada County is currently designated a maintenance area and has an approved $PM_{10}$ maintenance plan.

IDEQ began monitoring $PM_{10}$ in Canyon County in 1993. Levels there closely match those found in Ada County.

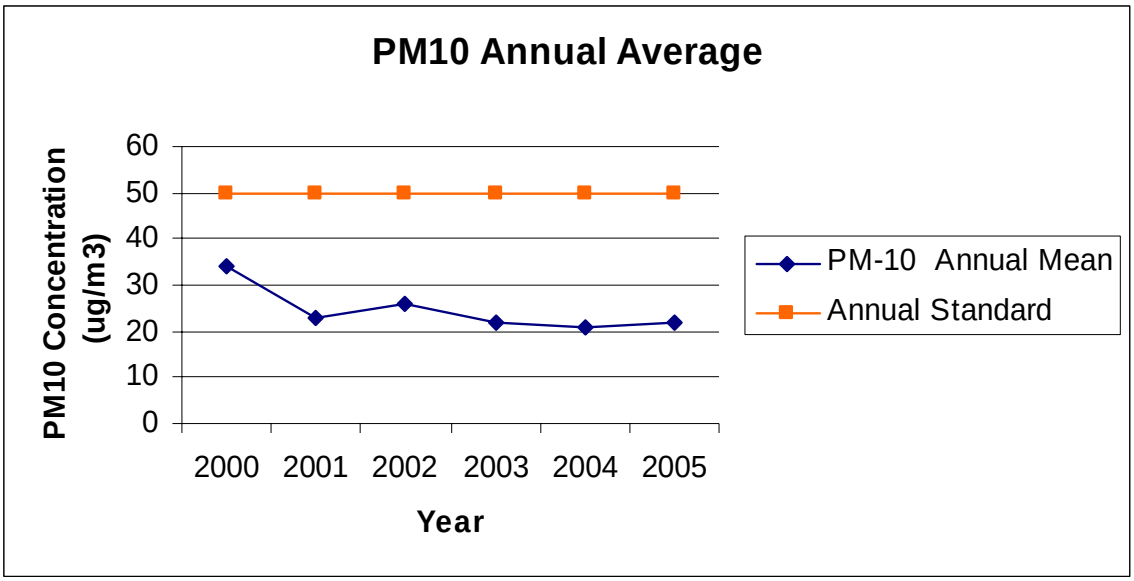


**Figure 3-2 Annual average $PM_{10}$ concentrations for Ada County**

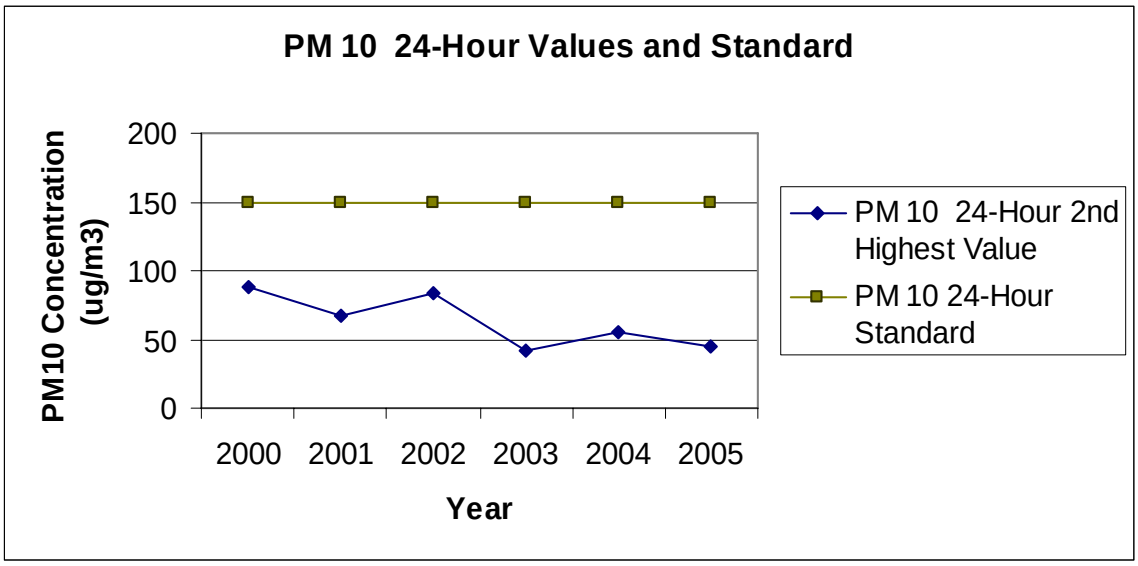


**Figure 3-3 24-hour $PM_{10}$ values and standard for Ada County**

## *3.2 Future Air Quality Concerns*

Although the Treasure Valley has been successful in reducing CO and $PM_{10}$ concentrations, rapid growth in the area and proposed modifications to EPA's air quality standards pose new challenges. Recent monitoring shows two primary pollutants of concern—fine particulate matter ($PM_{2.5}$) and ozone ($O_3$). Continued degradation of air quality in the Treasure Valley raises the possibility of an $O_3$ or $PM_{2.5}$ nonattainment designation. Nonattainment for either pollutant may affect public health and impact the economy and development of the region.

### 3.2.1 Fine Particulate Matter

Measurements of $PM_{2.5}$ are recorded daily at all air quality monitoring locations in the Treasure Valley. In December 2002, Ada and Canyon Counties experienced exceedances of the $PM_{2.5}$ 24-hour standard. Unlike coarse particles ($PM_{10}$) and CO, which can be effectively controlled by relatively simple measures, reducing $PM_{2.5}$ pollution is a much more complex task requiring a multifaceted approach.

Although $PM_{2.5}$ pollution is monitored continuously throughout the year, it is primarily a winter problem in the Treasure Valley. The season of major concern is from November 1 through March 31. $PM_{2.5}$ can exist at unhealthy levels when the Treasure Valley experiences strong temperature inversions, which trap air in the airshed and allow pollution levels to build. Nitrogen oxides ($NO_x$), sulfur oxides ($SO_x$), and ammonia ($NH_3$) contribute to the formation of $PM_{2.5}$ pollution. Analysis of IDEQ monitoring data indicates that, during recent winter stagnation events, the atmosphere was ammonia rich, creating prime conditions to chemically form $PM_{2.5}$. Monitoring data show compliance with the annual standard (Figure 3-4).

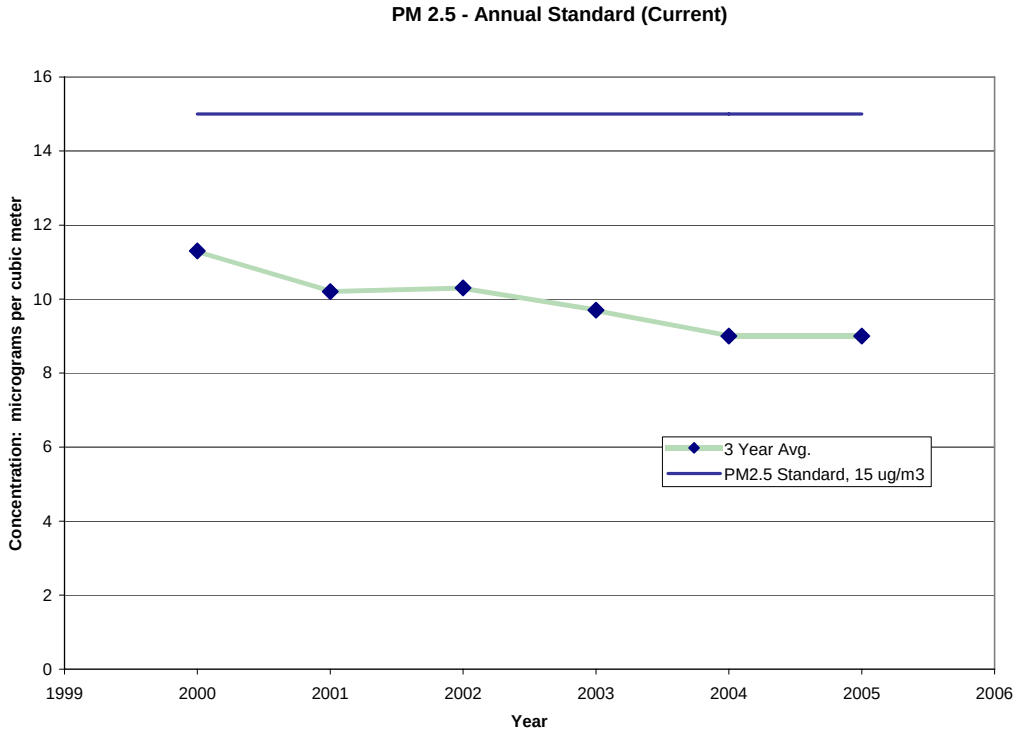


**Figure 3-4 Annual $PM_{2.5}$ values and standard**

EPA's new final standard for $PM_{2.5}$ (24-hour) requires designation of attainment or nonattainment. IDEQ provides a recommendation to EPA on attainment/nonattainment status based on the last three years of monitoring data (2004–2006). EPA then makes a decision on that recommendation. As demonstrated in Figure 3-5, $PM_{2.5}$ concentrations for the Treasure Valley airshed are near the new standard, meaning that the airshed could be designated as nonattainment. Figure 3-5 identifies the old $PM_{2.5}$ standard and the new one. Multifaceted control strategies are required to ensure compliance with the new $PM_{2.5}$ standard.

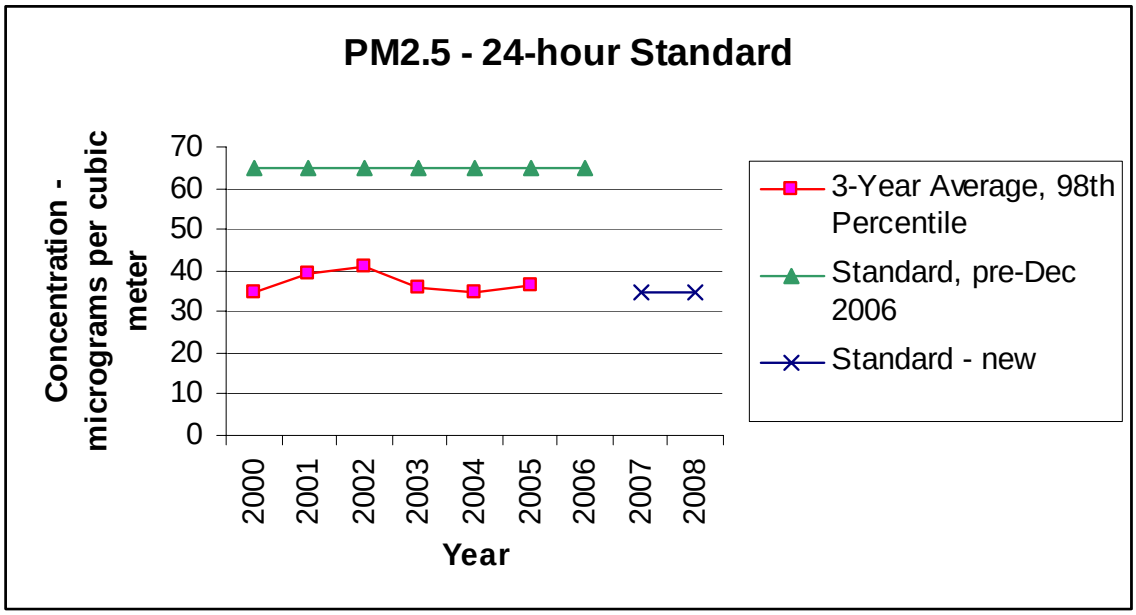


**Figure 3-5 24-hour standard for $PM_{2.5}$**

### 3.2.2 Ozone

Ozone ($O_3$,) levels are measured during the summer (May–September) at three locations in the Treasure Valley. IDEQ began monitoring ozone at two sites in Ada County in 2001 and one location in Canyon County in 2002. Figure 3-6 identifies the 3-year fourth highest average ozone concentrations the years 2003 through 2005. Individual measurements of the 8-hour average ozone concentration exceeded 0.08 ppm twice in 2001, five times in 2002, and once in 2003. These measured values raise the possibility of an ozone nonattainment designation for the Treasure Valley. Like $PM_{2.5}$, ozone formation is the result of a number of pollutants. Volatile organic compounds (VOCs) and $NO_x$ are the primary contributors to the formation of ozone. As with $PM_{2.5}$, a multifaceted control strategy that addresses multiple pollutants is required to ensure compliance with the ozone standard.

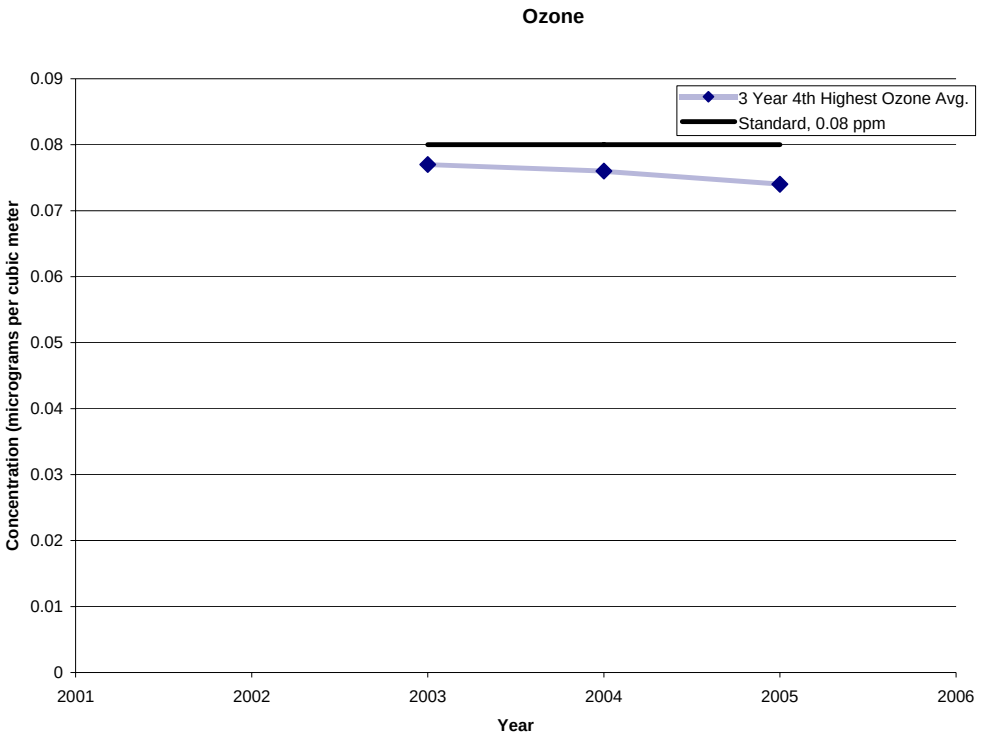


**Figure 3-6 8-hour standard for ozone**

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# 4 PREDICTED FUTURE AIR EMISSIONS AND AIR QUALITY

## *4.1 Demographic Changes*

It is estimated that almost one million people will be living and working in the airshed by 2030. During this same period, Ada County's population is expected to increase to 556,900, a jump of almost 174,000 people (a population almost equal to present-day Canyon County). Similarly, Canyon County's population is expected to more than double. Neighboring Boise, Elmore, Gem, and Payette Counties will also see large population increases by 2030. Approximately 70% of Idaho's projected growth is anticipated in the six-county region. Projected 2030 populations for each of these six counties are given in Table 4-1.

