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ENVIRONMENTAL QUALITY
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DEQ

State of Oregon
Department of Environmental Quality

Environmental Quality Commission

☒ Rule Adoption Item
☐ Action Item
☐ Information Item

Agenda Item F
October 1, 1999 Meeting

Title:

Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

Summary:

This rulemaking proposes that the Environmental Quality Commission adopt a carbon monoxide maintenance plan/redesignation request for Grants Pass. The plan allows the Department to request that the Environmental Protection Agency redesignate Grants Pass as an area that meets the public health standards for carbon monoxide. The maintenance plan demonstrates that, even with the modest growth projected for the area, Grants Pass will continue to meet the public health standards for carbon monoxide through 2015 without wintertime oxygenated fuel. The significant reduction in carbon monoxide emissions is a result of continuing improvements in motor vehicle emissions control technology. The redesignation protects Grants Pass from further control requirements for carbon monoxide nonattainment areas and allows wintertime oxygenated fuel to be discontinued. This rulemaking includes a proposed rule amendment to eliminate Grants Pass from the list of control areas required to dispense oxygenated fuel during the winter months. If adopted by the Commission as a rule amendment, wintertime oxygenated fuel will be eliminated in Grants Pass upon EPA approval of the maintenance plan/redesignation request. Only one public comment was received on this rulemaking, urging elimination of the oxygenated fuel requirement as soon as possible.

Department Recommendation:

The Department recommends that the Environmental Quality Commission adopt the maintenance plan, emission inventory, and redesignation and oxygenated fuel rule amendments as revisions to the federal Clean Air Act State Implementation Plan, as presented in Attachment A of the Department's staff report.

Patti Seastrom	Andrew Ginsburg	Langdon Marsh
Report Author	Division Administrator	Director

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State of Oregon
Department of Environmental Quality — Memorandum

Date: September 13, 1999

To: Environmental Quality Commission

From: Langdon Marsh

Subject: Agenda Item F, EQC Meeting October 1, 1999

Background

On June 14, 1999 the Director authorized the Air Quality Division to proceed to a rulemaking hearing on proposed rules that would adopt a carbon monoxide maintenance plan for Grants Pass and eliminate the wintertime oxygenated fuel requirement in that area.

Pursuant to the authorization, hearing notice was published in the Secretary of State's Bulletin on July 1, 1999. On June 15, 1999, the Hearing Notice and informational materials were mailed to the mailing list of those persons who have asked to be notified of rulemaking actions, and to a mailing list of persons known by the Department to be potentially affected by or interested in the proposed rulemaking action on the Grants Pass carbon monoxide maintenance plan, including the emission inventory and related oxygenated fuel requirement.

A public hearing was held July 22, 1999 with Keith Tong serving as Presiding Officer. Written comment was received through July 27, 1999. The Presiding Officer's Report (Attachment C) documents that no oral testimony was presented at the hearing concerning this proposal, and one written comment was received. Department staff have evaluated the comments received (Attachment D). No modifications to the initial rulemaking proposal are being recommended by the Department as a result of public comments received.

The following sections summarize the issue that this proposed rulemaking action is intended to address, the authority to address the issue, the process for development of the rulemaking proposal, including alternatives considered, a summary of the rulemaking proposal presented for public hearing, a summary of the public comments, a summary of how the rule will work and how it is proposed to be implemented, and a recommendation for Commission action.

Issue this Proposed Rulemaking Action is Intended to Address

The Grants Pass Central Business District has been classified as a nonattainment area for carbon monoxide since 1985. An attainment plan was developed in 1988 that successfully brought the area into attainment with the public health standard for carbon monoxide by 1991. Since then, the area has consistently met the public health standard. This proposed maintenance plan demonstrates that in spite of modest growth, the area will continue to meet the carbon monoxide standard through 2015, without continuing the wintertime oxygenated fuel requirement. The maintenance plan also allows DEQ to request that the Environmental Protection Agency redesignate the Grants Pass Central Business District to an area that meets the carbon monoxide public health standard. The redesignation will help the area to avoid unnecessary future regulations that might be required of nonattainment areas. Redesignation also allows the removal of the most stringent industrial control requirements for new and expanding major industry, although there is no existing industry located in the nonattainment area and current zoning prohibits locating new industry within the central business district.

Relationship to Federal and Adjacent State Rules

The Federal Clean Air Act requires that a redesignation request be accompanied by a maintenance plan. The maintenance plan must demonstrate that the area will not violate the applicable air quality standard for ten years after the Environmental Protection Agency approves the maintenance plan. The proposed Grants Pass carbon monoxide maintenance plan does not impose any additional regulations. The plan recommends eliminating the oxygenated fuel requirement for the Grants Pass area because it is no longer needed to meet the carbon monoxide public health standard.

Authority to Address the Issue

ORS 468.015, 468.035, 468A.035, 468A.420

Process for Development of the Rulemaking Proposal (including Advisory Committee and alternatives considered)

DEQ staff worked with an advisory committee in Grants Pass to develop the carbon monoxide maintenance plan. A list of the advisory committee members is included as Attachment F. The committee considered retaining the oxygenated fuel requirement as an alternative. The final decision to recommend eliminating the oxygenated fuel requirement was based on: 1) the significant margin projected in the maintenance plan without the oxygenated fuel requirement in place; 2) the cost of wintertime oxygenated fuel to distributors, retailers and vehicle owners; and 3) new studies showing that benefits from oxygenated fuel diminish with newer technology vehicles.

A public workshop was held on April 5, 1999 to gauge public support for eliminating wintertime oxygenated fuel in the Grants Pass area. Although the workshop was broadly advertised, attendance was low. The few members of the public in attendance supported eliminating oxygenated fuel. DEQ staff also met with the Josephine County Commissioners and the Grants Pass City Council on two occasions to brief them on the progress of the maintenance plan and to discuss the pros and cons of oxygenated fuel. While there was some sentiment expressed to retain oxygenated fuel to provide a larger cushion for clean air, the same three reasons listed above were more compelling to eliminate the requirement.

The advisory committee also considered the need to establish an industrial growth allowance and/or a transportation growth allowance in the maintenance plan. Either allowance would come from the projected margin (the difference between projected future emissions and the maximum emissions allowable to meet carbon monoxide public health standards). An industrial growth allowance would be available to new or expanding major industry to use in order to meet offset requirements. Local major industry was represented on the advisory committee. The committee decided against establishing an industrial growth allowance since no major industry is expected to locate in the nonattainment area and none are located there now. The downtown business association was consulted about the need to provide a transportation growth allowance for the Central Business District. Projected future emissions in the proposed maintenance plan account for a current major reconstruction project, in addition to a reasonable increase in transportation related emissions, in the Central Business District through 2015. An additional allowance would provide an opportunity for a future transportation project that would increase vehicle miles traveled beyond the projected growth rate of 1.5 percent per year. The committee agreed that a higher rate of growth in vehicle miles traveled was generally not desirable and no significant transportation projects are anticipated in the Central Business District. DEQ concluded, and the advisory committee agreed, that a transportation growth allowance is not warranted.

Summary of Rulemaking Proposal Presented for Public Hearing and Discussion of Significant Issues Involved.

This rulemaking proposes that the Environmental Quality Commission adopt a carbon monoxide maintenance plan for Grants Pass. The plan recommends that the oxygenated fuel requirement be eliminated in the Grants Pass area. A rule amendment is included in this rulemaking to remove Grants Pass from the list of control areas required to distribute oxygenated fuel during the winter months, to be effective upon EPA approval of the maintenance plan (Attachment A).

This rulemaking also allows DEQ to request that the Environmental Protection Agency redesignate Grants Pass to an area that meets the carbon monoxide public health standard. Completion of a maintenance plan is a prerequisite to a redesignation request. Upon redesignation, the most stringent emission control requirements for new or expanding major industrial sources of carbon monoxide (Lowest Achievable Emission Rate) will be relaxed to less stringent requirements (Best Available Control Technology). This is of no current consequence in Grants Pass since no industry is currently located in the Central Business District and zoning prohibits new industry from locating in the Central Business District in the foreseeable future.

The Grants Pass carbon monoxide maintenance plan provides an inventory of 1993 carbon monoxide emissions. Since the area was in attainment with the standards in 1993, this inventory establishes a baseline of emissions considered allowable in order to continue meeting the carbon monoxide public health standard. From the baseline inventory, the plan predicts future emissions based on growth in population, housing, employment, and traffic. Growth rates are based on adopted population and employment forecasts from the Grants Pass 1992 technical update to its comprehensive plan, the Oregon Office of Economic Analysis, and recommendations from the Grants Pass Air Quality Advisory Committee. The Rogue Valley Council of Governments travel demand model was used to predict growth in motor vehicle travel in Grants Pass. Future emissions from traffic were calculated without oxygenated fuel. Based on the growth rates and no oxygenated fuel, the plan demonstrates that future year emissions will not exceed the 1993 baseline level of emissions and that the public health standard for carbon monoxide will continue to be met through 2015.

Summary of Significant Public Comment and Changes Proposed in Response

One letter was received in support of removing the oxygenated fuel requirement and requested that DEQ seek early concurrent approval from EPA so that the removal of the oxygenated fuel requirement can be effective this winter season. No changes are proposed in response to this comment. The Clean Air Act requires that a maintenance plan be approved by EPA before an area can be redesignated. Oxygenated fuel is required in all carbon monoxide nonattainment areas by the 1990 Clean air Act Ammendments. The requirement cannot be removed until Grants Pass is redesignated to attainment. The Clean Air Act allows EPA eighteen months to approve the maintenance plan. DEQ requested that EPA allow elimination of the oxygenated fuel requirement effective this winter season since Grants Pass met the public health standard in 1991, prior to the introduction of wintertime oxygenated fuel in 1992. EPA denied this request based on the Clean Air Act Requirements.

Summary of How the Proposed Rule Will Work and How it Will be Implemented

If adopted by the Environmental Quality Commission and approved by the Environmental Protection Agency, the Grants Pass carbon monoxide maintenance plan will result in two changes for the regulated public: 1) Gasoline retailers will no longer be required to sell oxygenated fuel during the winter months. DEQ's Medford office air quality staff will notify affected gasoline retailers, distributors and suppliers after EPA approves the maintenance plan. 2) New major industrial sources of carbon monoxide will need to meet Best Available Control Technology emission control requirements. No new industry is expected to locate within the Grants Pass nonattainment area and no major industry currently operates within the area. Redesignation will not result in any changes for new or existing major sources outside of the nonattainment area.

Recommendation for Commission Action

It is recommended that the Commission adopt the Grants Pass carbon monoxide maintenance plan, as presented in Attachment A of the Department Staff Report, including the supporting rule amendments and emission inventory, as an amendment to the federal Clean Air Act State Implementation Plan.

Attachments

A. Amendments Proposed for Adoption
   1. Maintenance Plan
   2. Rule Amendments
B. Supporting Procedural Documentation:
   1. Legal Notice of Hearing
   2. Fiscal and Economic Impact Statement
   3. Land Use Evaluation Statement
   4. Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements
   5. Cover Memorandum from Public Notice
C. Presiding Officer's Report on Public Hearing
D. Department's Response to Public Comment
E. Detailed Changes to Original Rulemaking Proposal made in Response to Public Comment
F. Advisory Committee Membership
G. Rule Implementation Plan

Reference Documents (available upon request)

Written Comments Received (listed in Attachment C)

Approved:

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Division: Andrew Ginsburg

Report Prepared By: Patti Seastrom

Phone: (503) 229-5581

Date Prepared: August 24, 1999

Attachment A-1

State Implementation Plan Revision
For Carbon Monoxide in the Grants Pass Urban Growth Boundary

A Plan for Maintaining The National Ambient Air Quality Standards For Carbon Monoxide

September 13, 1999

State of Oregon
Department of Environmental Quality
Air Quality Division
811 SW Sixth Avenue
Portland, OR 97204-1390

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4.53.0 ACKNOWLEDGMENTS AND SUMMARY

4.53.0.1 Acknowledgments

Numerous individuals in state and local governments and private entities who are dedicated to healthy air have made this supplement to the Oregon State Implementation Plan possible. Special appreciation goes to:

- Grants Pass Air Quality Advisory Committee:
  - Kimberly Sellers, Committee Chair, Owner - Tierra del Sol
  - Mark Amrhein, City of Grants Pass
  - Vince Carrow, Oregon Department of Transportation
  - Roy Childers, U.S. Forest Industries
  - Tyler Deke, Rogue Valley Council of Governments
  - Dwight Ellis, Grants Pass Chamber of Commerce
  - Greg Gilpin, Oregon Department of Forestry
  - Gary Grimes, Timber Products Co.
  - Steve Hodge, Josephine County Public Works
  - Dennis Krois, Copeland Paving
  - Bill Olson, Josephine County Public Health Department
  - Dr. Bob Palzer, Sierra Club
  - Rob Pochert, SOREDI
  - Chris Sorensen, Three Rivers Community Hospital

- Rogue Valley Council of Governments for travel demand model development and transportation system network analysis;

- Oregon Department of Transportation for travel model support.

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4.53.0.2 Executive Summary: The Grants Pass Carbon Monoxide Maintenance Plan

The Grants Pass nonattainment area has met the national ambient air quality standards for carbon monoxide as demonstrated through air quality monitoring data. The nonattainment area is the Central Business District in downtown Grants Pass. In accordance with the 1990 Federal Clean Air Act Amendments, the Department of Environmental Quality is now applying to the Environmental Protection Agency (EPA) for redesignation of the Grants Pass Central Business District as meeting the national ambient air quality standards for carbon monoxide. Included with the redesignation request is a maintenance plan designed to maintain compliance with the carbon monoxide standard through the year 2015. EPA requires that maintenance plans demonstrate continued compliance with air quality standards for at least ten years following EPA redesignation. This redesignation request/maintenance plan has been adopted by the Oregon Environmental Quality Commission and submitted to EPA as an amendment to the Oregon State Implementation Plan.

This maintenance plan accommodates future growth and provides for continued protection of public health. The plan will remove the wintertime oxygenated fuel requirement and will maintain the area's eligibility for federal transportation funds. Finally, the plan will remove the most stringent industrial emission control requirements for new major industry in the Central Business District.

4.53.0.2.1 Background

What is Carbon Monoxide?

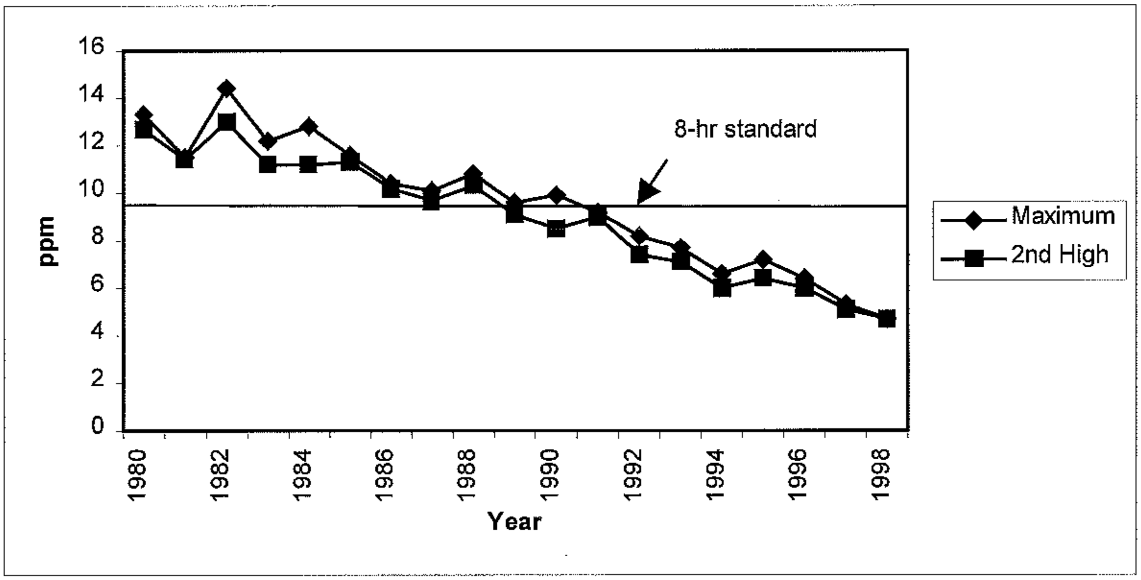
Carbon monoxide is a colorless, odorless, poisonous gas. It decreases the oxygen carrying capacity of the blood. High concentrations can severely impair the function of oxygen-dependent tissues, including the brain, heart and muscle. Prolonged exposure to even low levels of carbon monoxide can aggravate existing conditions in people with heart disease or circulatory disorders. Motor vehicles are the predominant source of carbon monoxide in Oregon.

EPA has established the national ambient air quality standards for carbon monoxide at 35 parts per million (ppm) for a 1-hour average and 9 ppm for an 8-hour average. Any value monitored above these levels is considered an exceedance. Two exceedances within one calendar year is considered a violation. If an area is in violation of the standard, it is designated by EPA as a nonattainment area. Experience has demonstrated that the 8-hour average is the more likely of the two standards to be exceeded.

Past Carbon Monoxide Problem

The highest 8-hour carbon monoxide concentration recorded in Grants Pass occurred in 1982 at a level of 14.4 ppm. In that same year, Grants Pass exceeded the federal 8-hour carbon monoxide standard of 9 ppm on 28 days. The 1-hour standard has never been exceeded in Grants Pass. By the late 1980's, maximum levels were closer to the standard level, and in fact there have been no violations in Grants Pass since 1988. The last exceedance of the 8-hour standard was in 1990. The trend in carbon monoxide levels, as recorded at the Wing Building monitor in downtown Grants Pass, is shown below in Figure 4.53.0.1.

Figure 4.53.0.1 Grants Pass Carbon Monoxide Trend
Maximum 8-Hr and 2nd High 8-Hr Average, 1980-98



Success in Reducing Carbon Monoxide

Attainment with the carbon monoxide public health standard was achieved in Grants Pass by 1990. Full compliance for the area was achieved by 1992 with no exceedances recorded at the carbon monoxide monitor for two consecutive years. The federal new car emission standards was the only control strategy in place during the two-year time period when attainment was achieved. A third bridge was constructed over the Rogue River and opened in October of 1991. Upon completion, the bridge diverted through traffic away from the Central Business District and reduced vehicle emissions. Wintertime distribution of oxygenated fuel began in November of 1992.

4.53.0.2.2 Need for Maintenance Plan

The Grants Pass carbon monoxide maintenance plan is designed to insure compliance with the carbon monoxide public health standard through 2015. Projections of future carbon monoxide emissions considered growth in all source categories as well as technological changes affecting carbon monoxide emissions.

Projections of Future Carbon Monoxide Levels

Future growth in Grants Pass is projected to be moderate over the next twenty years. Growth in population is projected to just slightly outpace growth in motor vehicle traffic. Offsetting this growth, motor vehicle emission controls are projected to be increasingly effective in reducing carbon monoxide emissions in future years.

Although the nonattainment area for Grants Pass is legally defined as the Central Business District, the Environmental Protection Agency requested that this plan assess future carbon monoxide emission levels for the Grants Pass Urban Growth Boundary in order to account for all emissions that may contribute to concentrations in the nonattainment area. The growth rates assumed for the Grants Pass Urban Growth Boundary in predicting future levels of carbon monoxide emissions are shown in Table 4.53.0.1.

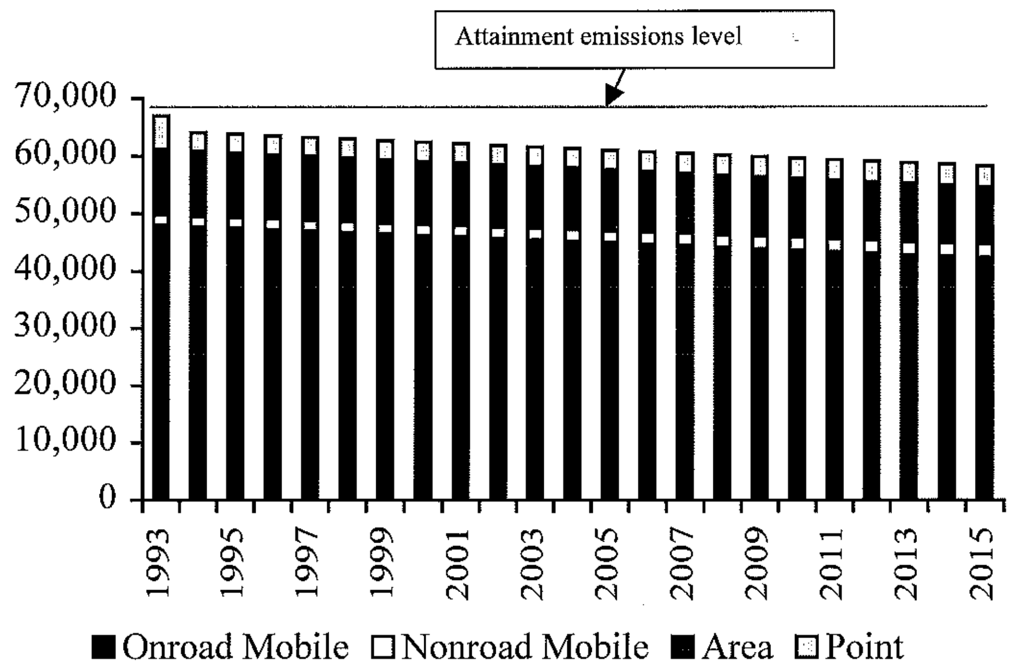
Table 4.53.0.1
Grants Pass Urban Growth Boundary
Projected Average Annual Growth Rates
1993-2015

Population growth	1.6%
Household growth	1.6%
Employment	1.2%
Vehicle Miles Traveled	1.5%

The selected growth rates are based on adopted population and employment forecasts from the Grants Pass 1992 technical update to its comprehensive plan, the Oregon Office of Economic Analysis, and recommendations from the Grants Pass Air Quality Advisory Committee. The Rogue Valley Council of Governments travel demand model was used to predict growth in motor vehicle travel in Grants Pass. More detail is provided in Appendix D4-6.

The maintenance plan analysis took these factors into account in order to evaluate future carbon monoxide air quality conditions in Grants Pass through 2015. The result is that carbon monoxide emissions through 2015 are projected to be below the attainment year level, without oxygenated fuel, as shown in Figure 4.53.0.2. Table 4.53.0.2 shows the expected maximum carbon monoxide concentrations at the most congested/highest volume intersections through 2015, without oxygenated fuel.

Figure 4.53.0.2 Carbon Monoxide Emission Growth From 1993 to 2015 Without Oxygenated Fuel (in pounds per day)



The values in Table 4.53.0.2 represent the highest projected carbon monoxide concentrations at the most congested/highest volume intersections in the Central Business District.

Table 4.53.0.2 Carbon Monoxide Concentrations at Selected Intersections

Intersection	2015, 8-hour Carbon Monoxide Concentration, parts per million (ppm)	1993, 8-hour Carbon Monoxide Concentration, ppm
6th and A	6.6	7.2
6th and G	6.6	7.4
6th and M	8.0	8.6

Benefits of Maintenance Plan

In order for EPA to redesignate the Grants Pass Central Business District from nonattainment to attainment, an enforceable plan must be approved by EPA that demonstrates how the area will continue to meet the carbon monoxide standard for a minimum of ten years. The primary benefits of an EPA-approved carbon monoxide maintenance plan and redesignation are:

- Assurance that future public health will be protected from adverse impacts of carbon monoxide;
- Assurance that regulatory limits, expectations and conditions will be known for at least the next ten years; and
- Ability to remove the wintertime oxygenated fuel requirement.

4.53.0.2.3 Maintenance Plan Development Process

DEQ relied primarily on the deliberations of the Grants Pass Air Quality Advisory Committee to develop the carbon monoxide maintenance plan provisions. Projections of future emissions were based on growth rates identified in the Grants Pass local comprehensive plan. The Grants Pass Urban Growth Boundary population was estimated at 25,396 in 1993. Based on the long-range forecast, the Grants Pass Urban Growth Boundary population is expected to grow to approximately 34,343 by 2015 (1.6 percent per year). The projection of future year motor vehicle emissions took into account the continuing improvements in motor vehicle technology and the continuing benefits of the third bridge diverting through-traffic around the Central Business District. The benefits of these ongoing measures will keep carbon monoxide levels in Grants Pass well within healthy levels. With a redesignation to attainment, the federal Clean Air Act allows the strictest Lowest Achievable Emission Rate requirement for new and expanding industrial sources to be replaced with the less restrictive Best Achievable Control Technology requirement.

With this in mind, the Grants Pass Air Quality Advisory Committee recommended the following actions:

- Discontinue the oxygenated fuel requirement in the Grants Pass control area;
- Allow requirements for new industry to revert to Best Available Control Technology;
- Establish a contingency plan that calls for a reinstatement of measures to reduce carbon monoxide, if future levels approach or exceed the public health standard.

In addition, the Rogue Valley Council of Governments and Oregon Department of Transportation reviewed and made recommendations on the plan and the transportation emissions budget incorporated in the plan. The emissions budget will be the benchmark for future transportation conformity determinations for significant transportation projects within the Central Business District.

4.53.0.2.4 Maintenance Plan Summary

Federal New Car Program

The federal new car program has been and will continue to be the most effective carbon monoxide emission reduction strategy. In contrast to other pollutants, vehicle emission controls for carbon monoxide have not experienced much deterioration in performance with increased age and mileage. A 37 percent reduction in the fleet average emission rate of carbon monoxide is expected between 1993 and 2015. Expected improvements in carbon monoxide emission control technology include heated catalysts that will help reduce the higher carbon monoxide emissions from cold starts.

Oxygenated Fuel

The 1990 Federal Clean Air Act Amendments required the Grants Pass area to implement an oxygenated fuel program to control carbon monoxide because the area was still designated nonattainment for the standard. The program was first implemented in 1992. DEQ's analysis shows that total carbon monoxide emissions in the Grants Pass Urban Growth Boundary in 2015 without oxygenated fuel still provides a thirteen percent safety margin of 8,733 pounds per day. The oxygenated fuel program will be discontinued in Grants Pass upon EPA approval of the carbon monoxide maintenance plan.

Industrial Requirements

The current New Source Review requirement for major new or expanding industry in the Central Business District is Lowest Achievable Emission Rate for carbon monoxide emissions. This is the most stringent requirement for industrial emission controls. However, no major industry is located in the Central Business District. Upon federal redesignation to attainment, the requirement for major new industry in the Central Business District will be Best Available Control Technology for carbon monoxide emissions. This is a less stringent requirement and allows a source to consider cost in designing industrial emission controls. However, no major industry is expected to locate within the Central Business District in the foreseeable future since zoning prohibits industrial land use in the Central Business District.

Residential Wood Heating

Woodstove emission control efforts in the Grants Pass Urban Growth Boundary have significantly reduced particulate emissions through emission certification standards for new stoves, changeout programs to encourage removal of noncertified stoves, and a local voluntary curtailment program to reduce burning during stagnant weather periods. These efforts have contributed, and will continue to contribute, to a decline in carbon monoxide emissions from residential wood heating.

Carbon Monoxide Emissions Budget

Transportation conformity regulations, required by the 1990 Federal Clean Air Act Amendments, require that motor vehicle emissions budgets be included in the State Implementation Plan. Regionally significant transportation projects must be evaluated for impacts on traffic and the resulting impact on carbon monoxide emissions from motor vehicles.

This plan establishes an emissions budget that will serve as a benchmark for the approval of regionally significant transportation projects within the Grants Pass Central Business District. When new transportation projects are proposed, the Rogue Valley Council of Governments forecasts vehicle miles traveled and motor vehicle emissions as part of periodically updating the Statewide Transportation Improvement Program. The emissions forecast must be equal to or less than the State Implementation Plan emissions budget.

The budget for Grants Pass was developed for the legally defined nonattainment area, the Grants Pass Central Business District. The carbon monoxide emissions budget will only apply to regionally significant transportation projects in the Central Business District. The Oregon Department of Transportation is currently undertaking a major redesign of the 6th and 7th Street Couplet through the Central Business District. Impacts on future carbon monoxide emissions from this project have been accounted for in the emissions budget. Once this project is completed, there are no regionally significant transportation projects planned for the Grants Pass Central Business District through 2015. Downtown parking and new retail or commercial construction in the Central Business District are not considered regionally significant transportation projects and will not be affected by the emissions budget.

Contingency Plan Elements

The maintenance plan must contain contingency measures that would be implemented either to prevent or correct a violation of the carbon monoxide standard after the area has been redesignated. The Clean Air Act requires that measures in the original attainment plan be reinstated if a violation occurs. Under the contingency plan recommended by the Grants Pass Air Quality Advisory Committee, DEQ will convene a planning group if the validated second highest (within one calendar year) 8-hour carbon monoxide concentration equals or exceeds 8.1 ppm (90 percent of the 8-hour carbon monoxide standard). A range of measures with the potential to reduce carbon monoxide emissions will be considered for implementation. However, if a violation of the 8-hour carbon monoxide standard occurs, control measures that will be restored include: 1) oxygenated fuel; and 2) Lowest Achievable Emission Rate requirements, plus offsets, for major new industrial sources in the Central Business District.

4.53.1 INTRODUCTION

4.53.1.1 Purpose of Redesignation Request and Maintenance Plan Document

This is a redesignation request and maintenance plan to document and ensure continued attainment of the national ambient air quality standards for carbon monoxide in the Grants Pass, Oregon nonattainment area. This document complies with applicable 1990 Federal Clean Air Act requirements and Environmental Protection Agency guidance and policies.

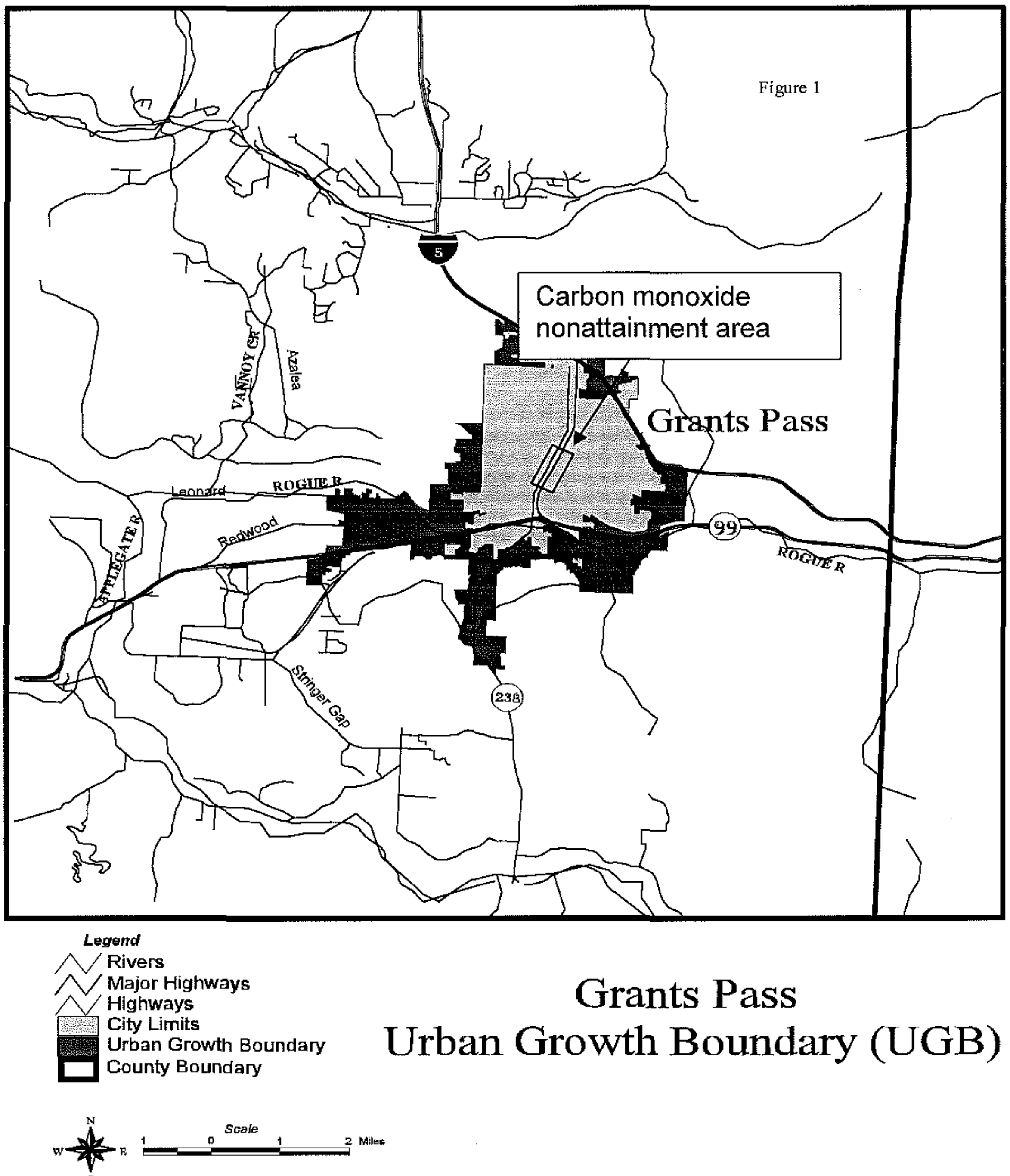
The maintenance plan removes the most stringent industrial controls for new sources and the wintertime oxygenated fuel requirement. The plan ensures that continuing permanent control strategies are sufficient to prevent future carbon monoxide violations through at least 2015.

4.53.1.2 History of Carbon Monoxide Problem in Grants Pass/Design Values

The Grants Pass Central Business District was designated by the Environmental Protection Agency (EPA) as a nonattainment area for carbon monoxide on December 15, 1985. Following enactment of the 1990 Clean Air Act Amendments, EPA classified the Grants Pass Central Business District as a moderate carbon monoxide nonattainment area based on a 1988-89 design value of 10.3 ppm. Under the Act, moderate carbon monoxide nonattainment areas were required to meet the national ambient air quality standards by December 31, 1995. The carbon monoxide nonattainment boundary was identified at the time as the Central Business District. The Grants Pass Central Business District is defined by "B" Street on the north, 8th Street to the east, "M" Street on the south, and 5th Street to the west. Figure 4.53.1.1 is a map of the Grants Pass area, indicating the location of the nonattainment area. The current design value for the Grants Pass carbon monoxide nonattainment area is 7.4 ppm. This value is based, following EPA guidance, on the annual second highest 8-hour concentration in 1992 and 1993 for monitoring sites operated by the Oregon Department of Environmental Quality. One carbon monoxide monitor operates in the Grants Pass Central Business District.

Historically, the carbon monoxide monitoring site in Grants Pass recorded exceedances of the 8-hour standard throughout the winter seasons. Control strategies adopted in 1986 proved effective and Grants Pass has been in compliance with the national ambient air quality standard for carbon monoxide since 1990. Based on this record of compliance, Grants Pass is able to apply for redesignation to attainment in accordance with the 1990 Clean Air Act amendments. This document is part of the formal procedure to redesignate the area to attainment status.

Figure 4.53.1.1 Grants Pass Carbon Monoxide Nonattainment Area



4.53.1.3 National Ambient Air Quality Standards for Carbon Monoxide

This maintenance plan addresses the 8-hour ambient air quality standard for carbon monoxide as defined in the Federal Clean Air Act. Carbon monoxide is a colorless, odorless gas which replaces the oxygen in the body's red blood cells through normal respiration. Exposure to high levels of carbon monoxide can slow reflexes, cause confusion and drowsiness, and in high doses and/or long exposure can result in death. People with heart disease are more susceptible to develop chest pains when exposed to high levels of carbon monoxide. The major human-caused source of carbon monoxide is incomplete combustion of carbon-based fuels. The primary source of carbon monoxide is gasoline-powered motor vehicles. How a motor vehicle is operated and maintained has an effect on the amount of carbon monoxide emitted. For example, in stop-and-go driving conditions, emissions are increased. Other important sources are woodstoves, open burning, and fuel combustion in industrial and utility boilers. The most serious carbon monoxide problems occur during the winter in urban areas, when cooler temperatures prevent complete combustion and the resulting carbon monoxide emissions are trapped near the ground by atmospheric inversions.

EPA has established the national ambient air quality standards for carbon monoxide at 35 parts per million (ppm) for a 1-hour average, and 9 ppm for an 8-hour average. Any value monitored above these levels, as defined by federal rules and guidance, is considered an exceedance. Two exceedances within one calendar year is considered a violation. If an area is in violation of the standard, it is designated by EPA as a nonattainment area. Experience has demonstrated that the 8-hour average is the more likely of the two standards to be exceeded.

The formal statement of the national 8-hour standard is contained in the Code of Federal Regulations (40 CFR part 50.8), which states:

> *The national primary ambient air quality standards for carbon monoxide are: 9 parts per million (10 milligrams per cubic meter) for an 8-hour average concentration not to be exceeded more than once per year...*

40 CFR part 50.8 also contains reference methods for measuring carbon monoxide concentrations in ambient air, procedures for averaging data to determine 8-hour concentrations, and requirements regarding presentation of data. In addition, EPA has also issued guidance specifying that two complete consecutive years of quality-assured ambient monitoring data with no violations of the standard must be collected before an area can be considered to have attained the standard.

40 CFR part 50.8 defines how ambient air quality monitoring data are to be compared to the applicable national ambient air quality standard. It states that all monitoring data should be expressed to one decimal place, and indicates that standards defined in parts per million should be compared "in terms of integers with fractional parts of 0.5 or greater rounding." This led to an interpretation by EPA that any 8-hour CO concentration of less than 9.5 ppm would be equivalent to attainment. This rounding convention is

therefore used for carbon monoxide monitoring data in this maintenance plan to demonstrate compliance with the standard.

In general, demonstrating "attainment" requires the collection of representative monitoring data using approved measuring instruments and procedures, with adequate quality assurance and quality control. All locations within an area must meet the standard. No monitor may exceed the 9 ppm 8-hour standard for more than one day during either of the two calendar years preceding the attainment year. Air quality measurements in Grants Pass satisfy this requirement, as shown in Section 4.53.2 of this plan.

4.53.1.4 Redesignation Criteria/Organization of Document

Section 107(d)(3)(E) and related subsections of the Clean Air Act establish five key criteria that must be satisfied in order for a nonattainment area to be redesignated to attainment status. Here is a summary of these redesignation criteria and where to find a discussion of each one in this plan:

<u>Attainment Verification</u>

The nonattainment area seeking redesignation must have attained the applicable national ambient air quality standard. Attainment of the carbon monoxide standard in Grants Pass is presented in Section 4.53.2, "Attainment Demonstration."

<u>State Implementation Plan Approval</u>

EPA must have fully approved the applicable state implementation plan for the area under Section 110(k) of the federal Clean Air Act. EPA approved the Grants Pass 1986 carbon monoxide attainment plan on March 15, 1988.

The City of Grants Pass was the designated lead agency in the development of the Grants Pass carbon monoxide attainment plan. This attainment plan identified the need for a third bridge crossing over the Rogue River to relieve traffic congestion in the Central Business District. The Environmental Quality Commission adopted the attainment plan as part of the state implementation plan on July 25, 1986.

The 1990 amendments to the Clean Air Act required carbon monoxide nonattainment areas to submit plan revisions in the following areas: 1) 1990 emission inventory; 2) oxygenated fuel program for the wintertime; 3) transportation conformity requirements; 4) New Source Review rules for major sources; and 5) a contingency plan. The draft 1990 emission inventory was submitted in November 1992. The 1990 inventory was not finalized; rather, EPA approved incorporating comments on the 1990 inventory into the development of the 1993 emission inventory. The 1993 emission inventory is included in Appendix D4-4 of this plan. The administrative rules for the oxygenated fuel program were submitted in October 1992. DEQ submitted New Source Review Rule revisions to EPA in 1992. The carbon monoxide contingency plan was submitted in November 1993.

These state implementation plan revisions and compliance with Section 110(k) of the federal Clean Air Act, are discussed in Section 4.53.4.1, "State Implementation Plan Requirements/Nonattainment Area Requirements."

Permanent and Enforceable Improvements in Air Quality

The improvement in air quality must be due to permanent and enforceable reductions in emissions resulting from the implementation of the applicable state implementation plan, federal air pollution control regulations, and other permanent and enforceable reductions. The permanent and enforceable nature of the reductions in emissions that are responsible for improvements in ambient carbon monoxide concentrations in Grants Pass are discussed in Section 4.53.2.3, "Permanent and Enforceable Improvements in Air Quality."

Nonattainment Area Requirements

The State must have met all requirements applicable to the nonattainment area under Section 110 and Part D of the Clean Air Act. Compliance with Section 110 and Part D of the Act is discussed in Section 4.53.4.1, "State Implementation Plan Requirements/Nonattainment Area Requirements."

Maintenance Plan Elements

For a nonattainment area to be redesignated to attainment, EPA must fully approve a maintenance plan for the area that meets the requirements of Section 175A of the Clean Air Act. Concurrent approval of the maintenance plan and redesignation request is allowed. There are five parts to the maintenance plan: an attainment inventory, a maintenance demonstration, a commitment to continue operating the monitoring network, a commitment to continue to verify attainment, and a contingency plan. These sections are outlined in Table 4.53.1.1.

Table 4.53.1.1 Summary of Redesignation Requirements

Required Element	Section of Plan	
Attainment Verification	Section 4.53.2:	ATTAINMENT DEMONSTRATION
SIP Approval	Section 4.53.4:	ADMINISTRATIVE REQUIREMENTS
Permanent and Enforceable Improvements in Air Quality	Section 4.53.2:	ATTAINMENT DEMONSTRATION
Nonattainment Area Requirements	Section 4.53.4:	ADMINISTRATIVE REQUIREMENTS
Attainment Inventory	Section 4.53.3:	MAINTENANCE PLAN
Maintenance Demonstration	Section 4.53.3:	MAINTENANCE PLAN
Monitoring Network	Section 4.53.4:	ADMINISTRATIVE REQUIREMENTS
Verification of Continued Attainment	Section 4.53.4:	ADMINISTRATIVE REQUIREMENTS
Contingency Plan	Section 4.53.3:	MAINTENANCE PLAN

4.53.2 ATTAINMENT DEMONSTRATION

4.53.2.1 Ambient Air Quality Monitoring Data

The Grants Pass area has one carbon monoxide monitor. The site is located in downtown Grants Pass at 215 SE 6th Street, known as the Wing Building. DEQ has monitored at this location since 1980. The Wing Building monitoring site operates during the winter season, October through March. During those months, the monitor runs continuously with hourly and 8-hour averages derived electronically via a data logger and an integrator. After rigorous quality assurance, the data is transferred into the Aerometric Information Retrieval System. This system provides EPA with DEQ's air quality monitoring data. These data are being utilized as the basis for the air quality attainment demonstration.

4.53.2.2 Attainment Years and Concentrations

The Grants Pass Central Business District has been in compliance with the national ambient air quality standard for carbon monoxide for ten consecutive calendar years. Listed below are the last three recorded violations of the 8-hour standard (two exceedances of the standard in one year is a violation):

Year	8-Hr 2nd High
1988	10.3 ppm
1986	10.2 ppm
1987	9.7 ppm

There have been no violations since 1988. The last exceedance of the carbon monoxide standard in Grants Pass occurred on November 13, 1990 at 9.9 ppm (any monitored 8-hour concentration of 9.5 ppm and above is an exceedance). The maximum 8-hour carbon monoxide concentrations recorded during each year since 1990 are shown in Table 4.53.2.1.

Table 4.53.2.1 Grants Pass Carbon Monoxide: Highest Values from 1990 to 1998 (Non-Overlapping 8-Hour Averages in Parts Per Million)

Concentration	Date
9.9 ppm	November 13, 1990
9.2 ppm	January 2, 1991
8.2 ppm	February 8, 1992
7.7 ppm	December 9, 1993
7.2 ppm	January 20, 1995
6.6 ppm	February 1, 1994
6.4 ppm	February 2, 1996
5.3 ppm	January 14, 1997
4.7 ppm	October 30, 1998

The long-term concentration trend at the Wing Building monitoring site is clearly declining, as is also shown in Figure 4.53.2.1. In this figure, the second highest value for each year is shown. This is the value that would determine if a violation occurred in that year.

Figure 4.53.2.1 Grants Pass 8-Hour Carbon Monoxide Trend at Wing Building

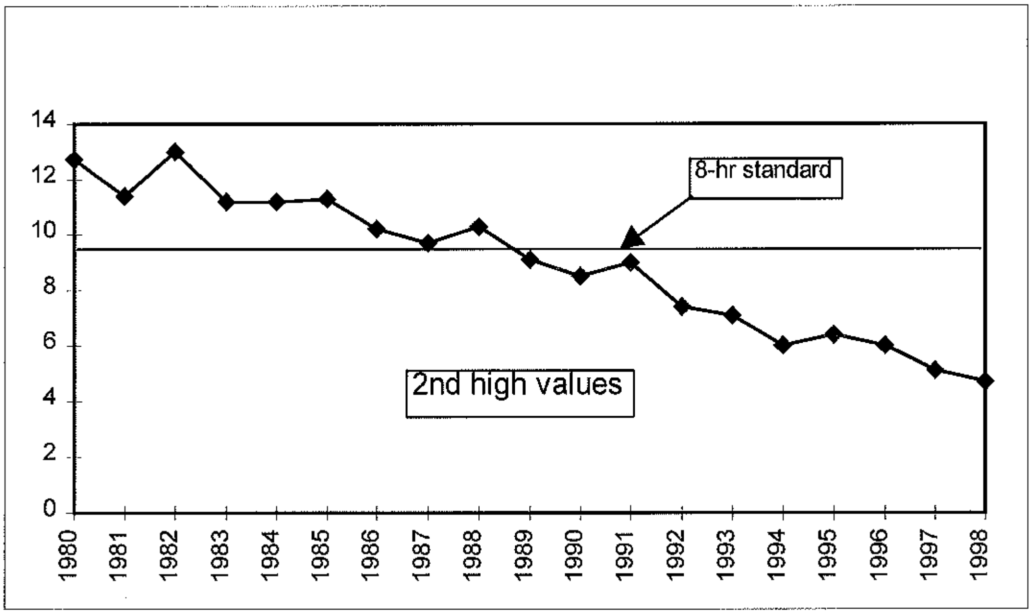


Table 4.53.2.2 summarizes the second highest 8-hour carbon monoxide concentrations recorded since 1980 at the Wing Building carbon monoxide monitoring site.

Table 4.53.2.2 Second High 8-Hour Carbon Monoxide Concentrations (1980-1998) (in Parts Per Million)

Year	Concentration
1980	12.7
1981	11.4
1982	13.0
1983	11.2
1984	11.2
1985	11.3
1986	10.2
1987	9.7
1988	10.3

Year	Concentration
1989	9.1
1990	8.5
1991	9.0
1992	7.4
1993	7.1
1994	6.0
1995	6.4
1996	6.0
1997	5.1
1998	4.7

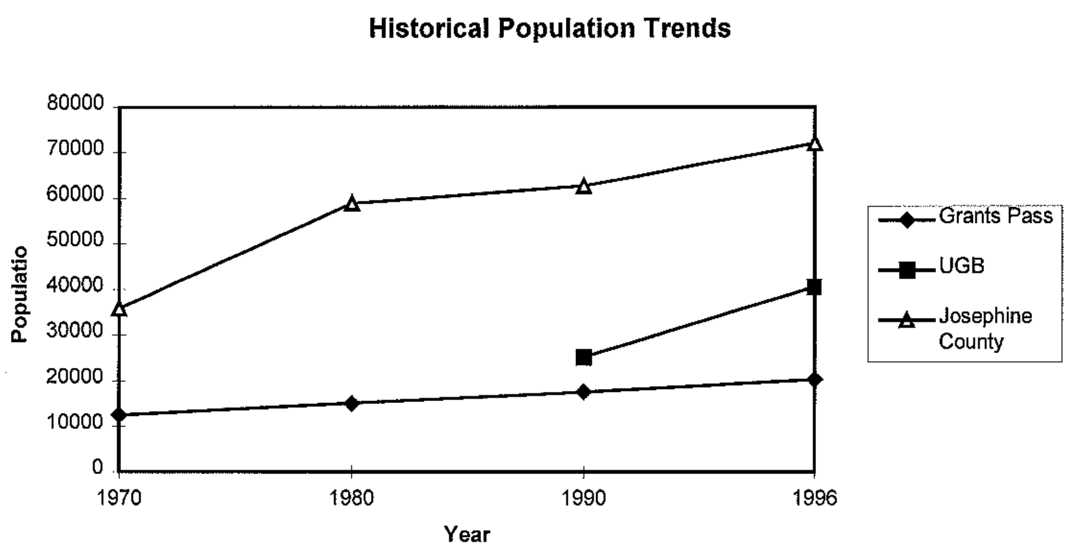
4.53.2.3 Permanent and Enforceable Improvement in Air Quality

In order for an area to be redesignated to attainment, EPA guidance specifies that a state must be able to reasonably attribute improvements in air quality to control measures that are permanent and enforceable. EPA recommends an analysis demonstrating that attainment has not been achieved due to either a temporary economic downturn or to especially favorable meteorology. This section discusses economic factors and meteorology in Grants Pass.

Economic Factors

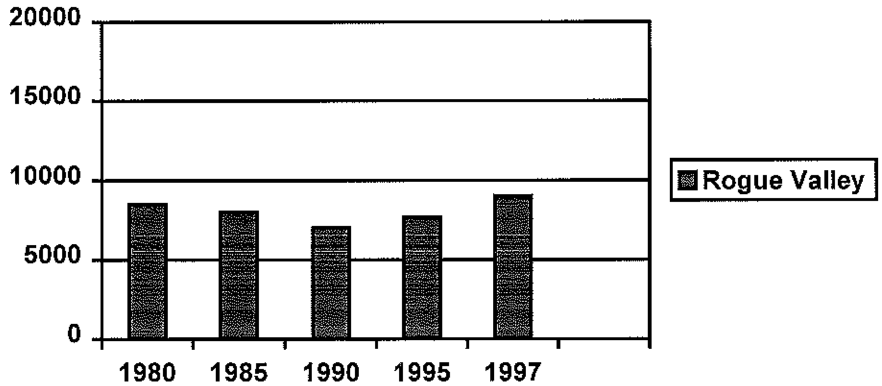
Population and employment are key indices of the overall level of economic activity and growth, reflecting changes in industrial activity and vehicle miles traveled. Complete information on the population and household projection figures used in developing this maintenance plan is presented in Appendix D4-6. Population trends for the city of Grants Pass, the Grants Pass Urban Growth Boundary and Josephine County are shown in Figure 4.53.2.2. Despite a recession in the early 1980's, the area has sustained a steady growth pattern since the 1970's. The labor force in Josephine County expanded by 40 percent between 1977 and 1997. Unemployment trends for the Rogue Valley are shown in Figure 4.53.2.3. The lowest period of unemployment in the Rogue Valley occurred during the late 1980's and early 1990's.

Figure 4.53.2.2 Population Trends in Grants Pass and Josephine County



Grants Pass reached attainment in 1990, the end of a period of modest growth and low unemployment. Since 1990, the growth rate has returned to the more rapid rate of the 1970's. Monitored levels since 1990 show a continuing decline of carbon monoxide concentrations despite this significant growth. The conclusion is that improvements in Grants Pass carbon monoxide air quality have not been due to a downturn in economic conditions.

Figure 4.53.2.3 Unemployment Trend in the Rogue Valley



Meteorological Effects

Low wind speed is the meteorological condition most generally present when peak carbon monoxide concentrations occur. This section evaluates wind speed conditions in Grants Pass from calendar years 1989 to 1997 during the six month winter period from October through March. The purpose of this analysis is to verify that lower carbon monoxide concentrations in recent years are not due to atypical winter dispersion conditions.

DEQ evaluated Grants Pass area meteorological patterns over the 1989-1997 period, and concluded that recent compliance with carbon monoxide standards is not attributable to favorable meteorology. Below is a summary of the meteorological analysis procedures and conclusions.

Hourly wind speeds recorded at the DEQ meteorological recording station at 11th and K Streets in downtown Grants Pass were collected and tabulated for this analysis and are portrayed in Table 4.53.2.3 and Figure 4.53.2.4. The carbon monoxide monitor is located at 6th and G Streets.

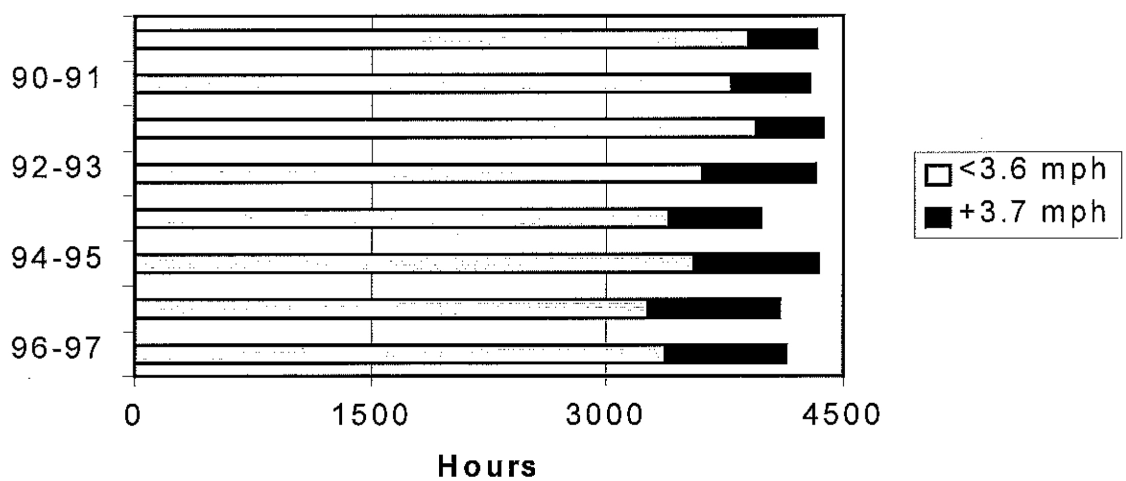
Table 4.53.2.3 Grants Pass Wind Speed Conditions from October through March
Recorded at 11th and K Streets

Year	Hours at Wind Speed					
	0 – 3.6 MPH	Rank - Most to Least Stagnant	3.7 – 5.5 MPH	Total Hours 0 – 5.5 MPH	Percent of Wind Speed <3.6 MPH	Rank - Most to Least Stagnant
1989-90	3,900	2	234	4,134	90.0%	2
1990-91	3,790	3	279	4,069	88.5%	3
1991-92	3,946	1	294	4,240	90.3%	1
1992-93	3,607	4	440	4,047	83.5%	5
1993-94	3,399	6	336	3,735	85.6%	4
1994-95	3,556	5	385	3,941	81.9%	6
1995-96	3,267	8	389	3,656	79.8%	8
1996-97	3,376	7	422	3,798	81.7%	7

From 1989 through 1997, two exceedances were recorded at the 6th Street monitor, one during the 1989-90 season and another in the 1990-91 winter season. While these two seasons are among the most stagnant, low wind speed conditions were most dominant during the 1991-92 winter season which had no exceedances of the standard.

Wind speeds in subsequent years have increased but cannot account for the improvement in air quality. Low wind speed conditions as a percentage of time vary by no more than 10 percent from 1989 to 1997, as shown in Figure 4.53.2.4. Carbon monoxide levels at the monitor have declined at a much greater rate, upwards of 50 percent during the same time. The 1991-92 winter season also suggests that other factors account for improving air quality. This season, predating the oxygenated fuels program, had the most stagnant wind conditions, but recorded no exceedances. Even with the improvements in ventilation, Grants Pass still experiences a high level of relatively stagnant conditions. During the most ventilated season considered, 1995-96, Grants Pass experienced a third more low wind speed conditions than Medford, which is 24 miles away (3,267 hours at 3.7 mph in Grants Pass vs. 2,368 hours at 4 mph in Medford).

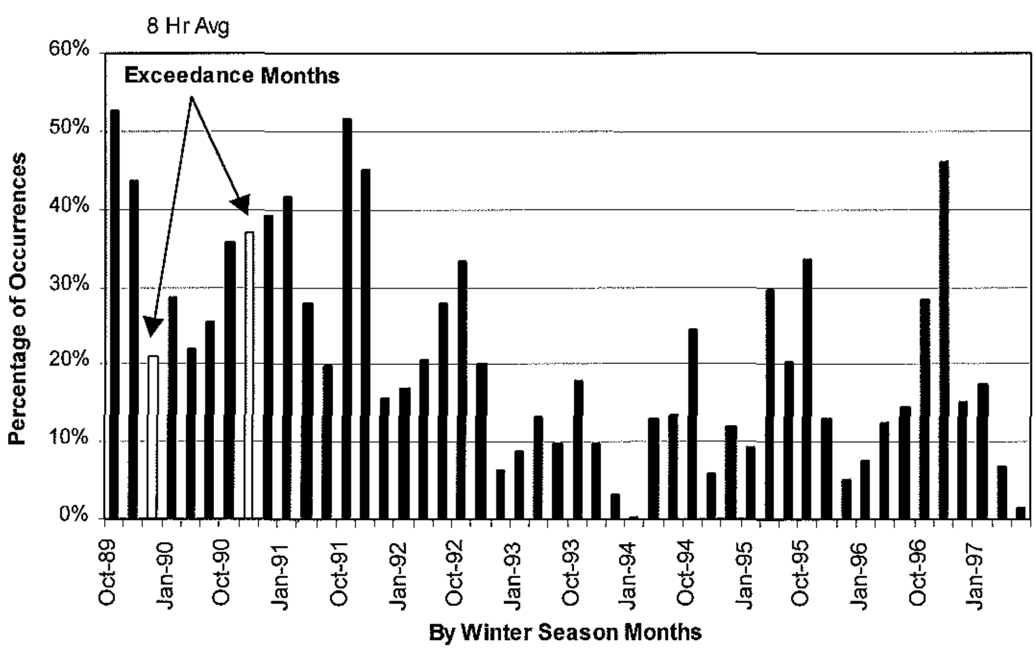
Figure 4.53.2.4 Wind Speed During Winter Season, October - March



This analysis is based on data that is somewhat coarse as exceedances are recorded within eight hour intervals, during which wind speeds may be markedly different from the rest of the day. Comparisons to conditions during actual exceedance events may show a different result. A more detailed review of the data was conducted to determine if this difference occurred. This analysis considered wind speed conditions recorded during the actual carbon monoxide exceedances and compared the distribution of similar events during the attainment period. In this analysis wind speeds are averaged over 8 hours, identical to the method used to determine the eight-hour carbon monoxide value. During the exceedances recorded in December 1989 and November 1990, the average eight-hour wind speed was 1.21 and 1.25 miles per hour, respectively. The frequency of eight-hour average wind speeds from October 1989 through March 1997, including the exceedance events, is shown in Figure 4.53.4.5. The figure shows that although the frequency of these exceedance-conducive low wind speed intervals has declined in recent years, periods similar to the pattern experienced during exceedances continued to occur during the attainment period.

Recognizing that relative increases in wind speed have occurred during the attainment period, it is still unlikely, based on this analysis, that the improvements in carbon monoxide concentrations can be attributed to increased ventilation.

Figure 4.53.2.5 Wind Speeds Less Than 1.23 mph



Permanent and Enforceable Emission Reductions

Permanent and enforceable control strategies that were in place during the attainment period include:

1. Federal Measures: Federal Motor Vehicle Control Program establishing emission standards for new motor vehicles.

2. State Implementation Plan measures: Major New Source Review Program (Lowest Achievable Emission Rate and offsets).

3. Third Bridge: Third bridge traffic diversion may have helped to avoid exceedance levels during the 1991-92 winter.

The federal motor vehicle control program helped counteract the increased activity of carbon monoxide pollution sources in Grants Pass and helped bring the area into attainment. There was no effect of the New Source Review program since no major industry is located in the Central Business District. In late 1991 and 1992, two additional measures went into effect. A third bridge over the Rogue River was completed in October 1991. The third bridge provides an alternate route over the Rogue River and diverts traffic away from the Central Business District, reducing traffic congestion in the Central Business District. A wintertime oxygenated fuel program was also started in Grants Pass in November 1992, as required by the 1990 Clean Air Act amendments. As shown by the air quality data, compliance levels were achieved within the Grants Pass carbon monoxide nonattainment area by 1990, before the oxygenated fuel program started or construction of the third bridge was completed.

4.53.2.4 Demonstration that DEQ's Monitor Reasonably Represents Worst Case Carbon Monoxide Concentrations

Evidence is presented in this section to demonstrate that the location of the DEQ monitor for carbon monoxide represents "worst case" or peak level concentrations.

4.53.2.4.1 DEQ Has Conducted Comprehensive Field Studies

During the winter of 1993-94, DEQ conducted a carbon monoxide saturation survey to evaluate the effectiveness of the current monitoring site at the Wing Building, as well as to determine the effect of the new bridge on carbon monoxide patterns in the Grants Pass Central Business District. Six sites were sampled in the Grants Pass Central Business District, based on proximity to high traffic count lanes or queues, or proximity to the existing carbon monoxide monitor. A seventh site was added at 11th and K Streets to measure background data for the survey. The results of the survey showed that the Wing Building is an appropriate location for monitoring maximum carbon monoxide levels in the Grants Pass Central Business District. Sampled sites at any distance from the Wing Building generally showed lower maximum carbon monoxide levels during the survey period. A complete report of the sampling survey results is provided in Appendix D4-3.

4.53.2.4.2 Screening Techniques Used To Identify Intersections With Potential For High Carbon Monoxide Concentrations

A screening analysis was used to identify the three highest intersections by volume and the three highest intersections by congestion. The specific algorithm used as a measure of congestion was "V * V/C," or volume weighted by volume divided by capacity. This is a screening technique commonly used by many other carbon monoxide planning areas. As part of the 6th and 7th Street Couplet project, the Oregon Department of Transportation (ODOT) prepared a comprehensive traffic analysis, documented in "Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County," August 1997 (see Appendix D4-7). This document provided evening peak hour traffic volumes for a 1995 analysis year for 22 intersections within the Central Business District along the 6th and 7th Street couplet. For the V/C part of the algorithm, DEQ used corresponding 1995 V/C ratios documented in the ODOT Traffic Narrative.

Evening peak hour volumes of each leg of the intersection were summed, and the peak hour volume total was then multiplied by the intersection V/C ratio determined by ODOT. Table 4.53.2.4 lists the six intersections with the highest screening values.

Table 4.53.2.4 Six Highest Intersections Screened by Volume and Congestion Using ODOT's 1995 Analysis Year for the 6th and 7th Street Couplet Project

Intersection	Screening Value by Volume
1. 6th and M	6340
2. 6th and G	5930
3. 6th and F	5520

Intersection	Screening Value by V*V/C
1. 6th and M	5706
2. 6th and A	4118
3. 7th and M	4107

The screening method by volume and congestion resulted in the identification of five unique intersections. In Section 4.53.2.5.1, analysis of the special bag sampling study results is presented demonstrating that the DEQ monitoring site at 6th and G measures maximum carbon monoxide exposure compared to the other screened intersections.

4.53.2.5 Conclusions Regarding Demonstration of Attainment

Monitoring data demonstrates that Grants Pass is in attainment with the national ambient air quality standards for carbon monoxide. Economic data shows attainment has not been attributable to a downturn in the Grants Pass area economy. An evaluation of meteorological data shows that attainment was not attributable to especially favorable meteorology. The saturation study presents evidence to demonstrate monitoring data can be reasonably characterized as representative of "worst case" peak carbon monoxide concentrations and that the DEQ monitoring site at 6th and G measures maximum carbon monoxide exposure compared to the other screened intersections.

This section has demonstrated attainment of the carbon monoxide standard in the Grants Pass nonattainment area and has demonstrated that the monitoring data may reasonably be considered to be representative of “worst case” concentrations.

4.53.3 MAINTENANCE PLAN

The Federal Clean Air Act, Section 175A(a), requires that a redesignation request/maintenance plan show that attainment will be maintained for at least 10 years after the date of redesignation. This section demonstrates that Grants Pass will remain in attainment with the national ambient air quality standard for carbon monoxide through 2015.

4.53.3.1 Attainment Inventory

An emission inventory was developed to represent base year emissions. This base year level of emissions is then compared to a future year emissions projection. In order to demonstrate continued attainment, future emissions must be at or below the base year emissions level. 1993 was selected as the base year to represent an attainment emissions level for Grants Pass.

An emission inventory consists of emission estimates from all sources in the area of influence that emit carbon monoxide. Although the Grants Pass nonattainment area is defined as the Central Business District, the Urban Growth Boundary is considered by the Environmental Protection Agency to be a more representative area of influence for carbon monoxide emissions. Sources emitting carbon monoxide in Grants Pass include industry, motor vehicles, non-road mobile sources (e.g., construction equipment, recreational vehicles, lawn and garden equipment), and area sources (e.g., outdoor burning, woodstoves, fireplaces, wildfires). Emissions from these sources are tabulated based on pounds of carbon monoxide emitted during a typical winter day.

The 1993 carbon monoxide attainment emission inventory prepared for the Grants Pass Urban Growth Boundary is summarized in Table 4.53.3.1. Emissions from motor vehicles were calculated by applying emission factors from the MOBILE5b EPA computer program to the total vehicles miles traveled in the Urban Growth Boundary calculated from the Rogue Valley Council of Governments' travel demand model. The procedures for calculating the attainment emission inventory and detailed results are presented in Appendix D4-4.

Table 4.53.3.1 1993 Emission Inventory

Source Category	Pounds per Day	Percent Contribution
On-road mobile	**48,104**	**72%**
Non-road mobile	**1,684**	**2%**
Industry	**5,789**	**9%**
Area sources	**11,379**	**17%**

4.53.3.2 Maintenance Demonstration

The maintenance demonstration must show that total emissions in the future year will not exceed attainment or base year emissions. If they are projected to exceed base year emissions, control strategies must be identified to reduce emissions below the attainment year level.

4.53.3.2.1 Inventory Projections

Figure 4.53.3.1 shows the Grants Pass Urban Growth Boundary carbon monoxide emissions projected to the year 2015. Table 4.53.3.2 presents the 1993 figures and projection year figures for carbon monoxide emissions in the four source categories. The procedures used for projecting these emissions and detailed results for individual sources are presented in Appendix D4-4.

Projection Results without Oxygenated Fuel

Total emissions are projected to be 58,224 pounds per winter day in 2015. This is a 13 percent decrease from the 1993 attainment emissions level. Emissions were projected assuming the oxygenated fuel program would be discontinued upon EPA approval of this plan. As shown, the total emissions in all years after 1993 stay below the 1993 attainment emission level. The decrease in emissions from 1993 to 2015 is largely due to the decrease in motor vehicle emissions from improved technology. As a share of total emissions, on-road mobile sources account for three-fourths of the total carbon monoxide emissions in the Urban Growth Boundary.

Figure 4.53.3.1 Carbon Monoxide Emission Growth From 1993 to 2015 Without Oxygenated Fuel

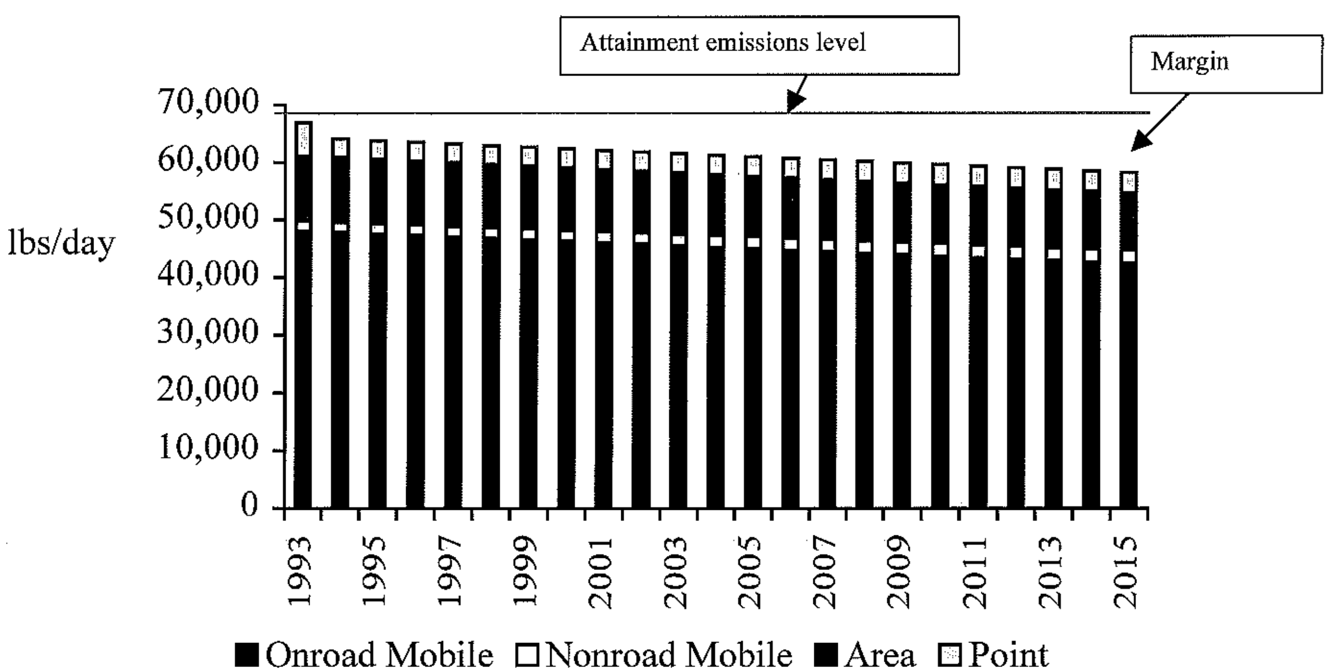


Table 4.53.3.2: Carbon Monoxide Emissions Attainment and Projection Inventories

Grants Pass Urban Growth Boundary
(Pounds Carbon Monoxide/Winter Day)

Year	1993	2000	2005	2010	2015
On-Road Mobile Sources	48,104	46,279	44,975	43,672	42,368
Non-Road Mobile Sources	1,684	1,872	2,007	2,141	2,275
Area Sources	11,379	10,943	10,631	10,319	10,007
Point Sources	5,789	3,283	3,380	3,477	3,574
Total	66,957	60,717	59,283	57,850	58,224

4.53.3.2.2 Transportation Emissions Budget for Conformity

The federal and state transportation conformity regulations require that mobile source emissions resulting from implementation of the transportation plan and transportation improvement program meet certain criteria to ensure compliance with the Clean Air Act.

For transportation conformity purposes, an emissions budget has been established for on-road motor vehicle emissions in the Grants Pass Central Business District. The transportation emissions budget numbers for the plan as adopted are shown in Table 4.53.3.3.

Table 4.53.3.3: Central Business District Transportation Emissions Budget Through 2015

(Pounds Carbon Monoxide/Winter Day)

Year	1993	2000	2005	2010	2015
Budget	4,626	4,404	4,245	4,087	3,929

Because the transportation emissions budget was developed based on forecasts from the Rogue Valley Council of Governments travel demand model, DEQ anticipates that the identified budget will be sufficient for conformity determinations.

Under state conformity rules, a localized carbon monoxide analysis (hot-spot) is required for projects, regardless of their funding source, at the top three intersections based on volume or congestion. These intersections have been identified so that localized carbon monoxide concentrations will be considered and problems addressed prior to approval. According to the 2015 traffic figures and peak hour capacity analysis conducted by ODOT for the 6th and 7th Street Couplet project (see Section 4.53.2.4.2), the top six intersections ranked by volume and congestion are shown in Table 4.53.3.4. Additional details on the 2015 intersection ranking are contained in Appendix D4-7.

Table 4.53.3.4 Six Highest Intersections Screened by Volume and Congestion Using RVCOG's 1993 Base Year

Intersection	Screening Value by Volume
6th and M	7490
6th and G	7170
6th and A	6580

Intersection	Screening Value by Congestion
6th and M	8014
6th and A	6251
6th and G	5521

Appendix D4-5 describes DEQ's transportation conformity rules and the transportation conformity process in Oregon.

4.53.3.2.3 Control Measures

The emissions projections showed an overall decrease without additional controls, and eliminating oxygenated fuel. The two continuing measures will be the federal new car program and the third bridge over the Rogue River.

<u>Federal New Car Program</u>

The federal new car program has been and will continue to be the most effective carbon monoxide emission reduction strategy. In contrast to other pollutants, vehicle carbon monoxide emission controls have not experienced much deterioration of performance with increased age and mileage. An additional 37 percent reduction in the fleet average emission rate is expected between 1993 and 2015. Expected improvements in carbon monoxide emission control technology include heated catalysts that will help reduce the higher emissions from cold starts.

Major New Source Review

Until the Grants Pass nonattainment area is redesignated to attainment, proposed major sources in the Central Business District are required to comply with nonattainment area New Source Review rules, including Lowest Achievable Emission Rate control technology. (There are no existing major industrial sources in the nonattainment area.) After redesignation to maintenance, the Lowest Achievable Emission Rate requirement will be replaced by Best Available Control Technology and either offsets (emission reduction credits or a growth allowance established in the maintenance plan) or modeling demonstrating no significant impact. However, no new industry is expected to locate within the Central Business District and no industrial growth allowance is established in the maintenance plan.

Oxygenated Fuel

The Clean Air Act Amendments of 1990 required the Department to implement an oxygenated fuel program for four classified carbon monoxide nonattainment areas, including the Grants Pass area. The program was implemented in the winter of 1992-93. Gasoline suppliers distributing fuel in the Grants pass control area are required to provide for a minimum oxygen content by weight of 2.7 percent from November 1st through the end of February. The oxygenated fuel program will be discontinued upon approval by EPA of the maintenance plan. The maintenance demonstration shows that the Grants Pass Urban Growth Boundary can continue to meet the carbon monoxide health standard through 2015 without oxygenated fuel, while maintaining a significant safety margin.

Woodsmoke Curtailment

Emissions from wood burning for home heating account for 10 percent of annual carbon monoxide emissions in the area. Woodstove emission control efforts in the Grants Pass Urban Growth Boundary have significantly reduced particulate emissions through emission certification standards for new stoves, changeout programs to encourage removal of noncertified stoves, and a local voluntary curtailment program to reduce burning during stagnant weather periods. These efforts have contributed, and will continue to contribute, to a decline in carbon monoxide emissions from residential wood heating. Between 1993 and 2015, carbon monoxide emissions from wood combustion for home heating are projected to decrease by 17 percent. (See Appendix D4-4 for more detail.)

4.53.3.2.4 Rollforward Analysis

To project future 8-hour average carbon monoxide concentrations at the Wing Building DEQ monitoring site and other screened, potential hot spots in the Central Business District, a rollforward analysis was conducted. This is a very simple technique based on the fact that carbon monoxide is a relatively stable gas, and motor vehicles contribute most of the carbon monoxide measured at traffic-oriented monitoring sites. The rollforward analysis consists of applying a ratio of future carbon monoxide emissions, based on expected growth, to a baseline level of emissions and corresponding, measured annual second highest 8-hour maximum carbon monoxide concentrations. Baseline carbon monoxide emissions for the 6th and G intersection were calculated for the attainment year 1993 and then for 2015, based on expected traffic growth from the Emme/2 transportation model for Grants Pass and EPA's Mobile5b emission factor model. The carbon monoxide emissions in gm/mile were calculated for each leg of the intersection, based on estimated/calculated speeds (PM peak hour and 7-hour off-peak period) and then summed for total intersection emissions. Carbon monoxide emission factors were calculated without taking credit for the wintertime oxygenated fuel program.

The non-monitored locations were selected on the basis of the same screening technique employed in the Attainment Demonstration (Section 4.53.2.4.2), that is, using volume and congestion factors derived from traffic data compiled by ODOT in the document, "Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County," June 1997. The intersections as shown in Table 4.53.3.5 were identified, based either on volume alone, or a combination of volume and expected congestion (V*V/C, where V is the traffic volume and V/C is the volume/capacity ratio of the intersection). In this analysis, the same intersections were identified by the volume and congestion screening criteria.

Table 4.53.3.5 Selected Intersections and Ranking Factors

Location	Ranking Factor(s)
6th and A	Volume and V*V/C
6th and G	Volume and V*V/C
6th and M	Volume and V*V/C

The results of the rollforward analysis, as shown in Table 4.53.3.6, take no credit for a wintertime oxygenated fuel program. This analysis indicated continued attainment at the screened intersections through the year 2015 without oxygenated fuel.

Table 4.53.3.6 2015 Second Highest Maximum 8-hour Carbon Monoxide Concentrations at the Screened Intersections

Location	2015 8-Hr CO Concentration, ppm
6th and A	6.6
6th and G (Wing Building Monitor)	6.6
6th and M	8.0

The details of the rollforward methodology and example calculations are contained in Appendix D4-7. The Mobile5b emission factor inputs and outputs and example calculations are contained in Appendix D4-4.

4.53.3.3 Contingency Plan

The Maintenance Plan must contain contingency measures that would be implemented in the event of: 1) a violation of the carbon monoxide standard after the area has been redesignated to maintenance, or 2) other appropriate triggering protocol contained in the plan. The contingency plan is outlined below.

The Clean Air Act Section 175A(d) requires that all control measures contained in the State Implementation Plan prior to redesignation be retained as a contingency measure in the maintenance plan. Therefore, Lowest Achievable Emission Rate and offsets for major industrial sources and the wintertime oxygenated fuel program must be contingency measures in the carbon monoxide maintenance plan.

<u>Phase 1: Risk of Violation</u>

If monitored (8-hour) carbon monoxide levels at any site within the Grants Pass nonattainment area on the National Air Monitoring System or the State and Local Air Monitoring System registers a second high concentration equaling or exceeding 90 percent (equal to or greater than 8.1 ppm) of the National Ambient Air Quality Standard level during a calendar year period, then DEQ will identify a planning group to recommend strategies that should be considered for implementation. Within six months of the validated 90 percent second high carbon monoxide concentration, the planning group will determine a schedule of selected strategies to either prevent or correct any violation of the 8-Hour national ambient air quality standard for carbon monoxide. This will allow a choice to be made to implement these measures before or after an actual violation has occurred.