**Table 4-1 2030 projected growth by county**

| County | 2000 Population[a] | 2030 Population[b] | Population Increase (%) |
|---|---|---|---|
| Ada | 300,904 | 556,900 | 85 |
| Canyon | 131,441 | 268,100 | 104 |
| **Subtotal** | **432,345** | **825,000** | **91** |
| Boise | 6,670 | 28,900 | 333 |
| Elmore | 29,100 | 53,700 | 85 |
| Gem | 15,220 | 32,400 | 113 |
| Payette | 20,630 | 38,300 | 86 |
| **Six County Total** | **503,965** | **978,300** | **94** |
| Idaho | 1,293,953 | 1,969,624 | 52 |
| Region % of state | 39 | 50 | 11 |

[a] 2000 population from the U.S. Census Bureau

[b] Growth forecast for Idaho in 2030 obtained from U.S. Census Bureau (www.census.gov/population/projections/PressTab1.xls)

Source: COMPASS, Chapter 2 of *Communities in Motion*. 2006.

Planning for this high level of growth presents many challenges for utilities, state agencies, and local governments. As the metropolitan planning organization for Ada and Canyon Counties, the Community Planning Association of Southwest Idaho, or COMPASS, has recently developed a long-range transportation plan for this six-county region in southwestern Idaho. Development of this plan, *Communities in Motion*, followed a process that departed from previous long-range transportation plans in its

exploration of different patterns of growth and their effects on transportation. This plan was based on the theory that, if communities can decide how and where new growth should happen, they can develop better plans to support that growth.

COMPASS held a series of public workshops on how future growth might unfold. Participants overwhelmingly favored land-use patterns that consumed less land, preserved open spaces, brought jobs closer to homes, and provided opportunities for alternative transportation, including transit, walking and biking. COMPASS took the input from these sessions and produced a growth scenario endorsed by the local jurisdictions in Ada and Canyon Counties. This scenario, "Community Choices," combines modest land-use intensification/densification along transportation corridors with additional employment and population growth in outlying communities. Less suburban residential development is anticipated in this growth scenario. With more infill development (and thus increased housing units per acre of land) along transportation corridor areas, this scenario consumes less land by 2030 than the current development trend. Figures 4-1 and 4-2 highlight 2030 household growth as a function of current development trends and the "Community Choices" scenario on which *Communities in Motion* is based. *Communities in Motion* can be obtained from www.compassidaho.org.

*Communities in Motion* was developed in coordination with another project, *Blueprint for Good Growth*. While *Communities in Motion* primarily addresses transportation needs across the six-county area, *Blueprint for Good Growth* focuses on Ada County and addresses a broader range of issues. Furthermore, *Blueprint for Good Growth* will develop necessary amendments to comprehensive plans and ordinances of those entities involved. These amendments will be needed to implement land-use policies to carry out the selected growth scenario. More information on this project can be found at www.blueprintforgoodgrowth.com.

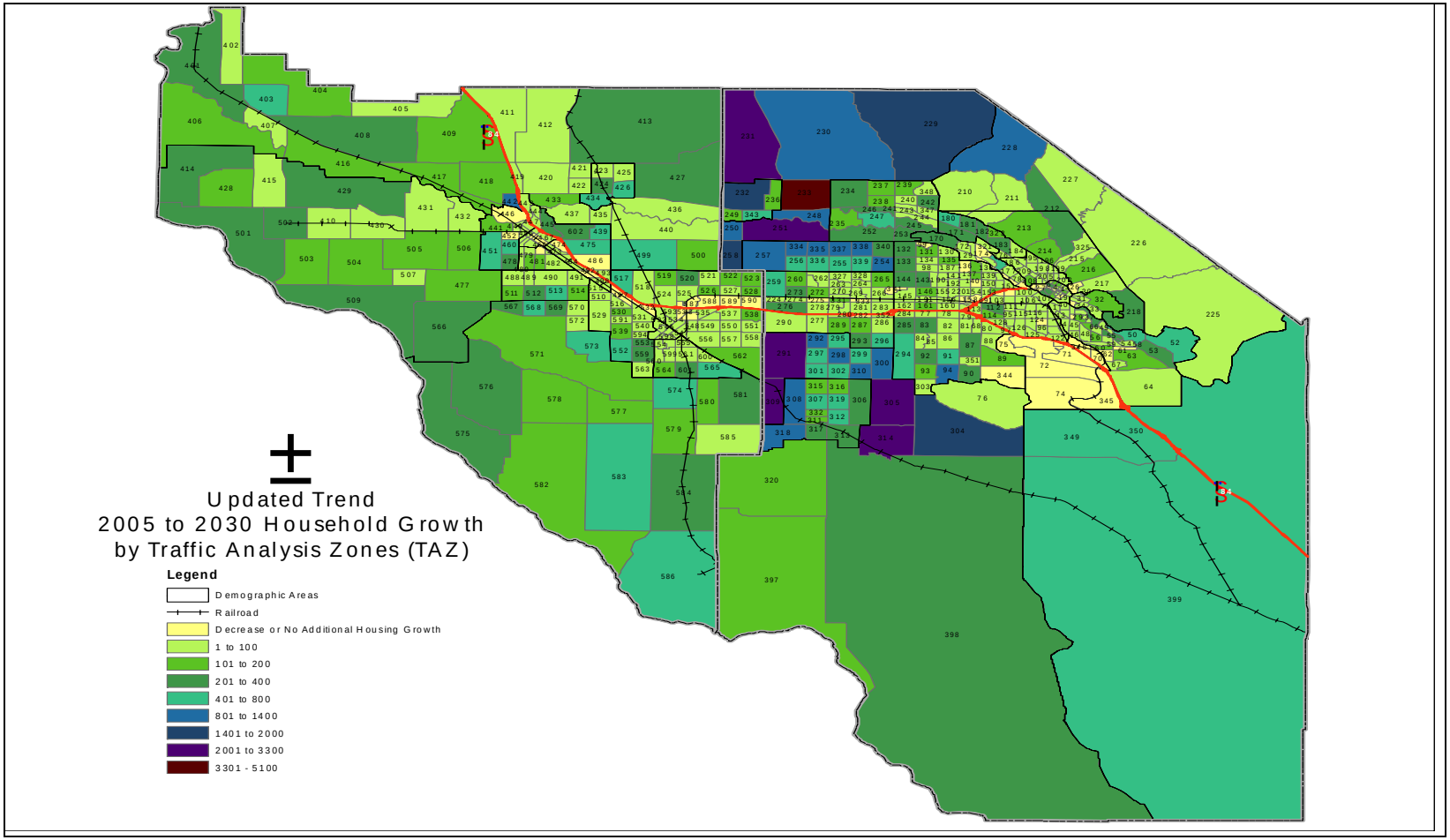


**Figure 4-1 Household growth based on current growth trends**

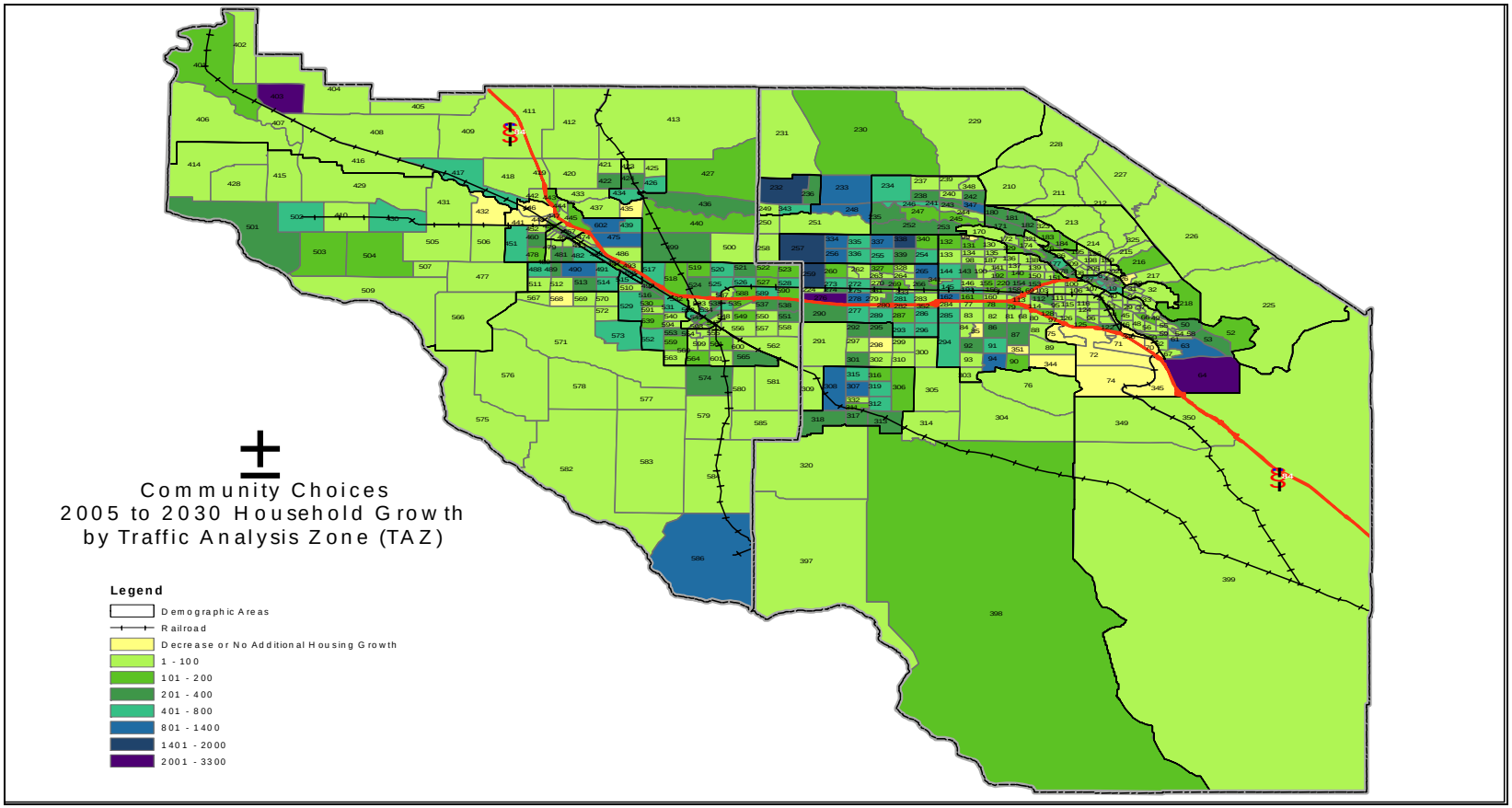


**Figure 4-2 Household growth based on the "Community Choices" scenario of *Communities in Motion***

### 4.1.1 Industrial and Commercial Development

The estimated 91% increase in population by 2030 will produce a corresponding, but not necessarily equal, increase in industrial and commercial development. For instance, between 1990 and 2006, the population of Meridian increased from 9,596 to an estimated 66,565, a 594% increase. During the same period of time, Meridian issued 482 new commercial and industrial building permits. More people mean more industrial and commercial development.

An increase in population may not necessarily produce an increase in large air pollution sources. Based on economic development trends, new large sources of air emissions are not anticipated for the Treasure Valley.[13] However, the anticipated increase in the Treasure Valley population base will undoubtedly produce an increase in numerous small and medium-sized air pollution sources. Those sources include but are not limited to 1) residential, commercial, industrial, and road construction activities; 2) wood and metal manufacturing facilities; 3) sand and gravel operations; 4) concrete and asphalt batch plants; 5) automotive repair shops; 6) restaurants; 7) painting and refinishing facilities; 8) dry-cleaning stores; and 9) printing shops. Obtaining emissions reductions from these numerous small to medium-sized sources will present a challenge to both regulators and the regulated community.

### 4.1.2 Agricultural and Other Development

Large areas of farmland in the Treasure Valley have been paved over and converted to homes and businesses in recent years, a trend that will probably continue. Emissions of pollutants from irrigated agriculture and dryland farming (primarily dust from plowed fields and VOC emissions from pesticide and herbicide application) are likely declining.

However, the dairy industry in the Treasure Valley has grown substantially over the last decade. Table 4-2 shows overall livestock numbers and milk cow numbers in Ada, Canyon and Payette Counties since 1995. It is unknown whether this growth trend will continue or the number of dairy cattle in these counties will stabilize or shrink.

[13] There have been two proposals for natural gas-fired turbines in the Treasure Valley, but those projects did not come to fruition for reasons other than air quality.

The primary pollutants that dairies are known to emit include ammonia, VOCs, hydrogen sulfide, and dust. The precise nature and amount of emissions of these pollutants are the subject of intensive study by academic researchers and the industry. Recent studies indicate that dairies may be a substantial source of ammonia and VOC emissions. But the amount of emissions at any individual dairy varies depending on the design and operation of the dairy, as well as the season of year. Collaborative efforts between IDEQ and the dairy industry are underway to reduce emissions. These efforts include the use of anaerobic digesters, development of biofuel facilities, and implementation of best management practices.