The contingency strategies that will be considered include, but are not limited to:

(1) Improvements to parking and traffic circulation;
(2) Aggressive signal retiming program;
(3) Funding for transit;
(4) Implementation of bicycle and pedestrian networks.

In the event of a second occurrence in a calendar year of an 8-hour carbon monoxide concentration equaling or exceeding 8.1 ppm, the planning group may also choose to conduct further studies to determine if further measures are necessary, or to take no further action at all if the problem was caused by an exceptional event.

<u>Phase 2: Actual Violation</u>

If a violation of the carbon monoxide national ambient air quality standard occurs, and is validated by DEQ, the following contingency measures will automatically be implemented:

(1) New Source Review requirements for proposed major sources and major modifications in the Maintenance Plan area (and the area of significant air quality impact) will be

modified. The requirement to install Best Available Control Technology will be replaced with a requirement to install Lowest Achievable Emission Rate technology. These requirements will take effect upon validation of the violation. Best Available Control Technology may be reinstated if provided for in a new maintenance plan adopted and approved by EPA.

(2) Reinstatement of oxygenated fuel.

4.53.4 ADMINISTRATIVE REQUIREMENTS

The criteria that must be satisfied for a nonattainment area to be redesignated to attainment include several administrative requirements related to compliance with various Clean Air Act provisions. Each of these elements is described below.

4.53.4.1 State Implementation Plan Requirements/Nonattainment Area Requirements

Grants Pass has met all state implementation plan requirements specified in Section 110 and Part D of the Clean Air Act.

In summary, Section 110 requires a state to submit a plan, that becomes part of the state implementation plan, to provide for the implementation, maintenance, and enforcement of an air quality standard. Part D of the Clean Air Act outlines specific plan requirements for nonattainment areas.

4.53.4.1.1 Summary of Fully Approved State Implementation Plan

The 1986 Grants Pass carbon monoxide attainment plan adopted several control strategies. Because motor vehicles represent the vast majority of the total carbon monoxide emissions generated in Grants Pass (77 percent in 1984), the control strategies focused primarily on transportation control measures. EPA approved the attainment plan in March 1988. The strategies in the approved plan include:

a. Federal Motor Vehicle Emission Control Program

b. Construction of a third bridge over the Rogue River

4.53.4.1.2 1990 Clean Air Act Requirements and Status

The 1990 Clean Air Act Amendments include additional requirements for moderate carbon monoxide nonattainment areas. Following are the DEQ submittal dates and EPA approval dates of submissions required by section 110 and Part D of the 1990 Clean Air Act Amendments:

a. *1990 Emissions inventory, to be revised every three years thereafter until attainment.* On November 15, 1992, DEQ submitted to EPA a comprehensive 1990 carbon monoxide emission inventory for the Grants Pass nonattainment area. EPA provided comments on the submittal in July, 1993. EPA agreed that completing the 1990 inventory at the same time that the 1993 inventory was due would not result in an environmental gain. Rather, DEQ should incorporate the comments on the 1990 base year emission inventory into the 1993 emission inventory preparation. The 1993 emission inventory provided in Appendix D4-4-2 in this Redesignation Request/Maintenance Plan submittal will be used to meet the periodic inventory requirement. The 1996 periodic emission inventory will be submitted to EPA at the time of maintenance plan submittal. The projection inventory to 2015 is included in Appendix D4-4-3.

b. *Oxygenated gasoline*. On November 16, 1992, DEQ submitted to EPA an oxygenated gasoline program for the Grants Pass area. The regulations were effective November 1, 1992. The program mandated the use of gasoline with no less than 2.7 percent oxygen content in the winter months.

Because Grants Pass was classified with a design value for carbon monoxide above 9.5 ppm, the area was required to establish a wintertime oxygenated fuel program. DEQ adopted rules (OAR 340-022-0440 through 022-0640) to meet this requirement. These regulations require that all gasoline suppliers in the Grants Pass area register with DEQ. These regulations further require that the average blend of any gasoline sold by the supplier should be at least 2.7 percent oxygen by weight and in no case be less than 2.0 percent oxygen content by weight (actual) from the months of November 1 through the end of February. The Clean Air Act allows the elimination of this program upon redesignation to attainment status.

c. *Transportation Conformity Requirements.* Section 176(c) of the Clean Air Act requires states to revise state implementation plans to establish criteria and procedures for demonstrating transportation plan conformity to a state implementation plan. On April 14, 1995, DEQ submitted to EPA a revision to the Oregon state implementation plan establishing transportation conformity requirements for Oregon (OAR 340-020-0710 through 340-020-1080). General Conformity requirements (OAR 340-020-1500 through 340-020-1600) were submitted on September 27, 1995. EPA approved the transportation conformity rules as a state implementation plan revision on May 16, 1996. EPA modified the transportation conformity rules in 1997 to allow more flexibility; DEQ adopted these changes in 1998. The revised state rules were submitted to EPA as a revision to the state implementation plan on October 13, 1998.

d. *New Source Review Rules for "major sources".* On November 16, 1992, DEQ submitted revisions to the New Source Review permit program. These revisions included a requirement that offsets come from contemporaneous, actual emission reductions under OAR 340-028-1970(5), and other changes.

e. *Contingency measures*. These measures were required to be established in the event that Grants Pass was not able to demonstrate reasonable further progress towards achieving the standard. Contingency measures included a review to determine if carbon monoxide strategy elements were delayed or if projects with an adverse effect had been included. Delayed projects with identified benefits were to be moved forward expeditiously. Transportation projects with adverse impacts were to be delayed until other measures were adopted to make up the shortfall.

The Environmental Quality Commission also adopted as a carbon monoxide contingency measure a requirement for oxygenated fuel to be formulated with a 2.9% oxygen content if the area should further violate the carbon monoxide standard. This measure was approved by EPA on June 28, 1994.

4.53.4.2 Monitoring Network and Commitments

DEQ is responsible for the operation of the permanent ambient carbon monoxide monitor in Grants Pass. DEQ oversees the quality control and quality assurance program for the monitoring data.

DEQ will continue to comply with the air monitoring requirements of Title III, Section 319, of the Clean Air Act. The monitoring site will also continue to be operated in compliance with EPA monitoring guidelines set forth in 40 CFR Part 58, "Ambient Air Quality Surveillance," and Appendices A through G of Part 58. In addition, DEQ will continue to comply with the "Ambient Air Quality Monitoring Program" specified in Volume 2, Section 6 of the SIP. Further, DEQ will continue to operate and maintain the network of State and Local Air Monitoring Stations and National Air Monitoring Stations in accordance with the terms of the State/EPA Agreement.

DEQ also periodically conducts saturation studies to verify that the existing monitors are recording the highest carbon monoxide concentrations in the area. DEQ will commit to conducting a reevaluation survey in the event of major changes in traffic patterns, as soon as practicable after identifying any such changes. DEQ will also commit to a five-year periodic survey, pending EPA review. Based on carbon monoxide monitoring data, relevant traffic data and other considerations such as special project funding availability, DEQ air monitoring, modeling and planning staff in consultation with EPA air monitoring, modeling and planning staff may reach agreement that the periodic survey is unnecessary, or should be delayed.

4.53.4.3 Verification of Continued Attainment

DEQ will analyze on an annual basis the carbon monoxide air quality monitoring data to verify continued attainment of the carbon monoxide standard, in accordance with 40 CFR Part 50 and EPA's Redesignation guidance. This data, along with the previous year's data, will provide the necessary information for determining whether the region continues to attain the National Ambient Air Quality Standard.

The Clean Air Act requires the state to submit a revision to the maintenance plan eight years after the redesignation request is approved by EPA. The revision will provide for maintenance of the National Ambient Air Quality Standards for an additional ten years following the first ten–year period. The next maintenance plan update will likely be in 2009, assuming EPA approval of this plan in 2001 (EPA has a maximum of 18 months from the date of submittal to act on the plan). The maintenance plan revision in 2009 will include a full emissions inventory update and project emissions and continued attainment for a minimum of ten additional years beyond EPA approval of the revised plan.

For the interim period between EPA approval of this plan and the 2009 plan revision, DEQ will rely on ambient monitoring data to track progress of the maintenance plan. The growth projections for the Grants Pass area are modest. As long as monitoring data shows no significant upward trend in concentrations, a mid-term emission inventory update will not be necessary. If carbon monoxide concentrations significantly increase over current levels, then an evaluation of growth and other planning assumptions will be necessary.

If a second-high carbon monoxide concentration in any year is measured above eighty percent of the National Ambient Air Quality Standard, DEQ will prepare an analysis of growth factors to determine if any significant planning assumptions have changed. The analysis will include a review of emission factors, growth factors, rule effectiveness and penetration factors and other significant assumptions used to prepare the maintenance plan. If there are significant changes, DEQ will consult with EPA to determine if a more extensive periodic emissions inventory is necessary, or if other action is warranted.

4.53.4.4 Maintenance Plan Commitments

As part of the carbon monoxide maintenance plan, DEQ commits to do the following:

DEQ will commit to conducting a saturation re-evaluation survey in the event of major changes in traffic patterns, as soon as practicable after identifying any such changes. DEQ will also commit to a five-year periodic saturation survey, pending EPA review.

DEQ will commit to an evaluation of growth and other planning assumptions if carbon monoxide concentrations significantly increase over current levels.

Oregon Administrative Rules
Chapter 340

DIVISION 204*

AIR POLLUTION CONTROL STANDARDS FOR AIR PURITY AND QUALITY

340-204-0030*
Designation of Nonattainment Areas

The following areas are designated as Nonattainment Areas:

(1) Carbon Monoxide Nonattainment Areas:
  (a) The Grants Pass Nonattainment Area for Carbon Monoxide is the Grants Pass CBD as defined in OAR 340-204-0010. <u>After the effective date of the Environmental Protection Agency's approval of this section as a revision to the Oregon Clean Air Act Implementation Plan as published in the Federal Register, the Grants Pass CBD is not subject to OAR 340-204-0030 and is no longer considered a nonattainment area.</u>
  (b) The Klamath Falls Nonattainment Area for Carbon Monoxide is the Klamath Falls UGB as defined in OAR 340-204-0010.
  (c) The Salem Nonattainment Area for Carbon Monoxide is the Salem-Kaiser Area Transportation Study as defined in OAR 340-204-0010.

(2) PM10 Nonattainment Areas:

Revocation of the nonattainment designation for the following areas will be effective upon final notice in the Federal Register:
  (a) The Eugene Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (b) The Grants Pass Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (c) The Klamath Falls Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (d) The LaGrande Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (e) The Lakeview Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (f) The Medford Nonattainment Area for PM10 as defined in OAR 340-204-0010.
  (g) The Oakridge Nonattainment Area for PM10 as defined in OAR 340-204-0010.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040.]
Stat. Auth.: ORS 468.020
Stat. Implemented: ORS 468A.025
Hist.: DEQ 14-1995, f. & cert. ef. 5-25-95; DEQ 18-1996, f. & cert. ef. 8-19-96; DEQ 15-1998, f. & cert. ef. 9-23-98; DEQ 1-1999, f. & cert. ef. 1-25-99; renumbered from OAR 340-031-0520.

**(Formerly Division 31, OAR 340-031-0520. Renumbering is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

340-204-0040**
Maintenance Areas

The following areas are designated as Maintenance Areas:

(1) Carbon Monoxide Maintenance Areas:

(a) The Eugene Maintenance Area for Carbon Monoxide is the Eugene-Springfield AQMA as defined in OAR 340-204-0010.
(b) The Portland Maintenance Area for Carbon Monoxide is the Portland Metropolitan Service District as referenced in OAR 340-204-0010.
(c) The Medford Maintenance Area for Carbon Monoxide is the Medford UGB as defined in OAR 340-204-0010.
(d) The Grants Pass Maintenance Area for Carbon Monoxide is the Grants Pass CBD as defined in OAR 340-204-0010. <u>After the effective date of the Environmental Protection Agency's approval of this section as a revision to the Oregon Clean Air Act Implementation Plan as published in the Federal Register, the Grants Pass CBD is subject to OAR 340-204-0040 and is considered a maintenance area.</u>

(2) Ozone Maintenance Areas:
(a) The Medford Maintenance Area for Ozone is the Medford-Ashland AQMA as defined in OAR 340-204-0010.
(b) The Oregon portion of the Portland - Vancouver Interstate Maintenance Area for Ozone is the Portland AQMA, as defined in OAR 340-204-0010.

(3) PM10 Maintenance Areas: There are no areas in the state that have been designated by the EQC as PM10 Maintenance Areas.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040.]
Stat. Auth.: ORS 468.020
Stat. Implemented: ORS 468A.025
Hist.: DEQ 14-1995, f. & cert. ef. 5-25-95; DEQ 18-1996, f. & cert. ef. 8-19-96; DEQ 15-1998, f. & cert. ef. 9-23-98; DEQ 1-1999, f. & cert. ef. 1-25-99; renumbered from OAR 340-031-0530.

**(Formerly OAR 340-031-0530. Renumbering is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

Oregon Administrative Rules
Chapter 340

DIVISION 204*

DESIGNATION OF AIR QUALITY AREAS

340-204-0090*
Oxygenated Gasoline Control Areas

The following are oxygenated gasoline control areas:

(1) Clackamas, Multnomah, Washington and Yamhill Counties;

(2) Jackson County;

(3) Grants Pass Control Area; after the effective date of the Environmental Protection Agency's approval of this section as a revision to the Oregon Clean Air Act Implementation Plan as published in the Federal Register, the Grants Pass control area is not subject to OAR 340-204-0090 and is no longer considered a control area.

(4) Klamath Falls Control Area.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040.]
Stat. Auth.: ORS 468 & ORS 468A
Stats. Implemented: ORS 468A.420
Hist.: DEQ 25-1992, f. 10-30-92, cert. ef. 11-1-92; DEQ 4-1993, f. & cert. ef. 3-10-93; renumbered from OAR 340-022-0470.

**(Formerly OAR 340-022-0470. Renumbering, including an amendment to move control area descriptions to OAR 340-204-0010, is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

DIVISION 200*

GENERAL AIR POLLUTION PROCEDURES AND DEFINITIONS

340-200-0040*

State of Oregon Clean Air Act Implementation Plan

(1) This implementation plan, consisting of Volumes 2 and 3 of the State of Oregon Air Quality Control Program, contains control strategies, rules and standards prepared by the Department of Environmental Quality and is adopted as the state implementation plan (SIP) of the State of Oregon pursuant to the federal Clean Air Act, Public Law 88-206 as last amended by Public Law 101-549.

(2) Except as provided in section (3) of this rule, revisions to the SIP shall be made pursuant to the Commission's rulemaking procedures in Division 11 of this Chapter and any other requirements contained in the SIP and shall be submitted to the United States Environmental Protection Agency for approval.

(3) Notwithstanding any other requirement contained in the SIP, the Department is authorized to submit to the Environmental Protection Agency any permit condition implementing a rule that is part of the federally-approved SIP as a source-specific SIP revision after the Department has complied with the public hearings provisions of 40 CFR 51.102 (July 1, 1992).

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040. Revisions to the State of Oregon Clean Air Act Implementation Plan become federally enforceable upon approval by the United States Environmental Protection Agency. If any provision of the federally approved Implementation Plan conflicts with any provision adopted by the Commission, the Department shall enforce the more stringent provision.]
[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]
Stat. Auth.: ORS Ch. 468.020
Stat. Implemented: ORS Ch. 468A.035
Hist.: DEQ 35, f. 2-3-72, ef. 2-15-72; DEQ 54, f. 6-21-73, ef. 7-1-73; DEQ 19-1979, f. & ef. 6-25-79; DEQ 21-1979, f. & ef. 7-2-79; DEQ 22-1980, f. & ef. 9-26-80; DEQ 11-1981, f. & ef. 3-26-81; DEQ 14-1982, f. & ef. 7-21-82; DEQ 21-1982, f. & ef. 10-27-82; DEQ 1-1983, f. & ef. 1-21-83; DEQ 6-1983, f. & ef. 4-18-83; DEQ 18-1984, f. & ef. 10-16-84; DEQ 25-1984, f. & ef. 11-27-84; DEQ 3-1985, f. & ef. 2-1-85; DEQ 12-1985, f. & ef. 9-30-85; DEQ 5-1986, f. & ef. 2-21-86; DEQ 10-1986, f. & ef. 5-9-86; DEQ 20-1986, f. & ef. 11-7-86; DEQ 21-1986, f. & ef. 11-7-86; DEQ 4-1987, f. & ef. 3-2-87; DEQ 5-1987, f. & ef. 3-2-87; DEQ 8-1987, f. & ef. 4-23-87; DEQ 21-1987, f. & ef. 12-16-87; DEQ 31-1988, f. 12-20-88, cert. ef. 12-23-88; DEQ 2-1991, f. & cert. ef. 2-14-91; DEQ 19-1991, f. & cert. ef. 11-13-91; DEQ 20-1991, f. & cert. ef. 11-13-91; DEQ 21-1991, f. & cert. ef. 11-13-91; DEQ 22-1991, f. & cert. ef. 11-13-91; DEQ 23-1991, f. & cert. ef. 11-13-91; DEQ 24-1991, f. & cert. ef. 11-13-91; DEQ 25-1991, f. & cert. ef. 11-13-91; DEQ 1-1992, f. & cert. ef. 2-4-92; DEQ 3-1992, f. & cert. ef. 2-4-92; DEQ 7-1992, f. & cert. ef. 3-30-92; DEQ 19-1992, f. & cert. ef. 8-11-92; DEQ 20-1992, f. & cert. ef. 8-11-92; DEQ 25-1992, f. 10-30-92, cert. ef. 11-1-92; DEQ 26-1992, f. & cert. ef. 11-2-92; DEQ 27-1992, f. &cert. ef. 11-12-92; DEQ 4-1993, f. & cert. ef. 3-10-93; DEQ 8-1993, f. & cert. ef. 5-11-93; DEQ 12-1993, f. & cert. ef. 9-24-93; DEQ 15-1993, f. & cert. ef. 11-4-93; DEQ 16-1993, f. & cert. ef. 11-4-93; DEQ 17-1993, f. & cert. ef. 11-4-93; DEQ 19-1993, f. & cert. ef. 11-4-93; DEQ 1-1994, f. & cert. ef. 1-3-94; DEQ 5-

1994, f. & cert. ef. 3-21-94; DEQ 14-1994, f. & cert. ef. 5-31-94; DEQ 15-1994, f. 6-8-94, cert. ef. 7-1-94; DEQ 25-1994, f. & cert. ef. 11-2-94; DEQ 9-1995, f. & cert. ef. 5-1-95; DEQ 10-1995, f. & cert. ef. 5-1-95; DEQ 14-1995, f. & cert. ef. 5-25-95; DEQ 17-1995, f. & cert. ef. 7-12-95; DEQ 19-1995, f. & cert. ef. 9-1-95; DEQ 20-1995 (Temp), f. & cert. ef. 9-14-95; DEQ 8-1996(Temp), f. & cert. ef. 6-3-96; DEQ 15-1996, f. & cert. ef. 8-14-96; DEQ 19-1996, f. & cert. ef. 9-24-96; DEQ 22-1996, f. & cert. ef. 10-22-96; DEQ 23-1996, f. & cert. ef. 11-4-96; DEQ 24-1996, f. & cert. ef. 11-26-96; DEQ 10-1998, f. & cert ef. 6-22-98; DEQ 15-1998, f. & cert. ef. 9-23-98; DEQ 16-1998, f. & cert. ef. 9-23-98; DEQ 17-1998, f. & cert. ef. 9-23-98; DEQ 20-1998, f. & cert. ef. 10-12-98; DEQ 21-1998, f. & cert. ef. 10-14-98; DEQ 1-1999, f. & cert. ef. 1-25-99; DEQ 2-1999, f. & cert. ef. 3-25-99; DEQ 6-1999, f. & cert. ef. 5-21-99; DEQ 10-1999, f. & cert. ef. 7-1-99; renumbered from OAR 340-020-0047.

* *(Formerly OAR 340-020-0047. Renumbering is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

Secretary of State
NOTICE OF PROPOSED RULEMAKING HEARING
A Statement of Need and Fiscal Impact accompanies this form.

DEQ – Air Quality Division	Chapter 340
Agency and Division	Administrative Rules Chapter Number
Susan M. Greco	(503) 229-5213
Rules Coordinator	Telephone

811 S.W. 6th Avenue, Portland, OR 97213
Address

July 22, 1999	4:30–6:30 p.m.	Council Chambers 101 NW 'A' Street, Grants Pass	Keith Tong
Hearing Date	Time	Location	Hearings Officer

Are auxiliary aids for persons with disabilities available upon advance request?
☒ Yes ☐ No

RULEMAKING ACTION

AMEND:

OAR 340-020-0047, 340-022-0470, 340-023-0115, 340-031-0520, 340-031-0530

RENUMBER*:
From OAR 340-020-0047 to 340-200-0400 [State Implementation Plan]
From OAR 340-022-0470 to 340-258-0130 [Oxygenated Gasoline Control Areas]
From OAR 340-023-0115 to 340-264-0200 [Open Burning Control Areas]
From OAR 340-031-0520 to 340-204-0030 [Designation of Nonattainment Areas]
From OAR 340-031-0530 to 340-204-0040 [Designation of Maintenance Areas]

*In a separate rulemaking action, DEQ is assigning new rule numbers to all Air Quality rules in a newly restructured system of organization. Therefore, it is likely that the rules being amended will also be renumbered as shown.

Stat. Auth.: ORS 468.015, 468.035
Stats. Implemented: ORS 468A.035, 468A.085, 468A.420

RULE SUMMARY

The Department of Environmental Quality is proposing that the Environmental Quality Commission adopt a maintenance plan and rule amendments regarding carbon monoxide in Grants Pass. The proposal, if adopted by the Environmental Quality Commission, will:

1. Establish a carbon monoxide maintenance plan for Grants Pass;
2. Request that the Environmental Protection Agency redesignate the Grants Pass Central Business District to an area that meets the National Ambient Air

Quality Standards for carbon monoxide;

3. Change the state designation of the Grants Pass Central Business District to a carbon monoxide maintenance area;
4. Establish a transportation conformity budget for the Grants Pass Central Business District; and
5. Eliminate the oxygenated fuel requirement for the Grants Pass area.

The maintenance plan (and its associated appendices, including the emission inventory), the request for redesignation, and elimination of the oxygenated fuel requirement, if adopted, will be submitted to the U.S. Environmental Protection Agency as a revision to the Oregon State Implementation Plan as required by the Clean Air Act. These rulemakings will take effect upon approval by the Environmental Protection Agency.

Additionally, the Department of Environmental Quality is proposing a rule amendment relating to fine particulate ($PM_{2.5}$) pollution prevention in Grants Pass. This proposal, if adopted by the Environmental Quality Commission, will expand the Rogue Basin Open Burning Control Area and will be submitted to the Environmental Protection Agency as a revision to the Oregon State Implementation Plan. The expansion of the Rogue Basin Open Burning Control Area will take effect upon adoption by the Environmental Quality Commission and filing with the Secretary of State.

Copies of the proposals are available for review at DEQ Headquarters, 11th Floor (address above); DEQ's Grants Pass Office, 510 NW 4th Street, Room 76, Grants Pass; or by calling (503) 229-5581.

July 27, 1999 at 5:00 p.m.
Last Day for Public Comment

Susan [signature]
Authorized Signer and Date

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

Fiscal and Economic Impact Statement

Introduction

This rulemaking proposes to adopt a carbon monoxide maintenance plan for the Grants Pass area, redesignate the Grants Pass Central Business District from a nonattainment area to a maintenance area, and adopt a rule amendment to eliminate the wintertime oxygenated fuel requirement for Grants Pass. This action will result in a minor cost savings to those involved in the sale and distribution of gasoline and to the general public. Because ethanol is the oxygenate used in Grants Pass, eliminating the oxygenated fuel requirement in Grants Pass will have a minor negative economic impact on producers of ethanol.

General Public

Oxygenated fuel can come with a slightly higher cost at the pump, generally no more than one or two cents per gallon. Oxygenated fuel is also reported to cause performance problems in some older vehicles. There is also some evidence that fuel economy decreases in older vehicles with the use of oxygenated fuel. These factors will result in a slight economic benefit to the general public if the oxygenated fuel requirement is eliminated in the Grants Pass area.

Small Business

Oxygenated Fuel

There are approximately 30 gas stations in the Grants Pass control area, both large and small. Eliminating oxygenated fuel will relieve gas stations within the Grants Pass control area, regardless of size, of the additional paperwork associated with selling oxygenated fuel during the winter months. There are a half dozen or so fuel hauling companies that deliver to Grants Pass, both large and small. There will be some simplification for fuel distributors of any size that will no longer have to carry two grades of fuel when making deliveries to both the Grants Pass control area and the surrounding area outside of the oxygenated fuel control area. The majority of gasoline sold in the Grants Pass area comes from a terminal in Eugene. The ethanol oxygenate is added by blenders to the gasoline when it is loaded into multi-compartmented delivery trucks at the Eugene terminal. The continuation of the oxygenated fuel program in the Medford area should not complicate delivery once Grants Pass is removed from the program because individual delivery trucks do not hold enough fuel to service more than the Grants Pass control area and immediately surrounding area retailers on any single delivery run.

Large Business

Oxygenated Fuel

Gasoline retailers, distributors, and terminals are required to have a permit to sell oxygenated fuel. The permit is free to retailers, $250 to distributors, and $2,500 to terminals. Distributors and terminals supplying oxygenated gasoline to the Grants Pass control area will continue to supply other areas in Oregon where oxygenate is still required, so will continue to need a permit and will continue recordkeeping practices. The impact on large distributors and large gas stations of removing the oxygenated fuel requirment will be the same for large business as that described above for small distributors and small gas stations.

Ethanol suppliers will suffer a small loss of ethanol sales; however, the Grants Pass market does not represent a significant percentage of the ethanol volume sold in Oregon. Six blenders registered to sell oxygenated fuel in the Grants Pass area during the 1998-99 winter season and reported selling approximately 4 million gallons of oxygenated fuel for the Grants Pass area during the winter months. (This compares to approximately 189 million gallons sold in the Portland area.)

Redesignation

Upon redesignation to a carbon monoxide maintenance area, major new or expanding industry will no longer be required to install the most stringent emissions control technology (Lowest Achievable Emission Rate). This will be replaced with a less stringent requirement to install emission control technology known as Best Available Control Technology. The result is an economic benefit to large business. However, no major industry is currently located within the central business district, nor is any major industry expected to locate within the central business district through 2015. (The central business district is small, three blocks wide and eleven blocks long, and is built out; current zoning also prohibits major industry from locating in the central business district.)

Local Governments

Local governments are not involved with the administration of the oxygenated fuel requirements. Local governments with fleet vehicles will experience the same savings as other motor vehicle users.

State Agencies

DEQ is the agency responsible for enforcing the oxygenated fuel requirement in the Grants Pass area. Staff inspect and sample gasoline stations each winter for oxygenate in fuel sold during the winter months. DEQ Medford Office staff administer the oxygenate program in Grants Pass, Medford and Klamath Falls. The Grants Pass market is small and eliminating the program there will not significantly reduce the workload. Therefore, no significant impact on staff resources is expected.

Assumptions

Cost assumptions assumed that current general practice by the fuel industry with regard to the sales and distribution of oxygenated fuel will not change significantly in the near future.

Housing Cost Impact Statement

The Department has determined that this proposed rulemaking will have no effect on the cost of development of a 6,000 square foot parcel and the construction of a 1,200 square foot detached single family dwelling on that parcel.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

The carbon monoxide maintenance plan is designed to maintain compliance with the carbon monoxide health standard in Grants Pass through 2015. The federal Clean Air Act requires a maintenance plan for areas seeking redesignation from nonattainment to attainment with national ambient air quality standards. The removal of the oxygenated fuel requirement is no longer needed to keep the area in attainment with the carbon monoxide standard.

2. Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program? ☒ Yes ☐ No

a. If yes, identify existing program/rule/activity:

The existing New Source Review requirement for major new or expanding industry in the central business district is for costly Lowest Achievable Emission Rate technology. Once the area is redesignated to an attainment area, this requirement will be replaced by the less costly Best Available Control Technology requirement. Although this change will theoretically make it easier for major new industry to locate in the Grants Pass Central Business District, the area is very small (three blocks by eleven blocks) and built out, is not zoned for major industry, and no industry is expected to locate within this area. Likewise, there is no existing industry within the central business district, making expansion of existing industry of no concern.

If for some unforeseen reason a major industrial source wanted to locate within the central business district, the existing procedure for statewide goal compliance and local plan compatibility adequately covers the New Source Review program. Under this procedure, DEQ requires permit applicants to obtain a land use compatibility statement from the appropriate local jurisdiction before issuing a permit.

b. If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules? ☒ Yes ☐ No (if no, explain):

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

The New Source Review program is covered by a State Agency Coordination agreement.

3. **If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.**

Not applicable, the New Source Review program is subject to land use compliance and compatibility procedures.

Gregory A Gr
Division

Intergovernmental Coordinator

6/9/99
Date

Questions to be Answered to Reveal
Potential Justification for Differing from Federal Requirements.

1. Are there federal requirements that are applicable to this situation? If so, exactly what are they?

Yes, the federal Clean Air Act requires that a redesignation request be accompanied by a maintenance plan. This maintenance plan must demonstrate that the area will not violate the applicable air quality standard for ten years after the Environmental Protection Agency approves the maintenance plan.

2. Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?

The federal requirements are performance based. A maintenance plan must demonstrate that future emissions will not cause a violation of the carbon monoxide standard.

3. Do the applicable federal requirements specifically address the issues that are of concern in Oregon? Was data or information that would reasonably reflect Oregon's concern and situation considered in the federal process that established the federal requirements?

No, the federal requirements are general in nature and allow states flexibility to design maintenance plans to meet local conditions. DEQ has used this flexibility to design the Grants Pass carbon monoxide maintenance plan with a local air quality advisory committee in order to accommodate local concerns.

4. Will the proposed requirement improve the ability of the regulated community to comply in a more cost effective way by clarifying confusing or potentially conflicting requirements (within or cross-media), increasing certainty, or preventing or reducing the need for costly retrofit to meet more stringent requirements later?

Yes. The carbon monoxide maintenance plan will allow the removal of emission control requirements that are no longer needed to maintain acceptable carbon monoxide levels in Grants Pass.

5. Is there a timing issue which might justify changing the time frame for implementation of federal requirements?

There is no deadline in the federal Clean Air Act for submitting a maintenance plan.

6. Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?

Yes, the carbon monoxide maintenance plan assumes a rate of growth consistent with the local comprehensive plan and was approved by the local air quality advisory committee. The plan provides for an approximate fifteen percent margin of safety for maintaining the carbon monoxide health standard.

7. Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)

Yes, the maintenance plan reduces the emission control requirements for major new and expanding industry, and removes oxygenated fuel requirements for motorists and gasoline distributors and retailers.

8. Would others face increased costs if a more stringent rule is not enacted?

The proposed carbon monoxide maintenance plan will not result in more stringent rules.

9. Does the proposed requirement include procedural requirements, reporting or monitoring requirements that are different from applicable federal requirements? If so, Why? What is the "compelling reason" for different procedural, reporting or monitoring requirements?

No.

10. Is demonstrated technology available to comply with the proposed requirement?

The carbon monoxide maintenance plan will not impose new requirements.

11. Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost-effective environmental gain?

The carbon monoxide maintenance plan will not impose new requirements.

State of Oregon
Department of Environmental Quality **Memorandum**

Date: June 15, 1999

To: Interested and Affected Public

Subject: Rulemaking Proposal and Rulemaking Statements - Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

This memorandum contains information on a proposal by the Department of Environmental Quality for a maintenance plan and rule amendments regarding carbon monoxide in Grants Pass. Pursuant to ORS 183.335, this memorandum also provides information about the Environmental Quality Commission's intended action to amend the Oregon Administrative Rules.

This proposal, if adopted by the Environmental Quality Commission, would:

1. Establish a carbon monoxide maintenance plan for Grants Pass;
2. Request that the Environmental Protection Agency redesignate the Grants Pass Central Business District to an area that meets the National Ambient Air Quality Standards for carbon monoxide;
3. Change the state designation of the Grants Pass Central Business District to a carbon monoxide maintenance area;
4. Establish a transportation conformity budget for the Grants Pass Central Business District; and
5. Eliminate the oxygenated fuel requirement for the Grants Pass area.

The maintenance plan (and its associated appendices, including emission inventories), the request for redesignation, and elimination of the oxygenated fuel requirement, if adopted, will be submitted to the Environmental Protection Agency as a revision to the Oregon State Implementation Plan, as required by the Clean Air Act. These rulemakings will take effect upon approval by the Environmental Protection Agency. DEQ has the statutory authority to address oxygenated fuel under ORS 468A.420. The maintenance plan and rules implement ORS 468A.035 regarding the state's comprehensive plan.

Acronyms and Keywords Used in this Package

Conformity	Relating to federal requirements that state and local transportation projects "conform" to meet air quality standards and not impact local air quality.
DEQ	Department of Environmental Quality
EQC	Environmental Quality Commission
Oxygenated fuel	Oxygenated fuel is gasoline that is blended with additives that contain extra oxygen. The oxygen promotes more complete combustion, which

reduces tailpipe emissions of carbon monoxide. The predominant oxygenate in Oregon is ethanol.

What's in this Package?

Attachments to this memorandum provide details on the proposal as follows:

Attachment A The official statement describing the fiscal and economic impact of the proposed maintenance plan and rule amendments. (required by ORS 183.335)

Attachment B A statement providing assurance that the proposed plan and rules are consistent with statewide land use goals and compatible with local land use plans.

Attachment C Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

Attachment D-1 A summary of the carbon monoxide maintenance plan. *A complete copy of the maintenance plan is available upon request to: Patti Seastrom, Oregon Department of Environmental Quality, 811 SW Sixth Avenue, Portland, OR 97204-1390, (503) 229-5581 or toll free in Oregon (800) 452-4011*

Or

A complete copy of the maintenance plan and appendices, including the emission inventory, is available for inspection from June 21, 1999 until July 27, 1999 at the Department of Environmental Quality's Grants Pass Office, 510 NW 4th, Room 76, Grants Pass, during these hours: Monday through Friday, 8 a.m. to 11:45 a.m. and 1 p.m. to 5 p.m., except on Wednesdays, 8 a.m. to noon only.

Attachment D-2 The actual language of the proposed rule amendments.

Hearing Process Details

DEQ is conducting a drop-in public hearing at which comments will be accepted either orally or in writing. DEQ staff will be available to informally and individually answer questions and discuss issues throughout the public hearing. Public testimony may be presented to the hearings officer at any time during the two-hour time period. The hearing will be held as follows:

Date: Thursday, July 22, 1999
Time: Between 4:30 p.m. and 6:30 p.m. on a drop-in basis
Place: Grants Pass City Hall, 101 NW 'A' Street, Council Chambers, Grants Pass

Deadline for submittal of Written Comments: 5:00 p.m., Tuesday, July 27, 1999
(This is not a postmark date, written comments must be received at the address below by this date.)

Keith Tong will be the Presiding Officer at the hearing.

Written comments can be presented at the hearing or to DEQ any time prior to the date above. Comments should be sent to: **Department of Environmental Quality, Attn: Patti Seastrom, 811 SW Sixth Avenue, Portland, Oregon 97204-1390.**

In accordance with ORS 183.335(13), no comments from any party can be accepted after the deadline for submission of comments has passed. Thus if you wish for your comments to be considered by DEQ in the development of the plan and rules, your comments must be **received** prior to the close of the comment period. DEQ recommends that comments be submitted as early as possible to allow adequate review and evaluation of the comments submitted.

What Happens After the Public Comment Period Closes

Following close of the public comment period, the Presiding Officer will prepare a report that summarizes the oral testimony presented and identifies written comments submitted. The Environmental Quality Commission (EQC) will receive a copy of the Presiding Officer's report. The public hearing will be tape recorded, but the tape will not be transcribed.

DEQ will review and evaluate the rulemaking proposal in light of all information received during the comment period. Following the review, the plan and rules may be presented to the EQC as originally proposed or with modifications made in response to public comments received.

The EQC will consider DEQ's recommendation for plan and rule adoption during one of the Commission's regularly scheduled public meetings. The targeted meeting date for consideration of this rulemaking proposal is October 1, 1999. This date may be delayed if needed to provide additional time for evaluation and response to testimony received in the hearing process.

You will be notified of the time and place for final EQC action if you present oral testimony at the hearing or submit written comment during the comment period. Otherwise, if you wish to be kept advised of this proceeding, you should request that your name be placed on the mailing list. Make requests to: *Patti Seastrom, Oregon Department of Environmental Quality, 811 SW Sixth Avenue, Portland, OR 97204-1390, (503) 229-5581 or toll free in Oregon (800) 452-4011.*

Background on Development of the Rulemaking Proposal

Why is there a need for the plan/rule?

Grants Pass has a history of violating the carbon monoxide health standard. While Grants Pass currently meets the federal health-based air quality standard for carbon monoxide, future growth in population and related vehicle travel can increase carbon monoxide levels. The Department of Environmental Quality and the Grants Pass Air Quality Advisory Committee have worked together to evaluate projected carbon monoxide emissions and the need for additional measures to keep emissions within healthy levels for the next fifteen years. The result is the Grants Pass Carbon Monoxide Maintenance Plan. As a result of developing this plan, DEQ can request that EPA redesignate Grants Pass as an area that meets the carbon monoxide health standards.

Carbon monoxide is an odorless, colorless pollutant that can cause dizziness, headaches and fatigue. The health risks of exposure to carbon monoxide can be severe, and at high levels this pollutant can even cause death. It is especially dangerous for the elderly, expectant mothers, small children, and people with pulmonary or cardiovascular diseases. Motor vehicles are the number one source of carbon monoxide emissions in Grants Pass. The highest levels of carbon monoxide occur in the winter. On cold, windless days, air doesn't circulate to dilute carbon monoxide pollution from cars. Emissions from slow-moving traffic become trapped near the ground and can build up to unhealthy levels.

In the winter of 1982, Grants Pass violated the carbon monoxide health standard on 28 days. Maximum levels of carbon monoxide were 50 percent higher than the health standard. Today, Grants Pass has successfully met the carbon monoxide standard for nine consecutive years. Improvements in motor vehicle emissions technology and traffic circulation in the Grants Pass Central Business District contributed to the region's success. Motor vehicle emissions account for almost 75 percent of carbon monoxide emissions in Grants Pass. Construction of the third bridge over the Rogue River has reduced congestion-related stop-and-go driving which boosts carbon monoxide emissions. The use of oxygenated fuel in the winter also has helped reduce carbon monoxide levels in Grants Pass. Oxygenated fuel is gasoline that is blended with additives that contain extra oxygen. The oxygen promotes more complete combustion, thereby reducing tailpipe emissions of carbon monoxide. Woodstove emission control efforts in the urban growth boundary, designed to reduce particulate emissions, have also contributed to a reduction in carbon monoxide emissions from residential wood heating and will continue. Residential wood heating emissions account for 13 percent of carbon monoxide emissions in Grants Pass.