**Table 4-2 Treasure Valley cattle numbers**

| | Ada & Canyon Counties (combined) | | Payette County | |
|---|---|---|---|---|
| Year | All Cattle | Milk Cows | All Cattle | Milk Cows |
| 1995 | 201,000 | 25,700 | 31,000 | 4,700 |
| 1996 | 203,500 | 28,700 | 30,500 | 4,700 |
| 1997 | 204,000 | 31,500 | 30,000 | 5,200 |
| 1998 | 207,000 | 32,500 | 32,500 | 5,400 |
| 1999 | 218,500 | 38,200 | 32,500 | 7,000 |
| 2000 | 205,000 | 40,000 | 35,000 | 7,200 |
| 2001 | 192,000 | 45,500 | 55,000 | 7,800 |
| 2002 | 194,500 | 49,000 | 66,500 | 7,800 |
| 2003 | 201,000 | 51,000 | 66,500 | 11,000 |
| 2004 | 189,500 | 51,500 | 72,500 | 12,000 |
| 2005 | 197,500 | 52,000 | 77,500 | 12,100 |
| 2006 | 209,000 | 51,000 | 75,500 | 12,400 |

## *4.2 2020 Air Emissions Inventory*

In September 2002, an emissions inventory was assembled in support of the *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request*, which included estimating annual and episodic emissions for point, area, on-road, and off-road sources for three future years—2010, 2015, and 2020. Emission inventories were

assembled for $PM_{10}$ and precursors to $PM_{10}$, including $NO_x$, $SO_x$, VOCs, CO, and ammonia.[14]

One purpose of the 2002 emissions inventory was to estimate the maximum potential emissions from industrial sources. Annual future emissions were therefore projected based on the maximum potential to emit from each industrial source. This approach substantially overestimates actual future emissions from those sources. Future area and nonroad emissions were increased slightly, corresponding primarily to growth factors. On-road emissions were projected to decrease in future years despite growth as fleet turnover leads to the introduction of new vehicles that are designed to meet tighter emissions standards. This approach may have underestimated future on-road emissions by underestimating future growth in the Treasure Valley. Table 4-3 reflects the 2020 estimated future emissions developed in 2002.

Episodic future emission inventories assumptions are similar to the annual future emission inventories with the exception that the voluntary burn ban was applied to generate a controlled emissions inventory and road dust emissions were adjusted to account for seven inches of snow, (duplicating the conditions of the December, 1991 episode.) Table 4-4 reflects 2020 estimated episodic future emissions.

The Council recognizes that the shortcomings described above impact the accuracy of the 2002 future emissions inventory for the year 2020 and that a more accurate analysis of future emissions should be conducted to address these deficiencies.

[14] Appendix A of the *Northern Ada County PM10 SIP Maintenance Plan and Redesignation Request* includes information about the development of base and future year emission inventories.

**Table 4-3 Estimated 2020 emissions inventory for Ada and Canyon Counties**

| Source Category | $PM_{10}$ | | $NO_x$ | | $SO_x$ | | $NH_3$ | | VOC | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total |
| **Industrial point sources** | **5,279** | **7.6** | **14,937** | **59.7** | **7,280** | **71.0** | **1,007** | **13.3** | **4,754** | **12.2** | **13,207** | **8.1** |
| **Area sources** | **22,992** | **32.9** | **2,303** | **9.2** | **145** | **1.4** | **6,212** | **82.1** | **28,065** | **72.3** | **15,316** | **9.4** |
| Residential wood combustion | 744 | 1.1 | 68 | 0.3 | 10 | 0.1 | 0 | 0.0 | 3,134 | 8.1 | 5,419 | 3.3 |
| Other fuel combustion | 228 | 0.3 | 1,315 | 5.3 | 83 | 0.8 | 10 | 0.1 | 61 | 0.2 | 716 | 0.4 |
| Open burning | 2,849 | 4.1 | 358 | 1.4 | 52 | 0.5 | 0 | 0.0 | 2,343 | 6.0 | 9,181 | 5.6 |
| Agricultural activities | 14,889 | 21.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Other fugitive dust | 4,282 | 6.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Ammonia sources | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6,202 | 82.0 | 0 | 0.0 | 0 | 0.0 |
| Biogenic emissions | 0 | 0.0 | 561 | 2.2 | 0 | 0.0 | 0 | 0.0 | 11,090 | 28.6 | 0 | 0.0 |
| VOC sources | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11,437 | 29.4 | 0 | 0.0 |
| **On-road mobile sources** | **41,044** | **58.7** | **3,144** | **12.6** | **779** | **7.6** | **332** | **4.4** | **2,321** | **6.0** | **56,953** | **35.0** |
| Vehicle emissions (exhaust, tire wear, & brake wear) | 531 | 0.8 | 3,144 | 12.6 | 779 | 7.6 | 332 | 4.4 | 2,321 | 6.0 | 56,953 | 35.0 |
| Fugitive road dust | 40,514 | 58.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Nonroad mobile sources** | **580** | **0.8** | **4,630** | **18.5** | **2,053** | **20.0** | **14** | **0.2** | **3,702** | **9.5** | **77,326** | **47.5** |
| Aircraft | 20 | 0.0 | 220 | 0.9 | 25 | 0.2 | 0 | 0.0 | 362 | 0.9 | 6,448 | 4.0 |
| Airport ground support equipment | 4 | 0.0 | 104 | 0.4 | 14 | 0.1 | 0 | 0.0 | 157 | 0.4 | 3,136 | 1.9 |
| Lawn & garden equipment | 135 | 0.2 | 468 | 1.9 | 122 | 1.2 | 2 | 0.0 | 2,127 | 5.5 | 42,362 | 26.0 |
| Recreational equipment | 5 | 0.0 | 25 | 0.1 | 4 | 0.0 | 0 | 0.0 | 258 | 0.7 | 3,760 | 2.3 |
| Commercial & industrial equipment | 124 | 0.2 | 1,187 | 4.7 | 444 | 4.3 | 5 | 0.1 | 350 | 0.9 | 16,565 | 10.2 |
| Construction & mining equipment | 169 | 0.2 | 1,103 | 4.4 | 902 | 8.8 | 4 | 0.0 | 158 | 0.4 | 2,876 | 1.8 |
| Agricultural equipment | 97 | 0.1 | 815 | 3.3 | 472 | 4.6 | 2 | 0.0 | 121 | 0.3 | 1,487 | 0.9 |
| Recreational marine vessels | 8 | 0.0 | 23 | 0.1 | 4 | 0.0 | 0 | 0.0 | 140 | 0.4 | 615 | 0.4 |
| Locomotives & railroad equipment | 17 | 0.0 | 685 | 2.7 | 65 | 0.6 | 0 | 0.0 | 29 | 0.1 | 78 | 0.0 |
| **Total** | **69,895** | | **25,014** | | **10,257** | | **7,565** | | **38,842** | | **162,802** | |

Source: ENVIRON. Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request. 2002.

**Table 4-4 Estimated 2020 episodic emissions inventory**

| Source Category | $PM_{10}$ | | $NO_x$ | | $SO_x$ | | $NH_3$ | | VOC | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total | tons/yr | % of total |
| **Industrial point sources** | **12.20** | **20.1** | **44.83** | **64.0** | **23.92** | **81.5** | **2.77** | **15.2** | **15.07** | **21.5** | **38.77** | **8.7** |
| **Area sources** | **3.90** | **6.4** | **6.52** | **9.3** | **0.47** | **1.6** | **14.50** | **79.6** | **39.28** | **56.0** | **26.04** | **5.9** |
| Residential wood combustion | 3.09 | 5.1 | 0.30 | 0.4 | 0.04 | 0.2 | 0.00 | 0.0 | 10.66 | 15.2 | 22.55 | 5.1 |
| Other fuel combustion | 0.79 | 1.3 | 5.54 | 7.9 | 0.43 | 1.5 | 0.04 | 0.2 | 0.28 | 0.4 | 3.41 | 0.8 |
| Open burning | 0.03 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.02 | 0.0 | 0.07 | 0.0 |
| Agricultural activities | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| Other fugitive dust | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| Ammonia sources | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 14.45 | 79.4 | 0.00 | 0.0 | 0.00 | 0.0 |
| Biogenic emissions | 0.00 | 0.0 | 0.67 | 1.0 | 0.00 | 0.0 | 0.00 | 0.0 | 2.87 | 4.1 | 0.00 | 0.0 |
| VOC sources | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 25.45 | 36.3 | 0.00 | 0.0 |
| **On-road mobile sources** | **43.56** | **71.8** | **9.82** | **14.0** | **2.04** | **7.0** | **0.92** | **5.1** | **6.52** | **9.3** | **252.70** | **56.8** |
| Vehicle emissions (exhaust, tire wear, & brake wear) | 0.55 | 0.9 | 9.82 | 14.0 | 2.04 | 7.0 | 0.92 | 5.1 | 6.52 | 9.3 | 252.70 | 56.8 |
| Fugitive road dust | 43.01 | 70.9 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 |
| **Nonroad mobile sources** | **1.00** | **1.6** | **8.85** | **12.6** | **2.91** | **9.9** | **0.02** | **0.1** | **9.31** | **13.3** | **127.49** | **28.6** |
| Aircraft | 0.06 | 0.1 | 0.60 | 0.9 | 0.07 | 0.2 | 0.00 | 0.0 | 0.99 | 1.4 | 17.62 | 4.0 |
| Airport ground support equipment | 0.01 | 0.0 | 0.36 | 0.5 | 0.04 | 0.1 | 0.00 | 0.0 | 0.42 | 0.6 | 8.03 | 1.8 |
| Lawn & garden equipment | 0.29 | 0.5 | 0.87 | 1.2 | 0.10 | 0.4 | 0.00 | 0.0 | 6.28 | 9.0 | 47.20 | 10.6 |
| Recreational equipment | 0.00 | 0.0 | 0.03 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.22 | 0.3 | 3.05 | 0.7 |
| Commercial & industrial equipment | 0.32 | 0.5 | 3.25 | 4.6 | 1.14 | 3.9 | 0.01 | 0.1 | 1.02 | 1.4 | 47.05 | 10.6 |
| Construction & mining equipment | 0.20 | 0.3 | 1.31 | 1.9 | 1.06 | 3.6 | 0.00 | 0.0 | 0.19 | 0.3 | 3.27 | 0.7 |
| Agricultural equipment | 0.07 | 0.1 | 0.56 | 0.8 | 0.32 | 1.1 | 0.00 | 0.0 | 0.08 | 0.1 | 0.95 | 0.2 |
| Recreational marine vessels | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.00 | 0.0 | 0.04 | 0.1 | 0.11 | 0.0 |
| Locomotives & railroad equipment | 0.05 | 0.1 | 1.87 | 2.7 | 0.18 | 0.6 | 0.00 | 0.0 | 0.08 | 0.1 | 0.22 | 0.0 |
| **Total** | **60.66** | | **70.02** | | **29.34** | | **18.21** | | **70.18** | | **445.00** | |

Source: ENVIRON. Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request. 2002.

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# 5 OPTIONS FOR MAINTAINING AND IMPROVING AIR QUALITY

## *5.1 Overview*

There are many ways to reduce air pollution. Other states and communities have faced air quality problems similar to those that now face the Treasure Valley. In addition, many existing programs that are being carried out by IDEQ, other public agencies, and Treasure Valley communities help build our understanding of what types of approaches will be effective here.

The Council investigated dozens of programs for the protection of air quality, including education programs, incentive-based programs, and regulatory programs. IDEQ contributed significantly to this effort by researching and providing detailed information to the Council. In addition, the Council received input from numerous other independent sources, including local community leaders, air quality experts, academia, COMPASS, the Ada County Air Quality Board, and others.

The Council, in its work reviewing potential measures, focused in particular on measures that would reduce pollutants that are components of the key air quality issues—ozone and $PM_{2.5}$. As discussed in chapter 3, air quality monitoring data show that the Treasure Valley has ozone concentrations that are very near the 8-hour ambient ozone standard. Ozone formation is of concern during the summer, and the key contaminants that lead to ozone formation are $NO_x$ and VOCs. Current monitoring data show that the Treasure Valley will have difficulty meeting the new $PM_{2.5}$ standard (see Figure 3-5). $PM_{2.5}$ is primarily a winter air quality issue. Key contaminants that result in $PM_{2.5}$ are fine particulates from combustion processes, $NO_x$, $SO_x$, and ammonia. For the Treasure Valley, the key pollutants evaluated for potential control measures were VOCs, $NO_x$ and fine particulates.

The Council followed a multiple-step process to examine potential measures for the protection and maintenance of air quality: a “screening” type review of potential measures, a more thorough discussion of measures deemed worthy of further investigation, and identification of measures and actions that the Council believes need to occur to achieve its mission. Potential measures were semiquantitatively evaluated using criteria in Table 5-1. Emission reductions were estimated based on the

experiences of other air quality agencies and subject matter experts who presented information to the Council.

This screening was done to help the Council generally categorize, organize, and prioritize air quality measures that warranted further investigation. No detailed technical estimates for reductions and costs were performed.

**Table 5-1 Screening criteria for potential measures to protect and maintain air quality**

| Rating | Description |
|---|---|
| **Estimated Emission Reduction** | |
| Low | Less than 100 tons per year or 1% of airshed total |
| Medium | Between 100 and 1,000 tons per year or 5% of airshed total |
| High | Greater than 1,000 tons annually |
| **Regulatory Complexity** | |
| Low | No regulatory barriers |
| Medium | Needs new regulations, but no existing regulations prohibiting action |
| High | Needs change to existing law to allow activity |
| **Technical Complexity** | |
| Low | Requires no technological improvements or applications |
| Medium | Requires application of technology but not new technology |
| High | Requires application of new or untested technologies |
| **Estimated Cost** | |
| Low | Less than $1,000 per ton of pollutant removed |
| Medium | Between $1,000 and $10,000 per ton of pollutant removed |
| High | Greater than $10,000 per ton of pollutant removed |

This chapter reviews the different measures initially considered by the Council according to the screening criteria. Those measures deemed worthy of further investigation are discussed in chapter 6. Finally, chapter 7 provides recommendations of the Council.

## *5.2 Potential Education and Voluntary Control Measures*

Control measures that result from education and voluntary efforts by the public and companies generally have the lowest cost. Benefits received from implementing some measures can vary widely. The benefits actually realized may depend on the resources expended to educate the public and promote the measure. These control measures generally fall into two types. First are actions to be taken by individuals such as reducing vehicle miles driven during hot periods in the summer when ozone formation is a problem. The second type are actions that can be taken by companies to help reduce the impacts that their operations, including employees, have on air quality. This type includes providing incentives for carpooling and educating employees on how they individually can reduce air pollution.

Potential control measures, shown in Table 5-2, can help reduce different types of air pollution with the primary ones being particulate matter, including fine particulates from wood combustion and emissions associated with automobiles (VOCs and $NO_x$).

**Table 5-2 Potential voluntary and education control measures**

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Education of homeowners in proper operation and maintenance of woodstoves | PM | low | low | low | low | Worthy of further consideration |
| Solid fuel burning device (woodstoves), conversion and removal Incentives | PM | low | low | medium | medium | Potential benefit is limited; EPA criteria for new stoves have been in place for years |
| Voluntary episodic curtailment (open burning/ woodstoves) | PM | medium | low | low | low | Worthy of further consideration |
| Voluntary employer-based trip reduction | VOC, CO, $NO_x$ | medium | low | low | medium | Has potential and is being used; should be a part of future plan |

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Air quality alerts | $NO_x$, VOC, CO, PM | medium | low | low | low | Current program; can be key in public education and action |
| Lawnmower rebate | $NO_x$ | low | low | low | high | High cost–benefit ratio; new federal rules on small motors will provide similar benefit |

## 5.3 Potential Mobile and Transportation Control Measures

As shown in the emission inventories presented in chapters 2 and 4, emissions from mobile sources (such as autos and trucks) are a significant source of air pollution in the Treasure Valley. As the population of the Treasure Valley continues to grow, emissions from automobiles (estimated using vehicle miles traveled) will play a larger part in influencing air quality. $NO_x$, fine particulates, and VOCs are all emitted by mobile sources. Thus, control measures that reduce these emissions are very important, especially in terms of ozone formation.

Many potential control measures exist for reducing emissions from mobile sources. As shown in Table 5-3, the Council discussed a number of potential measures related to mobile and transportation sources. These included expanding public transportation alternatives, auto emissions testing, mandatory trip-reduction rules, and vehicle emission standards. Because limiting the increase in emissions from mobile sources is key for maintaining air quality, the Council identified a number of potential control measures to examine further.

**Table 5-3 Potential control measures for mobile and transportation sources**

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Commuter trip-reduction law | $NO_x$, VOC, CO, PM | high | high | low | medium | Would be very burdensome to implement as a mandatory program |
| Accelerated vehicle retirement/buyback and scrappage ($500 buyback) | $NO_x$, VOC, CO, | low | medium | low | medium | Cost–benefit ratio very high; no further consideration |
| Diesel construction equipment retrofit project | CO, VOC, PM | low | low | medium | high | Cost–benefit ratio very high; warrants further evaluation |
| Discouragement of idling by school buses—voluntary program | $NO_x$, VOC | low | low | low | low | Current program in Idaho |
| Replacement of existing fleet vehicles with cleaner-fuel vehicles | $NO_x$, VOC, CO, PM | medium | high | medium | high | Cost–benefit ratio very high; no further consideration |
| Electric airport ground support equipment replacement | $NO_x$, VOC | low | low | low | medium | Most likely minimal emission reduction |
| Truck stop electrification | $NO_x$, VOC, CO | low | low | medium | medium | Cost–benefit ratio very high; warrants further evaluation |
| Traffic signal synchronization | $NO_x$, VOC | low | low | medium | medium | Needs to be considered further |
| Lower speed limits on rural interstates (75 to 55) | $NO_x$ | medium | high | high | Low | Not practicable; no further consideration |
| Smoking vehicle ordinance | $NO_x$, VOC, CO, | low | high | high | high | State already has some provisions for this; potential for improvements |

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Inspection and maintenance program | $NO_x$, VOC | high | high | high | high | Existing program addresses CO emissions; need to evaluate other inspection/ maintenance programs that will help reduce $NO_x$ and VOCs |
| School bus retrofit program | VOC, CO, $NO_x$, PM | low | low | low | medium | Existing Idaho program |
| Diesel truck retrofit project | VOC, PM | low | low | medium | medium | Cost–benefit ratio very high; warrants further evaluation |
| Area-wide rideshare incentives | $NO_x$ | low | low | low | high | Cost–benefit ratio may be high; program used in Ada County and should be part of future plan |
| Voluntary agricultural diesel engine retrofit | PM. VOC, CO | low | low | medium | medium | Existing IDEQ grant |
| Adoption of California low-emission vehicle/clean fuels standards | VOC, $NO_x$ | high | high | high | medium | Needs to be considered further |
| Railroad corridor trail | CO, VOC, $NO_x$ | low | high | high | medium | |
| Philadelphia bicycle network | $NO_x$, VOC | low | high | low | high | |
| Alternative, biofuels | $NO_x$ | low | high | low | medium | Air quality benefits may be limited; further evaluation warranted |
| Light rail vehicles | $NO_x$, VOC | low | high | high | high | Cost–benefit ratio likely very high; further consideration may be warranted |

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Park-n-Ride facility | $NO_x$, VOC | low | medium | low | medium to high | Is and will likely be an integral component of public transportation |

## *5.4 Potential Local Governance Control Measures*

Municipal and county ordinances have played a significant role in reducing emissions from such activities as open burning, woodstove emissions, and fugitive dust. Further refinements of such ordinances and consistency between different municipal and county governments on such ordinances can improve the effectiveness of such ordinances. Table 5-4 shows potential measures discussed and selected for further study.

**Table 5-4 Potential control measures for local governments**

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Open and prescribed burning ban | PM, $NO_x$ | high | high | low | low | Further evaluation with air quality alerts warranted |
| Municipal dust control ordinances | PM | medium | high | high | medium | Further evaluation warranted |
| Land-use planning | PM, $NO_x$, VOC | medium | high | medium | medium | Key component for future |
| Tree planting at urban parking lots | VOC | low | medium | high | medium | Actual emission reductions are uncertain |

## *5.5 Potential Control Measures for Specific Sources*

Stationary sources are currently regulated by both federal and state laws and rules that govern allowable emissions, air pollution-control technologies to be used, and monitoring and recordkeeping requirements. New stationary sources or modifications of existing sources that result in increased emissions above certain thresholds must

undergo a permitting process administered by IDEQ. This permitting process ensures that such new facilities or modifications of existing facilities do not result in air pollution emissions that violate NAAQS.

A number of potential control measures exist for stationary sources (Table 5-5). One would be requiring existing sources to upgrade existing air pollution equipment to achieve lower emission rates. However, these types of retrofits are often very expensive relative to the environmental benefit. Another potential control measure is requiring new sources to install control equipment that is more efficient than that required by existing federal and state permits and rules.

One specific source of emissions, VOCs from the filling of gasoline tanks at retail gas stations, was considered and discussed extensively. The capture of VOCs emitted from filling such tanks (known as stage 1 vapor recovery) is a common technique used to reduce VOC emissions for airsheds where maintaining the ambient air quality standard for ozone is a problem. The Council agreed that this potential control measure needed to be examined further.

**Table 5-5 Potential control measures for stationary sources**

| Program | Pollutant(s) | Reduction | Regulatory Complexity | Technical Complexity | Cost | Screening Evaluation |
|---|---|---|---|---|---|---|
| Industrial natural gas combustion RACT for new sources over 25 tons per year | $NO_x$ | medium | high | high | medium | Some variation of this measure may be worth examining |
| Stage I vapor recovery—gasoline stations | VOC | high | medium | high | medium | Needs further consideration; can achieve significant VOC reduction |
| BACT/MACT for new VOC sources over 10 tons per year | VOC | high | high | high | high | Some variation of this measure may be worth examining |
| Emissions trading program | $NO_x$, VOC, CO, PM, $SO_x$ | high | high | high | medium | Applicability to attainment areas may be limited |

## *5.6 Future Federal Measures*

EPA has several requirements in progress that will further reduce air emissions from either new or existing area, mobile, and stationary sources in the Treasure Valley. These measures need to be evaluated further to try to quantify how the emissions inventory for future years will change to accommodate these new requirements and programs.

- **Diesel Fuel Standards**. Sulfur content in diesel fuel must be lowered to enable modern pollution-control technology to be more effective on trucks and buses that burn diesel. EPA will require a 97% reduction in the sulfur content of highway diesel fuel from its current level of 500 ppm (low sulfur diesel, or LSD) to 15 ppm (ultra-low sulfur diesel, or ULSD). Refiners will start producing the cleaner-burning diesel fuel ULSD for use in highway vehicles beginning June 1, 2006, and continuing through 2010. ULSD enables advanced pollution-control technology for cars, trucks, and buses so that engine manufacturers can meet the 2007 emission standards. Engine manufacturers have the flexibility to meet the new standards through a phase-in approach between 2007 and 2010. The program also includes various flexible approaches, including additional time for some refiners and special provisions for small refiners.
- **Nonroad Engine Emission Standards**. These standards will require the use of catalytic converters on small engines such as those used in lawn mowers. Emissions of VOCs and CO, in particular, will be reduced from these devices as individuals replace small-motor equipment with new models.
- **Best Available Retrofit Technology/Regional Haze**. This regulation requires EPA and IDEQ to examine how emissions from the largest stationary sources impact visibility in wilderness areas. Visibility (haze) impairment occurs from small particles ($PM_{2.5}$) either being emitted or being formed in the atmosphere. It will be a number of years before the analysis is completed on what additional controls may be required of such large sources. However, this program will likely lead to some reduction in industrial emissions in the region (that is, the Northwest) and a corresponding improvement in air quality.

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# 6 EVALUATION OF CONTROL MEASURES

Following are detailed descriptions of programs that the Council carefully considered, discussed, and thought worth bringing forward. After receiving public comments and input, the Council will narrow this list to a recommended set of programs to be carried out in the Treasure Valley.

## *6.1 Voluntary/Good Citizenship Control Strategies*

Strategies listed below allow for citizens and public and private entities to take responsibility for how their actions affect air quality in the Treasure Valley. But before behavior that causes air pollution can be changed, people must first be educated in when and why certain precautions should be carried out.

### 6.1.1 "Treasure the Valley's Air"—Public Education and Awareness

The purpose of this control measure is to provide ongoing education to the public about air quality and to encourage residents, employers, and local governments to make choices that positively affect air quality, particularly regarding transportation and consumer activities. Special emphasis is placed on the need to curtail polluting activities on the relatively infrequent days when meteorological conditions could lead to poor air quality and possible exceedances of federal and state air quality standards. In the Treasure Valley, the current public education program for air quality, called "Treasure the Valley's Air," is largely administered by IDEQ.

Educating the public about the health effects of air pollution, sources of air pollution, and ways to reduce air pollutant emissions is a critical component of efforts to improve air quality. Increased awareness can lead to changes in personal behavior. Through the "Treasure the Valley's Air" program, IDEQ promotes a wide variety of public education campaigns that encourage voluntary actions to reduce air pollution throughout the year, but particular emphasis is focused on days when pollution levels are expected to be highest.

Since motor vehicles are a leading source of the emissions that form ozone and $PM_{2.5}$ in the Treasure Valley, efforts to reduce vehicle travel, particularly on air quality alert days, can help avoid exceedances of federal and state standards. IDEQ also

encourages the public to reduce other types of polluting activities including use of paints, solvents, and consumer products; use of gasoline-powered lawn and garden equipment; and burning of wood. IDEQ attempts to inform the public of actions that people can take through public announcements, employers and local governments, and various promotional activities. Because the "Treasure the Valley's Air" program is voluntary, its effectiveness depends on the cooperation of the public.

Successful air quality educational campaigns cannot exist without sufficient funding. To improve public awareness and education on air quality issues, state agencies and others concerned with air quality issues in the Treasure Valley should allocate sufficient funding to effectively coordinate and promote public understanding and action related to air quality. IDEQ has been funding the "Treasure the Valley's Air" program since its inception primarily through grants, which do not provide a stable funding source.

With a modest cost for an outreach awareness and education program, good citizenship and driving behavioral changes are extremely cost effective. For example, a reduction of only 1% of the current nearly 11 million vehicle miles of travel (VMTs) per day in Ada and Canyon Counties would have a very positive impact on air quality. Such a reduction of 110,000 VMTs per day would reduce emissions by over 2.2 tons per day for all pollutants (CO, PM, $NO_x$, $SO_2$, VOCs, and ammonia), or 810 tons per year. Assuming that a business spent $10,000 to achieve a one-ton emissions reduction, it would take an investment of approximately $8 million to yield the same reduction in pollutants accomplished by an awareness program that reduces VMT by 1%.

The Council strongly believes that IDEQ's "Treasure the Valley's Air" program must be expanded, strengthened, and given a long-term and consistent source of adequate funding for this Plan to be successful. The most logical source of funding to strengthen and enhance IDEQ's "Treasure the Valley's Air" program is a portion of the fees collected through annual vehicle emissions testing. That proposal is discussed in more detail in chapter 7.

### 6.1.2 "Air Quality Alert" Program

IDEQ is mandated to protect public health and the environment. Under that mandate, in situations where high levels of air pollution are anticipated or present, IDEQ coordinates efforts to ensure that the public is informed of associated health risks.

Simultaneously, to minimize health impacts, IDEQ coordinates efforts to reduce pollutant levels. To ensure that these efforts are effective, IDEQ has developed the "Air Quality Alert" program. The goal of this program is to create an opportunity for the public, governments, and businesses to become informed about high air pollution levels and take proactive steps to reduce those levels and protect the health of our citizens.

The alert program is based on IDEQ's air quality forecast. The declaration of a green, yellow, orange, red, purple, or maroon air quality alert is made by IDEQ, based on an analysis of pollutant indicators and meteorological conditions. The analysis follows EPA's rating scale known as the Air Quality Index (AQI). Table 6-1 lists the ratings and descriptions.

**Table 6-1 Ratings of the Air Quality Index and their descriptions**

| Air Quality | Protect Your Health | AQI |
|---|---|---|
| Good | None | 1–50 |
| Moderate | Sensitive people should consider limiting prolonged outdoor exertion | 51–100 |
| Unhealthy for sensitive groups | Everyone should limit exertion outdoors. | 101–150 |
| Unhealthy | Everyone should limit exertion | 151–200 |
| Very unhealthy | Limit any exertion | 201–300 |
| Hazardous | Stay indoors and avoid any exertion | 301–500 |

***GREEN*** Good—The AQI value for the community is between 0 and 50. Air quality is considered satisfactory, and air pollution poses little or no risk.

***YELLOW*** Moderate—The AQI for the community is between 51 and 100. Air quality is acceptable; however, for some pollutants, there may be a moderate healthy concern for a very small number of individuals. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.

***ORANGE*** Unhealthy for Sensitive Groups—When AQI values are between 101 and 150, members of sensitive groups may experience health effects. These groups of people are likely to be adversely affected by lower levels than the general public. For example, children and adults who are active

outdoors and people with respiratory disease are at greater risk from exposure to ozone, while people with heart disease are at greater risk from carbon monoxide. Some people may be sensitive to more than one pollutant. The general public is unlikely to be affected when the AQI is in this range.