DEQ proposes to request that the Environmental Protection Agency classify Grants Pass as an area that meets the federal carbon monoxide health standard. As a part of that request, the

Department of Environmental Quality studied the projected growth for Grants Pass. DEQ determined that the reductions in carbon monoxide emissions from continuing improvements in motor vehicle technology will be greater than the increase in emissions that will result from population growth. DEQ estimates that carbon monoxide emissions will remain well within healthy levels through at least 2015, without oxygenated fuel. The draft carbon monoxide maintenance plan proposes to eliminate the oxygenated fuel requirement in Grants Pass. The plan also establishes an emissions budget that will serve as a benchmark for the approval of regionally significant transportation projects within the Grants Pass Central Business District.

How was the plan/rule developed?

The Grants Pass carbon monoxide maintenance plan and related rule amendments, including the proposal to eliminate the oxygenated fuel requirement, were developed in accordance with: 1) federal Clean Air Act requirements for nonattainment area redesignation, 2) the recommendations of the Grants Pass Air Quality Advisory Committee, and 3) technical information provided by the Environmental Protection Agency and others concerning oxygenated fuel.

The Grants Pass Air Quality Advisory Committee specifically made recommendations to DEQ on future growth rates in Grants Pass with respect to population, households, employment, and vehicle miles traveled. From these growth rates, DEQ was able to project future year carbon monoxide emissions. Projections showed that carbon monoxide emissions, even without oxygenated fuel use in the winter months, would remain well below the level needed to meet the public health standard for ambient concentrations of carbon monoxide. The on-road motor vehicle component of the projected carbon monoxide emissions for the Grants Pass Central Business District will become the air quality budget for future transportation project conformity determinations.

Copies of the documents relied upon in the development of this rulemaking proposal can be reviewed at the Department of Environmental Quality's office at 811 SW 6th Avenue, Portland, Oregon. Please contact Patti Seastrom at (503) 229-5581 to schedule a time to review the documents. These documents include the Grants Pass Carbon Monoxide Control Strategy, June 1986; the Medford Carbon Monoxide Maintenance Plan, August 1998; and the Portland Carbon Monoxide Maintenance Plan, July 1996.

Who does this plan/rule affect including the public, regulated community or other agencies, and how does it affect these groups?

Eliminating the oxygenated fuel requirement will result in a slight cost savings to the distributors that supply oxygenated fuel to the retailers, and the general public that buys oxygenated fuel in the Grants Pass area in the winter months. Grants Pass area gasoline retailers that are currently required to sell oxygenated fuel in the winter months will no longer have to keep records of oxygenated fuel shipments received. Retailers and distributors will also no longer have to switch between selling and distributing oxygenated fuel during the winter months and traditional fuel during the remaining months.

The public may experience improved vehicle operation without oxygenated fuel. (Some owners of older vehicles have reported vehicle performance problems from the use of oxygenated fuel.) The public will also benefit from a slight improvement in fuel efficiency. The difference in cost for oxygenated fuel is about a penny a gallon at the distributor level. The final cost to the general public varies, but is usually no more than one or two cents more per gallon. Ethanol distributors (ethanol is the oxygenate used in Oregon), will experience a negative economic impact from a small loss of ethanol sales.

The Rogue Valley Council of Governments is responsible for making conformity determinations for all regionally significant transportation projects. The carbon monoxide emissions budget established in the plan for conformity determinations will only apply to regionally significant transportation projects.

The Oregon Department of Transportation is currently undertaking a major reconstruction of the 6th and 7th Street Couplet through the central business district. Impacts on future carbon monoxide emissions from this project have been accounted for in the emissions budget. Once this project is completed, there are no regionally significant transportation projects planned for the Grants Pass Central Business District through 2015. Downtown parking and new retail or commercial development in the central business district are not considered regionally significant transportation projects and will not be affected by the emissions budget.

The redesignation of the Grants Pass Central Business District from a carbon monoxide nonattainment area to a carbon monoxide maintenance area will relax industrial control requirements for major new and expanding industry in the central business district. However, there is no major industry currently located within the Grants Pass Central Business District. No new industry is expected to locate within the central business district through at least 2015 due to zoning restrictions and the fact that the central business district is built out.

How will the rule be implemented?

The change in oxygenated fuel requirements and industrial control requirements will be implemented through the DEQ Medford office air quality staff. Affected gasoline retailers will be notified after EPA approves the proposal to eliminate the oxygenated fuel requirement.
No new industry is expected to locate within the Grants Pass Central Business District and there

is no existing industry operating within the central business district. This rulemaking will not change existing requirements for industrial sources located outside of the central business district.

<u>Are there time constraints?</u>

There are no time constraints for the Grants Pass carbon monoxide maintenance plan, redesignation request, and related rule amendments. The incentive to move forward with the redesignation request is to remove the oxygenated fuel and industrial regulatory burdens no longer needed to keep carbon monoxide within healthy levels.

Contact for More Information

If you would like more information on this rulemaking proposal, or would like to receive a complete copy of the proposed maintenance plan, please contact:

Patti Seastrom
Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 972004-1390
(503) 229-5581 or toll free in Oregon (800) 452-4011

This publication is available in alternate format (e.g. large print, Braille) upon request. Please contact DEQ Public Affairs at 503-229-5317 to request an alternate format.

State of Oregon

Department of Environmental Quality

Memorandum

Date: July 23, 1999

To: Environmental Quality Commission

From: Keith Tong

Subject: Presiding Officer's Report for Rulemaking Hearing

Hearing Date and Time:	July 22, 1999, beginning at 4:30 p.m.
Hearing Location:	Grants Pass City Hall, Council Chambers
Title of Proposal:	Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

The rulemaking hearing on the above titled proposal was convened at 4:30 p.m. People were asked to sign witness registration forms if they wished to present testimony. People were also advised that the hearing was being recorded and of the procedures to be followed.

Thirty-five people were in attendance. No one signed up to give testimony on this proposal.

Prior to receiving testimony, Annette Liebe, Patti Seastrom and Keith Tong. briefly explained the specific rulemaking proposal, the reason for the proposal, and responded to questions from the audience.

Summary of Oral Testimony

There was no oral testimony for this proposal.

There was no further testimony and the hearing was closed at 6:30 p.m.

Written Testimony

No written comments were submitted at the public hearing.

The following written comments were received by the Department prior to the close of the public comment period on July 27, 1999.

Daniel Riley, Western States Petroleum Association, fax received 7-27-99

Attachment D

State of Oregon
Department of Environmental Quality

Rulemaking Proposal
Grants Pass Carbon Monoxide Maintenance Plan & Redesignation Request

Department Response to Public Comment

Comment: Agree that compliance with the carbon monoxide standard will not be threatened by removing the oxygenated fuel requirements. It is unnecessary to continue programs that carry compliance costs when they are no longer necessary.

Response: Agreed. Oxygenated fuel is no longer needed for compliance because of improvements in motor vehicle technology resulting in reduced carbon monoxide emissions, and because the benefits of oxygenated fuel are reduced in newer vehicles.

Comment: Oxygenated fuel should be removed this winter.

Response: The Clean Air Act requires that a maintenance plan be approved by EPA before an area can be redesignated. Oxygenated fuel is required in all carbon monoxide nonattainment areas by the 1990 Clean Air Act Amendments. The requirement cannot be removed until Grants Pass is redesignated to attainment. The Clean Air Act allows EPA eighteen months to approve the maintenance plan. DEQ requested that EPA allow elimination of the oxygenated fuel requirement effective this winter season since Grants Pass met the public health standard in 1991, prior to the introduction of wintertime oxygenated fuel in 1992. EPA denied this request based on the Clean Air Act Requirements.

Attachment E

State of Oregon
Department of Environmental Quality

Rulemaking Proposal for
Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

Detailed Changes in Response to Comments

Comments received support the proposal and therefore, no changes were made to the rulemaking proposal in response to comments received.

Attachment F

Grants Pass Air Quality Advisory Committee Members

Kimberly Sellers, Committee Chair, Owner - Tierra del Sol
Mark Amrhein, City of Grants Pass
Vince Carrow, Oregon Department of Transportation
Roy Childers, U.S. Forest Industries
Tyler Deke, Rogue Valley Council of Governments
Dwight Ellis, Grants Pass Chamber of Commerce
Greg Gilpin, Oregon Department of Forestry
Gary Grimes, Timber Products Co.
Steve Hodge, Josephine County Public Works
Dennis Krois, Copeland Paving
Bill Olson, Josephine County Public Health Department
Dr. Bob Palzer, Sierra Club
Rob Pochert, SOREDI
Chris Sorensen, Three Rivers Community Hospital

Attachment G

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Grants Pass Carbon Monoxide Maintenance Plan/ Redesignation Request

Rule Implementation Plan

Summary of the Proposed Rule

This proposed rulemaking would adopt a carbon monoxide maintenance plan for Grants Pass and eliminate the wintertime oxygenated fuel requirement in that area. Approval of the maintenance plan will allow the Grants Pass Central Business District to be reclassified to an area that meets the carbon monoxide public health standards.

Proposed Effective Date of the Rule

The maintenance plan, including eliminating the oxygenated fuel requirement, will be effective upon approval by the Environmental Protection Agency. EPA has eighteen months to act on the plan. The plan will be submitted to EPA upon adoption by the Environmental Quality Commission and filing with the Secretary of State. Approval is expected by early 2001.

Proposal for Notification of Affected Persons

Program staff in DEQ's Medford office responsible for the oxygenated fuel program will notify past permit holders one EPA approves eliminating the program in the Grants Pass control area.

Proposed Implementing Actions

No additional implementing actions are required.

Proposed Training/Assistance Actions

None required.

State Implementation Plan Revision
For Carbon Monoxide in the Grants Pass Urban Growth Boundary

A Plan for Maintaining The National Ambient Air Quality Standards For Carbon Monoxide

Appendix D4:

Maintenance Plan Appendices

Appendix D4-1

Technical Analysis Protocol

Technical Analysis Protocol

Grants Pass Carbon Monoxide Maintenance Plan
March 1999

I. Background Information

The Grants Pass nonattainment area is defined as the central business district, a 12-block by 3-block area in downtown Grants Pass. In order to adequately account for air pollution impacts on the CBD from the surrounding area, the Grants Pass carbon monoxide maintenance plan will account for emissions from all sources within the Grants Pass urban growth boundary, which includes the central business district. A map delineating the urban growth boundary and the central business district is provided as Figure 1.

A. Design Values

One carbon monoxide monitor has been in place at the same location in the Grants Pass central business district since 1985. The selected base year for the maintenance plan is 1993. The validated, maximum, second highest eight-hour concentration for the two-year period 1992-93 is 7.4 ppm.

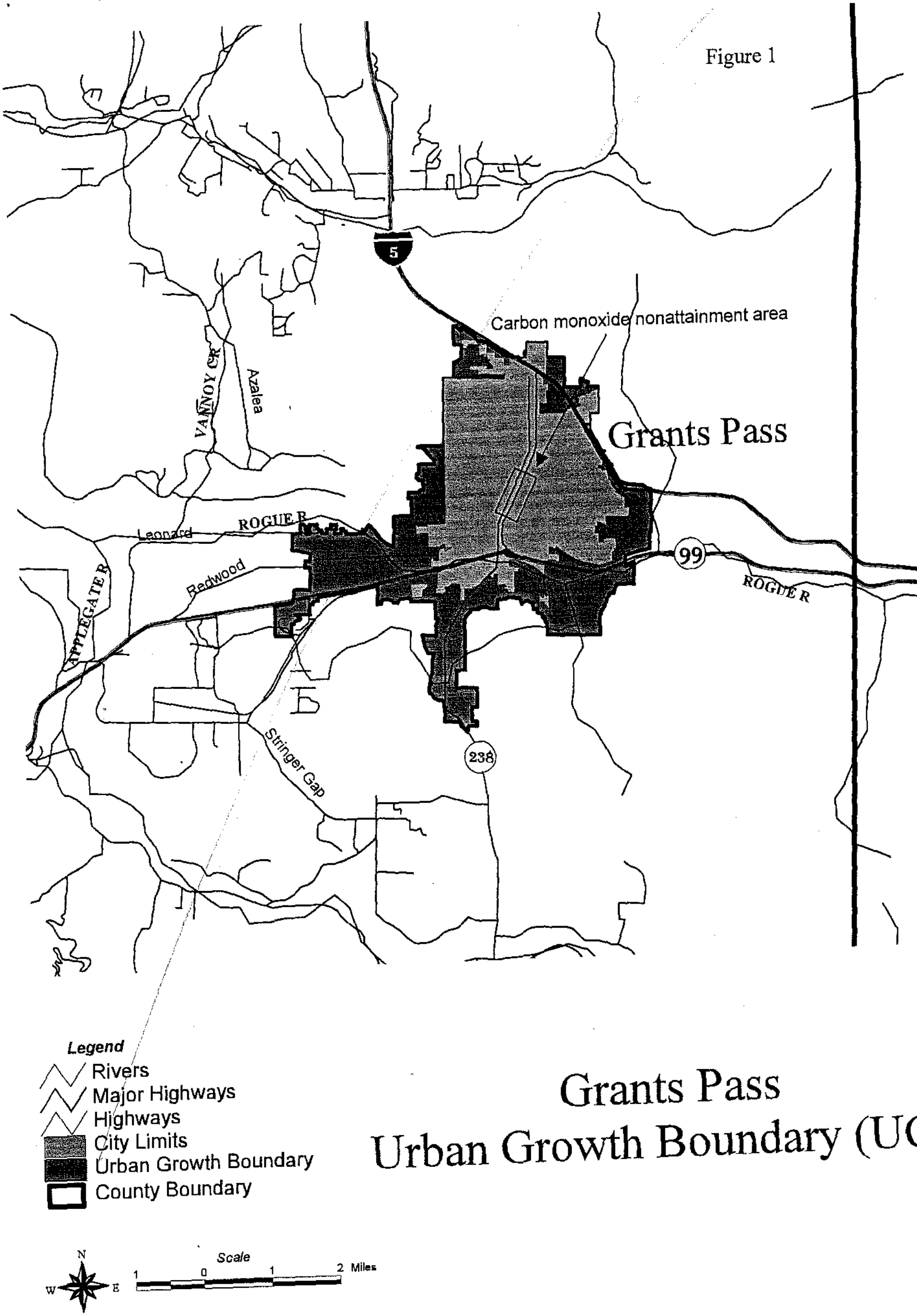
B. Attainment Year and Concentrations

The Grants Pass central business district attained the standard for carbon monoxide in 1990. The area has remained in compliance with the standard since 1990. The last violation of the standard for carbon monoxide in the Grants Pass central business district occurred on December 23, 1988. There have been two exceedances since 1988, 9.6 parts per million (ppm) on December 1, 1989, and 9.9 ppm on November 13, 1990. The maximum monitored second highest value since 1988 was 9.1 ppm on December 14, 1989. The maximum monitored carbon monoxide value in the 1993 base year was 7.7 ppm on December 9, 1993; the second highest monitored value was 7.1 ppm on December 1, 1993.

C. Control Strategies

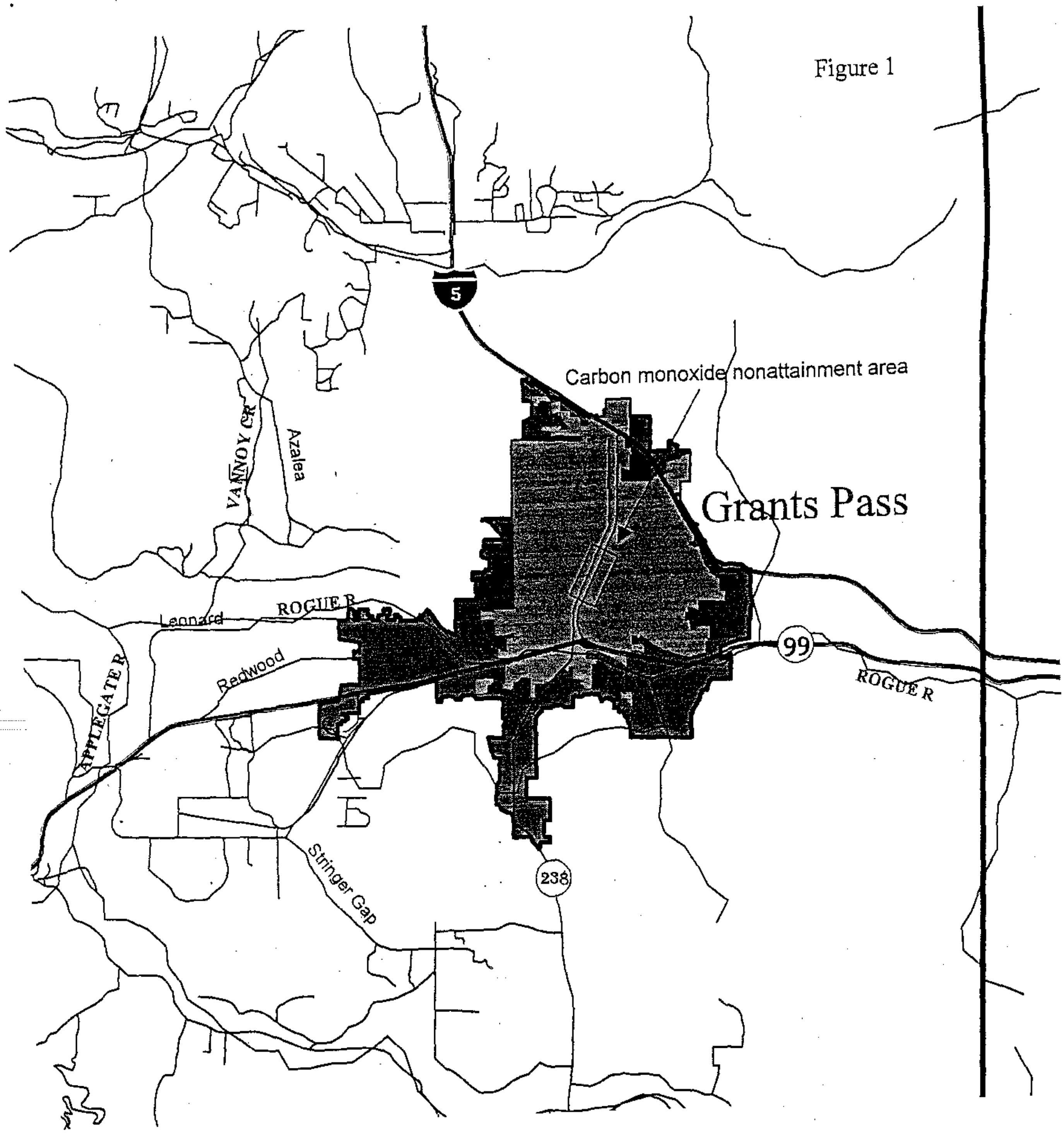
The Grants Pass central business district attained the standard for carbon monoxide prior to implementation of the primary control strategy adopted in the 1986 carbon monoxide attainment plan for Grants Pass. This strategy was construction of a third bridge over the Rogue River which was completed In 1992. The new bridge diverted traffic from the central business district and eased traffic congestion in the

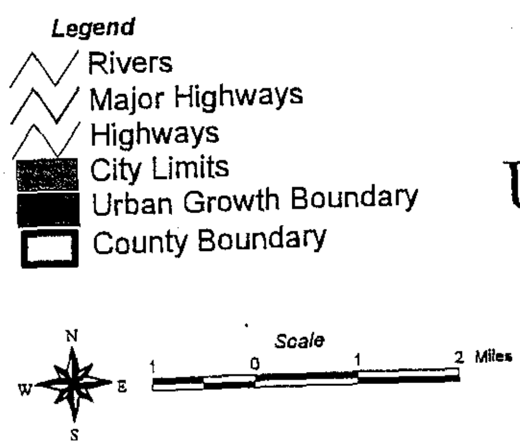
Figure 1



Grants Pass
Urban Growth Boundary (UGB)

Figure 1





Grants Pass Urban Growth Boundary (UGB)

nonattainment area. The 1986 attainment plan also identified the Federal Motor Vehicle Emissions Control Program as a carbon monoxide control strategy for Grants Pass. An oxygenated fuel program was required by the 1990 Clean Air Act Amendments and was introduced in the Grants Pass area in 1992. This program was required for carbon monoxide nonattainment areas with design values of 9.5 ppm or above (based on 1988-89 data, the design value for Grants Pass was 10.3 ppm).

II. Potential Risk for Renewed Nonattainment

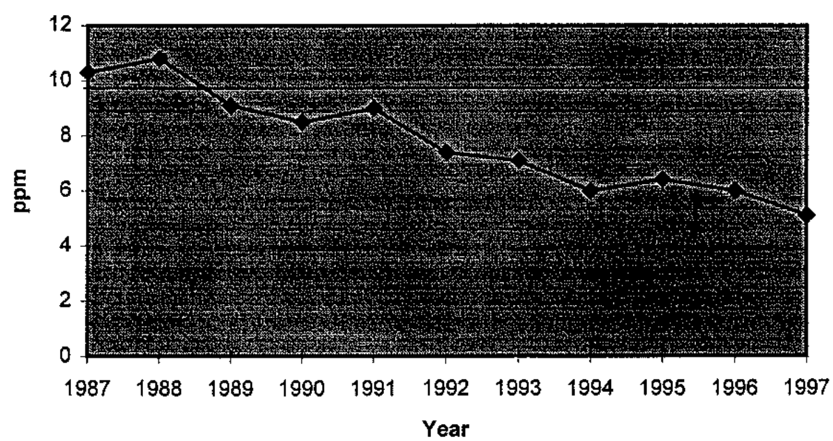
Table 1 shows the five highest monitored values for carbon monoxide since the last exceedance in 1990.

Table 1
Five Highest Values Since Last Exceedance

Concentration	Date
9.2 ppm	January 2, 1991
9.0 ppm	January 3, 1991
8.2 ppm	February 8, 1992
7.7 ppm	December 9, 1993
7.4 ppm	February 4, 1992

Figure 2 shows that the concentration trend since 1988 is clearly downward. Meteorological trends through the same time period will be addressed in the maintenance plan to demonstrate that attainment of the standard was not due to favorable meteorological conditions.

Figure 2
Grants Pass Carbon Monoxide Trend
8-Hour Second Highest Concentrations



A carbon monoxide saturation study was conducted in 1993-94 by DEQ to determine the effect of the new bridge on carbon monoxide concentrations in the central business district and to evaluate the appropriateness of the Wing Building monitoring site. The study showed that the current monitoring site is an appropriate location for monitoring maximum carbon monoxide levels in the central business district. The study also notes that although carbon monoxide levels continued to decrease through 1993, the effect of the new bridge could not be isolated from the effect of oxygenated fuels, introduced during the same period as construction of the bridge was completed.

The projection of motor vehicle emissions will be based on EPA's MOBILE5b model. The final maintenance plan document will have a complete emission inventory projection with the overall source mix for the maintenance period.

Growth projections for the Grants Pass urban growth boundary are shown in Table 2. The growth rates are recommended by the Grants Pass Air Quality Advisory Committee. This committee is advising the Department on the development of the carbon monoxide maintenance plan. The committee includes representatives from the local jurisdictions, Rogue Valley Council of Governments, industry, environmental groups, and local business. The growth rates are consistent with the current local comprehensive plan and Portland State University's Center for Population Research and Census projections.

Table 2
Grants Pass UGB Projected Average Annual Growth

Population growth	1.6%
Household growth	1.6%
Employment	1.2%
Regional VMT	1.7%

III. Demonstration of Attainment of National Ambient Air Quality Standards for Carbon Monoxide

A. Monitored Data

Monitored data from 1990 through 1993 will be used to show that the area is in attainment. Data through 1997 will demonstrate that the area continues to show attainment with the carbon monoxide standard.

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III. Demonstration of Attainment of National Ambient Air Quality Standards for Carbon Monoxide

A. Monitored Data

Monitored data from 1990 through 1993 will be used to show that the area is in attainment. Data through 1997 will demonstrate that the area continues to show attainment with the carbon monoxide standard.

B. Other Attainment Documentation

The saturation study referenced above provides further evidence that the area is in attainment. The findings of this study will be submitted as an appendix to the maintenance plan.

The Oregon Department of Transportation completed an air quality analysis in 1997 to meet conformity requirements for a proposed project in the Grants Pass central business district known as the 6th/7th Street couplet project. A carbon monoxide hot-spot analysis was performed on four worst-case intersections within the central business district. The analysis predicted that the carbon monoxide standard would not be exceeded at these intersections under either a build or no-build situation through 2018. The study also analyzed total emissions under a build/no-build scenario. The results of the study showed a decrease in carbon monoxide levels under both alternatives through 2018. A summary of the study findings and methodology is included as Appendix A.

A meteorological analysis will be performed to demonstrate that the lower carbon monoxide levels of recent years are not attributable to especially favorable meteorological conditions. This analysis will be summarized in the maintenance plan.

IV. Summary of Approved SIP Revision

A. Summary of Air Quality Attainment Plan/Dates of Approval

- EPA designated Grants Pass as a carbon monoxide nonattainment area on December 16, 1985.
- A carbon monoxide attainment plan for Grants Pass was adopted and submitted to EPA on November 24, 1986 and was supplemented on January 8, 1987. EPA approved the attainment plan on March 15, 1988.
- On November 15, 1990, EPA designated the Grants Pass central business district as a moderate nonattainment area for carbon monoxide.
- An oxygenated fuel requirement for the Grants Pass area was adopted on October 16, 1992 and submitted to EPA to meet 1990 Clean Air Act Amendment requirements.
- An oxygenated fuel contingency plan was adopted for Grants Pass in November, 1993 to meet 1992 Clean Air Act Amendment requirements and was approved by EPA in 1994.

B. Description of Permanent and Enforceable Emission Reductions

The Grants Pass central business district achieved attainment in 1990 due to the Federal Motor Vehicle Emissions Control Program. Carbon monoxide levels have continued to decline due to construction in 1992 of the third bridge over the Rogue River reducing congestion through the central business district, in addition to the introduction of oxygenated fuels in 1992. These are permanent and enforceable strategies that will carry over to the maintenance plan, although the possibility of eliminating oxygenated fuels will be evaluated. The final mix of strategies for the maintenance plan will be documented through an emission inventory and MOBILE5b.

Clean Air Act Sections 110 and Part D Requirements

The portions of Section 110 and Part D that apply to the Grants Pass nonattainment area are sections 172(c), 176(c)(4) and 187(a).

1977 Clean Air Act Amendments -- New Source Review and Plant Site Emission Limit rules were submitted to EPA on September 9, 1981 and approved on August 13, 1982.

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The 1993 and the 1996 periodic emission inventory requirement will be addressed concurrently through the maintenance plan emission inventory.

V. Air Quality Maintenance Plan

A. Attainment Year Emissions Inventory

A baseline emission inventory will be developed for 1993. Two scenarios will be evaluated – a baseline emission inventory that includes oxygenated fuel and a baseline inventory without oxygenated fuel. Although oxygenated fuel was introduced in 1992, the area attained the standard by 1990, before the introduction of oxygenated fuel. If the decision is made to eliminate oxygenated fuel, a baseline inventory without oxygenated fuel will be more comparable to a 2015 projection without oxygenated fuel for the purpose of demonstrating maintenance of the standard. EPA's MOBILE5b model will be used to estimate mobile source emissions.

B. Description of Permanent and Enforceable Emission Reductions

The Grants Pass central business district achieved attainment in 1990 due to the Federal Motor Vehicle Emissions Control Program. Carbon monoxide levels have continued to decline due to construction in 1992 of the third bridge over the Rogue River reducing congestion through the central business district, in addition to the introduction of oxygenated fuels in 1992. These are permanent and enforceable strategies that will carry over to the maintenance plan, although the possibility of eliminating oxygenated fuels will be evaluated. The final mix of strategies for the maintenance plan will be documented through an emission inventory and MOBILE5b.

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B. Maintenance Demonstration

The maintenance demonstration will rely on a comparison of the 1993 attainment inventory with projected 2015 emissions. Base year emissions will be calculated with and without oxygenated fuel. 2015 emissions will also be projected with and without oxygenated fuel. The results of each scenario will be presented to the Grants Pass Air Quality Advisory Committee for a recommendation on retaining or eliminating the wintertime oxygenated fuel program. The final emissions projection will show that 2015 emissions will not exceed 1993 attainment emissions. Results of the 1997 Oregon Department of Transportation 6th/7th Street couplet analysis will be relied upon to demonstrate that hot spots are not a concern. The findings of this study will be re-assessed to consider the impact of removing oxygenated fuel.

The Rogue Valley Metropolitan Planning Organization travel demand model will be used to predict 2015 vehicle miles traveled. The Grants Pass travel model provides a localized tool for estimating the area's travel, potential travel changes under various policy options and land use, and demographic changes. The Rogue Valley Metropolitan Planning Organization, with the Oregon Department of Transportation, spent several months in 1998 improving and updating the Grants Pass model. The use of the travel demand model in lieu of Highway Performance Monitoring Systems data is consistent with a June 26, 1997 letter from the Federal Highway Administration to EPA, Region 10 supporting the use of travel demand model data in developing air quality plans. The travel model output will be used in MOBILE5b to estimate mobile source emissions. A summary of the travel model validation is provided in Appendix B.

It is anticipated that additional control measures will not be required to keep the area in attainment throughout the maintenance period. The possibility of removing the oxygenated fuel requirement will be assessed. The Grants Pass Air Quality Advisory Committee will provide recommendations on the retention of the oxygenated fuels program.

An emissions budget that will govern future transportation conformity determinations will be established.

C. Monitoring Network and Commitments

The 1993-94 saturation study confirmed that the existing monitor is recording the highest carbon monoxide values for the Grants Pass area. DEQ will also commit to a five-year periodic survey, pending EPA review. Based on monitoring data, relevant traffic data and other considerations such as special project funding availability, DEQ air monitoring, modeling and planning staff in consultation with EPA air monitoring, modeling and planning staff may reach agreement that the periodic survey is unnecessary, or should be delayed.

D. Verification of Continued Attainment

DEQ will continue to operate a carbon monoxide monitor in the nonattainment area. A tracking method, such as periodic emission inventories, will be evaluated and addressed in the final redesignation document.

E. Contingency Measures

Contingency measures and triggering events will be discussed with the local advisory committee and addressed in the final plan. If a decision is made to eliminate the oxygenated fuel program, oxygenated fuel will be included as a contingency measure.

VI. Schedule for Completion

• Technical Analysis Protocol to EPA	March 1999
• Technical Work Completed (draft emission inventory and projection)	March 1999
• Topic Review Meeting	April 1999
• Authorization for public hearing	May 1999
• Submit Legal Notice for Bulletin	May 1999
• Conduct Public Hearing (maintenance plan with proposed emission inventory)	June 1999
• Adoption by Rogue Valley COG	June 1999
• EQC Adoption (maintenance plan with final emission inventory)	August 1999
• Submit redesignation request and adopted maintenance plan to EPA	September 1999
• EPA Approval (18 months)	February 2001

Department of Environmental Quality

Annette Liebe 3/8/99

Annette Liebe, Manager, Airshed Planning Section Date

Region 10 Environmental Protection Agency

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3/8/99

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Region 10 Environmental Protection Agency

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Air Quality Technical Report; Amended

6th/7th Street Couplet

Redwood Highway (US-199)
Grants Pass, Josephine County

Prepared by:

Oregon Department of Transportation
Environmental Services

Vince Carrow
Environmental Engineering Specialist

December, 1997

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6th Street / 7th Street Couplet
Redwood Hwy., Grants Pass
Josephine County

1.0 Summary

This report presents amended information to the September, 1996 Air Quality Technical Report. The data presented in this report is intended for use in the preparation of the Revised Environmental Assessment for this project. The study compares a no-build alternative with the build 3-lane alternative, option 2.

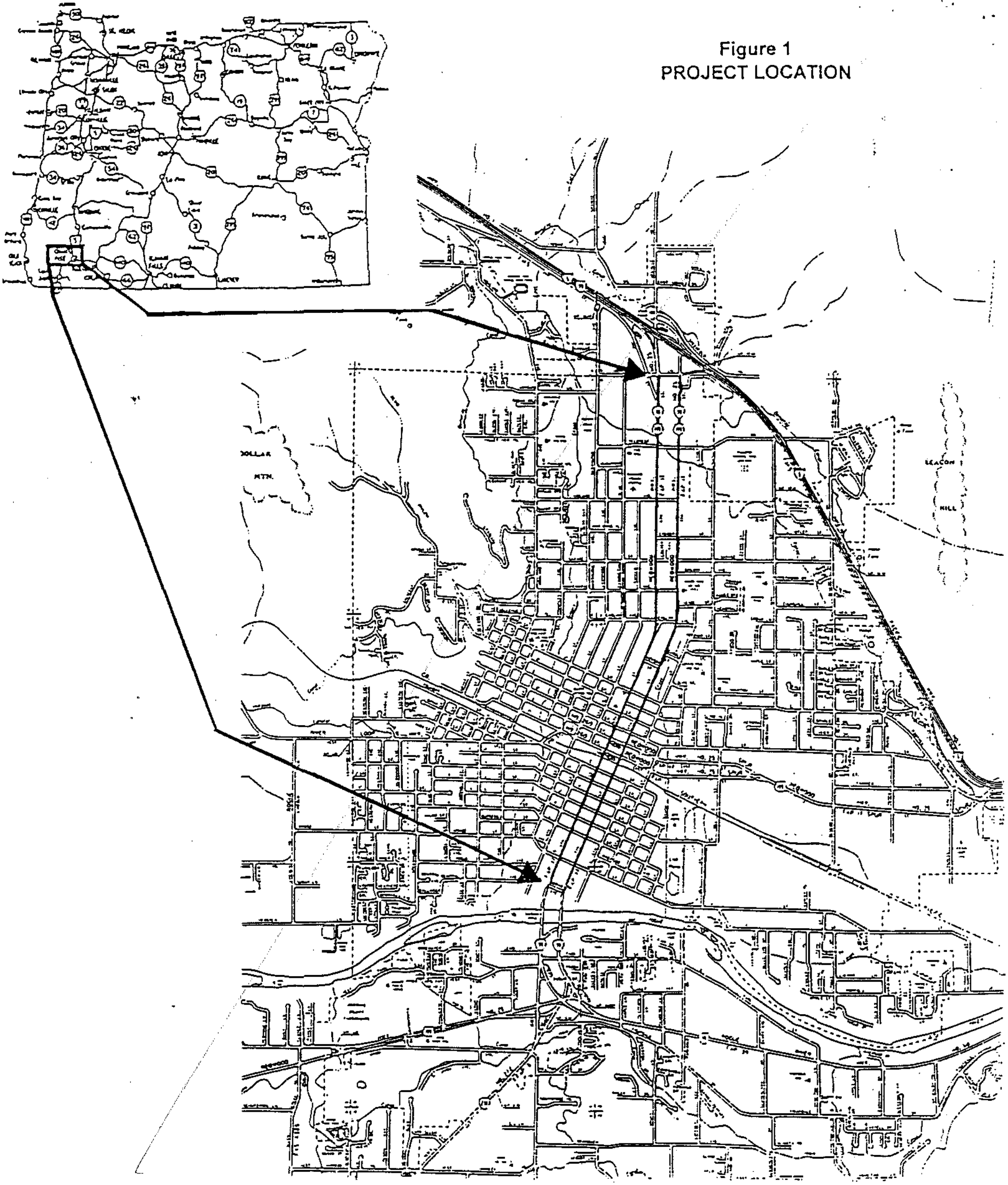
The study area is within the Grants Pass urban growth boundary (UGB) which is designated as non-attainment for the pollutant PM-10 (particulate matter) and encompasses the entire Central Business District (CBD) which is designated as a non-attainment area for the pollutant CO (carbon monoxide). The designation of an area as a non-attainment or maintenance area carries the requirement that a State Implementation Plan (SIP) be prepared demonstrating how attainment of National Ambient Air Quality Standards (NAAQS) will be achieved. An attainment plan for both PM-10 and CO has been submitted to EPA and approved. However, an area retains the non-attainment designation until a maintenance plan has been submitted to EPA.

Future year predictions of VMT based on the most current models and population forecasts were used to estimate the affect of this project on transportation related PM-10 emissions. Build alternative VMT is predicted to be 3–7 % less than the no-build alternative by the year 2015. However, construction of the project will have minimal affect on regional PM-10 emissions. Analysis of local or hot-spot PM-10 emissions is not required.

Total transportation related emissions of CO within the project study area were predicted in kilograms per day (kg/day) for the build and no-build alternatives in the years 1990, 1995 and 2018. Study area CO emissions show a significant decrease between the years 1990 and 1995 due primarily to the use of oxygenated fuels in the Grants Pass area. Build alternative emissions are predicted to be lower than the no-build alternative in all analysis years. Build and no-build emissions in future years are predicted to be lower than either 1990 baseline emissions or 1995 attainment year emissions.

The affect of this project on local or hot-spot concentrations of CO was analyzed for the years 1995, 1998 and 2018 at the following four intersections; 6th Street at Midland Street, 6th Street at G Street, 6th Street at H Street and 6th Street at M Street. These intersections represent the worst case LOS within the area affected by the project. Build alternative CO concentrations are not predicted to exceed the CO standard in future years at any intersection within the project area. Construction of this project would not cause any new violation of the CO standard or exacerbate any existing exceedance within the nonattainment area.

Figure 1
PROJECT LOCATION



6th and 7th Street Couplet (Grants Pass)
Redwood Highway
Josephine County

Figure 1
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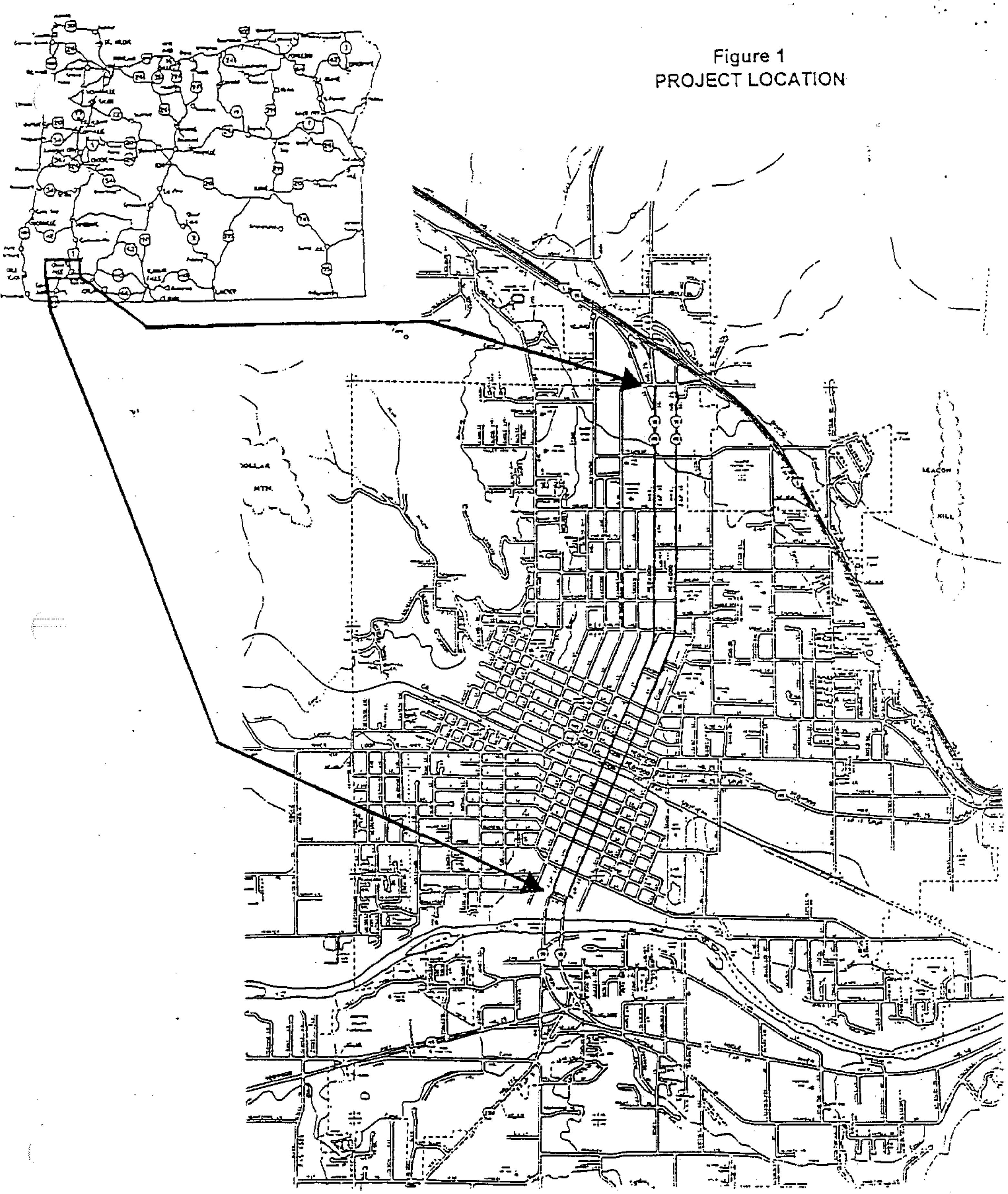

6th and 7th Street Couplet (Grants Pass)
Redwood Highway
Josephine County

2.0 Project Description

The project study area is in the city of Grants Pass, Josephine County. 6th Street and 7th Street are one way streets comprising the northbound and southbound couplet through the central business district of the community. This couplet is a section of the Redwood Highway (US 199).