**RED** Unhealthy—AQI values are between 151 and 200. Everyone may begin to experience health effects. Members of sensitive groups may experience more serious health effects.

**PURPLE** Very unhealthy—AQI values between 201 and 300 trigger a health alert, meaning everyone may experience more serious health effects.

**MAROON** Hazardous—AQI values over 300 trigger health warnings of emergency conditions. The entire population is more likely to be affected.

On yellow, orange, and red air quality alert days, IDEQ issues advisories and asks Treasure Valley residents to curtail or postpone activities that pollute. This includes eliminating discretionary driving and substituting driving trips with biking, walking, telecommuting, taking public transit, or carpooling instead. The strategy also includes linking motor vehicle trips together ("trip-linking") to avoid excessive emissions associated with engine cold starts. To inform the public of these days, IDEQ sends e-mail notices, contacts television news bureaus, publishes announcements in newspapers, and makes public service announcements on the radio. The Idaho Transportation Department (ITD) posts messages on its variable message signs on valley highways, letting motorists know of alert conditions. Residents are also asked to avoid activities that generate pollution such as using gasoline-powered lawn and maintenance equipment. IDEQ also has an active public service announcement program that places 30-second air quality spots on local television with targeted messages at intervals throughout the year.

The AQI is also posted seven days a week on the IDEQ website and on an air quality/burn day hotline. It should be noted that purple and maroon days are extremely unlikely in the Treasure Valley.

Getting alert information to the public quickly can be difficult. Both TV and radio newscasters generally report bad air pollution days. But there is no guarantee that elevated pollution levels will be mentioned outside news segments. A potential strategy is to encourage brief announcements during traffic reports and other shows. The difficulty is purchasing airtime beforehand as alerts are episodic and cannot always be predicted. Again, a stable and adequate source of funding would enhance IDEQ's implementation of the "Air Quality Alert" program.

### 6.1.3 Voluntary Employer-based Trip-reduction and Alternative Transportation Initiatives

This control measure focuses on supporting and encouraging voluntary efforts by Treasure Valley employers to promote the use of commute alternatives among their employees. Empirical results show that employer trip-reduction programs can decrease vehicle trips to a typical worksite by as much as 5% to 10%.

There is a strong need for enhancing trip-reduction programs in the Treasure Valley. Without continued trip-reduction programs, increased traffic volumes in general could increase motor vehicle emissions, and congestion in particular increases auto emissions due to stop-and-go traffic and lower average speeds. Growth in the Treasure Valley has been especially robust in suburban areas, which due to land-use patterns and limited transit infrastructure, tend to have the highest drive-alone rates. In the near term, carpool and vanpool programs are especially suited for many suburban locations. Commute trips, which comprise 25% of daily trips, are still logical targets for employer-based trip-reduction efforts due to 1) their key role in contributing to peak-period traffic congestion and ozone formation; 2) the long average distance of commute trips compared with other trip types; 3) the repetitive nature of commute trips that occur on the same route and schedule each day; 4) the pool of potential candidates for ride sharing at larger work sites; and 5) the ability of employers to influence employee commute-mode choices by means of the facilities, services, and incentives that they provide.

Ada and Canyon Counties are well positioned to expand and strengthen existing trip-reduction and alternative transportation initiatives. The Ada County Highway District's (ACHD) Commuteride program interacts with 140 of the Treasure Valley's employers to promote alternative transportation. ACHD's Commuteride vanpool service has more than 65 routes criss-crossing the region, works with 140 of the region's employers, and has

1,500 registered users. In 2005, the service removed more than 10 million vehicle miles from area roadways and prevented the emission of more than 250 tons of pollutants from the Treasure Valley airshed.

ACHD and Valley Regional Transit (VRT) organize the "May in Motion" campaign each year. In 2006 alone, 80 employers participated in the program, and more than 18,000 trips were eliminated from the region's roadways that month. ACHD's Guaranteed Ride Home program and Park-n-Ride facilities, as well as the Commuter Pass initiative sponsored by ACHD and VRT, are other examples of promising alternative transportation measures. However, stronger public education and awareness programs are needed to promote these various programs to their maximum potential.

Total VMTs can also be reduced by promoting development that encourages walking and bicycling and improves safety for pedestrians and bicyclists. Transportation agencies should work to connect existing bike routes; establish safe routes to the greenbelt; add bicycle lanes whenever roads are repaved or constructed; and require bike paths, bike lanes, and sidewalks around schools. Education programs should include campaigns to encourage motorists to share the road and raise awareness about bicycle safety.

### 6.1.4 Energy Star

Idaho's Energy Star® Home program promotes construction and certification of high-performance homes throughout the state. This state and regional program offers training, seminars, and conferences for home performance specialists, builder partners, and realtor partners covering the latest techniques using building science principles.

The Idaho Energy Division and its energy partners, such as Idaho Power Company, Northwest Energy Efficiency Alliance, Portland Energy Conservation, Inc., Conservation Services Group, EPA, and Department of Energy, are working together to build a more energy-efficient Idaho.

The Idaho Energy Division manages and markets the Energy Star® Homes Northwest Builder Option Package program, which offers home certification through a network of home performance specialists, builder partners, subcontractors, suppliers, and realtors.

### 6.1.5 Homeowner Woodstove Education

The Council encourages community-wide education in the proper operation and maintenance of residential woodstoves. Many believe using wood, a renewable source, as fuel creates fewer environmental impacts than fossil fuels. But woodstoves emit substantial quantities of pollutants. Residential burning of wood results in high ground-level concentrations of particulate matter, which has adverse air quality and health effects. In addition, it also releases CO, VOCs, $SO_x$, and $NO_x$. These contaminants directly contribute to smog formation.

High PM levels are commonly linked to illness, particularly respiratory. Children's health studies document a decrease in lung capacity and increase in asthma attacks, frequency and severity of general respiratory illness, emergency room visits and school absences among children living in homes where wood is burned and in communities where wood smoke is prevalent. These high PM levels aggravate asthma and can cause bronchitis, decreased lung function, and premature death. In some neighborhoods around the country, up to 90% of the particle pollution is from residential burning. Regulating this burning is an easy, cost-effective way to reduce PM concentrations in the valley's airshed.

Woodstove education will focus on comparable and cost-effective alternatives available to homeowners, as well as measures that can be taken to maintain the efficiency of residential stoves. Valley citizens can take responsibility for their own actions by being educated and understanding the effects of wood burning.

## *6.2 Vehicle Emissions Controls*

### 6.2.1 Inspection and Maintenance

The 1999 emissions inventory shows that, in the Treasure Valley, vehicles account for 50% of the $NO_x$ and 20% of the VOC sources, respectively. Because these two pollutants are major contributors to the ozone and small particulate pollution experienced in the Treasure Valley, they are a logical place to look for reductions. Also, automobile growth is increasing rapidly in the Treasure Valley. Since 2001, there has been a 24.3% increase in the combined number of registered vehicles in Ada and Canyon Counties. The growth rate in Canyon County alone has been 32.3%. As of May 2006, the number

of registered vehicles in Ada and Canyon Counties is 433,672, with 65.6% of those vehicles registered in Ada County.[15]

Since the early 1970s, vehicle manufacturers have been required to produce vehicles designed to meet increasingly stringent pollution standards. Figure 6-1 shows the types of reductions mandated by these requirements.

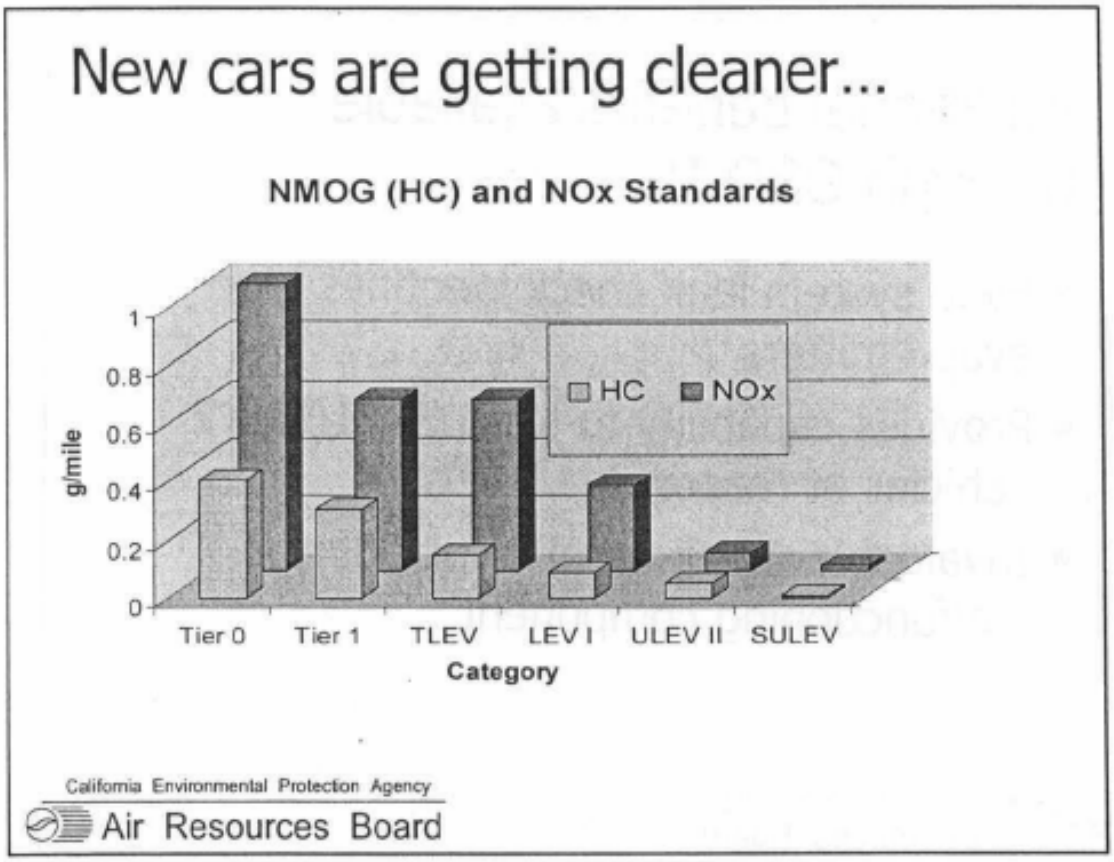


**Figure 6-1 Types of mandated reductions designed to meet stringent pollution standards**

As older vehicles are removed from service and replaced with newer, cleaner-burning vehicles, there is a corresponding decrease in the amount of vehicular pollution produced. (However, increases in both the overall number of vehicles on the road and an increasing number of miles driven each year by each vehicle have offset some of the reductions.) These stringent pollution standards have greatly reduced the amount of vehicular pollution, but vehicles that are not properly maintained or that have

[15] Vehicle registration data obtained from Ada County Air Quality Board, December 2006

malfunctioning emissions-control systems can often exceed these standards by significant amounts.

A recent study of Ada County emissions testing records analyzed the production of hydrocarbons (VOCs) by 1990 model vehicles. The study determined that failing vehicles produced, on average, over 9 times as much hydrocarbon as the average 1990 vehicle and that the dirtiest vehicle emitted over 100 times as much as the average vehicle. Numerous other studies, conducted throughout the country, have consistently shown that 10% of all vehicles produce over 50% of vehicular pollution. These studies emphasize the importance of identifying gross emitters and requiring them to get repairs.

Various strategies are available for testing emissions of a fleet of vehicles. Several options were examined for their benefits and costs.

***IM240 Testing of All Vehicles***

IM240 is a test procedure, devised by EPA, that puts the vehicle on a dynamometer (a treadmill that allows the vehicle to operate under a load similar to driving on the highway). During the test, the vehicle is driven through several accelerations and stops while the exhaust is captured and pollutants measured. This test is considered the most reliable type of emissions testing and, if used, would generate the greatest reduction of pollutants. It is also the only way to test for $NO_x$ in vehicles from model years before 1996. However, the primary disadvantage is the cost involved. Dynamometer equipment is fairly expensive, and any program using this procedure would, of necessity, have fewer stations charging a higher test fee.

***On-board Diagnostic Testing***

New production standards introduced in the early 1990s required that all vehicles produced and sold in the United States starting in 1996 must include on-board diagnostics (OBD) with a standardized connector that would allow for an external computer connection. The OBD computer is required to monitor all critical powertrain functions and record any anomalies that could affect vehicle emissions. A computer can then be connected to “read” the recorded malfunction code(s) and determine the nature of the problem. The diagnostic must also turn on a dashboard light to inform the driver that a malfunction has occurred.

There are two basic steps to the OBD test:

1. With the key on and the engine off, the malfunction indicator lamp is checked to verify that it works.

2. A cable is attached to the on-board computer connection (called a data link connector) that checks the OBD system status.

The advantage of testing using the OBD connector is that it detects most malfunctions that cause increased pollution and does so at a relatively low cost. In addition, it detects intermittent problems that would go unnoticed during tailpipe or IM240 testing. It is also a much quicker test that requires less equipment and less operator training. But this procedure can only be used on 1996 and newer model vehicles.

On-board diagnostic testing of 1996 and newer vehicles offers the most cost-effective means of reducing vehicular pollution. Motor vehicle records indicate that currently 59% of the vehicles registered in Ada and Canyon Counties are 1996 and newer vehicles. In addition, newer vehicles tend to be driven more miles per year than older vehicles. According to the Ada County Air Quality Board, when average miles driven are taken into account, 1996 and newer vehicles account for almost 80% of the miles driven by all vehicles registered in Ada County.

***Tailpipe Testing***

Tailpipe or idle testing involves sampling vehicle exhaust to determine the amount of pollution in the exhaust stream while the vehicle is at a standstill. In Ada County, this is the type of testing being conducted on all vehicles older than the 1996 model year. Measurements of CO and VOCs are typically used to reduce overall emissions of these pollutants. The cost of doing tailpipe testing falls between the costs of IM240 and OBD testing. Unfortunately, meaningful measurement of $NO_x$ emission is impossible with this type of test. $NO_x$ is not produced in significant amounts until the vehicle is operated under a load, and that analysis cannot be done with this type of test. But as the operating fleet of vehicles gets newer and a larger percentage of vehicles can be tested using OBD technology, tailpipe testing can be eliminated.

***Variations to Test Method***

Some variations of these emissions testing strategies can be implemented to make the programs more or less comprehensive and/or easy to implement.