The project will rehabilitate a badly deteriorated section of roadway with substandard lane widths and a severe crown. The build alternative would modernize the couplet by; 1) Adding one travel lane on 6th Street from Morgan Street to Midland Avenue; 2) Reducing the number of travel lanes on 6th from 4 to 3 through the CBD; 3) Adding one travel lane to 7th Street from Jackson Street to Morgan Street; 4) Provide a designated bike lane through the central business district. Reference Figure 1.

3.0 Air Quality Analysis

The scope of this analysis is to provide the information and data needed to fulfill National Environmental Policy Act (NEPA) requirements for the Revised Environmental Assessment (EA) and demonstrate project conformity.

3.1 Existing Air Quality

The project study area is within the Grants Pass urban growth boundary (UGB) which is designated as a moderate nonattainment area for the pollutant PM-10, particulate matter of less than 10 microns (μ). The area also encompasses the entire central business district (CBD) which is designated as a moderate nonattainment area for the pollutant carbon monoxide (CO). Rogue Valley Council of Governments (RVCOG) is the lead agency for transportation program conformity determinations in this area.

In general terms, weather processes cleanse atmospheric pollutants. Pollutants are dispersed or removed by chemical reaction, deposition, condensation or scrubbing which results from precipitation and air movement. Periods of prolonged atmospheric stability usually result in increased pollutant concentrations near the ground.

Seasonal weather patterns have an important impact on air quality. During the winter months, Oregon is often covered with a stable and dry air mass that inhibits the dispersion of pollutants. In these cold winter months automobile engines produce more CO and road sanding during icy periods contributes to PM-10 pollutant levels. Home heating with wood also contributes to CO and PM-10 emissions during the winter. Therefore, CO and PM-10 pollution problems are most often exhibited between the months of November and February.

DEQ maintains monitoring stations in the Grants Pass area for both CO and PM-10. PM-10 levels are monitored at the following three sites; 11th Street and K Street, Beacon Street and Madrone Avenue and 720 NE 11th Street. CO levels are monitored at one site that is in the study area for this report. It is located at the Wing Building, 215 SE 6th Street (between G Street and H Street). Following is a discussion of monitoring data. See attached Appendix A.

- Historical data from the PM-10 monitoring sites shows that the last exceedance of this standard occurred in 1987 at the 11th Street and K Street site. Average winter PM-10 levels have generally decreased since monitoring began in 1987.

- Historical data from the CO monitoring site shows that the last exceedance of this standard occurred in 1990. Since monitoring began in 1985, maximum 8-hour CO concentrations have decreased from a high of 11.6 ppm in 1985 to 6.4 ppm in 1996.

3.2 Traffic Analysis

The traffic model EMME was used by the ODOT Transportation Planning Analysis Unit to generate areawide and intersection traffic data within the air quality study area. The model emphasizes the coordination of land use, transit and non-vehicle mode related variables with residential and employment density, heterogeneity and the pedestrian environment.

Average daily and peak hour traffic volumes and speeds were used for the air quality study. This data includes all affected traffic links within the study area for the years 1990, 1995, 1998 and 2018. Predicted future year traffic is based on a growth factor of 1.18 percent per year. Directional and signal timing data at the four intersections was used for the CO hot-spot analysis. Intersection data included peak hour link and turn movement volumes and speeds, average signal cycle length, average red time length by link and clearance lost time (yellow phase).

In general, future peak and average hour speeds are somewhat higher for the build alternative. This is attributable to increased lane widths throughout the project length and the addition of one travel lane on both 6th Street and 7th Street through the northern portion of the study area. Traffic data for the entire study area is attached as Appendix B.

3.3 Total Emissions Analysis

Total emissions of carbon monoxide matter were estimated for the study years . Emissions estimates were made based on vehicle-miles-traveled (VMT), emission factors from the EPA model MOBILE5a, roadway link lengths and average daily traffic volumes and speeds. MOBILE5a model inputs specific to Grants Pass and approved by DEQ were used. Roadway links used for the analysis included all affected collector and arterial class roads within the study area, reference Figure 2. Particulate matter emissions were not estimated, but a VMT comparison was performed as PM emissions are directly proportional to VMT.

Carbon Monoxide

CO emission estimates were made for the nonattainment area that includes the central business district (CBD). The study years analyzed were; 1990, baseline year for demonstrating conformity; 1995, CO attainment year and; 2018, transportation planning year. CO emissions are predicted to be lower than 1990 emissions for both alternatives in the years 1995 and 2018 within the CBD. Reference Figure 3.

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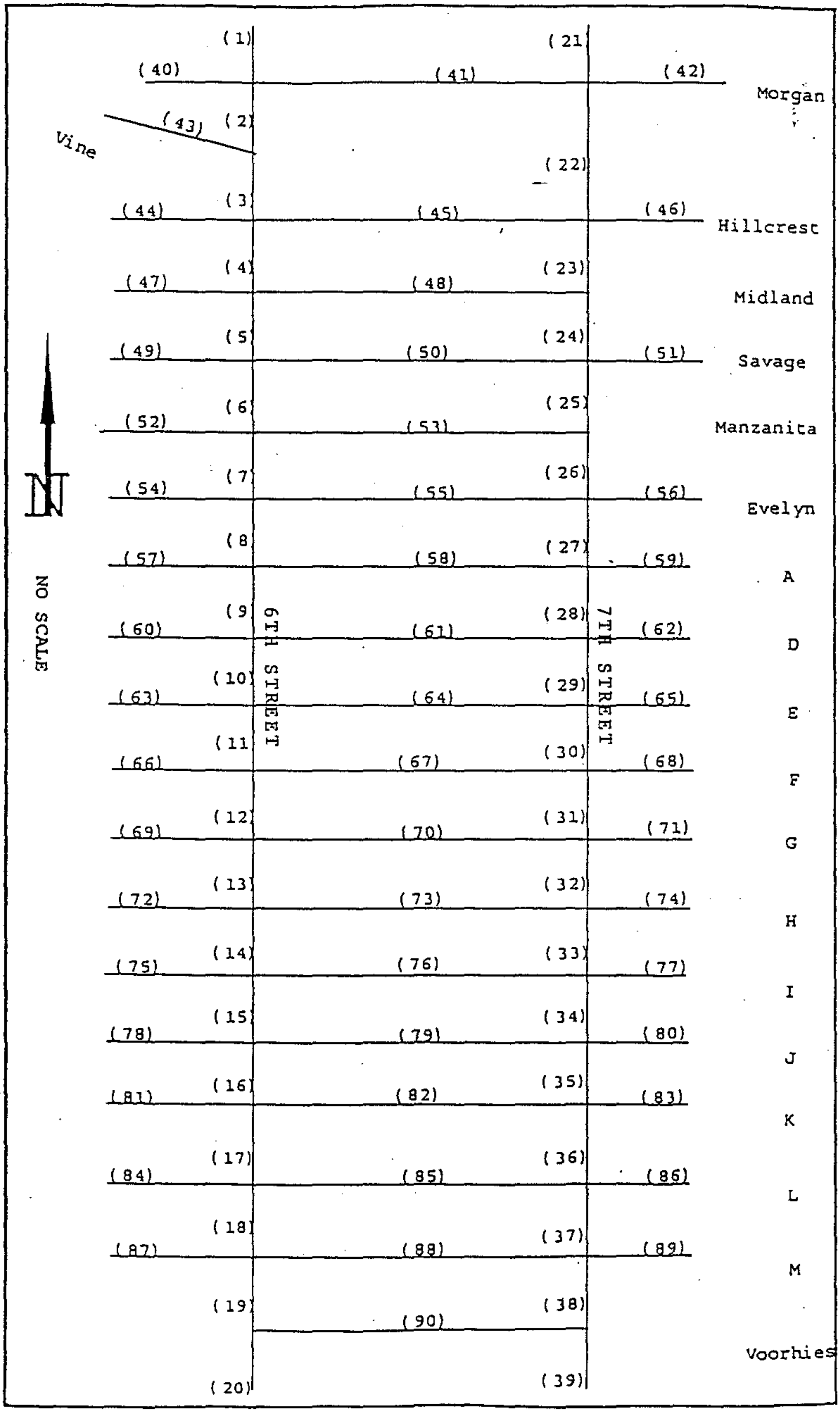


OREGON DEPARTMENT OF TRANSPORTATION

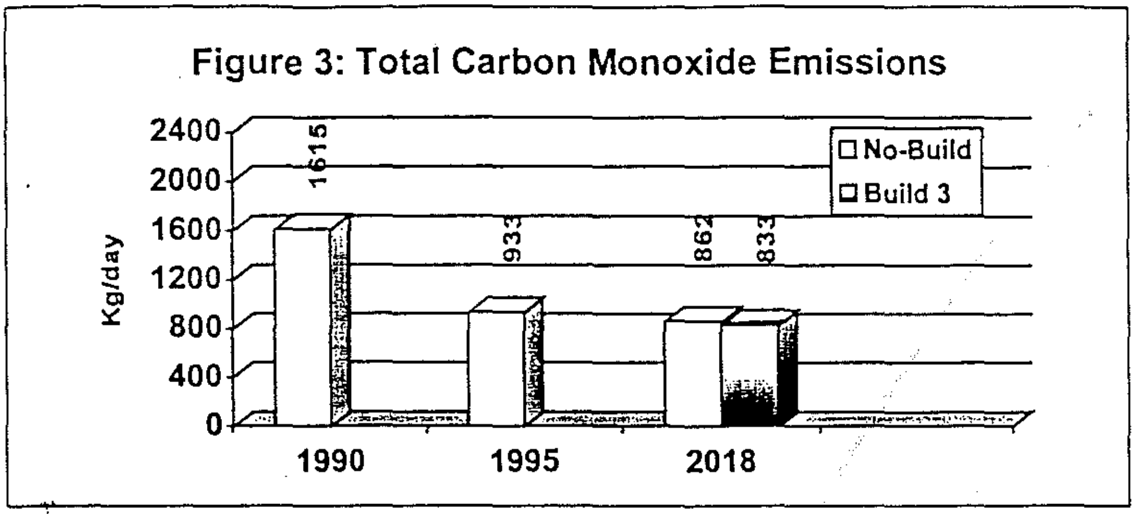
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet Section Numbers for EIS Data
Grants Pass

FILE: FRAME.FT

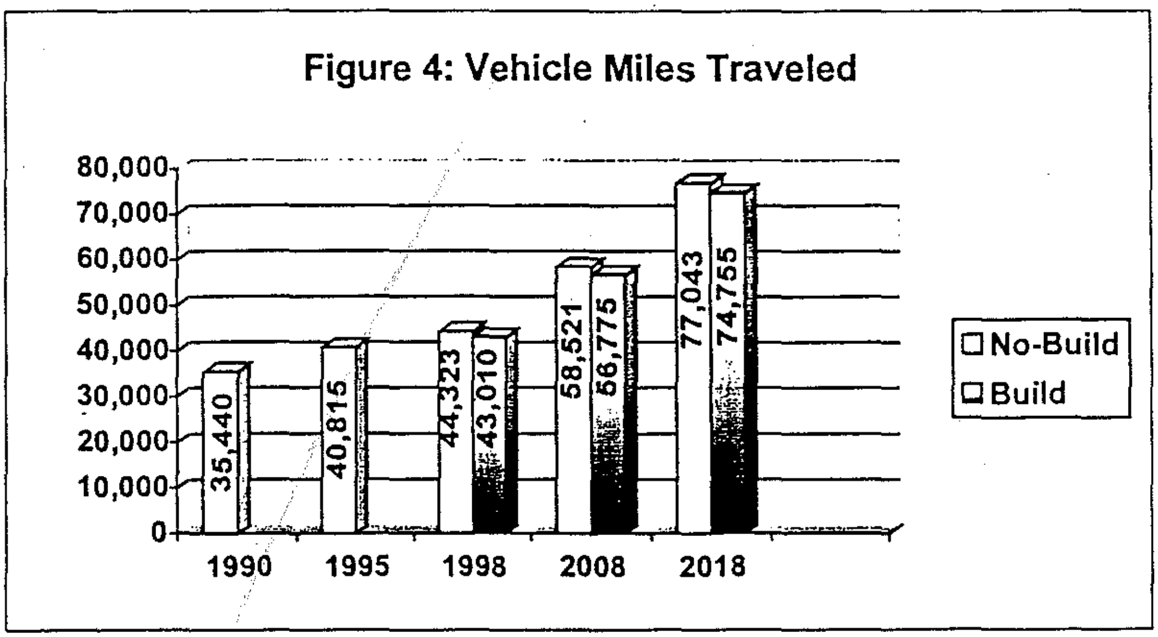
January 8, 1996

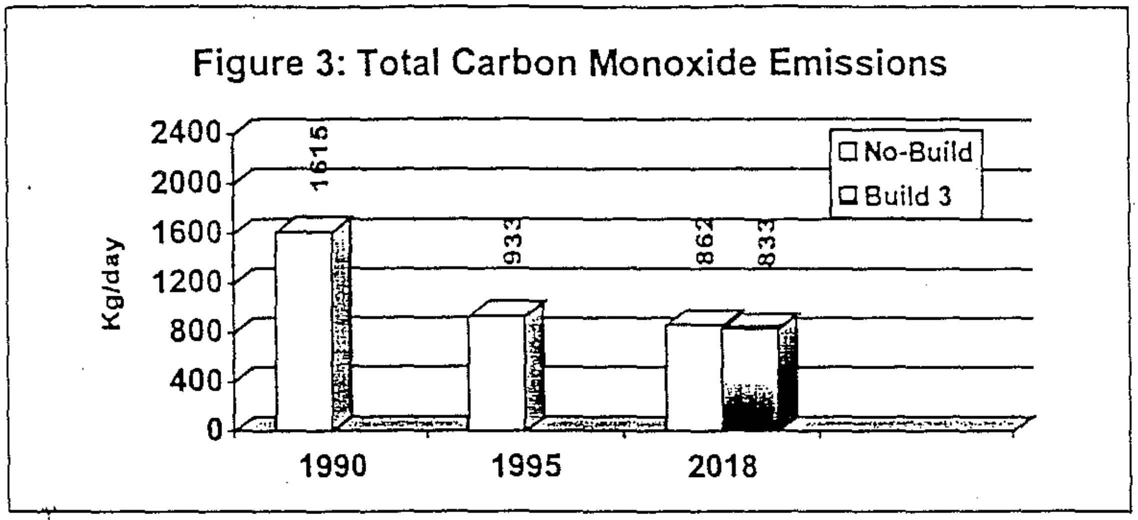
FIGURE 2



PM-10 (particulate matter of less than 10µ)

The major source of transportation related particulate matter is tire wear, brake wear, vehicular exhaust and fugitive dust. Particulate from these sources can be directly related to vehicle-miles-traveled (VMT) in the study area. An increase in VMT will result in an increase in transportation source particulate emissions. VMT is predicted to increase in the study area for all alternatives in the future. Future year vehicle miles traveled decrease with the build alternative, primarily due to motorists finding alternative routes as congestion increases. Figure 4 shows graphically the estimated study area growth in VMT.





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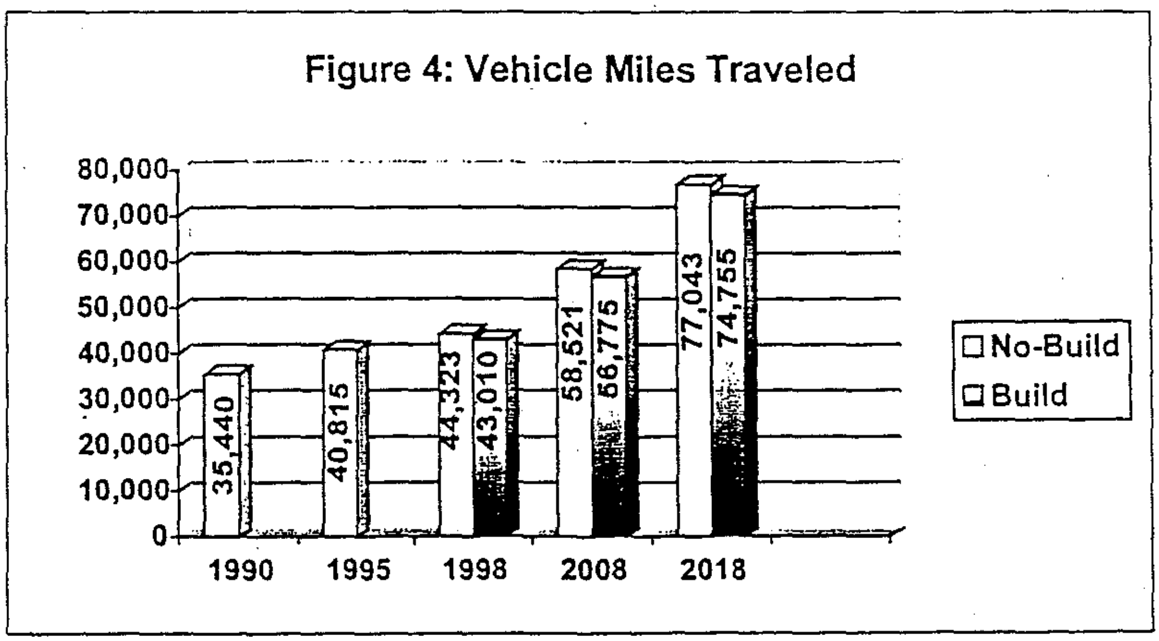


3.4 Local 'Hot-Spot' CO Analysis

Methodology

The pollutant of most concern for highway improvement projects is carbon monoxide. Motor vehicles account for the majority of CO emissions therefore; CO impacts (hot-spots) are generally localized with the highest concentrations occurring at locations close to roadways. Dispersion modeling is used to estimate the affect of traffic on CO concentrations at specific intersections within the study area.

Intersections reflect situations were worst case CO concentrations will exist. Potentially, CO concentrations may exceed air quality standards at congested intersections where queuing times at signals may leave traffic idling for extended periods. CO local or hot-spot analysis at intersections identified as potentially exceeding the CO standard is necessary to meet regulatory requirements NEPA and transportation conformity.

Dispersion analysis was performed at four intersections within the study area. The intersections selected for analysis and the reasons for their selection are as follows: 1) Midland Avenue at 6th Street, selected based on LOS E and traffic signal data; 2) G Street and H Street at 6th Street, these intersections were selected and modeled together because the CO monitor is located mid-block between G Street and H Street, both intersections have future LOS E/F designations; 3) M Street at 6th Street, this intersection has the worst case LOS F and volume to capacity ratio for the build alternative and involves changes in lane configuration which could exacerbate existing conditions.

The intersections selected represent the worst case situations within the study area. If these intersections meet air quality standards and conformity criteria, then it follows that all other intersections in the study would also meet the standards and criteria. This approach has been reviewed and approved by DEQ.

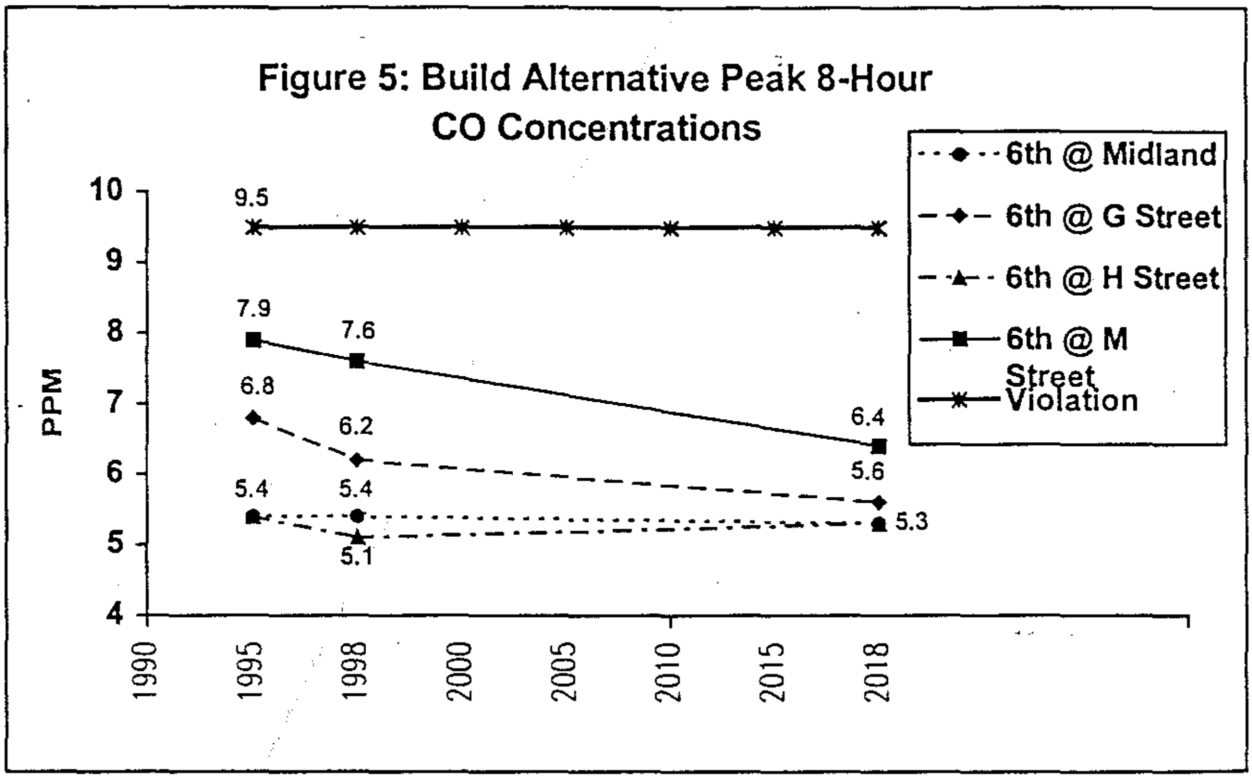
Vehicle emission factors for this study were calculated using the EPA model MOBILE5a. Model input parameters reflect those used for emissions estimates in the latest plan/program conformity determination for Grants Pass. Parameters specific to the study area include winter season meteorological conditions and the use of oxygenated fuels.

The air dispersion model CAL3QHC (EPA, 1992) was used to predict maximum peak hour CO concentrations near selected intersections. This model uses the dispersion algorithm of the CALINE3 model with signal timing and queuing data to predict CO concentrations. Meteorological assumptions used in the modeling were; stability class E (moderate stability), 1 meter/second wind velocity, averaging time = 60 seconds, surface roughness of 175 centimeters (urban) and 1000 meter mixing height. Model input/output runs are included in Appendix C.

Peak hour (1-hour) CO concentrations were predicted using the dispersion model. Average hour (8-hour) CO concentrations were then calculated by multiplying the peak hour concentrations by a persistence factor of 0.67. The persistence factor was established from a ratio of 1-hour and 8-hour monitored data observed at the Wing Building site. This was done in accordance with the procedure outlined in the guidance document EPA-454/R-92-005 (Guideline for Modeling Carbon Monoxide from Roadway Intersections).

Prediction site locations were established using the same guidance document. Prediction sites were located at 3 meters from the edge of the roadway at 25 and 50 meters from the intersection and on both sides of the road. Modeling was done for the years 1995 (existing), 1998 (project implementation) and 2018 (future case). A background (ambient) CO concentration was added to the peak hour concentration to account for all areawide sources of CO. The background levels used were, 3.9 ppm (parts per million) for 1995, 3.6 ppm for 1998 and 3.7 ppm for 2018.

CO concentrations are not predicted to exceed the CO standard in future years at any of the intersections analyzed for this study. The highest predicted 8-hour CO concentrations at each of the intersections for the build alternative are given below in Figure 5. Highest predicted CO concentrations for every prediction site at each intersection and for both the build and no-build alternatives are given in Appendix C.



3.5 Project Construction Impacts

Highway construction activities contribute to local and areawide air pollution. Carbon monoxide and PM-10 emissions are expected to increase resulting from heavy construction equipment, lowered traffic speeds and earth excavation associated with the project. To mitigate for increases in PM-10 and dust particulate, watering will be required to control generation of these pollutants.

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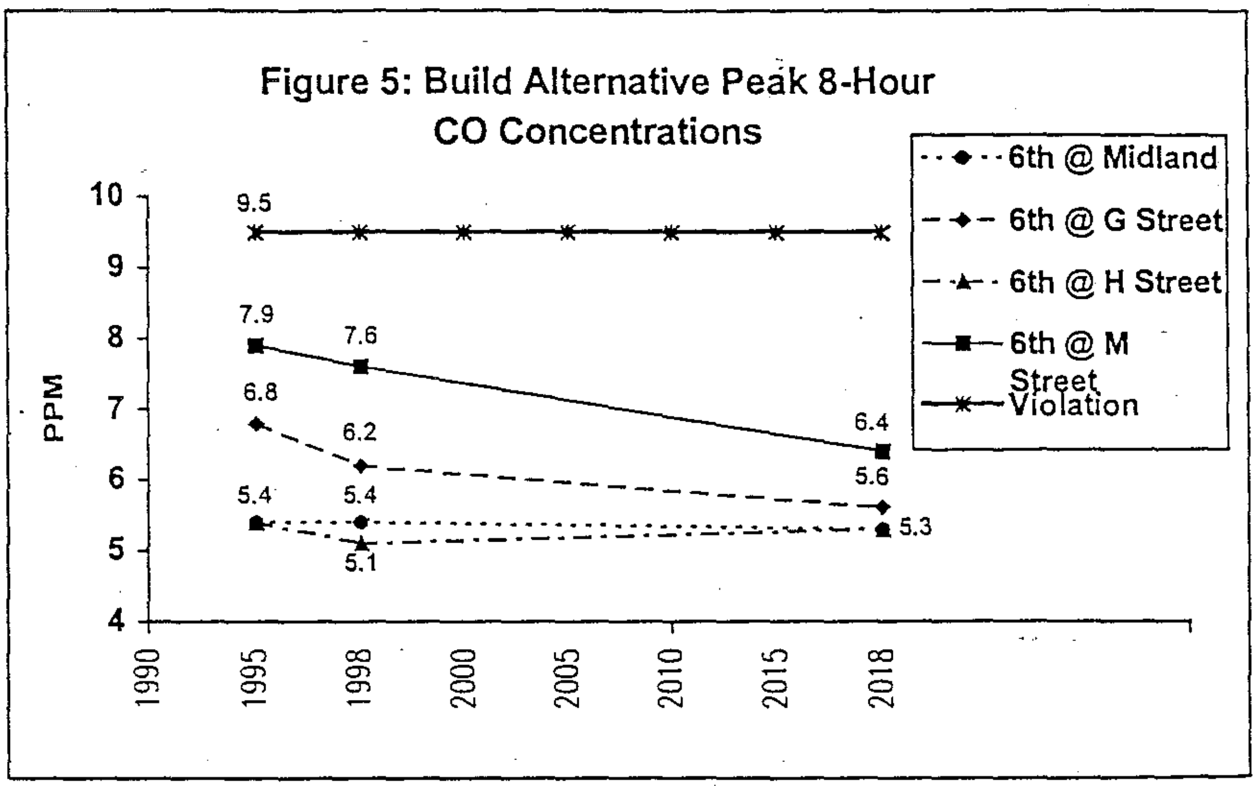

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4.0 Regulatory Requirements

4.1 National Environmental Policy Act (NEPA)

The National Environmental Policy Act of 1969 requires the examination of environmental consequences attributable to a proposed activity with the goal of protecting and enhancing the human environment. This air quality technical report was prepared in accordance with federal and state guidance to meet NEPA requirements. The information in this study will be summarized and incorporated into the 6th Street / 7th Street Couplet Revised Environmental Assessment (REA) document.

4.2 Project Conformity with the State Implementation Plan (SIP)

Conformity Background

Gas/diesel powered vehicles are the major contributors to air pollution within urbanized areas. The federal Clean Air Act (CAA) required states to develop and implement a State Implementation Plan (SIP) which demonstrates how designated nonattainment areas will achieve attainment of air pollutant standards for each of the seven criteria air pollutants. The Oregon Department of Environmental Quality (DEQ) is designated as the responsible agency for the development and implementation of the SIP for the Grants Pass CO and PM-10 nonattainment areas. The SIP becomes a federally enforceable state law upon approval by the federal Environmental Protection Agency.

Conformity Statement

Air quality conformity determinations are required for all projects that require a federal action are federally funded or that are considered regionally significant.

- Conformity Total Emissions CO: The build alternative is identified in the current conforming Statewide Transportation Improvement Program (STIP). Under the current state and federal conformity criteria, total CO emissions resulting from the build alternative (CBD / nonattainment area) must be less than 1990 and no-build alternative emissions. Build 3-lane alternative emissions are less than 1990 and no-build emissions.

- Conformity CO 'Hot-spot': There are several potential hot-spots within the Grants Pass CO non-attainment area. The proposed project will generally reduce CO concentrations at those hot-spot intersections, by widening traffic lanes and thus facilitating increased speeds. Construction of this project would not cause any new violation of the CO standard or exacerbate any existing exceedance within the nonattainment area.

- Conformity PM-10: The build alternative is consistent with the Control Strategy SIP emissions budget for Grants Pass and meets the regional emissions criteria for conformity. Regional PM10 emissions versus budgeted PM10 emissions in the Grants Pass attainment SIP are shown in Table 1. The regional emissions analysis includes implementation of the 6th/7th Street Couplet.

Conformity Determination

A regional analysis of carbon monoxide and PM10 emissions within the respective nonattainment boundaries demonstrates that this project conforms with the Grants Pass CO and PM10 State Implementation Plans. Implementation of this project is will not create new or exacerbate existing CO hot-spots within the Grants Pass CO nonattainment area. The 6th/7th Street Couplet project meets all of the conformity criteria for carbon monoxide and PM10 isolated rural nonattainment areas in the State Conformity Rule.

Table 1
PM10 Emissions: Predicted Regional (UGB) vs. SIP Budget

Year	VMT	Regional Emissions (tons/year)	Regional Emissions (lbs/day)	SIP Budget (tons/year)	SIP Budget (lbs/day)	SIP vs. Predicted Annual	SIP vs. Predicted Daily
2000				393	2635		
2005	809,009	296	1692	393	2635	97	943
2012	975,897	346	1965	393	2635	47	670
2015	1,027,978	362	2054	393	2635	31	581

4.3 Indirect Source Construction Permit

An indirect source is defined as a facility (i.e. highway) which indirectly causes vehicular activity that results in air pollutant emissions. Construction of new facilities or the modification of existing facilities may require an Indirect Source Construction Permit (ISCP) from the Oregon Department of Environmental Quality, or regional authority having jurisdiction. Guidelines for identifying construction projects requiring this permit are contained in Oregon Administrative Rule (OAR) section 340-20-15(2), 'Rules for Indirect Sources'.

In Grants Pass, highway sections being proposed for construction with an annual average daily traffic (ADT) volume of 50,000 of more vehicles within ten years of completion, or being modified so that the ADT will increase to 50,000 or more vehicles or will be increases by 25,000 or more vehicles within 10 years of completion require an ISCP.

The build alternative does not meet any of these criteria; therefore, an ISCP would not be required for project construction.

Conformity Determination

A regional analysis of carbon monoxide and PM10 emissions within the respective nonattainment boundaries demonstrates that this project conforms with the Grants Pass CO and PM10 State Implementation Plans. Implementation of this project is will not create new or exacerbate existing CO hot-spots within the Grants Pass CO nonattainment area. The 6th/7th Street Couplet project meets all of the conformity criteria for carbon monoxide and PM10 isolated rural nonattainment areas in the State Conformity Rule.

Table 1
PM10 Emissions: Predicted Regional (UGB) vs. SIP Budget

Year	VMT	Regional Emissions (tons/year)	Regional Emissions (lbs/day)	SIP Budget (tons/year)	SIP Budget (lbs/day)	SIP vs. Predicted Annual	SIP vs. Predicted Daily
2000				393	2635		
2005	809,009	296	1692	393	2635	97	943
2012	975,897	346	1965	393	2635	47	670
2015	1,027,978	362	2054	393	2635	31	581

4.3 Indirect Source Construction Permit

An indirect source is defined as a facility (i.e. highway) which indirectly causes vehicular activity that results in air pollutant emissions. Construction of new facilities or the modification of existing facilities may require an Indirect Source Construction Permit (ISCP) from the Oregon Department of Environmental Quality, or regional authority having jurisdiction. Guidelines for identifying construction projects requiring this permit are contained in Oregon Administrative Rule (OAR) section 340-20-15(2), 'Rules for Indirect Sources'.

In Grants Pass, highway sections being proposed for construction with an annual average daily traffic (ADT) volume of 50,000 of more vehicles within ten years of completion, or being modified so that the ADT will increase to 50,000 or more vehicles or will be increases by 25,000 or more vehicles within 10 years of completion require an ISCP.

The build alternative does not meet any of these criteria; therefore, an ISCP would not be required for project construction.

Grants Pass Travel Demand Model Calibration
Rogue Valley Council of Governments
March, 1999

In recent months, the Oregon Department of Environmental Quality (ODEQ) has been required to update the Grants Pass Air Quality Plan. In order to do this it was necessary for the Grants Pass Travel Demand Model to be recalibrated from a 1992 base year to a 1993 base year. This recalibration was carried out in the closing months of 1998 and early in 1999 by staff from the Rogue Valley Council of Governments and the Transportation Planning Analysis Unit (TPAU) of the Oregon Department of Transportation. This report is a summary of the results of this recalibration effort.

Population and Employment

As part of the recalibration process, the housing inputs to the Travel Demand Model were updated. This began with using aerial photographs to count the number of dwelling units within each Traffic Analysis Zone (TAZ). These counts were then spot checked by visual inspection. Additionally the dwelling unit counts were identified as being either within the Grants Pass Urban Growth Boundary, or outside of the Urban Growth Boundary. The counts were made using 1994 aerial photographs which were then "backcasted" to 1993 numbers. Using a 1.6% growth rate from the Grants Pass Comprehensive Plan, the forecasted number of dwelling units for 2015 was produced. Through meetings with Grants Pass and Josephine County Officials, future year population and employment numbers by TAZ were obtained.

Mean Travel Times

The most standard check of the trip distribution model is to compare observed travel times by trip purpose to estimated (or modeled) travel times. Since observed travel times were not available at the time of recalibration, the travel times from the 1992 Travel Demand Model were used as controls for the recalibration. The calibration for the 1992 model was valid, only the population/employment numbers required adjustment. For this reason, using the numbers from the earlier version as targets is acceptable.

Table 1: Comparison of Mean Travel Times

Model Year	1992		1993	
Trip Purpose	Mean Travel Time	Standard Deviation	Mean Travel Time	Standard Deviation
Home-based Work	6.69	3.46	6.73	3.36
Home-based Other	6.80	3.47	6.73	3.36
Non Home-based	5.11	3.09	5.16	3.22
All	6.66	3.57	6.53	3.58

From Table 1, the mean travel times shown in the 1993 recalibration model compare favorably with those used in the 1992 model. The Standard Deviations show very similar distributions. Mean travel time for Home-based Other trips should in actuality be about 70-80% of the Home-based Work travel time. However, given the fact that the mean travel times between the base years are very close, this will not amount to a substantial difference in the overall performance of the model. This fix will require only minor adjustments to the friction factors for this trip purpose. Due to time constraints there was insufficiant time to make this minor adjustment. This will be revisited at a later date.

Screen Line Comparisons

The purpose of screen line checks is to validate both trip distribution and traffic assignment. In practice, screenlines are selected based on the availability of base-year traffic counts and development density. However, due again to time constraints, these screenlines were selected based only upon the availability of counts.

Table 2: Screen Line Comparison

Screen Line	Location	Traffic Count	Model Volume	% Difference
1	6th and 7th Streets, north of A Street	36863	33565	-8.94664026
2	D, E, and F Streets east of 6th Street	11333	12090	6.67960822
3	6th and 7th Streets between E and F Streets	40421	39713	-1.75156478
4	OR199 between Terry and Beacon Streets	15768	17248	9.38609843
5	OR199 south of 199 Spur	18759	24848	32.4590863
6	OR199 and Redwood Ave	29842	29892	0.16754909
7	OR199 East of 7th Street	14078	17234	22.4179571
8	OR199 West of 6th Street	23295	25097	7.73556557
9	6th Street connection to OR238	17790	17077	-4.00786959
10	6th and 7th Streets south of OR199	17083	15008	-12.1465785
11	Danielle/Willow/Leonard	3158	1274	-59.6580114
12	Leonard/Redwood Avenue	3810	2957	-22.3884514
13*	Fruitdale/Grandview	2598	7936	205.465743

Overall, the screenline checks are very good. With a few notable exceptions, assigned volumes are within 15% of observed volumes. Also, the higher deviations tend to occur on lower volume roads where even a small difference in observed to estimated volume can show a relatively large percent deviation.

Vehicle-Miles Traveled (VMT)

VMT validation is very important for urban areas that have been designated by the EPA as non-attainment areas for moderate and serious carbon monoxide. VMT is the product of the link volume and the link distance, summed over the geographic area and facility types. Modeled regional VMT should be within 5% of the observed VMT.