***Frequency of Testing***

The cost–benefit ratio of a testing program can be maximized by evaluating whether testing should be conducted every year or on another schedule. Computer simulations have shown that biennial testing will gather 79% of the reductions that an annual testing program will generate.[16] Doubling the cost to vehicle owners by requiring yearly testing for an additional 16% in reductions should only be done if that additional 16% is critical for the success in maintaining health standards.

***Testing of New Vehicles***

New vehicles can be exempted for some period. Failure rates are very low during the first years of use.

| | |
|---|---|
| 1 year old | 0.4% failure rate |
| 2 years old | 0.5% failure rate |
| 3 years old | 1.2% failure rate |
| 4 years old | 1.9% failure rate |
| 5 years old | 3.4% failure rate |

Testing of these newer vehicles is not often considered cost effective. Exempting vehicles for the first four years reduces the number of vehicles tested by 22.3% while losing only 3.9% of the failures identified for repairs. Exempting vehicles for an additional year (the first five years) reduces the number of vehicles tested by an additional 7.3%, but it doubles the loss of emissions reductions to 7.8%.

[16] Data provided by the Ada County Air Quality Board

***Exempting of Older Vehicles***

The Ada County Air Quality Board tests vehicles back to 1965 models. There were several reasons for exempting 1964 and older models:

- Few vehicles in these older model year groups still exist.
- Many of these older vehicles are well-maintained show cars.
- These vehicles are typically driven considerably fewer miles per year than newer vehicles; that is, they are often secondary vehicles that are infrequently used.

Benefits of identifying gross emitters in model year groups before 1972 are minimal. Prior to 1972, vehicles had no emissions controls, and they were not designed to limit their emissions. So they are fairly high emitters even when working as designed. If one of these vehicles has a malfunction that causes its emissions to increase, it can only get about three times over its design standard before it will cease to run. Because of this limitation, EPA recommends emissions testing starting with 1972 models.

Testing of vehicles manufactured before model year 1996 requires some sort of tailpipe emissions test. If these vehicles are exempted from a testing requirement, the subsequent testing program can consist entirely of an OBD program, which is less expensive and easier to operate. However, a mechanism for identifying older model year gross emitters might be needed to address this potentially significant source.

The following control measures also relate to directly reducing emissions from vehicles and sources associated with vehicles (such as fueling). Vehicle emissions account for the greatest amount of emissions in the Treasure Valley. Large benefits can result from increased controls. These measures are, for the most part, mandatory and may require regulatory changes.

### 6.2.2 Gross Polluter Enforcement Program

Vehicles with poorly running engines burn fuel incompletely, resulting in excess smoke emissions. The smoke contains harmful pollutants such as $NO_x$, VOC, and CO. It is estimated that 10% of vehicles driven produce 50% of this form of pollution.

A gross polluter program could be operated in several ways. Many areas around the country have established smoking vehicle ordinances. Idaho statute 49-937(2) requires that vehicles be equipped and adjusted to prevent the escape of excessive fumes or

smoke. Other smoking vehicle ordinances may include rules on how long visible emissions can be emitted from a vehicle and mechanisms by which citizens can report excessively smoking vehicles. Smoking vehicle enforcement typically includes creation of a well-publicized hotline to encourage community involvement. Citizens can report a smoking vehicle by calling in the license plate number, make and model, date and time, and location. After vehicles are reported, owners receive letters informing them of the ordinances and penalties. If the vehicle is then spotted by a trained inspector, the owner is sent a summons and must prove that the vehicle has been brought into compliance. A variation to this reporting method trains traffic officers to address smoking vehicles as part of traffic enforcement. The local community must allow for a smoking vehicle pullover to count as a traffic pullover of this regulation is to be effective. Individuals can verify their compliance by providing a receipt of vehicle repair within a designated time frame and avoid heavy fines or penalties. Screening for a smoking vehicle can be part of routine vehicle inspections, thereby minimizing extra costs associated with this type of testing.

Another form of gross polluter enforcement is remote sensing. Technology is available that can measure the exhaust of a vehicle as it travels down the highway. A camera takes a picture of the license plate and allows data to be identified with a particular vehicle. A remote sensing program would use mobile monitors to measure the exhaust of vehicles during their normal driving and identify gross emitters that need repairs. If a vehicle appears to be a gross emitter, it would be sent to an emissions testing station. This type of program can be combined with an inspection and maintenance program to reduce the need for routine testing of a large number of vehicles in the fleet.

### 6.2.3 Low-Emission Vehicle (LEV) II Program

Modern engine controls and improved technological design make vehicle emissions reductions a potential air pollution-control measure available today. Adoption of the low-emission vehicle (LEV) II program could be an additional control measure for the Treasure Valley. These standards have been popular across the country and are being adopted and considered by many states, including our neighbors in the Pacific Northwest. LEV II standards reduce criteria and precursor emissions below the existing

federal Tier II standards currently in place. The standards are generally phased in over several years.

The Clean Air Act allows states to voluntarily adopt all or part of these standards, as long as such adoption does not create a "third vehicle requirement" beyond the federal standard and what is called the "California standard." LEV II standards have been adopted or are being adopted in Maine, Vermont, New York, California, Washington, Oregon, Massachusetts, Rhode Island, New Jersey, Connecticut, and Pennsylvania. The Council is not convinced that a LEV II program would be approved by the Idaho Legislature. However, if Idaho were to consider adopting a LEV II program, an analysis of the costs and benefits of any existing vehicle inspection and maintenance program should be undertaken to determine whether LEV II standards and an inspection and maintenance program would both be necessary to achieve air quality standards.

### 6.2.4 Diesel Retrofit Programs

IDEQ has an active program to control air pollution from heavy-duty school bus engines, construction equipment, and agricultural diesel engines. These programs retrofit diesel engines with diesel oxidation catalysts (DOCs), which are pollution-control devices that use a chemical process to break down pollutants in the exhaust stream to less harmful components, and replace older dirtier engines with newer engines that meet stricter emissions standards.

The Clean Air Zone Idaho program has obtained over $500,000 in federal grants to fund DOC retrofits on Idaho school buses. In the Treasure Valley, federal grants of $50,000 and $100,000 have been obtained to fund DOC retrofits and engine swaps on agricultural equipment. Diesel retrofitting is active across the country, and many states also include state funding for these efforts, which greatly increases a state's ability to compete for federal dollars.

### 6.2.5 Stricter Off-road Diesel Fuel Standard

Off-road diesel engines are defined as railroad locomotives, marine vessels, and equipment used for agriculture, construction, logging, and mining. Off-road diesel equipment is the source of approximately 3% of all particulate matter. Emissions-control technologies developed for on-road engines, such as diesel oxidation catalysts, particulate filters, selective catalytic reduction, and lower sulfur diesel fuel, are available

for use on off-road vehicles. EPA's revised Tier 4 rule, effective in 2010, will decrease exhaust emissions for off-road diesel vehicles by more than 90%. Sulfur content in off-road diesel fuel will also be reduced by more than 99%, from 3,000 ppm today to 15 ppm. These changes in the federal fuel standard will provide additional emissions reductions in the Treasure Valley for PM, $NO_x$, CO, and VOCs from use of diesel fuel, especially from off-road diesel use.The Council has determined that, before further off-road diesel restrictions are considered, emissions reductions associated with the pending federal standards should be evaluated.

### 6.2.6 Alternative Fuels

The increased use of alternative fuels in vehicles can have air quality benefits. Ethanol, biodiesel, electricity, compressed natural gas (CNG), and liquefied natural gas (LNG) all provide air quality benefits to varying degrees. Ethanol, which is grain alcohol, is commonly produced from corn and sugar. Production of ethanol from cellulose (such as crop residue) is an emerging technology. Ethanol is used as a gasoline additive or substitute. The two most common blends are known as E10 (10% ethanol, 90% gasoline) and E85 (85% ethanol, 15% gasoline). Biodiesel can be produced from vegetable and seed oils, as well as from animal fats (including waste oil from restaurant fryers). The most common blend of biodiesel is B20 (20% biodiesel, 80% petroleum diesel). Other blends of biodiesel are also produced. There are several proposals for new or reopened ethanol and biodiesel production facilities in the Treasure Valley and elsewhere in Idaho.

More detailed descriptions of each of these alternative fuels follow:

- **Electric cars/hybrids**. Electric vehicles are zero-emission vehicles. They produce no tailpipe or evaporative emissions that contribute to air pollution. Gas/electric hybrids reduce the amount of gasoline burned, thus reducing tailpipe emissions.
- **CNG and LNG**. Compared with vehicles fueled by diesel and gasoline, natural gas vehicles can emit significantly lower amounts of nitrogen oxides, particulate matter, and toxic and carcinogenic pollutants in their exhaust emissions (www.eere.energy.gov/afdc/afv/afvehicles.html). CNG buses were introduced in the Boise area in the 1980s due to the need to control $PM_{10}$.

- **E10**. All gas-powered vehicles can use E10. Some stations in the Treasure Valley already sell E10. Ethanol burns more completely and reduces tailpipe emissions of carbon monoxide and VOCs. E10 poses two air quality concerns: it evaporates more easily than regular gasoline, leading to greater VOC emissions at fueling stations, and it causes greater fuel permeation through fuel lines and other vehicle components. The widespread use of E10 in the Treasure Valley today could result in an increase in VOC emissions. These concerns could be resolved with implementation of stage 1 vapor recovery at fueling stations (see section 6.4.2), which would ensure substantial net reductions in VOC emissions regardless of whether E10 or other fuels are used.
- **E85**. The use of E85 in vehicles can substantially reduce tailpipe emissions of $NO_x$, carbon monoxide, and VOCs. The VOCs that are emitted are less toxic and less likely to form harmful ozone than VOCs emitted from using gasoline as fuel. However, E85 poses some practical problems. Currently, only a small subset of vehicles can use E85 (these are called “flex fuel” vehicles), so the vehicle market is not ready for widespread use of E85. In addition, E85 causes vehicle mileage to decline by about 10%, and vehicles may have problems starting in cold weather.

- **Published emission test results for E10 and E85**. Precise emission reductions are difficult to determine due to variability among vehicle models, the age of tested vehicles, and driving conditions. Table 6-2 identifies possible emission reductions as published by Renewable Energy Partners.

**Table 6-2 Ethanol emissions as compared with gasoline emissions**

| Emission | Increase/Decrease with E10 | Increase/Decrease with E85 |
|---|---|---|
| Carbon monoxide (CO) | –25% to 30% | –40% |
| Nitrogen oxides ($NO_x$) | –5% | –10% |
| Volatile organic compounds (VOC) | –7% | –30%+ |
| Sulfur dioxide ($SO_2$) | Some reduction | Up to –80% |
| Particulates | Some reduction | –20% |
| Aldehydes | +30% to 50% but negligible due to catalytic converter | Insufficient data |
| Aromatics (benzene and butadiene) | Some reduction | –50% |

Source: EPA Fact Sheet EPA420-F-00-035 from www.renewableenergypartners.org/ethanol.html

- **Biodiesel (B20)**. Most diesel engines can run on B20. The use of B20 reduces tailpipe emissions of particulate matter, carbon monoxide, and VOCs by 10% to 20%. Further, these emissions are less toxic than emissions from the use of petroleum diesel. Engine performance and longevity can also improve with the use of B20 because of its increased lubricity. There are two main drawbacks of B20. First, B20 can cause a modest increase in tailpipe emissions of $NO_x$ (about 10%). In addition, the use of B20 in an engine that has been running on petroleum diesel can lead to a short-term spike in tailpipe emissions. However, this problem can be anticipated and managed cost effectively.
- **B100**. Diesel vehicles can run on B100. However most require some fuel-system modifications. Additionally, the fuel is very thick and can cause gelling problems.

- **Estimated emission reductions for B20 and B100**. Table 6-3 identifies estimate emission reductions associated with B20 and B100.

**Table 6-3 Change in biodiesel emissions**

| Emission | Increase/Decrease with B20 | Increase/Decrease with B100 |
|---|---|---|
| Carbon monoxide (CO) | –12.6% | –43.2% |
| Volatile organic compounds (VOC) | –11.0% | –56.3% |
| Particulates | –18.0% | –55.4% |
| Nitrogen oxides ($No_x$) | +1.2%[a] | +5.8%[a] |
| Air toxins | –12.0% to –20.0% | –60.0% to –90.0% |

Source: "Biodiesel—the Clean, Green Fuel for Diesel Engines." DOE/GO-102000-104. May 2000.

Some states require fuels to have a minimum biofuel content. Washington recently passed a biofuel standard that phases in requirements for the use of E10, as well as a 5% biodiesel blend. Minnesota and Hawaii also have biofuel standards. In addition, the federal government and numerous states have adopted tax incentives for the use and sale of biofuels.

## *6.3 Regional Planning and Coordination*

Numerous entities are involved in the management of air quality in the Treasure Valley, including IDEQ, local governments, COMPASS, the Ada County Air Quality Board, Clean Cities Coalition, environmental groups, and others. Coordinating air quality management activities throughout the Treasure Valley is essential to attain consistency and integration of pollution-control measures. Piecemeal implementation of control measures unfairly distributes the responsibility for control measures and puts additional burdens on many sectors of the community in interpreting and adapting to divergent regulations. The following measures seek to establish a regional perspective on air quality issues, and recognize the interrelatedness of Treasure Valley air quality issues.

### 6.3.1 Land-use Planning and Development

Many studies have established a clear linkage between transportation, land-use, and air quality. Land-use decisions made at the local level influence regional travel behavior such as trip frequency, trip length, and travel mode. All of these factors directly impact the vehicle miles traveled in a region, which directly impact the region's emissions from on-road vehicles. The more fuel consumed, the more CO, $NO_x$, and VOC released into the air.

As mentioned in chapter 4, the population of the region is expected to be almost one million by 2030. COMPASS's long-range transportation plan, *Communities in Motion*, developed two future growth scenarios—"Trend" and "Community Choices." The "Trend" growth scenario continues the pattern of historical and current residential densities, much of which is low-density, suburban-style housing, resulting in growth extending well beyond all areas of impact. Contrasting the "Trend" is "Community Choices." This growth scenario combines modest land-use intensification/densification along transportation corridors with additional employment and population growth in outlying communities. Less reliance on traditional suburban residential development and more focus on infill and mixed-use development is anticipated in the "Community Choices" scenario.

Figure 6-2 displays the differences in VMT associated with each growth scenario. "Community Choices" provides more opportunities for fewer, shorter trips and better access to alternative travel modes (such as walking, biking, and public transportation). As a result, VMT estimates for "Community Choices" are lower than for "Trend." The difference in projected VMT between the two growth scenarios does not account for the possible VMT reductions associated with an expanded public transportation system. VMT differences are estimated solely from the proximity of housing to jobs and services and do not assume other significant changes in driving patterns or behavior.

As a result of implementing the "Community Choices" approach to land use, there would be a reduction of 2 million VMTs by 2030, compared with the "Trend" growth scenario. At today's vehicle emissions levels, the "Community Choices" scenario would result in a reduction of approximately 40 tons per day of pollutants ($PM_{10}$, $No_x$, $SO_2$, CO, VOC, and ammonia) to the Treasure Valley airshed, or 14,000 tons per year. Using a low average cost of investment to achieve a reduction of 1 ton per year at $10,000 per ton, an investment of $140 million would be required to achieve the same 14,000 ton-

per-year reduction. As a practical matter, there are few other opportunities to create similar improvements in our air quality, given the current technology and volume of pollution generated by stationary sources. As noted, this scenario does not account for projected land-use patterns leading to opportunities for public transportation that would not otherwise exist under the "Trend" scenario, nor does it forecast any benefit from an enhanced awareness and education program.

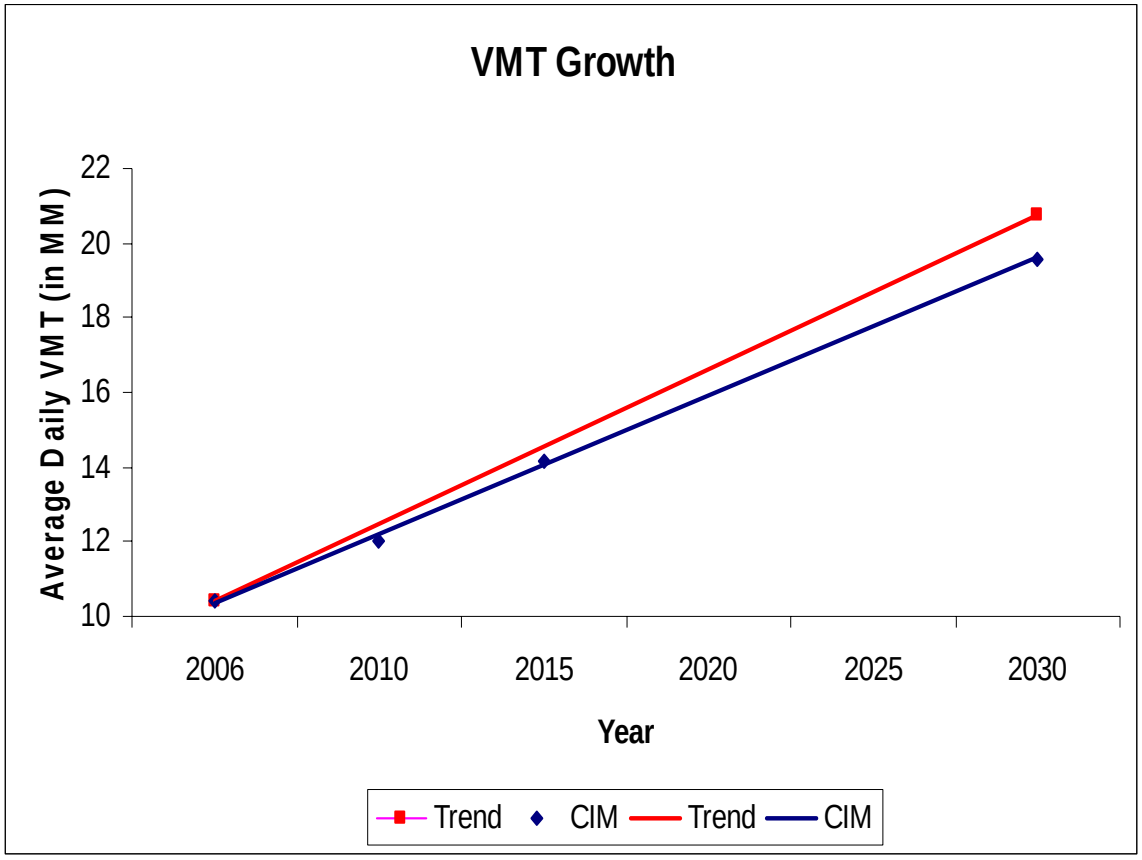


**Figure 6-2 Treasure Valley (Ada and Canyon Counties) daily vehicle miles of travel (VMT) as a function of growth scenarios**

To effectively implement a regional growth strategy such as the "Community Choices" scenario of *Communities in Motion*, local land-use plans and decisions need to be consistent. Conversely, transportation plans must be consistent with the plans and decisions being made at the local level. Developments consistent with transportation plans could then maximize the benefit from publicly funded improvements to the transportation system. To help further this effort, local comprehensive plans would need to be updated to reflect regional transportation goals. Consistent planning and land development ordinances are then needed as implementation tools.

Local governments in Ada County have played a critical role in establishing Ada County's *Blueprint for Good Growth*. A $600,000 transportation and land-use integration plan is underway and aimed at creating more sustainable design in roadway projects in Ada County. Once completed, all Ada County land-use agencies should implement *Blueprint for Good Growth* and the transportation and land-use integration plan, as well as making the necessary amendments to area comprehensive plans and land-use ordinances. The net result will be a more integrated transportation system, less single-occupancy automobile trips, and corresponding reductions in VMTs and vehicle-related air emissions. Implementation of the "Community Choices" scenario will also help pave the way for preservation of key transportation corridors and implementation of long-term public transportation alternatives such as those recommended by Valley Regional Transit and the Coalition for Regional Public Transportation.

### 6.3.2 Uniform Dust Management Ordinances

When measured in terms of the number of complaints received by IDEQ, fugitive dust is the largest air quality problem in the Treasure Valley. Fugitive dust is the name given to dust, primarily soil, that is not adequately controlled and becomes airborne and a nuisance. With the combination of hot, dry summers, a high desert environment, a large agricultural industry, and massive amounts of construction, the Treasure Valley presents prime conditions for severe fugitive dust problems.

There are few municipal or county dust control ordinances that can be used to control fugitive dust. Idaho state law contains provisions under IDAPA 58.01.01.650 requiring that "reasonable controls" be used to prevent fugitive dust. But these general rules are meant to apply to all sources; because they are not specific, they are difficult to enforce. In addition, since these regulations are contained under state code, only IDEQ can enforce them, and currently IDEQ has staff resources sufficient only to devote a small fraction of one person's time to investigation and enforcement of dust control for the entire 10-county region of southwestern Idaho.

One of the major impediments to adoption of dust control ordinances by municipalities is the concern that these ordinances will not be consistent across the valley. If one city adopts an ordinance that is substantively different from an ordinance that could literally be in force on the other side of the road, it becomes difficult for businesses and other dust generators to comply and for the public to understand. This

situation is something of an impasse in the valley, and leadership and direction are needed to move the issue forward. A set of model ordinances needs to be developed in consultation with a broad-based stakeholder group that can then be adopted by municipalities throughout the Treasure Valley.

## *6.4 Stationary Sources*

As discussed in chapter 2, stationary sources are already extensively regulated by IDEQ and EPA. However, the Council assessed several specific stationary sources to determine whether further controls might be warranted and began considering the cost–benefits of further emission limitations on new or existing sources.

### 6.4.1 Truck Stop Electrification

Installing electrical outlets at all truck stops keeps trucks from having to idle an average of six hours a day. Idling trucks emit $NO_x$, VOC, and CO, which are detrimental to the Treasure Valley's air quality. Trucks could "plug in" to the outlets for heat and air conditioning, as well as potential Internet, cable TV, and telephone access. Electrical power is not "clean," but it is generated at a much cleaner rate than diesel engines. So it provides truck drivers with a better alternative to wasting almost 2,000 gallons of fuel a year to idling.

### 6.4.2 Stage 1 Vapor Recovery at Retail Gas Stations

Stage 1 vapor recovery is a system designed to recover fumes that escape when fuel is delivered to storage tanks at retail gasoline stations. Vapors are captured by a second hose as the fumes in the underground tank are displaced by the fuel being delivered. These vapors are routed back to the delivery truck where they condense into a liquid state. Based on the most current emissions inventory for gasoline fuel delivery in Ada and County Counties, 1,108 tons per year of VOCs are emitted due to fuel delivery at retail gasoline stations. This amount represents almost 3% of all VOC emissions in the Treasure Valley and about the same amount emitted by all the stationary point sources combined (that is, industry). If stage 1 vapor recovery was installed at all retail gas stations, VOC emissions would be reduced by 1,079 tons per year (a 97% reduction). This control measure probably represents the greatest single source category for VOC reduction in the Treasure Valley at this time; it would pay great benefits in reducing precursor compounds for ozone and $PM_{2.5}$.

Stage 1 vapor recovery systems at gasoline service stations consist of a fitting where hoses from the tanker truck are connected to allow gasoline to be dispensed to the underground tank and vapors to be collected from the tank and returned to the truck. In many cases, this is a single coaxial fitting. A submerged fill tube is also typically installed. The control efficiency of these systems is estimated to be 97% or better.

A cost–benefit analysis of a stage 1 vapor recovery installation project has been conducted for the Treasure Valley. The following assumptions were used in the analysis:

- 410 active underground gasoline storage tanks at retail gasoline stations in Ada and Canyon Counties.
- Cost of stage 1 vapor recovery installation between $1,500 and $3,500 per tank (average of actual cost on a similar installation program in Utah [$1,000/tank] and estimate from local supplier to install equipment [$2,000/tank]).
- Emissions reductions from the project totaling 16,185 tons over the life of the project (1,079 tpy × 15 yr).

Retrofitting all 410 current underground storage tanks with stage 1 vapor recovery at a per-tank average cost of $1,500 totals $615,000. This action would reduce VOC emission by 1,709 tons per year, for a 15-year project life total reduction of 16,185 tons of VOC. At a $615,000 funding cost, the estimated cost benefit for this project equals $39/ton of VOCs reduced, or $0.043/kg of VOCs reduced. At a cost of $3,500 per tank, the cost–benefit ratio is $1,330 per ton of VOCs removed.

### 6.4.3 Emissions Trading

An emissions trading program may be useful if an area is designated nonattainment under the Clean Air Act. For now, the Council recommends further study to evaluate opportunities for establishing such a program in the Treasure Valley.

### 6.4.4 Other Stationary Controls

Future growth for stationary sources is anticipated to occur primarily in the commercial and light industry areas. New or additional heavy industry or processing is unlikely for the Treasure Valley, so no new large sources are expected. However, there have been two proposals for new gas-fired turbines to be located in the Treasure Valley. Neither of these projects has moved forward. Thus, most new sources in the future will

likely be small to medium-sized boilers and small VOC sources that are associated with and needed by commercial and light industry.

One option is requiring more stringent emission limitations for new sources such as small and medium-sized boilers. For example, all such boilers could be required to have low-$NO_x$ burners. At this time, the air quality benefit that such a requirement would provide and the associated costs are unknown. Further information on this and related options is needed.

# 7 CONCLUSIONS AND RECOMMENDATIONS

As stated in the statute, the charge of the Council is to "develop and submit to the Idaho Legislature for approval, a comprehensive air quality management plan for Ada and Canyon Counties." Currently, concentrations of ozone in the Treasure Valley are close to violating the ambient air quality standard for ozone. Similarly, concentrations of $PM_{2.5}$ in the Treasure Valley may be close to violating the new $PM_{2.5}$ standard. Consequently, much of the focus of the Council was on precursors to ozone and $PM_{2.5}$. Nevertheless, it is important to keep in mind that the Treasure Valley's air quality is negatively impacted by all pollutants to our air. As required by Idaho Code § 39-6706(4), the Council's Plan describes actions to be taken by governmental and nongovernmental entities to reduce all pollutants to our air. The Plan addresses this requirement, with particular attention paid to concentrations of VOCs, $NO_x$, and $PM_{2.5}$. These measures are summarized in Table 7-1.

Each recommendation is based on specific findings set forth in chapters 1 through 6. After carefully considering the cost, regulatory complexity, degree of emissions reduction, and ease of implementation, the Council selected six actions to be taken by governmental and nongovernmental entities. Only two recommendations are regulatory in nature while the other four focus on changing individual and societal behavior patterns that cost relatively little to implement but have a large benefit in reducing pollutants and maintaining our air quality.

The Plan also describes measures that need further study and federal measures in progress that will further reduce emissions of $NO_x$, VOCs, and $PM_{2.5}$.

**Table 7-1 Summary of recommendations**

| Measure | $NO_x$ Reduction (tons) | VOC Reduction (tons) | Cost Benefit ($/ton) of Pollution Reduced |
|---|---|---|---|
| 1. Public education and awareness[a] | 1,000 | | 1,000 |
| 2. OBD testing in Ada and Canyon Counties | 345.7 | 270.6 | 2,271 |
| 3. Stage 1 vapor recovery at retail gas stations in Ada and Canyon Counties | 0 | 1079 | 1,330 |
| 4. Uniform ordinances | Not quantified | Not quantified | Not quantified |
| 5. Regional land-use planning[b] | 1,788 | 909 | Not quantified |
| 6. Air quality data and coordination | Not quantified | Not quantified | Not quantified |

[a] Assumes that public education and awareness results in a reduction of all pollutants of a thousand tons per year at a cost of $1 million per year

[b] Calculation based on 2 million daily VMT reduction by the year 2030 using 1999 data for $NO_x$ and VOC vehicle emission rates

## *7.1 Required Actions*

The Council's recommendations and associated measures for implementation are listed below, with explanatory information in italics.

**1. Enhance public education and awareness and establish an air quality recognition and award program.**

*For the Treasure Valley, daily choices by individuals, businesses, and public agencies have a measurable impact on air quality. A significant portion of the emissions in the Treasure Valley airshed is related to behavioral choices made daily. For air quality in the Treasure Valley to remain acceptable, all citizens of the valley must understand what role they play in maintaining that air quality and how changes in their behavior can improve air quality. Employers in the Treasure Valley must be educated on how they can help reduce vehicle miles driven by creating incentives for employees to change their behavior.*

A. Enhance education and awareness.

i. IDEQ

Implement an enhanced and coordinated education and awareness program and fund the program initially through a legislative appropriation and then through allocation of a portion of the vehicle emissions testing fee.

ii. IDEQ, ITD, ACHD, VRT

Strengthen and expand the existing “Treasure the Valley’s Air” education and awareness program, and then operate the program in cooperation with existing Commuteride, ride-share, and other alternative transportation programs.

iii. IDEQ

Submit an annual air quality education and awareness plan to the Council for approval prior to receipt of the recommended funding.

iv. IDEQ

Strengthen the woodstove education and awareness program.