Table 3: VMT Comparison by Facility Type

Type	Observed	Modeled	Estimated VMT	Observed VMT	Absolute Difference
Rural Major Collector	7095	7229	7951	7001	13.57%
Urban Freeways and Expressways	541412	549863	85405	81543.7	4.74%
Other Urban Principal Arterials	40228	27283	849	1315.46	35.46%
Urban Minor Arterials	45252	39484	2882	3184.31	9.49%
Urban Collectors	97557	90028	22173	22293.03	0.54%
Total	731544	713887	119260	115337.5	3.40%

With a 3.4% deviation region-wide, modeled VMT is well within the recommended 5%. It should be noted that the 35.46% deviation for Other Urban Principal Arterials is due to the fact that the counts available were for low volume roadways and therefore while the deviation is large, it actually represents a relatively low volume of traffic.

Percent Root Mean Squared Error

Percent Root Mean Squared Error (RMSE) is a statistical indicator for traffic assignment. It gives an indication of whether the simulated network contains the correct number and type of facilities and whether the relative speeds and capacities among these facilites have resulted in a reasonable assignment of traffic. A model which is producing a more accurate assignment will show a lower RMSE. In general, higher volume roads (>50,000 ADT) should have an RMSE less than 25%, while lower volume groups can be between 30-100%. RMSE can be measured in two ways, by volume group and facility type. For this recalibration, both methods were used.

Table 4: RMSE By Volume Group

Volume Group	% RMSE
0 - 5,000 ADT	28.39
5,000 - 10,000 ADT	23.03
10,000 - 15,000 ADT	9.88
15,000 - 20,000 + ADT	15.25

Table 5: RMSE By Facility Type

Facility Type	% RMSE
Rural Major Collector	0.51
Urban Freeways and Expressways	12.11
Other Urban Principal Arterials	54.41
Urban Minor Arterials	16.34
Urban Collectors	9.38
Total	14.68

Conclusion

The Grants Pass Travel Demand Model was recalibrated to meet the immediate needs of the Grants Pass Air Quality Analysis by ODEQ. The standard checks on the validation of the model show that it is performing well in all aspects. However, the validation checks do point out some minor shortcomings that should be revisited as time permits. These include:

1. Revisiting the Trip Distribution Model to adjust the Home-based Other Trip calibration.
2. Further exploration of the possible causes of high degrees of variation in VMT along some of the network links.

The Grants Pass Travel Demand Model is performing well under the current calibration. This model is a Quick Response type model and is therefore adequate for the immediate air quality analysis, as-well-as regional analysis. The usefulness of this model for other types of analysis should be reviewed on a case by case basis.

State of Oregon
Department of Environmental Quality Memorandum

Date: May 20, 1999

To: Montel Livingston

From: Patti Seastrom PS

Subject: Amendment to Grants Pass CO Technical Analysis Protocol

Montel, as we discussed several weeks ago, we are requesting that the technical analysis protocol for the Grants Pass carbon monoxide maintenance plan be amended. The original TAP proposed to meet the hot spot intersection analysis requirement by modifying ODOT's analysis of the 6th/7th Street couplet project. ODOT's study showed favorable results, but did not account for future year projections without oxygenated fuel. Our attempts to do so were unsuccessful. Based on your recommendation, we proceeded with a rollforward analysis to demonstrate that carbon monoxide concentrations at hot spot intersections will not exceed the 8-hour standard without oxygenated fuel in future years. Attached for Bonnie's signature is the proposed amendment for the TAP describing the rollforward analysis methodology. Thank you for your help.

Amendment to the Grants Pass Carbon Monoxide Maintenance Plan Technical Analysis Protocol, dated March 1999.

The following paragraph replaces the last two sentences of the first paragraph on Page 6, Section B, Maintenance Demonstration, beginning with "Results of the 1997 Oregon Department of Transportation 6th/7th Street couplet analysis…".

Replacement paragraph: "ODEQ will perform a rollforward analysis for the permanent monitoring site at 6th and G Streets and for non-monitored intersections based on a screening procedure used to identify the most congested intersections. (The intersections will be ranked separately by volume and congestion, identifying the top three for each ranking.) The department will use the following congestion indicator: "V*V/C," or traffic volume divided by capacity times volume. This algorithm weights volume by the corresponding level of capacity utilization. For the V/C part of the algorithm, ODEQ will use V/C ratios determined by the Oregon Department of Transportation (ODOT) and documented in "Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County," August 1997. Over twenty intersections along the 6th and 7th Street couplet within the Central Business District were analyzed. Evening peak hour volumes of each leg of the intersection will be summed, and the peak hour volume total will then be multiplied by the intersection V/C ratio determined by ODOT. Depending upon the level of overlap from the two rankings, ODEQ will conduct rollforward analysis for at least three intersections."

Department of Environmental Quality

Annette Liebe, Manager, Airshed Planning Section — Date 5/20/99

Region 10 Environmental Protection Agency

Bonnie Thie, Manager, State & Tribal Programs Unit — Date 6-7-99

Appendix D4-2

Carbon Monoxide Monitoring Network

Air Quality Planning Areas
Grants Pass

Appendix D4-3

Carbon Monoxide Saturation Study

Special Study Report

Grants Pass Carbon Monoxide

Validation Study

Winter 1993 - 94

Oregon Department of Environmental Quality

Air Quality Division

Technical Services Division

Approved: ______________________

Date: 2/14/96

Introduction

The Grants Pass Central Business District (CBD) was designated as a carbon monoxide (CO) nonattainment area in a letter to the Environmental Protection Agency (EPA) in March 1991. Recorded CO levels at the time the area was designated as nonattainment fell into the moderate category.

Grants Pass is located along the Rogue River and receives considerable traffic flow due to its proximity to Interstate 5. US Highway 199 (US199) originates in Grants Pass and is a principle roadway from southwest Oregon to the northern CA and OR coastal area; OR99 and US199 (Redwood Highway Spur) are the same roadway in the CBD for approximately 20 blocks. Historically all traffic headed southbound via US199 from Oregon State Highway 99N (OR99) and Interstate 5 was directed through the CBD along US199/OR99 to two one-way bridges over the Rogue river. The CBD has an increase in traffic during summer periods due to seasonal tourist traffic, however this increase occurs when CO levels are generally lower than winter-time levels. Eight-hour average maximum CO levels of 9.9 ppm were recorded as recently as 1990 at the Grants Pass Wing Building in the CBD; 1990 was the most recent year during which an exceedance was recorded.

In order to lessen the effect of vehicular congestion upon traffic patterns within the CBD a new section of US199 (known as the Redwood Highway Parkway) was constructed. The new section facilitates travel from the Interstate 5 corridor (east Grants Pass exit) along US199 and directs traffic around the CBD. Included in the project was construction of a new bridge crossing the Rogue river. The parkway was opened to traffic in November 1991. During the winter of 1993-94 Oregon DEQ conducted a CO saturation survey to determine the effect of the new bridge upon carbon monoxide patterns in the Grants Pass CBD and to evaluate the effectiveness of the current CO monitoring site at the Wing Building.

Procedure

Between December 15, 1993 and February 1, 1994 CO sampling was conducted at six sites in the Grants Pass CBD. Sites were selected based upon proximity to high traffic count lanes or queues, or proximity to existing CO monitors. Duplicate bag samplers were located at the Wing Building (Site GPW) within 31 feet of the permanent NAMS CO monitor probe. A seventh monitor was operated continuously at 11th and K (Site GPK) to provided background site data for the survey and a location for bag analysis. Forecast sensitive samples were collected in three, four-hour blocks on fifteen sample days. Forecasting of sample days were provided by Oregon DEQ, Air Quality Laboratory. A sampling schedules was established for a noon to midnight sampling period as follows:

Bag #1:	12:00 p.m. to 4:00 p.m.
Bag #2:	4:00 p.m. to 8:00 p.m.

Bag #3: 8:00 p.m. to 12:00 a.m.

A map indicating the location of the sample sites can be found in Attachment A. Survey activity was conducted at the following locations:

6th St. & D St. (424 6th St.)- Site #1

6th St. (215 6th St. between G & H St.) - Site #2

6th St. (215 6th St. between G & H St.) - Site #2D

Wing Building - Site GPW

Sixth & M St. (780 6th St.) - Site #3

Bi-Mart (6th & and Hwy 238) - Site #4

7th & M St. - Site #5

GPK (11th & K St.) - Site #6

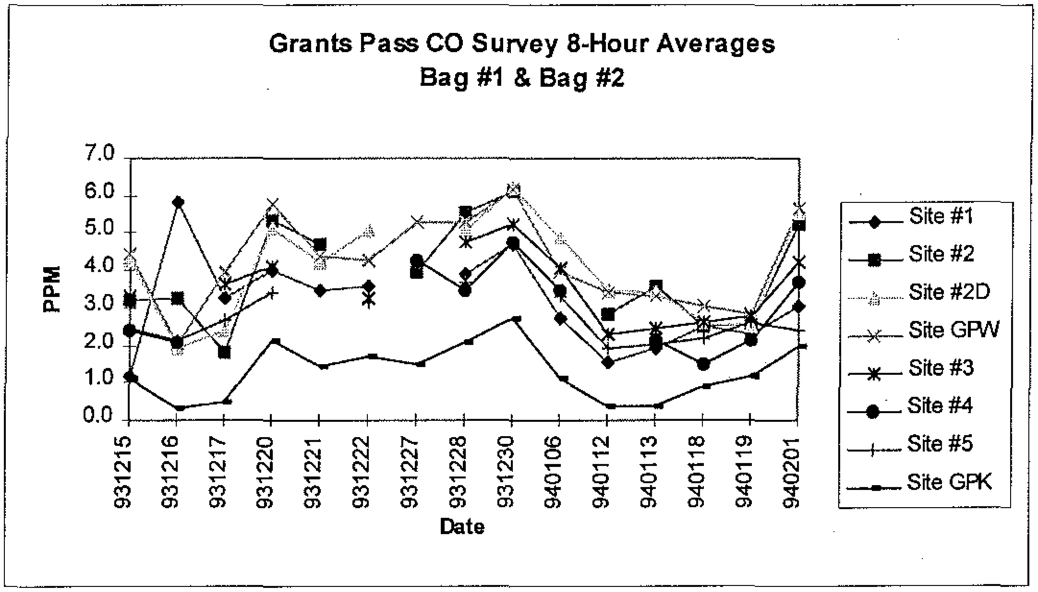
Quality control consisted of a thorough audit of the CO monitor at the 11th and K site used to analyze the survey samples. The sampler was audited according to the QA/QC procedures on file at the DEQ Laboratory. Results of the flow audits and data comparisons are available. Duplicate samplers were set up at the current monitoring site and the Wing Building (GPW). Sites were operated according to DEQ plans on file.

Results and Discussion

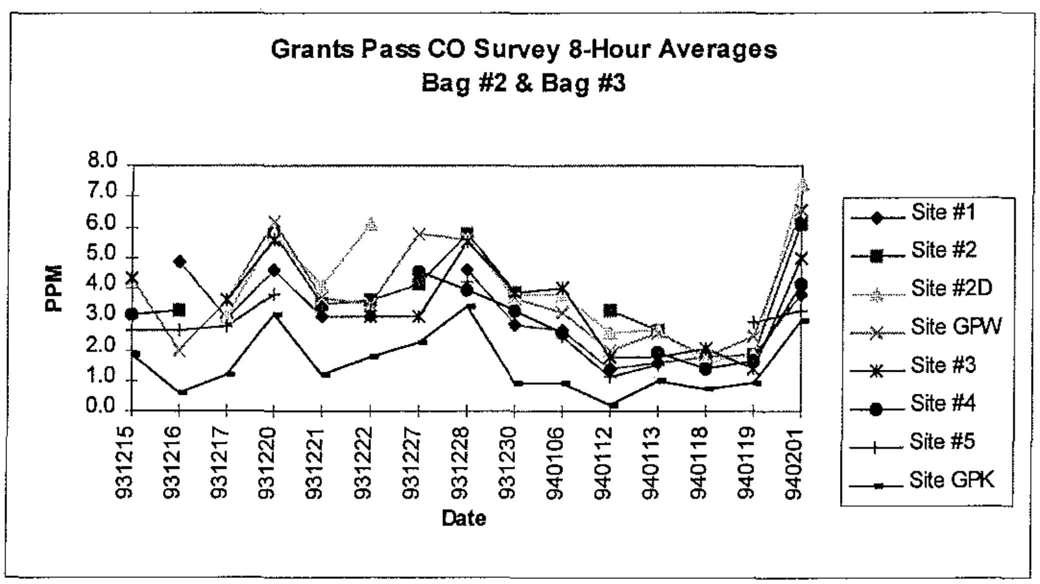
For the purposes of this discussion the Redwood Highway Spur handling traffic from the Interstate 5 east Grants Pass exit refers to the original traffic pattern (pre-1991) on US199. Traffic from the same exit traveling via the newly constructed roadway and bridge is referred to as the Redwood Highway Parkway.

Maximum, minimum, and average values for CO recorded for each site during the study are included in Attachment B. During the course of the survey twenty maximum values were recorded at the Wing Building (Site GPW) site. The maximum CO value occurred at the Wing Building (Site GPW) on February 1, 1994 and was 7.6 ppm. Overall 79% (38 of 48) of the maximum values for all samples taken occurred at Site #2, Site #2D, or Site GPW. The minimum value at Site GPW was 1.0 ppm and the average was 3.78 ppm; Site GPK showed the minimum value for the survey at 0.0 ppm.

Eight-hour averages during the survey indicate higher daily CO values occurred during the Bag #1 and Bag #2 sampling period. Data for the 8-hour average can be found in Attachment C. The following chart summarizes 8-hour averages for Bag #1 and Bag #2. Based upon the survey data site GPW generally shows the highest CO levels during the same period. Site GPK consistently shows the lowest values and appears to be an appropriate background site for the survey.

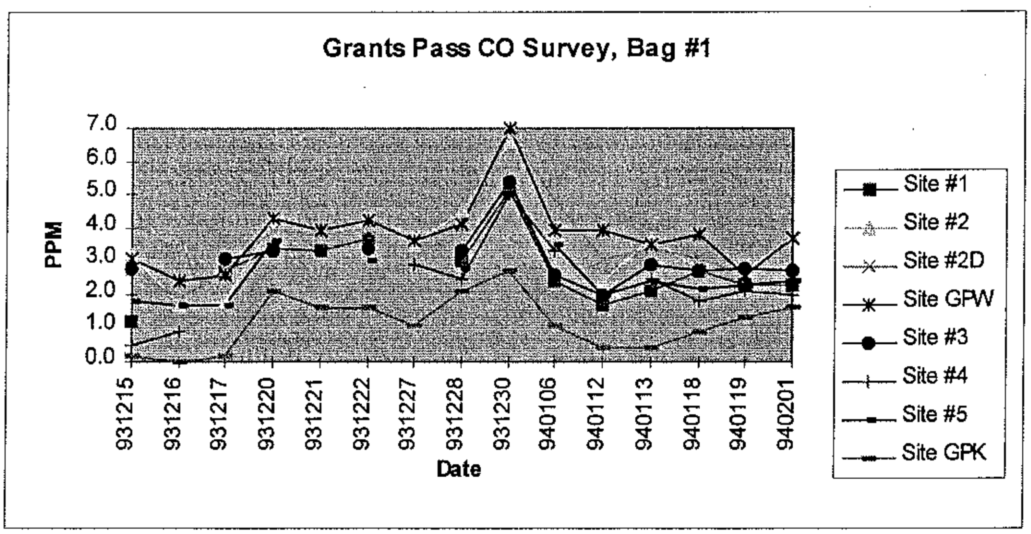


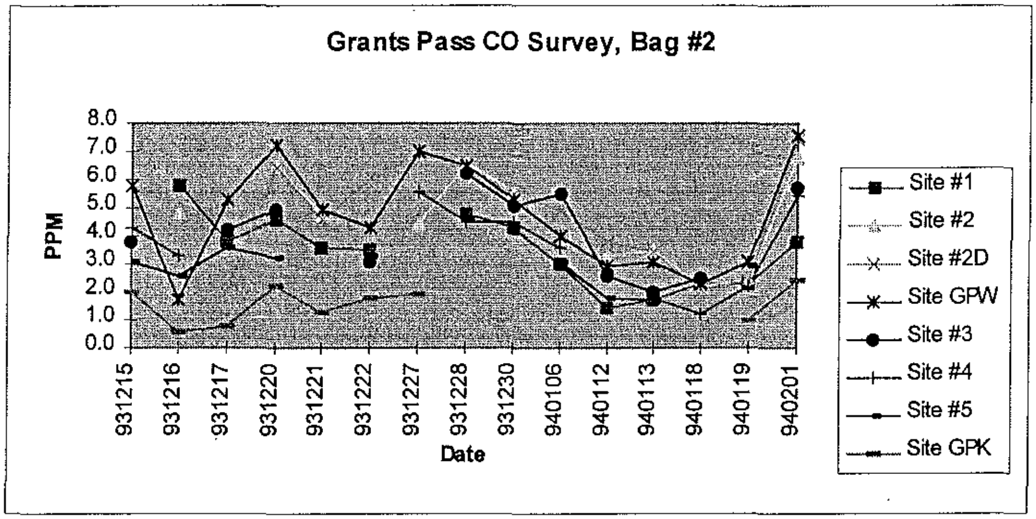
Eight-hour averages for Bag #2 and Bag #3 are summarized in the chart below. Site GPK again appears to be an appropriate background site for the survey. Site GPW generally shows the highest CO levels during the same period; Sites in close proximity to GPW and within the CBD also show elevated CO levels in comparison to the background site.

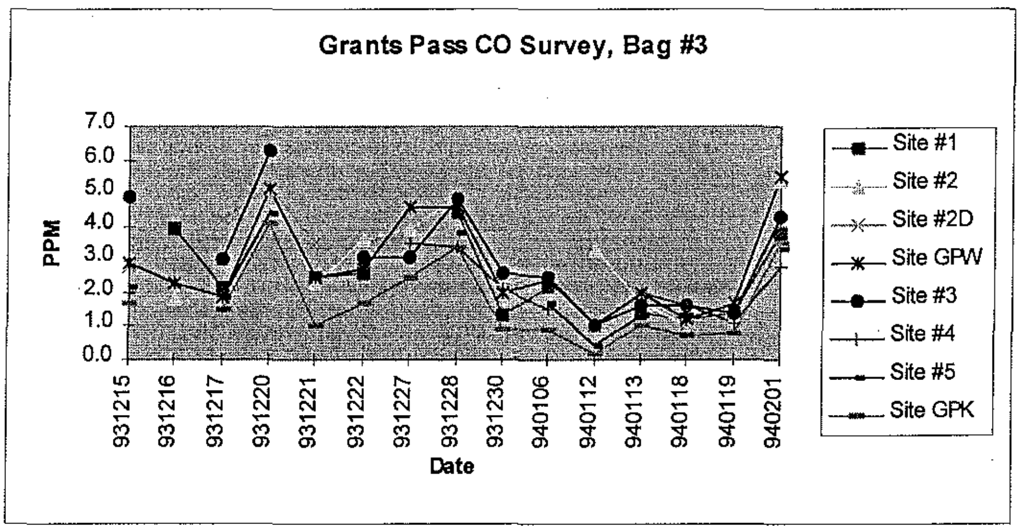


Maximum values at sites other than Site GPW, Site #2, and Site #2D accounted for 21% (10 of 48) of the maximum values recorded during the survey. Of those ten maximum values two occurred at Site #1 and 8 occurred at Site #3. Site #1 was located north of the permanent (Site GPW) site and north of where the Redwood Highway Spur enters the CBD one-way grid. Site #1 included southbound traffic from the I-5 north Grants Pass exit connecting to US199 (Redwood Highway Spur) or continuing southbound on OR99. Site #3 located south of Site GPW included southbound traffic from both the US199 (Redwood Highway Spur) and from OR99. These two sites, while not equidistant from Site GPW, showed a good linear relationship with an r^2 of 0.76. Minimum values at these sites were similar to those at Site GPW, Site #2, and Site #2D.

When data is evaluated on a bag-by-bag basis for all sites the GPW site continues to demonstrate maximum values. Site GPK again shows the minimum values. The following graphs illustrate the data from the area around the permanent site during the course of the survey. Each graph represents sample values for specific time blocks (i.e., Bag #1 = noon - 4:00 p.m., Bag #2 = 4:00 p.m. - 8:00 p.m., and Bag #3 = 8:00 p.m. to 12:0 a.m.).

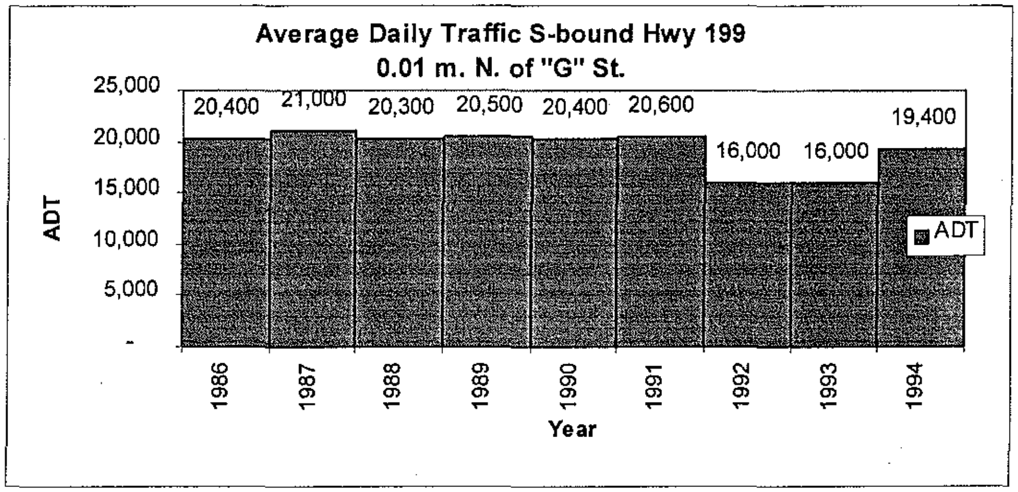






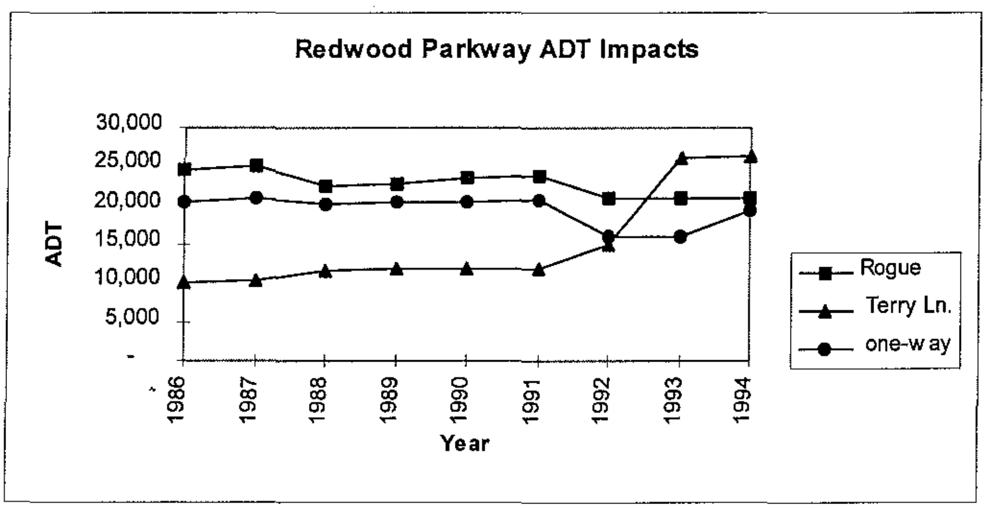
Construction of the Redwood Highway Parkway has impacted overall average daily traffic volume (ADT) at the GPW site. Traffic signals in the CBD are set for 20 mph. Traffic speeds on the Redwood Highway Parkway are higher; ODOT personnel state that the maximum speed limit for the parkway is 45 mph. ODOT data indicates that, while ADT along the "Redwood Highway Spur/Redwood Highway Parkway" increased between 1990 and 1993, traffic at "G" St. (southbound) decreased by approximately 22%; traffic at the Rogue river bridge (southbound) decreased by approximately 11%. The table in Attachment D summarizes Average Daily Traffic (ADT) at selected ODOT sites.

ADT data from the "G" St. ODOT site clearly indicates the effect of the Redwood Highway Parkway upon traffic in the CBD when presented graphically.



ADT data included is on an annual basis only; Seasonal variation, especially due to summer tourist traffic, is somewhat masked by this format because the CO season occurs during winter when cold air inversions contribute to stagnant air. Elevated CO levels are directly related to the heaviest traffic volumes.

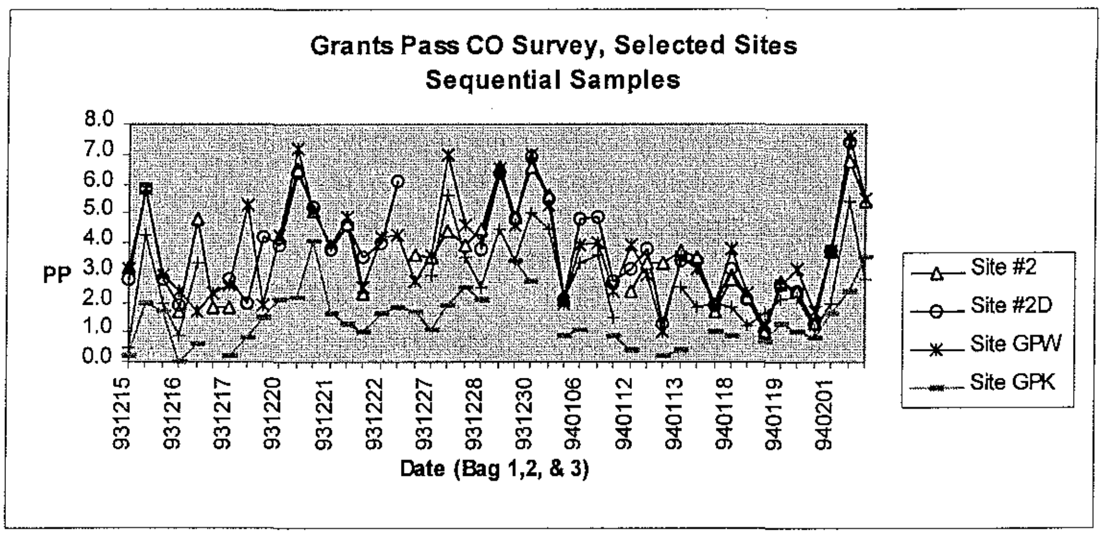
When annual ADT is compared at three selected ODOT locations the impact of the newly constructed parkway upon CBD traffic volume is clearly demonstrated (see chart below). The influence of signs on Interstate 5 which might direct traffic to the East Grants Pass exit and yearly fluctuations in tourism traffic is unknown.



Correlation analysis

Linear regressions were performed on the CO data in comparison to the permanent site at GPW. Good correlation was found between the duplicate bag samples (Sites #2, & #2D) and the permanent CO monitoring probe site (Site GPW) where r^2 ranged from $0.72 < r^2 < 0.75$. A linear relationship between Site #2 and Site #2D (the duplicate site) also exists as would be expected from samplers operating side-by-side. Very good correlation between these sites was indicated with an $r^2 = 0.89$. Additional correlation analysis data for other sites can be found in Appendix B (pg.2).

The QA/QC duplicate samplers at sites #2 and #2D showed good precision in measurement and compared very well to the averages generated from data at the permanent monitor (GPW). Daily variation in CO levels at Site GPW, QA/QC sites, and the background site (GPK) are illustrated in the graph below.. Each day for which a sample was collected is presented in sequence. The tick mark with the date below represents CO values for Bag #1 and is followed by values for Bag #2 and Bag #3. Elevated daily CO levels during the 4:00 p.m. to 8:00 p.m. (Bag #2) period are clearly illustrated.



While the CO NAAQS are based upon 8-hour averages, when the survey data is presented in this manner the daily period where the monitor was most affected traffic volume is clearly illustrated.

Meteorology

A total of 10 days were forecast for sampling. Of the 3 highest average 1 hour/8 hour CO days during survey period, all days were forecasted for sampling. Weather patterns were generally cooler and drier than normal during the survey period. Strong surface inversions and high barometric pressure, indicative of wintertime poor local mixing conditions, occurred during the first two weeks (Dec. 15-31, 1993) of the survey period and ten sampling days were called; sampling was conducted on nine of those days. The second period of strong inversion coupled with higher barometric pressure began at the end of January, 1994 near the end of the survey period. While daytime temperatures were higher than during the December inversion period, cooling reestablished the inversion during the night. The resulting bag samples during this period showed the highest CO levels of the survey period.

Conclusions

Survey results indicate that the Grants Pass Wing Building (Site GPW) is an appropriate location for monitoring maximum CO levels in the Grants Pass CBD area. Sampled sites at any distance from GPW generally showed lower maximum CO levels during the survey period. Because of the traffic reengineering and the opening of the Redwood Highway Parkway recently accomplished in the Grants Pass area future surveys should probably continue to focus on the CBD where traffic speeds are low.

Data for the permanent CO monitor at site GPW indicate that CO levels in the CBD have declined. These lower CO values may be the result of the shift in traffic out of the CBD resulting from the construction of the Redwood Highway Parkway. Lower CO values, however, may also be attributed to the introduction of oxyfuels in 1992 and the effects of changing vehicle mix as newer model vehicles with cleaner burning engines replace older vehicles.

The survey period in 1993/94 probably does not represent the highest potential CO levels for the Grants Pass CBD. A period of elevated CO levels which occurred during November 1993 was not surveyed because it fell outside the more normally accepted months of December - February during which high CO levels generally occur. Future surveys should included sampling beginning in mid-November.

The Redwood Highway Parkway was designed to facilitate traffic movement and, therefore, should result in lower CO levels. The CO survey data indicates that CO levels are lower and the Redwood Highway Parkway may have contributed to the lower values. Average Daily Traffic (ADT) data within the CBD at the ODOT southbound "G" street site showed reduced traffic volume once the Redwood Highway Parkway was opened; 1994 ADT data was 21% higher than the previous year at the same site. There is not enough information available to indicate a trend toward a return to historic traffic volume levels at the site, however, future CO data collected in the CBD should provide insight into the effect of changing vehicle mix on CBD CO levels.

Limited sampling should be considered in the future at locations where traffic volume is high and speeds are low such as the limited stop lights. These levels should be compared to the existing permanent site at GPW and could serve to verify the effects of the redistribution of traffic from the CBD to the new roadway.

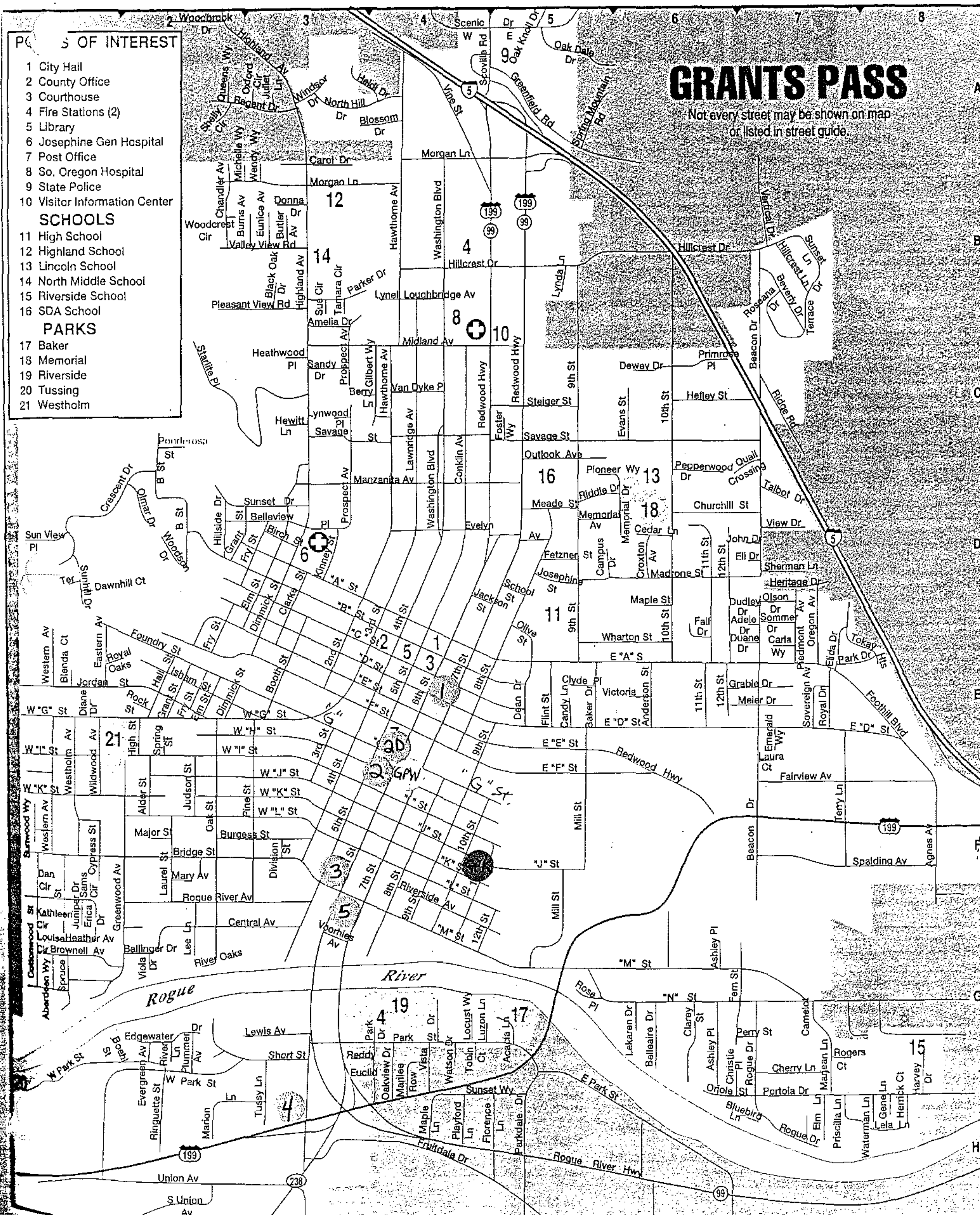
Attachment A: Survey Site Map

Attachment B: CO Survey Data Spreadsheet/

Attachment C: 8-hour Average Data Spreadsheet

Attachment D: ODOT Average Daily Traffic Spreadsheet

Attachment A

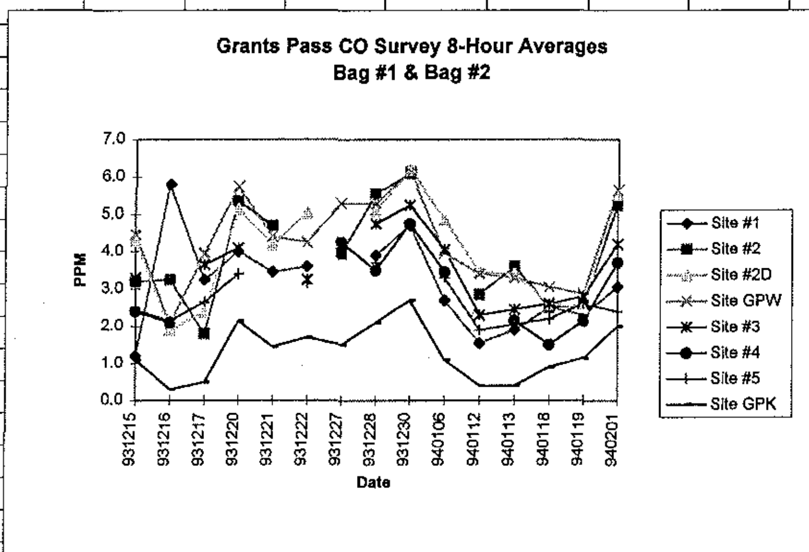


1993/94 Grants Pass CO
Validation Survey Data

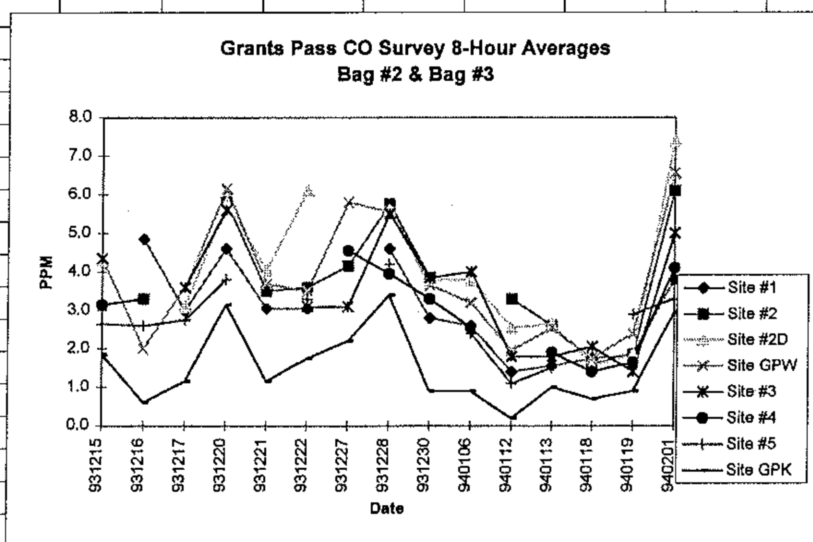
Grants Pass CO Validation Study										
		Site #1	Site #2	Site #2D	Site GPW	Site #3	Site #4	Site #5	Site GPK	Max. =
DATE	Bag #	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
931215	1	1.2	3.2	2.8	3.1	2.8	0.5	1.8	0.2	3.2
	2	NA	NU	5.8	5.8	3.8	4.3	3.1	2.0	5.8
	3	NA	NU	2.8	2.9	4.9	2.0	2.2	1.7	4.9
931216	1		1.7	1.9	2.4	NA	0.9	1.7	0.0	2.4
	2	5.8	4.8	NU	1.7	NA	3.3	2.6	0.6	5.8
	3	3.9	1.8	NU	2.3	NA	NA	NA	NA	3.9
931217	1	2.7	1.8	2.8	2.6	3.1	NA	1.7	0.2	3.1
	2	3.8	NA	2.0	5.3	4.2	NA	3.6	0.8	5.3
	3	2.2	NA	4.2	1.9	3.0	NA	1.9	1.5	4.2
931220	1	3.4	4.2	3.9	4.3	3.3	NA	3.6	2.1	4.3
	2	4.6	6.5	6.4	7.2	4.9	NA	3.2	2.2	7.2
	3	NA	5.1	5.2	5.1	6.3	NA	4.4	4.1	6.3
931221	1	3.3	NA	3.8	3.9	NA	NA	NA	1.6	3.9
	2	3.6	4.7	4.6	4.9	NA	NA	NA	1.3	4.9
	3	2.5	2.3	3.5	2.5	NA	NA	NA	1.0	3.5
931222	1	3.7	NA	4.0	4.2	3.4	NA	3.0	1.6	4.2
	2	3.5	NA	6.1	4.3	3.1	NA	3.3	1.8	6.1
	3	2.6	3.6	NA	2.7	3.1	NA	NA	1.7	3.6
931227	1	NA	3.5	NA	3.6	NA	2.9	NA	1.1	3.6
	2	NA	4.4	NA	7.0	NA	5.6	NA	1.9	7.0
	3	NA	3.9	NA	4.6	3.1	3.5	NA	2.5	4.6
931228	1	3.0	4.5	3.8	4.1	3.3	2.5	2.8	2.1	4.5
	2	4.8	6.6	6.4	6.5	6.2	4.5	4.6	NA	6.6
	3	4.4	4.9	4.8	4.6	4.8	3.4	3.8	3.4	4.9
931230	1	5.1	6.6	6.9	7.0	5.4	5.0	NA	2.7	7.0
	2	4.3	5.6	5.5	5.3	5.1	4.5	NA	NA	5.6
	3	1.3	2.1	2.1	2.0	2.6	2.1	NA	0.9	2.6
940106	1	2.4	NA	4.8	3.9	2.6	3.3	3.5	1.1	4.8
	2	3.0	NA	4.9	4.0	5.5	3.6	3.1	NA	5.5
	3	2.2	NA	2.7	2.4	2.5	1.5	1.7	0.9	2.7
940112	1	1.7	2.4	3.1	3.9	2.0	NA	2.0	0.4	3.9
	2	1.4	3.3	3.8	2.9	2.6	NA	1.8	NA	3.8
	3	NA	3.3	1.3	1.0	1.0	NA	0.4	0.2	3.3
940113	1	2.1	3.7	3.4	3.5	2.9	2.5	2.4	0.4	3.7
	2	1.7	3.5	3.4	3.1	2.0	1.8	1.7	NA	3.5
	3	1.4	1.7	1.9	2.0	1.6	2.0	1.3	1.0	2.0
940118	1	2.7	2.8	3.1	3.8	2.7	1.8	2.2	0.9	3.8
	2	2.3	2.2	2.1	2.3	2.5	1.2	NA	NA	2.5
	3	1.2	1.0	1.0	1.2	1.6	1.6	NA	0.7	1.6
940119	1	2.3	2.7	2.6	2.6	2.8	2.1	2.3	1.3	2.8
	2	2.3	2.4	2.4	3.1	NA	2.2	2.9	1.0	3.1
	3	1.4	1.3	1.3	1.7	1.4	1.1	NA	0.8	1.7
940201	1	2.3	3.7	3.7	3.7	2.7	2.0	2.4	1.6	3.7
	2	3.8	6.8	7.4	7.6	5.7	5.4	NA	2.4	7.6
	3	3.8	5.4	NA	5.5	4.3	2.8	3.3	3.5	5.5
Avg. =		2.91	3.66	3.74	3.78	3.41	2.76	2.61	1.45	
Max. =		5.8	6.8	7.4	7.6	6.3	5.6	4.6	4.1	
Min. =		1.2	1.0	1.0	1.0	1.0	0.5	0.4	0.0	
			Site #2	Site #2D	Site GPW				Site GPK	

r^2 of Site #2 and Site #2D	
	with y(dependent variable) as Site #2 and x(independent variable) as Site #2D.
r^2=	0.895
r^2 of Site #2 and Site GPW	
	with y(dependent variable) as Site GPW and x(independent variable) as Site #2
r^2=	0.723
r^2 of Site #2D and Site GPW	
	with y(dependent variable) as Site GPW and x(independent variable) as Site #2D
r^2=	0.751
r^2 of Site #1 and Site GPW	
	with y (dependent variable) as Site GPW and x (indep) variable as Site #1
r^2=	0.403
r^2 of Site #3 and Site GPW	
	with y (dependent variable) as Site GPW and x(indep) variable as Site #3
r^2=	0.629
r^2 of Site #4 and Site GPW	
	with y (dependent variable) as Site GPW and x (indep) variable as Site #4
r^2=	0.729
r^2 of Site #5 and Site GPW	
	with y (dependent variable) as Site GPW and x(indep) variable as Site #5
r^2=	0.639
r^2 of Site #GPK and Site GPW	
	with y (dependent variable) as Site GPW and x(indep) variable as Site #GPK
r^2=	0.404
r^2 of Site #1 and Site #3	
	with y (dependent variable) as Site #1 and x(indep) variable as Site #3
r^2=	0.759
r^2 of Site #3 and Site #5	
	with y (dependent variable) as Site #3 and x(indep) variable as Site #5
r^2=	0.646

8-hour ppm Averages (Bags 1 & 2)										
DATE									Max. =	
	Site #1	Site #2	Site #2D	Site GP	Site #3	Site #4	Site #5	Site GPK	ppm	
931215	1.2	3.2	4.3	4.5	3.3	2.4	2.5	1.1		
931216	5.8	3.3	1.9	2.1		2.1	2.2	0.3		
931217	3.3	1.8	2.4	4.0	3.7		2.7	0.5		
931220	4.0	5.4	5.2	5.8	4.1		3.4	2.2		
931221	3.5	4.7	4.2	4.4				1.5		
931222	3.6		5.1	4.3	3.3		3.2	1.7		
931227		4.0		5.3		4.3		1.5		
931228	3.9	5.6	5.1	5.3	4.8	3.5	3.7	2.1		
931230	4.7	6.1	6.2	6.2	5.3	4.8		2.7		
940106	2.7		4.9	4.0	4.1	3.5	3.3	1.1		
940112	1.6	2.9	3.5	3.4	2.3		1.9	0.4		
940113	1.9	3.6	3.4	3.3	2.5	2.2	2.1	0.4		
940118	2.5	2.5	2.6	3.1	2.6	1.5	2.2	0.9		
940119	2.3	2.6	2.5	2.9	2.8	2.2	2.6	1.2		
940201	3.1	5.3	5.6	5.7	4.2	3.7	2.4	2.0		



8-hour ppm Averages (Bags 2 & 3)										
DATE										
									Max. =	
931215	Site #1	Site #2	Site #2D	Site GP	Site #3	Site #4	Site #5	Site GPK	ppm	
931216			4.3	4.4	4.4	3.2	2.7	1.9		
931217	4.9	3.3		2.0		3.3	2.6	0.6		
931220	3.0		3.1	3.6	3.6		2.8	1.2		
931221	4.6	5.8	5.8	6.2	5.6		3.8	3.2		
931222	3.1	3.5	4.1	3.7				1.2		
931227	3.1	3.6	6.1	3.5	3.1		3.3	1.8		
931228		4.2		5.8	3.1	4.6		2.2		
931230	4.6	5.8	5.6	5.6	5.5	4.0	4.2	3.4		
940106	2.8	3.9	3.8	3.7	3.9	3.3		0.9		
940112	2.6		3.8	3.2	4.0	2.6	2.4	0.9		
940113	1.4	3.3	2.6	2.0	1.8		1.1	0.2		
940118	1.6	2.6	2.7	2.6	1.8	1.9	1.5	1.0		
940119	1.8	1.6	1.6	1.8	2.1	1.4		0.7		
940201	1.9	1.9	1.9	2.4	1.4	1.7	2.9	0.9		
	3.8	6.1	7.4	6.6	5.0	4.1	3.3	3.0		



Grants Pass Area Average Daily Traffic
(Selected Sites)

Grants Pass CO Highway Traffic Analysis

For 1993/94 Grants Pass CO Survey

Location: Redwood Hwy Spur (Hwy 199), 0.04 mile E. of Terry Lane

	ADT		
1986	10,200		
1987	10,400		
1988	11,700		
1989	11,800		
1990	12,000		
1991	12,000	1986 - 1991 avg. =	11,350
1992	15,000		
1993	26,000		
1994	26,300	1992 - 1994 avg. =	22,433
Avg =	16,400		
	Previous to 1992 data was given for "E" & "F" St.couplet is for the Redwood Spur.		
	The new road (called the "Parkway") and opened in November 1991.		
	The road counts for the spur beginning in 1992 are for the Parkway.		
	Road opening date from:		
	David Boyd, ODOT District 8 Maintenance Office 1/12/95.		

Location: On Rogue River Bridge (HWY 99) Southbound

	ADT		
1986	24,500		
1987	25,200		
1988	22,600		
1989	22,800		
1990	23,500		
1991	23,700	1989 - 1991 avg. =	23,717
1992	21,000		
1993	21,000		
1994	20,900	1992 - 1994 avg. =	20,967
Avg =	22,214		

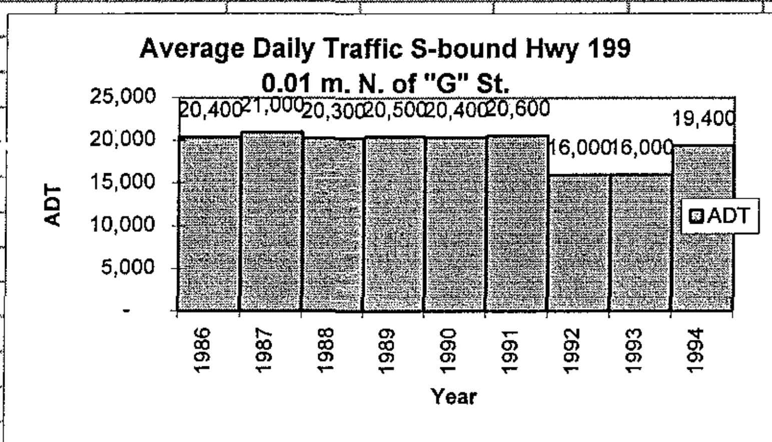
Grants Pass Area Average Daily Traffic
(Selected Sites)

Location: 0.4 mile S of E. Grants Pass Interchange (HWY 99)

	ADT
1986	20,100
1987	20,700
1988	21,200
1989	22,100
1990	22,800
1991	22,900
1992	27,000
1993	28,000
1994	25,900
Avg =	24,271

Location: S-bound Redwood Hwy 199, one-way: 0.01 N. of "G" St.

	ADT		
1986	20,400		
1987	21,000		
1988	20,300		
1989	20,500		
1990	20,400	1986 - 1991 avg =	20,520
1991	20,600		
1992	16,000		
1993	16,000		
1994	19,400	1992 - 1994 avg =	17,133
Avg =	19,029	Difference =	3,387



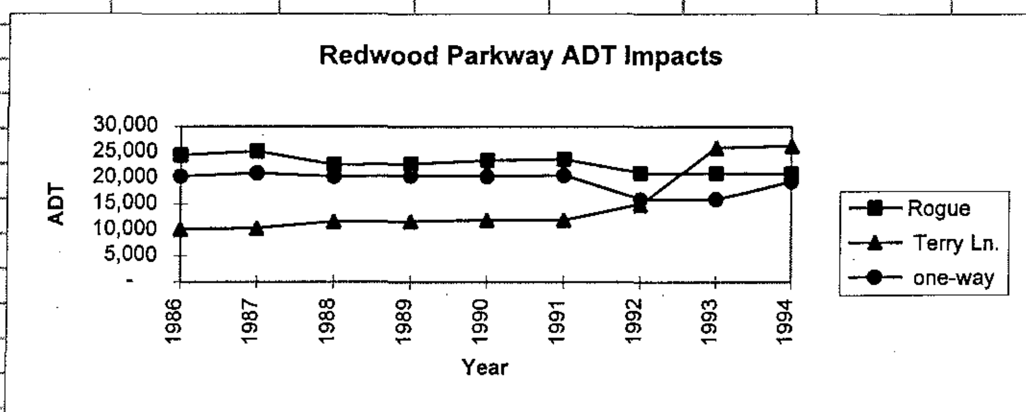
Grants Pass Area Average Daily Traffic
(Selected Sites)

Location: US HWY199 (Redwood Hwy), 0.4 mile N. of OR-CA Border

	ADT	Permanent Site
1984	2,232	
1985	2,201	
1986	2,351	
1987	2,507	
1988	2,635	
1989	2,599	
1990	2,576	
1991	2,685	
1992	2,710	
1993	2,638	
1994	2,644	
Avg =	2,641	

Notes:
ADT = Average Daily Traffic
Redwood Hwy (Hwy 199) is Hwy No. 25

	Rogue River Bridge, S-bound	Redwood Spur, E. of Terry Ln.	"G" St., S-Bound, one-way
1986	24,500	10,200	20,400
1987	25,200	10,400	21,000
1988	22,600	11,700	20,300
1989	22,800	11,800	20,500
1990	23,500	12,000	20,400
1991	23,700	12,000	20,600
1992	21,000	15,000	16,000
1993	21,000	26,000	16,000
1994	20,900	26,300	19,400



Appendix D4-4

Emission Inventory and Forecast

(Published under separate cover)

Appendix D4-5

Conformity Process

Appendix D4-5
(Volume 3)
CONFORMITY PROCESS

The transportation conformity process for Oregon is contained in OAR 340-020-0710 through 340-020-1080[1]. The transportation conformity rule was adopted by the Environmental Quality Commission on March 3, 1995. EPA approved the transportation conformity rules as a SIP revision on May 16, 1996.

EPA modified the federal transportation conformity rules in 1997 to allow more flexibility; DEQ adopted these changes one year later. These revised state rules were also submitted to EPA as a revision to the SIP but have not yet been approved. EPA was sued over the 1997 revisions, and in March 1999 the court rejected many of the new provisions. Thus, the original state rules approved by EPA in 1996 still govern. DEQ is awaiting guidance from EPA on what changes will need to be made to the state rules and when they will be due.

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[1] The conformity rules are scheduled to be renumbered to OAR 340-252-0010 through 340-252-0290.

Appendix D4-6

Historical and Projected Population, Households, and Employment

Growth Rates for Grants Pass UGB

	1993	2015	Average Annual Growth Rate
Population	25,396	34343	1.6%
Households*	10,582	14,310	1.6%
Employment	14,378	18,131	1.2%
Retail	4,337	5,501	1.2%
Indust	2,958	3,371	0.6%
Service	4,832	6,180	1.3%
Educat	372	507	1.6%
Govt	975	1,094	0.6%
Other	904	1,466	2.8%

*Households derived by applying 2.4 persons per household to population, according to the "Technical Document Updating the Population Element of the Comprehensive Plan for the City of Grants Pass, Oregon".

1993 Grants Pass UGB Population

CBD
Shared
Rural

TAZ	Population				
	Single Family	Multi-Family	Mobile Home	Total Dwellings	Total Pop.
20	19	0	0	19	45
21	92	0	0	92	[illegible]
22	101	0	0	101	[illegible]
23	0	0	0	0	0
24	183	269	178	631	1514
25	354	0	12	366	878
26	328	41	0	369	885
27	576	19	0	595	1428
28	36	0	0	36	85
29	152	68	0	220	528
30	713	26	0	739	1773
31	67	0	0	67	161
32	35	35	0	70	168
33	160	85	0	245	588
34	29	35	0	64	155
35	54	0	40	94	225
36	200	0	285	485	1165
37	333	19	0	352	844
38	102	135	0	237	569
39	295	56	0	351	841
40	12	12	0	24	57
41	145	27	0	172	413
42	214	312	0	526	1262
43	70	162	0	232	557
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	0	0
47	48	38	0	86	206
48	88	65	0	153	367
49	63	57	0	120	287
50	270	0	0	270	647
51	242	223	6	471	1130
52	42	0	0	42	101
53	140	0	16	156	374
54	190	0	7	197	473
55	278	274	51	604	1449
56	154	38	0	192	460
57	167	44	0	211	507
58	322	0	86	408	980
59	94	0	58	152	364
60	0	0	0	0	0
61	67	0	36	103	248
62	291	0	0	291	698
63	94	24	5	123	295
64	210	0	51	261	627
65	142	0	0	142	341
66	0	0	0	0	0
67	187	0	16	203	488
68	0	0	0	0	0
69	52	0	0	52	125
70	231	0	27	258	619
71	0	0	0	0	0
72	0	0	0	0	0
73	3	0	0	3	7
Total	7642	2064	876	10582	25396

1993 Grants Pass UGB Employment*

TAZ	1993 UGB Only Employment						
	UGB Only Retail	UGB Only Indust	UGB Only Service	UGB Only Educat	UGB Only Govt	UGB Only Other	Total Emp.
20	227	15	226	0	188	1	656
21	12	33	3	0	23	0	71
22	0	0	1	0	0	0	1
23	0	0	0	0	0	0	0
24	362	284	137	0	18	59	860
25	6	27	397	1	0	6	437
26	0	4	15	0	0	0	19
27	0	304	357	6	0	0	667
28	502	9	203	0	3	59	776
29	0	4	18	0	0	0	22
30	18	29	87	183	0	10	327
31	94	14	294	0	2	2	405
32	219	13	525	0	258	109	1123
33	10	4	527	0	266	16	822
34	47	7	17	5	0	6	82
35	3	5	5	0	2	24	37
36	9	0	2	0	0	4	15
37	14	0	0	0	6	5	24
38	0	0	4	0	0	11	15
39	42	84	106	0	0	2	234
40	544	167	267	0	2	88	1067
41	197	0	126	1	1	32	357
42	369	9	89	14	47	2	530
43	76	7	259	0	0	0	341
44	338	236	24	0	15	8	621
45	13	329	8	0	0	42	392
46	5	535	0	0	0	7	547
47	34	0	22	0	19	15	90
48	0	316	31	0	28	69	443
49	128	33	646	0	0	28	835
50	0	0	0	0	0	5	5
51	2	161	3	37	0	25	228
52	227	45	34	0	27	34	367
53	25	9	2	0	0	13	49
54	78	10	58	0	0	24	170
55	80	23	41	0	0	5	149
56	17	18	6	0	0	3	44
57	205	29	83	0	71	37	424
58	85	70	46	37	0	39	277
59	0	2	5	0	0	6	13
60	0	2	3	0	0	10	15
61	4	41	4	0	0	6	55
62	40	62	9	0	0	29	140
63	284	1	80	0	0	53	419
64	12	0	0	0	0	0	12
65	4	8	56	74	0	6	148
66	0	0	0	0	0	0	0
67	4	7	2	0	0	7	21
68	0	0	0	0	0	0	0
69	1	1	6	0	0	0	7
70	1	2	0	0	0	0	3
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	1	0	13	0	0	14
Total	4337	2958	4832	372	975	904	14378

*Each zone apportioned for ratio of employment within UGB.
Ratio based on population ratio inside and outside of UGB.

1993 Grants Pass Travel Model Study Area Population

CBD
Shared
Rural

TAZ	Housing/Population Single Family	Multi-Family	Mobile Home	Total Dwellings	Total Pop.
20	19	0	0	19	45
21	191	0	0	191	459
22	101	0	0	101	[illegible]
23	325	0	0	325	780
24	183	269	178	631	1514
25	354	0	12	366	878
26	328	41	0	369	885
27	576	19	0	595	1428
28	36	0	0	36	85
29	152	68	0	220	528
30	713	26	0	739	1773
31	67	0	0	67	161
32	35	35	0	70	168
33	160	85	0	245	588
34	29	35	0	64	155
35	171	0	40	210	504
36	225	0	285	510	1225
37	333	19	0	352	844
38	102	135	0	237	569
39	295	56	0	351	841
40	12	12	0	24	57
41	145	27	0	172	413
42	214	312	0	526	1262
43	70	162	0	232	557
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	0	0
47	48	38	0	86	206
48	88	65	0	153	367
49	63	57	0	120	287
50	270	0	0	270	647
51	242	223	6	471	1130
52	42	0	0	42	101
53	213	0	20	233	560
54	190	0	7	197	473
55	278	274	51	604	1449
56	154	38	0	192	460
57	167	44	0	211	507
58	322	0	86	408	980
59	243	0	58	301	723
60	128	0	0	128	306
61	216	0	36	252	605
62	291	0	0	291	698
63	94	24	5	123	295
64	210	0	51	261	627
65	158	0	0	158	380
66	543	0	64	607	1456
67	304	0	16	321	769
68	322	0	0	322	774
69	202	0	4	206	495
70	553	0	126	679	1630
71	216	14	71	302	724
72	97	0	0	97	234
73	85	0	6	91	219
Total	10574	2078	1124	13776	33062

1993 Grants Pass Travel Model Study Area Employment

TAZ	Employment						
	Retail	Indust	Service	Educat	Govt	Other	Total Emp.
20	227	15	226	0	188	1	656
21	24	68	7	0	49	0	148
22	0	0	1	0	0	0	1
23	0	110	9	0	0	73	192
24	362	284	137	0	18	59	860
25	6	27	397	1	0	6	437
26	0	4	15	0	0	0	19
27	0	304	357	6	0	0	667
28	502	9	203	0	3	59	776
29	0	4	18	0	0	0	22
30	18	29	87	183	0	10	327
31	94	14	294	0	2	2	405
32	219	13	525	0	258	109	1123
33	10	4	527	0	266	16	822
34	47	7	17	5	0	6	82
35	6	10	10	0	5	52	83
36	9	0	2	0	0	4	15
37	14	0	0	0	6	5	24
38	0	0	4	0	0	11	15
39	42	84	106	0	0	2	234
40	544	167	267	0	2	88	1067
41	197	0	126	1	1	32	357
42	369	9	89	14	47	2	530
43	76	7	259	0	0	0	341
44	338	236	24	0	15	8	621
45	13	329	8	0	0	42	392
46	5	535	0	0	0	7	547
47	34	0	22	0	19	15	90
48	0	316	31	0	28	69	443
49	128	33	646	0	0	28	835
50	0	0	0	0	0	5	5
51	2	161	3	37	0	25	228
52	227	45	34	0	27	34	367
53	37	14	3	0	0	19	73
54	78	10	58	0	0	24	170
55	80	23	41	0	0	5	149
56	17	18	6	0	0	3	44
57	205	29	83	0	71	37	424
58	85	70	46	37	0	39	277
59	0	2	5	0	0	6	13
60	0	2	3	0	0	10	15
61	4	41	4	0	0	6	55
62	40	62	9	0	0	29	140
63	284	1	80	0	0	53	419
64	12	0	0	0	0	0	12
65	5	9	62	83	0	7	165
66	7	70	1	31	0	4	113
67	7	11	1	0	0	14	33
68	2	10	20	0	0	4	36
69	3	3	24	0	0	0	30
70	3	5	0	0	0	1	9
71	3	151	4	0	0	14	172
72	32	174	0	0	0	10	216
73	0	20	0	448	0	0	468
Total	4415	3548	4902	846	1003	1049	15764

2015 Grants Pass UGB Population

TAZ	Prop Multi Family	Prop Mobile Homes	2015 Dwelling Units	Multi Family	Mobile	Single Family	Pop
20	0.00	0.00	29	0	0	29	69
21	0.00	0.00	92	0	0	92	221
22	0.00	0.00	101	0	0	101	243
23	0.00	0.00	0	0	0	0	0
24	0.43	0.28	681	290	192	198	1634
25	0.00	0.03	466	0	15	451	1118
26	0.11	0.00	449	49	0	399	1077
27	0.03	0.00	615	20	0	595	1476
28	0.00	0.00	86	0	0	86	205
29	0.31	0.00	270	84	0	186	648
30	0.04	0.00	759	27	0	732	1821
31	0.00	0.00	67	0	0	67	161
32	0.50	0.00	70	35	0	35	168
33	0.35	0.00	265	92	0	173	636
34	0.54	0.00	89	48	0	42	215
35	0.00	0.19	94	0	18	76	225
36	0.00	0.56	545	0	305	240	1309
37	0.05	0.00	402	22	0	380	964
38	0.57	0.00	257	147	0	110	617
39	0.16	0.00	351	56	0	295	841
40	0.50	0.00	34	17	0	17	81
41	0.16	0.00	172	27	0	145	413
42	0.59	0.00	526	312	0	214	1262
43	0.70	0.00	232	162	0	70	557
44	0.00	0.00	0	0	0	0	0
45	0.00	0.00	0	0	0	0	0
46	0.00	0.00	0	0	0	0	0
47	0.44	0.00	86	38	0	48	206
48	0.42	0.00	153	65	0	88	367
49	0.48	0.00	130	62	0	68	311
50	0.00	0.00	280	0	0	280	671
51	0.47	0.01	521	247	7	268	1250
52	0.00	0.00	42	0	0	42	101
53	0.00	0.08	181	0	15	166	434
54	0.00	0.04	267	0	9	258	641
55	0.46	0.09	754	343	64	346	1809
56	0.20	0.00	202	40	0	162	484
57	0.21	0.00	231	48	0	183	555
58	0.00	0.21	813	0	172	641	1952
59	0.00	0.19	557	0	107	450	1336
60	0.00	0.00	405	0	0	405	972
61	0.00	0.14	508	0	73	435	1220
62	0.00	0.00	391	0	0	391	938
63	0.20	0.04	203	40	8	155	487
64	0.00	0.20	331	0	65	266	795
65	0.00	0.00	242	0	0	242	581
66	0.00	0.11	405	0	43	362	972
67	0.00	0.05	506	0	26	480	1215
68	0.00	0.00	0	0	0	0	0
69	0.00	0.02	52	0	1	51	125
70	0.00	0.19	378	0	70	308	907
71	0.00	0.24	0	0	0	0	0
72	0.00	0.00	0	0	0	0	0
73	0.00	0.07	23	0	2	22	55
Total			14310	2269	1192	10848	34343

2015 Grants Pass UGB Employment

TAZ	2015 UGB only Employment Retail UGB only	Indust UGB only	Service UGB only	Education UGB Only	Govt UGB only	Other UGB only	Total Emp. In UGB*
20	237	15	252	0	211	1	716
[redacted]	25	33	8	0	26	0	92
[redacted]	0	0	1	0	0	0	1
[redacted]	0	0	0	0	0	0	0
24	380	285	153	0	20	97	935
25	47	139	496	1	0	8	691
26	0	4	17	35	0	0	56
27	0	305	399	6	0	0	710
28	526	9	227	0	5	77	844
29	0	4	20	0	0	0	24
30	37	29	97	197	0	13	373
31	98	14	328	0	2	3	445
32	229	28	587	0	289	142	1275
33	10	29	589	0	298	21	947
34	49	7	17	5	0	8	86
[redacted]	[redacted]	5	17	0	3	31	66
36	9	0	2	35	0	5	51
37	30	0	10	0	7	6	53
38	10	0	9	0	0	14	33
39	60	84	134	0	0	3	281
40	596	169	319	0	2	115	1201
41	206	0	141	1	1	41	390
42	465	9	89	15	52	3	633
43	116	7	289	0	0	0	412
44	433	237	63	0	17	10	760
45	40	355	45	0	0	80	520
46	5	537	0	0	0	9	551
47	57	0	46	0	21	19	143
48	35	317	86	0	31	168	637
49	166	33	743	0	0	36	978
50	0	0	15	0	0	6	21
51	77	183	79	40	0	74	453
52	311	249	105	0	30	65	760
[redacted]	61	9	32	0	0	31	133
54	108	10	64	0	0	52	234
55	84	23	46	0	0	6	159
56	18	18	7	0	0	4	47
57	214	29	92	0	79	59	473
58	167	70	128	37	0	62	464
59	25	2	31	40	0	8	106
60	15	2	18	0	0	13	48
61	54	41	56	0	0	26	177
62	94	62	86	0	0	64	306
63	345	1	141	0	0	70	557
64	13	0	0	0	0	0	13
65	41	8	86	80	0	8	222
[redacted]	0	0	0	0	0	0	0
[redacted]	5	7	3	0	0	8	23
68	0	0	0	0	0	0	0
69	1	1	6	0	0	0	8
70	1	2	0	0	0	0	3
[redacted]	0	0	0	0	0	0	0
[redacted]	0	0	0	0	0	0	0
[redacted]	2	1	1	15	0	0	19
Total	5501	3371	6180	507	1094	1466	18131

*Each zone apportioned for ratio of employment within UGB
Ratio based on population ratio inside and outside of UGB.

2015 Grants Pass Travel Model Study Area Population

TAZ	Prop Multi Family	Prop Mobile Homes	2015 Dwelling Units	Multi Family	Mobile	Single Family	Pop
20	0.00	0.00	29	0	0	29	69
21	0.00	0.00	228	0	0	228	548
22	0.00	0.00	198	0	0	198	[illegible]
23	0.00	0.00	362	0	0	362	869
24	0.43	0.28	681	290	192	198	1634
25	0.00	0.03	466	0	15	451	1118
26	0.11	0.00	449	49	0	399	1077
27	0.03	0.00	615	20	0	595	1476
28	0.00	0.00	86	0	0	86	205
29	0.31	0.00	270	84	0	186	648
30	0.04	0.00	759	27	0	732	1821
31	0.00	0.00	67	0	0	67	161
32	0.50	0.00	70	35	0	35	168
33	0.35	0.00	265	92	0	173	636
34	0.54	0.00	89	48	0	42	215
35	0.00	0.19	242	0	47	201	593
36	0.00	0.56	570	0	319	251	1369
37	0.05	0.00	402	22	0	380	964
38	0.57	0.00	257	147	0	110	617
39	0.16	0.00	351	56	0	295	841
40	0.50	0.00	34	17	0	17	81
41	0.16	0.00	172	27	0	145	413
42	0.59	0.00	526	312	0	214	1262
43	0.70	0.00	232	162	0	70	557
44	0.00	0.00	0	0	0	0	0
45	0.00	0.00	0	0	0	0	0
46	0.00	0.00	0	0	0	0	0
47	0.44	0.00	86	38	0	48	206
48	0.42	0.00	153	65	0	88	367
49	0.48	0.00	130	62	0	68	311
50	0.00	0.00	280	0	.0	280	671
51	0.47	0.01	521	247	7	268	1250
52	0.00	0.00	42	0	0	42	101
53	0.00	0.08	370	0	31	339	888
54	0.00	0.04	267	0	9	258	641
55	0.46	0.09	754	343	64	346	1809
56	0.20	0.00	202	40	0	162	484
57	0.21	0.00	231	48	0	183	555
58	0.00	0.21	813	0	172	641	1952
59	0.00	0.19	706	0	135	571	1695
60	0.00	0.00	533	0	0	533	1278
61	0.00	0.14	657	0	94	563	1577
62	0.00	0.00	391	0	0	391	938
63	0.20	0.04	203	40	8	155	487
64	0.00	0.20	331	0	65	266	795
65	0.00	0.00	370	0	0	370	889
66	0.00	0.11	1124	0	119	1005	2697
67	0.00	0.05	736	0	38	698	1766
68	0.00	0.00	434	0	0	434	1043
69	0.00	0.02	318	0	6	312	764
70	0.00	0.19	911	0	169	742	2187
71	0.09	0.24	339	18	80	243	813
72	0.00	0.00	134	0	0	134	322
73	0.00	0.07	226	0	15	211	543
Total			18625	2285	1586	14753	44699

2015 Grants Pass Travel Model Study Area Employment

TAZ	2015 Employment						
	Retail	Indust	Service	Educat	Govt	Other	Total Emp.
20	237	15	252	0	211	1	716
21	52	58	17	0	55	0	192
22	0	0	1	0	0	0	1
23	0	170	61	0	0	122	[illegible]
24	380	285	153	0	20	97	935
25	47	139	496	1	0	8	691
26	0	4	17	35	0	0	56
27	0	305	399	6	0	0	710
28	526	9	227	0	5	77	844
29	0	4	20	0	0	0	24
30	37	29	97	197	0	13	373
31	98	14	328	0	2	3	445
32	229	28	587	0	289	142	1275
33	10	29	589	0	298	21	947
34	49	7	17	5	0	8	86
35	26	10	47	0	6	58	147
36	9	0	2	35	0	5	51
37	30	0	10	0	7	6	53
38	10	0	9	0	0	14	33
39	60	84	134	0	0	3	281
40	596	169	319	0	2	115	1201
41	206	0	141	1	1	41	390
42	465	9	89	15	52	3	633
43	116	7	289	0	0	0	412
44	433	237	63	0	17	10	760
45	40	355	45	0	0	80	520
46	5	537	0	0	0	9	551
47	57	0	46	0	21	19	143
48	35	317	86	0	31	168	637
49	166	33	743	0	0	36	978
50	0	0	15	0	0	6	21
51	77	183	79	40	0	74	453
52	311	249	105	0	30	65	760
53	91	14	48	0	0	46	199
54	108	10	64	0	0	52	234
55	84	23	46	0	0	6	159
56	18	18	7	0	0	4	47
57	214	29	92	0	79	59	473
58	167	70	128	37	0	62	464
59	25	2	31	40	0	8	106
60	15	2	18	0	0	13	48
61	54	41	56	0	0	26	177
62	94	62	86	0	0	64	306
63	345	1	141	0	0	70	557
64	13	0	0	0	0	0	13
65	45	9	95	89	0	9	247
66	58	[illegible]	86	[illegible]	0	18	[illegible]
67	[illegible]	11	[illegible]	0	0	12	[illegible]
68	22	10	43	0	0	5	80
69	4	3	25	0	0	1	33
70	3	5	0	0	0	1	9
71	21	151	4	0	0	18	[illegible]
72	55	175	15	0	0	13	258
73	50	20	40	512	0	0	622
Total	5833	3982	6501	1051	1126	1701	20194

State Implementation Plan Revision
For Carbon Monoxide in the Grants Pass Urban Growth Boundary

Appendix D4-7

Rollforward Analysis

Appendix D4-7

Grants Pass Rollforward Analysis—General Approach and Procedures

Introduction

The purpose of the following documentation is to describe the general approach and procedures used to conduct a rollforward carbon monoxide analysis as part of the Grants Pass Carbon Monoxide Maintenance Plan.

Technical Considerations

Attainment Baseline Year = 1993

Forecast Year = 2015

8-Hour Carbon Monoxide Design Value = 7.4 ppm (recorded on 02-04-92)

1993 Base Year Carbon Monoxide Emissions calculated without oxyfuel—The oxyfuel program began in November 1992 well after attainment had been achieved. The last calendar year of a standard violation was 1988. Based on this circumstance and the fact that the design value is based on a pre-oxyfuel recorded concentration, the 1993 carbon monoxide emissions for the rollforward analysis will be calculated without oxyfuel.

Maximum 8-Hour Period = 2:00 P.M. to 10:00 P.M.—This period was selected based on an analysis of time periods corresponding to the annual maximum and second highest 8-hour average concentrations recorded at the Wing Building monitor in 1992 and 1993.

General Approach

There is one continuous carbon monoxide monitoring site in Grants Pass located on 6th Street between "G" and "H" Streets; the monitoring equipment is housed in the Wing Building. The designated nonattainment area is relatively small, encompassing the Central Business District (CBD) from "B" to "M" Streets (north to south) and 5th and 8th Streets (west to east). The largest traffic volumes in this area occur on the one-way couplet of 6th and 7th Streets. For purposes of the attainment demonstration and the maintenance demonstration (rollforward analysis), intersections along the couplet were ranked by volume and congestion (volume * volume/capacity) for 1993 and 2015. Approximately twenty intersections were ranked. The chief source of data for the intersection ranking was the Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County prepared by the Oregon Department of Transportation (ODOT August 6, 1997). The traffic data in this document was used to conduct the traffic-related, environmental analysis for the 6th and 7th Street Couplet project. ODOT developed traffic volume estimates by intersection for the years 1995, 1997, 1999 and 2015. There was an extensive data base of hose counts and manual counts covering the period from 1992 to 1995. ODOT furnished the department with a copy of the count data.

ODOT performed intersection capacity analysis for 1995 and 2015 utilizing a computer program called SIGCAP. For the CBD, ODOT projected an annual rate of growth of 1.18 percent, slightly higher than the 0.8 percent per year growth rate from the RVCOG model that will be used for the rollforward 8-hour carbon monoxide concentration projections. The department used the results of the ODOT capacity analysis for the intersection ranking. The three highest intersections by volume and congestion are shown below for the years 1995 and 2015.

1995 Three Highest Intersections by Volume and Congestion (V*V/C)

By Volume		By Congestion (V*V/C)	
1. 6th & M	6340	1. 6th & M	5706
2. 6th & G	5930	2. 6th & A	4118
3. 6th & F	5520	3. 7th & M	4107

2015 Three Highest Intersections by Volume and Congestion (V*V/C)

By Volume		By Congestion (V*V/C)	
1. 6th & M	7490	1. 6th & M	8014
2. 6th & G	7170	2. 6th & A	6251
3. 6th & A	6580	3. 6th & G	5521

Proportional Emissions Analysis

As part of the attainment demonstration, a proportional emissions analysis was conducted for the following intersections for the 1993 attainment year baseline, based on the 1995 intersection ranking.

6th and A
6th and F
6th and G
6th and M
7th and M

The carbon monoxide emissions for the intersection of 6th and "G" were assumed to be directly proportional to the design value concentration (7.4 ppm) at the Wing building monitoring site. Carbon monoxide emissions for the maximum 8-hour period (2 P.M. to 10 P.M.) were calculated for each leg of the above listed intersections and then totaled.

The first step of the emissions calculation procedure was to establish the 1993, baseline 24-hour volumes for each leg of the intersection being analyzed. The process involved a critical evaluation of the historical count data, ODOT's 1995 traffic volume estimates for the 6th and 7th Street Couplet project, and RVCOG's 1993 model output. ODOT estimated 1995 traffic volumes for the intersections of 6th and A and then every block from 6th and D to 6th and M. However, ODOT's 1995 traffic volumes were factored up for its environmental analysis to represent summertime conditions for the analysis years. In order to use ODOT's 1995 volumes as a basis for deriving 1993 estimates, it was necessary to factor the 1995 volumes back to 1993 based on the annual growth rate of 1.18 percent and a summer weekday to annual average weekday adjustment of 1.049. While the RVCOG model output appeared to provide a more accurate basis for estimating 1993, 24-hour volumes for 6th and 7th Streets, ODOT's 1995 volumes were used to establish the 1993, 24-hour cross street volumes. (The RVCOG model did not provide traffic volume and speed output for every cross street, whereas the ODOT coverage of the cross streets was comprehensive.)

The 6th and A intersection was counted in September 1993, so the results of that count were used without any adjustment to establish the 1993, 24-hour volumes. For the south leg of the intersection, there was fairly close agreement between the 1993 RVCOG model output and the 1993 count (20,296 for the RVCOG model and 20,514 for the count.)

For the 6th and F intersection, the RVCOG 1993 model output was used for the north and south legs of the intersection. For the F cross street, ODOT's 1995, 24-hour volumes were adjusted back to 1993, based on the 1.18 percent annual growth rate and a seasonal adjustment factor of 1.049.

For the 6th and G intersection, the RVCOG 1993 model output (19,400) was used for the north leg of the intersection. For the south leg, 1992 hose counts on 6th north and south of G Street were applied as a ratio to the 19,400 north leg volume to yield a 1993, 24-hour volume of 20,000. For the G cross street, ODOT's 1995, 24-hour volumes were adjusted back to 1993, the same as for F Street.

For the 6th and M intersection, the RVCOG 1993 model output was used for the north and south legs of the intersection. For the M cross street, ODOT's 1995, 24-hour volumes were adjusted back to 1993, the same as for F and G Streets.

For the 7th and M intersection, the RVCOG 1993 model output was used for the north and south legs of the intersection. For the M cross street, ODOT's 1995, 24-hour volumes were adjusted back to 1993, the same as for F and G Streets.

The 1993, 24-hour volumes, peak-hour and off-peak speeds are tabulated below for the five intersections (6th & A, 6th & F, 6th & G, 6th & M and 7th & M).