B. Establish a “Treasure the Valley’s Air” recognition and award program.

i. Council, Governor’s Office

Establish an annual “Treasure the Valley’s Air” award and present it to businesses, public agencies, or other entities who voluntarily implement actions to reduce air pollution, such as reducing employee vehicle trips by 10% annually, creating and implementing ongoing efforts to educate employees on how they can reduce air emissions, or participating in valley-wide promotions such as “May in Motion.”

## 2. Establish a vehicle emissions testing program in Ada and Canyon Counties.

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*On-road vehicular emissions contribute significantly to air pollution problems in the Treasure Valley. The 1999 emissions inventory shows that, in the Treasure Valley, vehicles account for 50% of the $NO_x$ and 20% of the VOC sources, respectively. On-board diagnostic (OBD) testing of 1996 and newer vehicles offers the most cost-effective means of reducing vehicular pollution. In addition, remote sensing monitors should be established to measure emissions of passing cars to identify "gross polluters" (all model year groups) to be more thoroughly tested. When the OBD testing and remote sensing have been implemented, current tailpipe testing in Ada County can be phased out.*

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A. Idaho Legislature

Establish a vehicle emissions testing program in both Ada and Canyon Counties. A legislative task force should be created to assist the Council with the analysis and development of the legislation and ordinances necessary to establish the program. The Council strongly recommends that the program include the following elements:

i. One entity should oversee the vehicle emissions testing program for both counties.

ii. All vehicles 1996 or newer should be OBD tested every other year, with the exception that new vehicles should not be tested until they are five years old.

iii. A remote sensing program should be implemented to identify gross polluters for all model year vehicles.

iv. A portion of the fee generated by the emissions testing program should be used to fund the comprehensive air quality education and awareness program.

The legislative task force, working with the Council, should also address and resolve the following issues regarding the vehicle emissions testing program:

i. Whether tailpipe testing should be eliminated or phased out, and if so, the impact on existing emission test station operators.

ii. The most effective method for verifying that designated vehicles have met the emissions testing requirement.

iii. The most effective method for collecting the vehicle emissions testing fee on an annual basis from all registered vehicles.

iv. The best financial structure for the program, including the desired amount of the emissions testing fee, cost to administer the program, and amount to be designated for air quality education and awareness.

v. Any other issues related to the establishment of an effective vehicle emissions testing program.

**3. Implement stage 1 vapor recovery at retail gas stations.**

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*The filling of storage tanks at gasoline retail stations represents a significant uncontrolled source of VOC emissions. Implementation of stage 1 vapor recovery systems would substantially reduce these emissions in a cost-effective manner.*

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A. IDEQ

Adopt rules through the negotiated rulemaking process requiring stage 1 vapor recovery to be installed and operational at all retail gasoline stations in Ada and Canyon Counties by December 31, 2011. The negotiated rules should establish incentives, low-interest loans, or other funding mechanisms to assist station owners with the expense of installing the required equipment. As part of the rulemaking process, IDEQ and interested parties should also consider whether any possible exemptions to the rules should exist.

**4. Adopt uniform ordinances for local air quality problems.**

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*Fugitive (transient) dust is not a significant source of $NO_x$ or VOCs, but it is the subject of many air quality complaints in the Treasure Valley. Open burning also results in complaints and contributes emissions of PM, $NO_x$, and VOCs. The existing differences in ordinances among the various cities and counties create a "patchwork" of varying requirements for these and other sources. Uniform local ordinances would provide consistent treatment across what is becoming one common urban landscape in the Treasure Valley.*

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A. Ada and Canyon Counties and all municipalities

Adopt uniform ordinances to address open burning, burning bans, and fugitive dust control from road building, dirt hauling, construction, and related activities.

**5. Commit to integrate regional land-use and transportation planning (*Communities in Motion*) into local plans and implement such plans.**

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*There is a strong connection among transportation, land use, and air quality. Land-use decisions made at the local level can increase total vehicle miles traveled in a region, which directly increase emissions from on-road vehicles. The more vehicle miles traveled, the more air emissions released.*

*To effectively implement the "Community Choices" scenario, local land-use and transportation plans need to be consistent with* Communities in Motion*. Developments consistent with such plans would then maximize the benefit from publicly funded improvements to the transportation system. To help further this effort, local governments should also adopt concurrency management ordinances such as those advocated in Ada County's* Blueprint for Good Growth*. Canyon County must commit to implementing similar long-range land-use and transportation planning.*

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A. Ada and Canyon Counties, all highway districts, all municipalities, and COMPASS

Implement the goals, objectives, and policies set forth in *Communities in Motion* and *Blueprint for Good Growth,* and take the following actions:

i. Adopt comprehensive plans and land-use development ordinances throughout the Treasure Valley that are consistent with the "Community Choices" scenario and that emphasize regional land-use and transportation planning goals.

ii. Only approve those development applications that are consistent with the "Community Choices" scenario.

iii. Promote redevelopment and infill projects.

iv. Encourage transit-oriented developments.

v. Develop funding to implement both transit and roadway improvements.

vi. Develop local funding options for regional transportation systems through Valley Regional Transit.

vii. Increase access to a regional public transportation system.

viii. Encourage development that promotes walking and biking trips.

ix. Promote economic development to create jobs in locations that reduce commute distances.

x. Allow commercial, service, and recreation uses in close proximity to residential areas to combine trips and/or reduce vehicle miles traveled.

xi. Expand on traditional employment options through the development of ordinances that allow live-work units, home occupations, and home-based businesses.

xii. Connect stub streets to allow greater pedestrian, bicycle, and vehicle circulation within neighborhoods, reducing the need to travel along the arterial street system.

xiii. Adopt ordinances that have minimum densities consistent with the "Community Choices" scenario.

**6. Improve regional air quality data and coordination.**

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*A review of studies and information on air quality show that additional data and studies are needed to further manage the Treasure Valley airshed. Also, there are many different entities working on air quality management in the Treasure Valley.*

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A. IDEQ and Council

Complete a more robust and technically sound analysis of future air emissions in cooperation with interested stakeholders.

B. Council

Continue to evaluate options for improving communication and coordination between the various groups working on air quality management.

## *7.2 Control Measures Needing Further Study*

At least five potential control measures were identified by the Council as warranting further evaluation to determine whether they should be incorporated into the Plan. In addition, the Council will continue to look at measures taken in other parts of the United States to determine whether such measures may be appropriate in the Treasure Valley.

### 7.2.1 More Stringent Stationary Source Requirements

Emissions from industrial and commercial sites are regulated by IDEQ. As discussed in chapter 5, a potential control measure is the adoption of more stringent emission limitations for new sources of $NO_x$ and VOC emissions over a certain threshold. An example would be the requirement for "low-$NO_x$ burners" for new boilers over a certain size. The Council needs to further evaluate potential emission limitations and the cost–

benefit ratio of such limitations. Any such new emissions limitations would have to be adopted into rules by IDEQ and then approved by the Idaho Legislature.

### 7.2.2 Low-Emission Vehicle (LEV) II Program

A number of states have adopted the California standard for emissions from gasoline-powered vehicles. These standards reduce emissions of VOCs, $NO_x$ and PM below the current federal Tier II standards. At this time, the Council needs further information on what environmental benefits can be gained from this measure, how LEV requirements change the car price, and what the availability is of such automobiles. From an implementation perspective, such a requirement would likely have to be implemented statewide for any benefit to be gained in the Treasure Valley. This would require action by the Idaho Legislature.

### 7.2.3 Emissions Trading Program

The Council recommends further research to determine whether an emissions trading program is feasible for the Treasure Valley.

### 7.2.4 Agricultural Activities

A considerable number of studies are being conducted on how agricultural operations can affect air quality. The Council recommends further review of how best management practices, incentives, and other measures can be implemented to improve air quality.

### 7.2.5 Alternative Fuels

Alternative fuels can provide an emissions reduction from mobile sources for some pollutants. It is anticipated that existing federal legislation (Energy Policy Act of 2005) will result in greater use of biofuels such as E10 in an effort to diversify energy sources. The Council should monitor the development of alternative fuels in Idaho and determine whether supplemental measures to encourage further use of such fuels in the Treasure Valley are warranted.

## *7.3 Federal Measures in Progress*

As discussed in chapter 5, EPA has several regulations that are being implemented that will reduce emissions from both mobile, small engine, and stationary sources. The

regulations pertaining to diesel-powered mobile vehicles and small engines may offer measurable reductions in emissions from these sources. The Council needs to further understand how these new limitations will reduce emissions of $NO_x$, $SO_x$, and VOCs from these sources and when such emission reductions will be realized.

## *7.4 Summary*

The actions described in this Plan are expected to result in improved air quality in the Treasure Valley by reducing emissions of $NO_{x,}$ VOCs, and $PM_{2.5}$. These reductions are focused primarily on mobile and area sources and on keeping the air quality in the Treasure Valley below the federal air quality standards for ozone and $PM_{2.5}$. As the Treasure Valley continues to grow and expand, air emission contributions from these sources will continue to increase. Addressing emissions from these types of sources offers the best opportunity for maintaining good air quality in the Treasure Valley.

# APPENDIX A—SUMMARY OF PUBLIC AND AGENCY COMMENTS

## *Public Comments*

10 comments from citizens (9 email, 1 letter)

- Canyon County vehicles should be tested (6)
- Tailpipe testing should remain for all cars (4)
- Emissions trading should not be allowed (1)
- Grandfathering of older facilities should be eliminated (1)
- Additional controls should be paid for by the state through taxation (1)
- OBD only testing is a good idea (1)
- Remote sensing is a good idea (1)
- Remote sensing is an unproven technology (1)
- If remote sensing can identify gross polluters, it should be used for all testing (1)
- A hot line to report smoking vehicles should be created (1)
- Diesel also needs to be addressed (1)
- All pollutants should be considered, not just criteria (1)

## *Agency Comments*

COMPASS

- Several technical clarifications and recommended corrections

Ada County Highway District

- Support of regional planning and employer-based trip reduction efforts

American Lung Association

- Support of public education and regional planning

Valley Regional Transit

- Support of public education and voluntary trip reduction
- Would like to see more mention and support of alternative transportation

Air Quality Board

- Maintain tailpipe testing in near term and eventual phase out

### *Public Hearings*

Ada County

- 4 citizen comments (all emission testing station owners)
  - All cars should be tested (2)
  - Should not eliminate tailpipe testing (4)
  - Remote sensing not a proven technology, and very expensive (1)
  - Canyon County should test (2)

Canyon County

- 1 citizen comment
  - Emissions testing not needed in Canyon County
  - Air quality predicted to improve valley-wide per DEQ, so why do this?

# APPENDIX B—LIST OF STUDIES AND REPORTS ON AIR QUALITY IN THE TREASURE VALLEY

The following plans and documents are available at the Idaho DEQ, Boise Regional Office, or at COMPASS.

***Carbon Monoxide***

- *1984 Air Quality Improvement Plan (Transportation Control Plan for Attaining Ambient Air Quality Standards for Carbon Monoxide in Northern Ada County.* 1984.
- *Minor Revision of the Northern Ada Country, Idaho 1984 State Implementation Plan (SIP) for Carbon Monoxide*. June 1994.
- *Limited Maintenance Plan and Request for Redesignation to Attainment for the Northern Ada County: Carbon Monoxide Not-classified Nonattainment Area.* December 2001.
- *Boise Carbon Monoxide Saturation Studies Summary*. April 1999.

***Particulate Matter***

- *Northern Ada County/Boise Particulate ($PM_{10}$) Air Quality Improvement Plan.* October 1991.
- *Northern Ada County $PM_{10}$ SIP Maintenance Plan and Redesignation Request.* September 25, 2002.
- *Trends in Particulate Levels in Boise: A Review of the Effectiveness of the Air Quality Index Program and Wood Stove Curtailment in Boise, for the Winter of 1990–1991.* Winter 1991–1991.
- *Development of Base and Future Year Emission Inventories for Area Sources, Non-road Mobile Sources, and On-road Motor Vehicles for the Northern Ada County $PM_{10}$ Nonattainment Area.* November 1997.
- *Development of Base and Future Year Emission Inventories for Industrial Sources for the Northern Ada County $PM_{10}$ Nonattainment Area.* March 1998.
- *Analyzing Speciated Ambient $PM_{10}$ Concentrations and Emissions in Ada and Canyon Counties, Idaho.* May 8, 1998.
- *Screening Analysis for Determining Significance of Secondary Particulates.* May 27. 1998.
- *$PM_{10}$ Dispersion Modeling for Treasure Valley, Idaho.* December 1998.

- *Technical Paper: $PM_{10}$ Dispersion Modeling for Treasure Valley, Idaho.* August 2000.
- *Treasure Valley Secondary Aerosol Study: Final Report.* November 15, 2000.
- *Development of Boise and Future Year Emission Inventories for the Northern Ada County $PM_{10}$ SIP Maintenance Plan.* September 2002.
- *Dispersion Modeling for the $PM_{10}$ Maintenance SIP.* July 2002.
- *Meteorological Modeling for the $PM_{10}$ Maintenance SIP*. July 24, 2002.
- *Receptor Modeling for the $PM_{10}$ Maintenance SIP.* May 2002.
- *Rollback Analysis for $PM_{10}$ Concentrations in Ada County, Idaho.* September 2002.
- *Treasure Valley Road Dust Study: Final Report.* February 2002.
- *Field Testing and Evaluation of Dust Deposition and Removal Mechanisms: Final Report.* January 2003.

***Ozone***

- *Final Report: Conceptual Model Development and Screening Analysis for Recent Treasure Valley 8-hour Ozone Episodes.* March 2003.

***Miscellaneous Plans, Studies, and Surveys***

- *1997 Air Quality Public Opinion Survey.* July 1997.
- *Evaluating vehicle Emissions Inspection and Maintenance Programs.* 2001.
- *Meridian School Bus Biodiesel Evaluation Study: Final Report.* April 2005.
- *Particulate Matter Air Quality Conformity Demonstration of the FY2006–2010 Northern Ada County TIP.* September 2005.
- *Development of Fleet Characteristics Data for the Idaho On-road Motor Vehicle Fleet.* January 2006.
- *Communities in Motion.* August 21, 2006.