6th and A 1993 Traffic Volumes and Speeds

Street Segment	1993, 24-Hour Vol.	1993 Peak Hr Speed, mph	1993 Off-Peak Speed, mph
6th North of A	18,900	28	30
A West of 6th	7,200	25	25
6th South of A	20,500	23	23
A East of 6th	7,800	25	25

6th and F 1993 Traffic Volumes and Speeds

Street Segment	1993, 24-Hour Vol.	1993 Peak Hr Speed, mph	1993 Off-Peak Speed, mph
6th North of F	20,400	23	23
F West of 6th	3,400	20	20
6th South of F	19,400	24	24
F East of 6th	4,700	20	20

6th and G 1993 Traffic Volumes and Speeds

Street Segment	1993, 24-Hour Vol.	1993 Peak Hr Speed, mph	1993 Off-Peak Speed, mph
6th North of G	19,400	24	24
G West of 6th	8,600	25	25
6th South of G	20,000	23	23
G East of 6th	6,300	25	25

6th and M 1993 Traffic Volumes and Speeds

Street Segment	1993, 24-Hour Vol.	1993 Peak Hr Speed, mph	1993 Off-Peak Speed, mph
6th North of M	18,500	15	23
M West of 6th	10,700	22	30
6th South of M	23,700	10	20
M East of 6th	9,000	23	30

7th and M 1993 Traffic Volumes and Speeds

Street Segment	1993, 24-Hour Vol.	1993 Peak Hr Speed, mph	1993 Off-Peak Speed, mph
7th North of M	16,600	23	23
M West of 7th	9,100	23	30
7th South of M	23,000	22	22
M East of 7th	9,000	30	30

The next step of the process involved factoring the 24-hour volumes to eight-hour volumes, consisting of the PM Peak Hour and a seven-hour off-peak period. Eight-hour factors and peak hour factors were developed from the ODOT-conducted manual counts. In general, ODOT's estimate of 1995 and 2015 travel speeds for off-peak and peak hour conditions were used to calculate corresponding carbon monoxide emission factors. (The analysis assumed that 1993 speeds would not be different than 1995 conditions.) The general form for estimating 1993, 8-hour carbon monoxide concentrations at the non-monitored intersections is shown below.

1993, 8-Hr Carbon Monoxide Conc. = [1993 Design Conc. – Background Conc.]* [1993 Intersection 8-Hr Carbon Monoxide Ems.]/[1993, 6th&G, 8-Hr Carbon Monoxide Ems.] + Background Conc.

Where 1993, 8-Hr Carbon Monoxide Conc. is the calculated concentration at one of the non-monitored intersections;

1993 Design Conc. is 7.4 parts per million;

Background Conc. is the estimated 8-Hour carbon monoxide concentration from sources other than motor vehicles traveling next to the monitoring site.

The 8-Hour carbon monoxide concentrations for 2015 are derived similarly as shown below.

2015, 8-Hr Carbon Monoxide Conc. = [1993 Design Conc. – Background Conc.]* [2015 Intersection 8-Hr Carbon Monoxide Ems.]/[1993, 6th&G, 8-Hr Carbon Monoxide Ems.] + Background Conc.

The derivation of the 8-Hour Background carbon monoxide concentration is explained below.

Background Carbon Monoxide Concentration

Estimates of background carbon monoxide have been based on the results of periodic saturation bag sampling surveys. In recent years, the Department has usually devoted one or two sites in a saturation survey to neighborhood scale locations. The Department conducted bag sampling surveys in Grants Pass in 1983/1984 and in 1993/1994. In the 1983/1984 study, two sites were operated in residential neighborhoods on the edge of the identified downtown problem area. One site was operated at 3rd and H Streets, two blocks west of the nonattainment area. The other site was operated at 9th and J Streets, one block east of the nonattainment area.

During the 1993/1994 saturation survey in Grants Pass, one of the bag samplers was set up at 11th and "K", a neighborhood scale site where the Department has monitored for particulate. The 1993/1994 survey was conducted under the influence of the wintertime oxygenated fuel program, whereas the 1983/1984 survey predated the oxygenated fuel program. Because the rollforward analysis was conducted on the basis of no oxygenated fuel (for the carbon monoxide emissions), it was necessary to estimate a background carbon monoxide concentration commensurate with no oxygenated fuel.

For the 1983/1984 study, the highest day (for the 1983 calendar year at the Wing Building continuous monitor) occurred on December 16, 1983. On this day the site to the west of the nonattainment area recorded an 8-hour carbon monoxide concentration of 3.0 ppm, and the site to the east of the nonattainment area recorded an 8-hour carbon monoxide concentration of 4.0 ppm. While the 1993/1994 study missed the highest and second highest days for the 1993 calendar year, the highest sampling day, December 21, 1993, was at 87 percent of the annual second highest level and recorded an 8-hour carbon monoxide concentration of 3.2 ppm at the neighborhood scale site.

Studies documented in the EPA's Interagency Assessment of Oxygenated Fuels, June 1997 indicated that the wintertime oxygenated fuel program lowered maximum carbon monoxide concentrations in the range of 0.5 to 1.0 ppm. Adding this concentration range to 3.2 ppm yields a range of 3.7 ppm to 4.2 ppm. Based on this consideration and the results of the two bag sampling studies in Grants Pass, a pre-oxygenated fuel background level of 4.0 ppm was used for the rollforward analysis. This concentration level was also assumed to apply to the 2015 calendar year.

Example Rollforward Calculation (Wing Building at 6th and G)

The calculation of the 2015, 8-hour carbon monoxide concentration for the Wing Building monitoring site at 6th and G Streets follows. The first step was to estimate 1993, 24-hour traffic volumes for the intersection of 6th and G. RVCOG's 1993 model output for 6th Street compared favorably with traffic count data and was used directly. For the G cross street, ODOT's 1995 traffic volume estimate (from the 6th and 7th Street Couplet project Traffic Narrative) was adjusted to 1993. As previously explained, ODOT manual traffic counts were used to factor the 24-hour volumes into 8-hour estimates. The 8-hour traffic volumes were divided into a one-hour peak and a 7-hour off-peak period. Based on the modeled 1993 and 2015 traffic volumes for the Central Business District of Grants Pass, a linear growth rate of 0.8 percent per year was applied to the 1993 traffic volumes to yield estimated 2015 volumes.

ODOT's Traffic Narrative was used to provide the 1993 and 2015 estimates of travel speed. Peak period speeds reflected volume to capacity constraints. The 1993 and 2015 traffic volumes and speeds for the 6th and G intersection are tabulated below.

6th and G Traffic Volumes and Speeds

Street Segment	1993 24-Hr Volume	2015 24-Hr Volume	1993 Peak 1-Hr Speed, mph	1993 Off-Peak Speed, mph	2015 Peak 1-Hr Speed, mph	2015 Off-Peak Speed, mph
6th North of G	19,400	22,800	24	24	21	24
G West of 6th	8,600	10,100	25	25	24	25
6th South of G	20,000	23,500	23	23	23	23
G East of 6th	6,300	7,400	25	25	25	25

The calculation of 1993 and 2015, 8-hour carbon monoxide emissions for 6th and G is shown below.

6^{th} & G Intersection Carbon Monoxide Emissions for 1993 and 2015

6th & G 1993												
Leg	1993, 24-Hr Vol	7-Hr Factor	1-Hr Factor	1993, 7-Hr Vol	7-Hr Speed, mph	1993, 7-Hr CO EF, gm/VMT	1993, 1-Hr Vol	1-Hr Speed, mph	1993, 1-Hr CO EF, gm/VMT	1993, 7-Hr CO Ems, gm/mi	1993, 1-Hr CO Ems, gm/mi	1993, 8-Hr CO Ems, gm/mi
North	19400	0.39	0.088	7566	24	41.89	1707.2	24	41.89	316939.7	71514.61	388454.3
West	8600	0.351	0.084	3018.6	25	40.43	722.4	25	40.43	122042	29206.63	151248.6
South	20000	0.391	0.089	7820	23	43.46	1780	23	43.46	339857.2	77358.8	417216
East	6300	0.371	0.081	2337.3	25	40.43	510.3	25	40.43	94497.04	20631.43	115128.5
Total Ems												1072047

6th & G 2015												
Leg	2015, 24-Hr Vol	7-Hr Factor	1-Hr Factor	2015, 7-Hr Vol	7-Hr Speed, mph	2015, 7-Hr CO EF, gm/VMT	2015, 1-Hr Vol	1-Hr Speed, mph	2015, 1-Hr CO EF, gm/VMT	2015, 7-Hr CO Ems, gm/mi	2015, 1-Hr CO Ems, gm/mi	2015, 8-Hr CO Ems, gm/mi
North	22800	0.39	0.088	8892	24	26.94	2006.4	21	31.54	239550.5	63281.86	302832.3
West	10100	0.351	0.084	3545.1	25	25.65	848.4	24	26.94	90931.82	22855.9	113787.7
South	23500	0.391	0.089	9188.5	23	28.34	2091.5	23	28.34	260402.1	59273.11	319675.2
East	7400	0.371	0.081	2745.4	25	25.65	599.4	25	25.65	70419.51	15374.61	85794.12
Total Ems												822089.4

Using the rollforward formula, the estimated 2015, 8-hour carbon monoxide concentration for 6th and G (without oxygenated fuel) is calculated as follows.

2015 8-Hr Carbon Monoxide Conc. = (7.4 ppm – 4.0 ppm)(2015 8-Hr Carbon Monoxide Ems)/(1993 8-Hr CO Ems) + 4.0 ppm
= (3.4 ppm)(822,089 gm/mi)/(1,072,047 gm/mi) + 4.0 ppm
= 6.6 ppm

The 1993 and 2015 traffic volumes and speeds for the other two intersections (6th and A and 6th and M) that screened out for the 2015 calendar year are tabulated below.

6th and A Traffic Volumes and Speeds

Street Segment	1993 24-Hr Volume	2015 24-Hr Volume	1993 Peak 1-Hr Speed, mph	1993 Off-Peak Speed, mph	2015 Peak 1-Hr Speed, mph	2015 Off-Peak Speed, mph
6th North of A	18,900	22,200	28	30	17	26
A West of 6th	7,200	7,600	25	25	22	25
6th South of A	20,500	24,100	23	23	23	23
A East of 6th	7,800	8,200	25	25	19	25

6th and M Traffic Volumes and Speeds

Street Segment	1993 24-Hr Volume	2015 24-Hr Volume	1993 Peak 1-Hr Speed, mph	1993 Off-Peak Speed, mph	2015 Peak 1-Hr Speed, mph	2015 Off-Peak Speed, mph
6th North of M	18,500	21,800	15	23	10	20
M West of 6th	10,700	12,600	22	30	10	24
6th South of M	23,700	27,900	10	20	10	18
M East of 6th	9,000	10,600	23	30	14	27

The 2015 forecast year, 8-hour carbon monoxide emissions were computed for the street segments of the above tabulated intersections and then substituted into the rollforward formula to estimate 2015, 8-hour carbon monoxide concentrations. The spreadsheet calculations of the 2015, 8-hour carbon monoxide emissions for the screened intersections are contained in the Technical Data and Supporting documentation.

Projected 8-Hour Carbon Monoxide Concentrations

The resulting 8-hour carbon monoxide concentrations for the DEQ monitoring site at 6th and G Streets and the other two screened intersections (6th and A and 6th and M) are tabulated below.

2015 Second Highest Maximum 8-Hour Carbon Monoxide Concentrations

Screened Intersection	2015 8-Hr Carbon Monoxide Concentration, ppm
6th and A	6.6
6th and G (Wing Building DEQ Monitor)	6.6
6th and M	8.0

Grants Pass CBD VMT for 1993
EMME/2 Output

Fnode	Tnode	Length	Type	Speed	Volau	Vmt
240	230	0.03	16	6	7110	213
230	207	0.02	16	19	4031	81
211	277	0.04	14	20	3845	154
237	275	0.03	14	20	5075	152
275	210	0.03	14	20	2564	77
277	236	0.04	14	20	3845	154
209	291	0.02	17	21	2975	60
215	214	0.12	12	21	23662	2839
291	238	0.05	17	21	2903	145
215	407	0.14	16	22	5496	769
233	232	0.07	12	22	22954	1607
234	235	0.11	12	22	17943	1974
235	236	0.13	12	22	17952	2334
236	237	0.06	12	22	17691	1061
237	529	0.03	12	22	18071	542
407	215	0.14	16	22	5403	756
529	238	0.03	12	22	18082	542
207	527	0.03	12	23	20296	609
208	209	0.05	12	23	20296	1015
209	322	0.14	17	23	2269	318
210	211	0.05	12	23	20429	1021
232	472	0.02	12	23	16629	333
240	350	0.01	16	23	2997	30
283	234	0.17	12	23	16629	2827
291	209	0.02	17	23	2269	45
350	240	0.01	16	23	2747	27
350	369	0.18	16	23	2997	539
369	350	0.18	16	23	2747	494
472	283	0.07	12	23	16629	1164
527	208	0.08	12	23	20296	1624
528	210	0.03	12	23	21722	652
209	528	0.03	12	24	19367	581
211	534	0.03	12	24	19407	582
212	213	0.11	12	24	19398	2134
213	280	0.16	12	24	18472	2956
230	240	0.03	16	24	2037	61
238	291	0.05	17	24	2051	103
238	366	0.15	17	24	1856	278
280	471	0.06	12	24	18472	1108
322	209	0.14	17	24	2046	286
366	238	0.15	17	24	1853	278
471	215	0.02	12	24	18472	369
534	212	0.11	12	24	19407	2135
207	230	0.02	16	25	1839	37
207	478	0.12	16	25	3576	429

	210	370	0.14	16	25	3857	540
	213	397	0.03	17	25	1746	52
	213	480	0.12	17	25	1161	139
	234	397	0.03	17	25	325	10
	234	484	0.02	17	25	486	10
	236	531	0.05	14	25	4106	205
	320	478	0.02	16	25	3163	63
	368	530	0.09	14	25	5455	491
	378	211	0.14	16	25	2823	395
	397	213	0.03	17	25	325	10
	397	234	0.03	17	25	1746	52
	423	484	0.13	17	25	379	49
	478	207	0.12	16	25	3163	380
	478	320	0.02	16	25	3576	72
	480	213	0.12	17	25	1656	199
	484	234	0.02	17	25	379	8
	484	423	0.13	17	25	486	63
	530	237	0.05	14	25	5455	273
	531	380	0.08	14	25	4106	328
	238	239	0.12	12	26	18931	2272
	239	240	0.04	12	26	18931	757
	232	408	0.05	16	27	6868	343
	408	215	0.04	16	27	6868	275
	232	422	0.13	16	29	3445	448
	215	408	0.04	16	30	1585	63
	408	232	0.05	16	30	1585	79
	422	232	0.13	16	30	2402	312
total					**23.66667**	**601815**	**43383**

Grants Pass CBD VMT for 2015 without the 4th Bridge
EMME/2 Output

Fnode	Tnode	Length	Type	Speed	Volau	Vmt
240	230	0.03	16	7	6715	201
215	407	0.14	16	14	5557	778
215	214	0.12	12	15	29659	3559
407	215	0.14	16	15	5257	736
233	232	0.07	12	16	28499	1995
213	480	0.12	17	17	3677	441
232	472	0.02	12	19	21492	430
237	275	0.03	14	19	8524	256
283	234	0.17	12	19	21492	3654
472	283	0.07	12	19	21492	1504
211	277	0.04	14	20	5708	228
234	235	0.11	12	20	20316	2235
235	236	0.13	12	20	20164	2621
275	210	0.03	14	20	5442	163
277	236	0.04	14	20	5708	228
209	291	0.02	17	21	2938	59
236	237	0.06	12	21	18733	1124
529	238	0.03	12	21	18673	560
210	211	0.05	12	22	22920	1146
211	534	0.03	12	22	23185	696
212	213	0.11	12	22	23337	2567
213	280	0.16	12	22	23393	3743
230	207	0.02	16	22	3233	65
237	529	0.03	12	22	18616	558
240	350	0.01	16	22	3170	32
280	471	0.06	12	22	23393	1404
291	238	0.05	17	22	2686	134
350	369	0.18	16	22	3170	571
471	215	0.02	12	22	23393	468
528	210	0.03	12	22	22919	688
534	212	0.11	12	22	23185	2550
207	230	0.02	16	23	2913	58
207	527	0.03	12	23	20298	609
208	209	0.05	12	23	20298	1015
209	322	0.14	17	23	2258	316
209	528	0.03	12	23	19874	596
210	370	0.14	16	23	5441	762
234	397	0.03	17	23	2812	84
291	209	0.02	17	23	2258	45
322	209	0.14	17	23	2514	352
350	240	0.01	16	23	2706	27
369	350	0.18	16	23	2706	487
378	211	0.14	16	23	5973	836
480	213	0.12	17	23	2506	301
527	208	0.08	12	23	20298	1624

	230	240	0.03	16	24	2473	74
	238	291	0.05	17	24	2027	101
	366	238	0.15	17	24	1891	284
	368	530	0.09	14	24	8407	757
	530	237	0.05	14	24	8407	420
	207	478	0.12	16	25	3556	427
	213	397	0.03	17	25	1584	48
	232	408	0.05	16	25	7777	389
	234	484	0.02	17	25	810	16
	236	531	0.05	14	25	7140	357
	238	239	0.12	12	25	19660	2359
	238	366	0.15	17	25	1563	234
	239	240	0.04	12	25	19660	786
	320	478	0.02	16	25	2077	42
	397	213	0.03	17	25	2812	84
	397	234	0.03	17	25	1584	48
	408	215	0.04	16	25	7777	311
	423	484	0.13	17	25	862	112
	478	207	0.12	16	25	2077	249
	478	320	0.02	16	25	3556	71
	484	234	0.02	17	25	862	17
	484	423	0.13	17	25	810	105
	531	380	0.08	14	25	7140	571
	232	422	0.13	16	29	3427	446
	422	232	0.13	16	29	2985	388
	215	408	0.04	16	30	1212	48
	408	232	0.05	16	30	1212	61
total					**22.48611**	**702849**	**51311**

Average annual growth rate 0.008307

Projected 2015, 8-Hr CO Concentrations at Screened Intersections

Intersection	1993, 8-Hr CO Ems, gm/mi	1993, 8-Hr CO Concentration, ppm
6th & G	1072047	7.4

Note: 7.4 ppm is the 1992-1993 Design Value measured at the Wing Building CO Monitor

2015 Projection Year 8-Hr CO Concentrations

Intersection	2015, 8-Hr CO Ems, gm/mi	2015, 8-Hr CO Concentration, ppm
6th & G	822089	6.607258
6th & M	1255560	7.982012
6th & A	809461	6.567208

Note: 2015, 8-Hr CO Background Concentration assumed to be the same as 1993 (= 4.0 ppm)

6th and G Intersection 8-Hr CO Emissions for 1993 and 2015

6th & G 1993												
Leg	1993, 24-Hr Vol	7-Hr Factor	1-Hr Factor	1993, 7-Hr Vol	7-Hr Spee	1993, 7-Hr CO EF, gm/VMT	1993, 1-Hr Vol	1-Hr Spee	1993, 1-Hr CO EF, gm/VMT	1993, 7-Hr CO Ems, gm/mi	1993, 1-Hr CO Ems, gm/mi	1993, 8-Hr CO Ems, gm/mi
North	19400	0.39	0.088	7566	24	41.89	1707.2	24	41.89	316939.7	71514.61	388454.3
West	8600	0.351	0.084	3018.6	25	40.43	722.4	25	40.43	122042	29206.63	151248.6
South	20000	0.391	0.089	7820	23	43.46	1780	23	43.46	339857.2	77358.8	417216
East	6300	0.371	0.081	2337.3	25	40.43	510.3	25	40.43	94497.04	20631.43	115128.5
Total Ems												1072047

6th & G 2015												
Leg	2015, 24-Hr Vol	7-Hr Factor	1-Hr Factor	2015, 7-Hr Vol	7-Hr Spee	2015, 7-Hr CO EF, gm/VMT	2015, 1-Hr Vol	1-Hr Spee	2015, 1-Hr CO EF, gm/VMT	2015, 7-Hr CO Ems, gm/mi	2015, 1-Hr CO Ems, gm/mi	2015, 8-Hr CO Ems, gm/mi
North	22800	0.39	0.088	8892	24	26.94	2006.4	21	31.54	239550.5	63281.86	302832.3
West	10100	0.351	0.084	3545.1	25	25.65	848.4	24	26.94	90931.82	22855.9	113787.7
South	23500	0.391	0.089	9188.5	23	28.34	2091.5	23	28.34	260402.1	59273.11	319675.2
East	7400	0.371	0.081	2745.4	25	25.65	599.4	25	25.65	70419.51	15374.61	85794.12
Total Ems												822089.4

Grants Pass CO--2015 Rollforward (Proportional) Modeling for Highest Intersections by Volume and Congestion

Note: 2015 CO Emission Factors calculated without oxyfuel.

6th & M

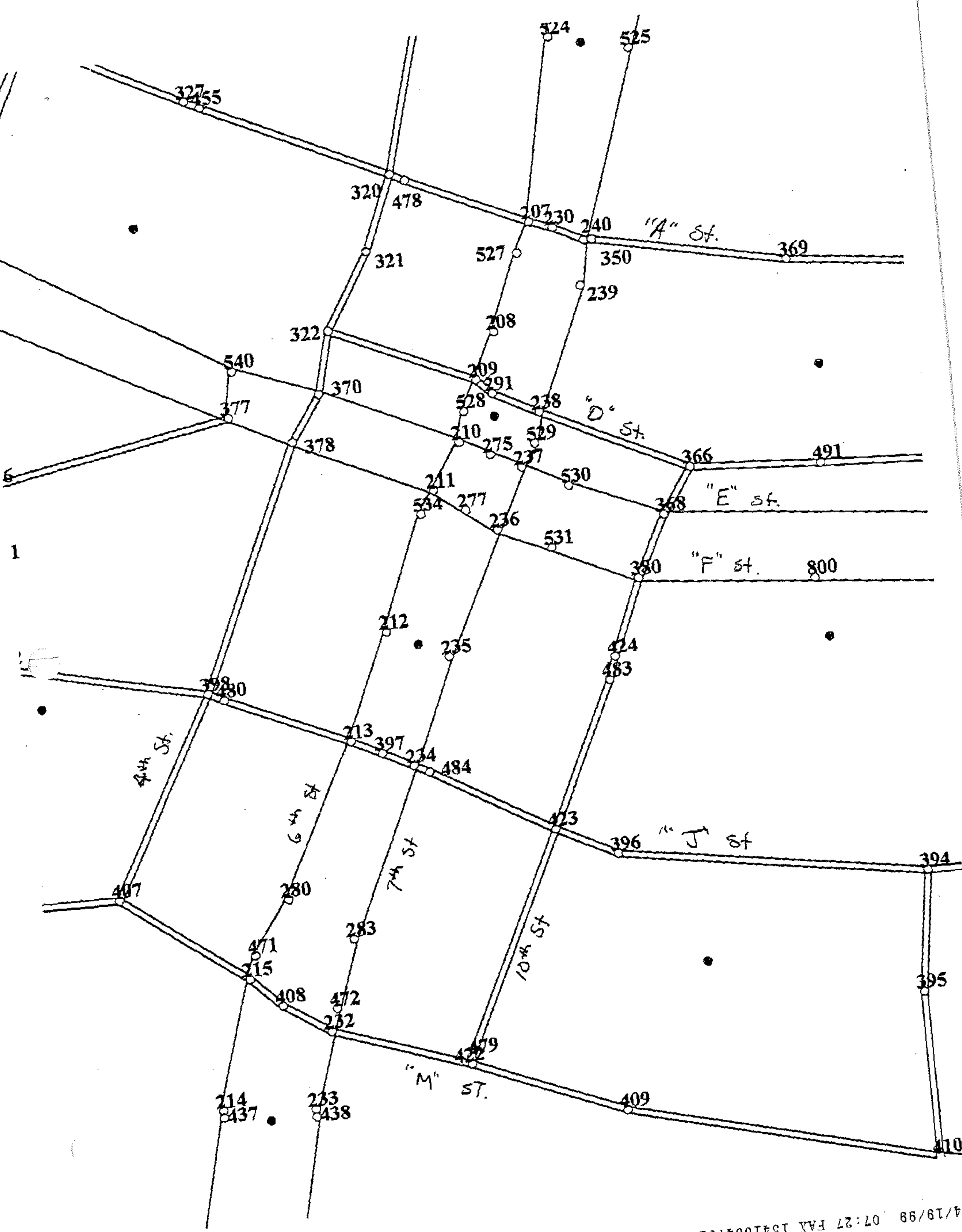
Leg	2015, 24-Hr Vol	7-Hr Factor	1-Hr Factor	2015, 7-Hr Vol	7-Hr Spee	2015, 7-Hr CO EF, gm/VMT	2015, 1-Hr Vol	1-Hr Spee	2015, 1-Hr CO EF, gm/VMT	2015, 7-Hr CO Ems, gm/mi	2015, 1-Hr CO Ems, gm/mi	2015, 8-Hr CO Ems, gm/mi
North	21800	0.4	0.105	8720	20	33.38	2289	10	50.56	291073.6	115731.8	406805.4
West	12600	0.369	0.089	4649.4	24	26.94	1121.4	10	50.56	125254.8	56697.98	181952.8
South	27900	0.393	0.105	10964.7	18	35.81	2929.5	10	50.56	392645.9	148115.5	540761.4
East	10600	0.354	0.088	3752.4	27	23.36	932.8	14	41.15	87656.06	38384.72	126040.8
Total Ems												1255560

6th & G

Leg	2015, 24-Hr Vol	7-Hr Factor	1-Hr Factor	2015, 7-Hr Vol	7-Hr Spee	2015, 7-Hr CO EF, gm/VMT	2015, 1-Hr Vol	1-Hr Spee	2015, 1-Hr CO EF, gm/VMT	2015, 7-Hr CO Ems, gm/mi	2015, 1-Hr CO Ems, gm/mi	2015, 8-Hr CO Ems, gm/mi
North	22800	0.39	0.088	8892	24	26.94	2006.4	21	31.54	239550.5	63281.86	302832.3
West	10100	0.351	0.084	3545.1	25	25.65	848.4	24	26.94	90931.82	22855.9	113787.7
South	23500	0.391	0.089	9188.5	23	28.34	2091.5	23	28.34	260402.1	59273.11	319675.2
East	7400	0.371	0.081	2745.4	25	25.65	599.4	25	25.65	70419.51	15374.61	85794.12
Total Ems												822089.4

6th & A

Leg	2015, 24-Hr Vol	7-Hr Factor	1-Hr Factor	2015, 7-Hr Vol	7-Hr Spee	2015, 7-Hr CO EF, gm/VMT	2015, 1-Hr Vol	1-Hr Spee	2015, 1-Hr CO EF, gm/VMT	2015, 7-Hr CO Ems, gm/mi	2015, 1-Hr CO Ems, gm/mi	2015, 8-Hr CO Ems, gm/mi
North	22200	0.383	0.094	8502.6	26	24.46	2086.8	17	36.91	207973.6	77023.79	284997.4
West	7600	0.377	0.097	2865.2	25	25.65	737.2	22	29.86	73492.38	22012.79	95505.17
South	24100	0.375	0.096	9037.5	23	28.34	2313.6	23	28.34	256122.8	65567.42	321690.2
East	8200	0.377	0.098	3091.4	25	25.65	803.6	19	34.81	79294.41	27973.32	107267.7
Total Ems												809460.5



"A" St.
"D" St.
"E" St.
"F" St.
"J" St
"M" ST.
4th St.
6th St
7th St
10th St

Grants Pass Intersection Screening by Volume and Congestion for 1995

Traffic Data from Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County, ODOT, August 1997

Sort by Volume

Intersection	1995 Peak Hr Vol.	1995 V/C	95V*95V/C
6th & M	6340	0.9	5706
6th & G	5930	0.66	3913.8
6th & F	5520	0.61	3367.2
6th & A	5490	0.75	4117.5
6th & E	5130	0.57	2924.1
7th & F	5090	0.67	3410.3
7th & M	5070	0.81	4106.7
7th & E	4870	0.64	3116.8
7th & G	4870	0.69	3360.3
7th & A	4840	0.72	3484.8
6th & D	4570	0.51	2330.7
6th & J	4400	0.5	2200
6th & H	4290	0.48	2059.2
6th & L	4220	0.47	1983.4
7th & D	4160	0.56	2329.6
6th & I	4120	0.5	2060
6th & K	4020		
7th & H	3940	0.58	2285.2
7th & I	3680		
7th & J	3660	0.54	1976.4
7th & K	3370		
7th & L	3310	0.49	1621.9

Grants Pass Intersection Screening by Volume and Congestion for 1995

Traffic Data from Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County, ODOT, August 1997

Sort by Congestion (95V*95V/C)

Intersection	1995 Peak Hr Vol.	1995 V/C	95V*95V/C
6th & M	6340	0.9	5706
6th & A	5490	0.75	4117.5
7th & M	5070	0.81	4106.7
6th & G	5930	0.66	3913.8
7th & A	4840	0.72	3484.8
7th & F	5090	0.67	3410.3
6th & F	5520	0.61	3367.2
7th & G	4870	0.69	3360.3
7th & E	4870	0.64	3116.8
6th & E	5130	0.57	2924.1
6th & D	4570	0.51	2330.7
7th & D	4160	0.56	2329.6
7th & H	3940	0.58	2285.2
6th & J	4400	0.5	2200
6th & I	4120	0.5	2060
6th & H	4290	0.48	2059.2
6th & L	4220	0.47	1983.4
7th & J	3660	0.54	1976.4
7th & L	3310	0.49	1621.9
6th & K	4020		
7th & I	3680		
7th & K	3370		

Note: 95V/C not calculated for 6th & K, 7th & I and 7th & K

Grants Pass Intersection Screening by Volume and Congestion for 2015

Traffic Data from Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County, ODOT, August 1997

Sort by Volume

Intersection	2015 Peak Hr Vol.	2015 V/C	15V*15V/C
6th & M	7490	1.07	8014.3
6th & G	7170	0.77	5520.9
6th & A	6580	0.95	6251
6th & F	6560	0.71	4657.6
6th & E	6140	0.71	4359.4
7th & M	6000	0.79	4740
7th & F	5910	0.8	4728
7th & E	5820	0.77	4481.4
6th & D	5710	0.73	4168.3
7th & A	5630	0.79	4447.7
7th & G	5445	0.76	4138.2
6th & H	5440	0.69	3753.6
6th & J	5310	0.73	3876.3
6th & L	5010	0.67	3356.7
7th & D	4960	0.67	3323.2
6th & I	4910	0.64	3142.4
6th & K	4735		
7th & H	4670	0.58	2708.6
7th & I	4415		
7th & J	4415	0.67	2958.05
7th & K	4015		
7th & L	3940	0.71	2797.4

Grants Pass Intersection Screening by Volume and Congestion for 2015

Traffic Data from Traffic Narrative, 6th and 7th Street Couplet, Grants Pass, Josephine County, ODOT, August 1997

Sort by Congestion (15V*15V/C)

Intersection	2015 Peak Hr Vol.	2015 V/C	15V*15V/C
6th & M	7490	1.07	8014.3
6th & A	6580	0.95	6251
6th & G	7170	0.77	5520.9
7th & M	6000	0.79	4740
7th & F	5910	0.8	4728
6th & F	6560	0.71	4657.6
7th & E	5820	0.77	4481.4
7th & A	5630	0.79	4447.7
6th & E	6140	0.71	4359.4
6th & D	5710	0.73	4168.3
7th & G	5445	0.76	4138.2
6th & J	5310	0.73	3876.3
6th & H	5440	0.69	3753.6
6th & L	5010	0.67	3356.7
7th & D	4960	0.67	3323.2
6th & I	4910	0.64	3142.4
7th & J	4415	0.67	2958.05
7th & L	3940	0.71	2797.4
7th & H	4670	0.58	2708.6
6th & K	4735		
7th & I	4415		
7th & K	4015		

Note: 2015V/C not calculated for 6th & K, 7th & I and 7th & K

Traffic Narrative 6th and 7th Street Couplet

Grants Pass

Josephine County

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Grants Pass

INTRODUCTION

The proposed project is located on the Redwood Highway (Hwy. 25), from approximately mile point X2.46 to mile point X0.14 on 6th street, and from approximately mile point 2.56N to mile point 0.24N on 7th street (See figure 1). The initial purpose of the project was to rebuild the roadway and upgrade the signal equipment. The existing lane widths are generally ten feet, however the lane widths narrow to nine feet in some areas. In order to solve the problem of the narrow lane widths, it was decided by ODOT Region 3 to widen the travel lanes, and add bike lanes to the highway.

The Citizen Advisory Committee (CAC) set limits as to the options ODOT could consider in order widening the travel lanes.

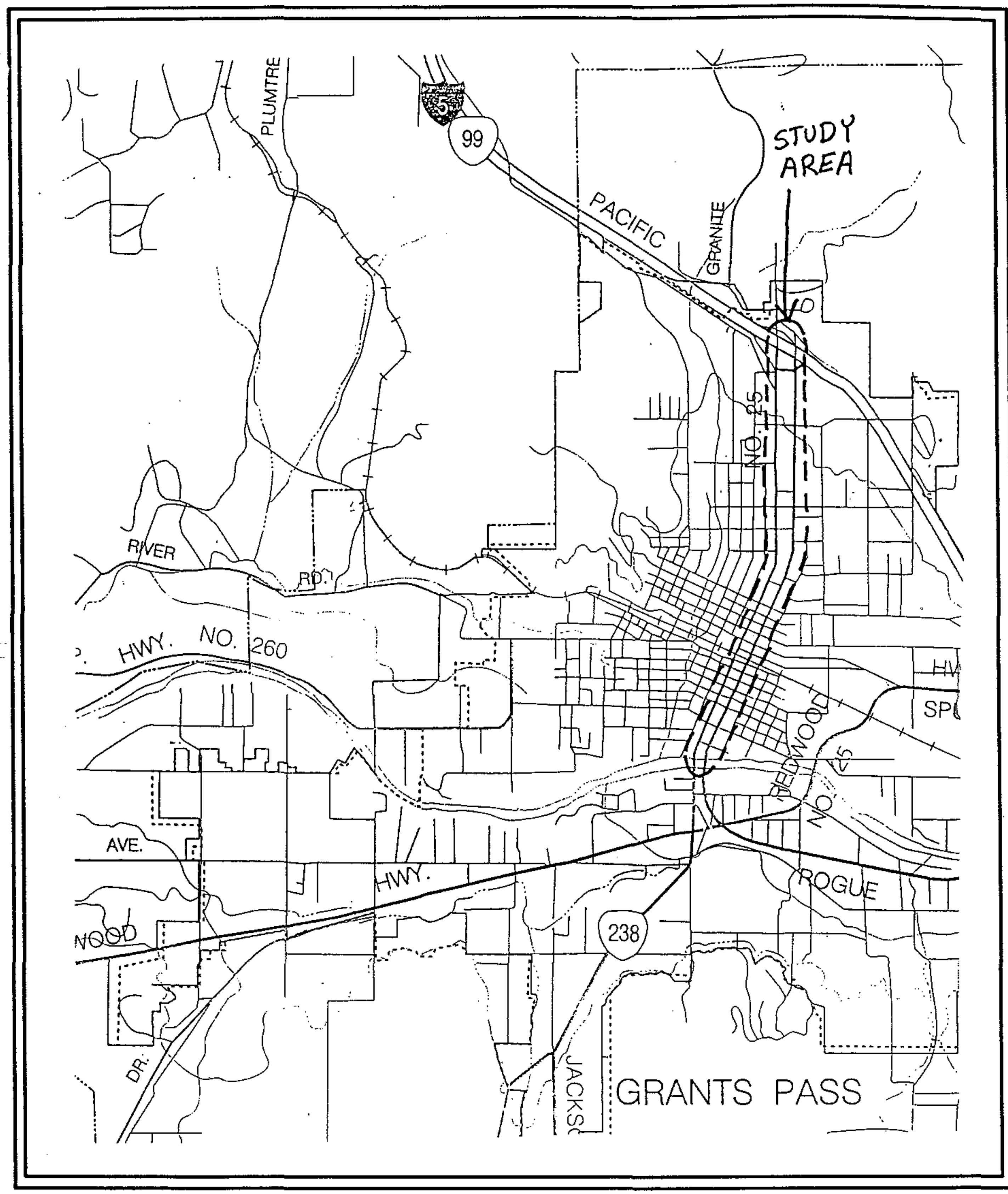
- The width of the sidewalks could not be reduced.
- On street parking could not be removed.
- Improvements to streets other than 6th or 7th could not be considered.
- A one way grid could not be considered.

Due to the restrictions set by the CAC, the only alternate that could be considered was reducing the number of travel lanes from four to three where possible.

This project has some very unique issues and problems, and in no way should decisions made for this project be considered as examples, or used to set precedence for other projects.

Unique aspects of this project.

- An alternate through traffic route, other than 6th and 7th street, is available.
- 95% of the traffic on 6th and 7th streets is local traffic.
- 6th and 7th streets are not used as a state highway, but as a local street.



OREGON DEPARTMENT OF TRANSPORTATION — TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet, Grants Pass Vicinity Map	File : .PPT	Prepared By:	FIGURE 1
	Date : 7/28/97	Reviewed By:	

TRAFFIC DEVELOPMENT

EXISTING

Ground counts were collected throughout the study area. Tables 1 and 2 are lists of the location, date, and type of ground count. Since the counts vary in year and month, factors were calculated so that the traffic volumes provided by the ground counts could be adjusted to reflect a common year and month.

ODOT is required to design to the 30th highest hour, which is typically represented by a PM peak summer day hour. The adjustment factors to summer month were calculated from data provided by the permanent recorder station 17-006.

The most recent traffic model of the project area was used to calculate the growth rate. Model runs of 1995 and 2015 daily traffic volumes were used. The resulting growth rate was calculated to be 1.18% per year within the study area. The yearly growth and the summer month factors were applied to the ground counts, resulting in the 1995 base year design traffic volumes. See figures 2,3, 4, and 5 for base year daily design and peak hour design traffic volumes.

Table 1- Traffic Count Summation Hose Counts and Peak Hour Counts

Intersection	Type of count	Date of Count
.01 mile east of 6th on E St.	Hose – day	8/92
.01 mile east of 7th on E St.	Hose – day	8/92
.01 mile east of 6th on F St.	Hose – day	8/92
.01 mile east of 7th on F St.	Hose – day	8/92
7th and M	Peak hour	2/92
6th and M	Peak hour	2/92
6th and A	Peak hour	9/93
7th and A	Peak hour	9/93
7th and G	15 min. peak hour	10/93
6th and G	15 min. peak hour	10/93
7th and H	15 min. peak hour	10/93
6th and H	15 min. peak hour	10/93
6th and K	15 min. peak hour	10/93
7th and K	15 min. peak hour	10/93

Table 2 – Traffic Count Summation   Manual Counts

7th and Morgan	14 hour manual	1/91
6th and Morgan	14 hour manual	1/91
7th and Midland	14 hour manual	1/93
6th and Midland	14 hour manual	1/93
7th and Savage	14 hour manual	1/93
6th and Savage	14 hour manual	2/93
7th and Manzanita	14 hour manual	2/93
6th and Manzanita	14 hour manual	2/93
6th and D	14 hour manual	1/93
7th and D	14 hour manual	1/93
7th and G	14 hour manual	1/95
6th and G	14 hour manual	1/95
7th and H	14 hour manual	2/95
6th and H	14 hour manual	1/95
6th and I	14 hour manual	1/95

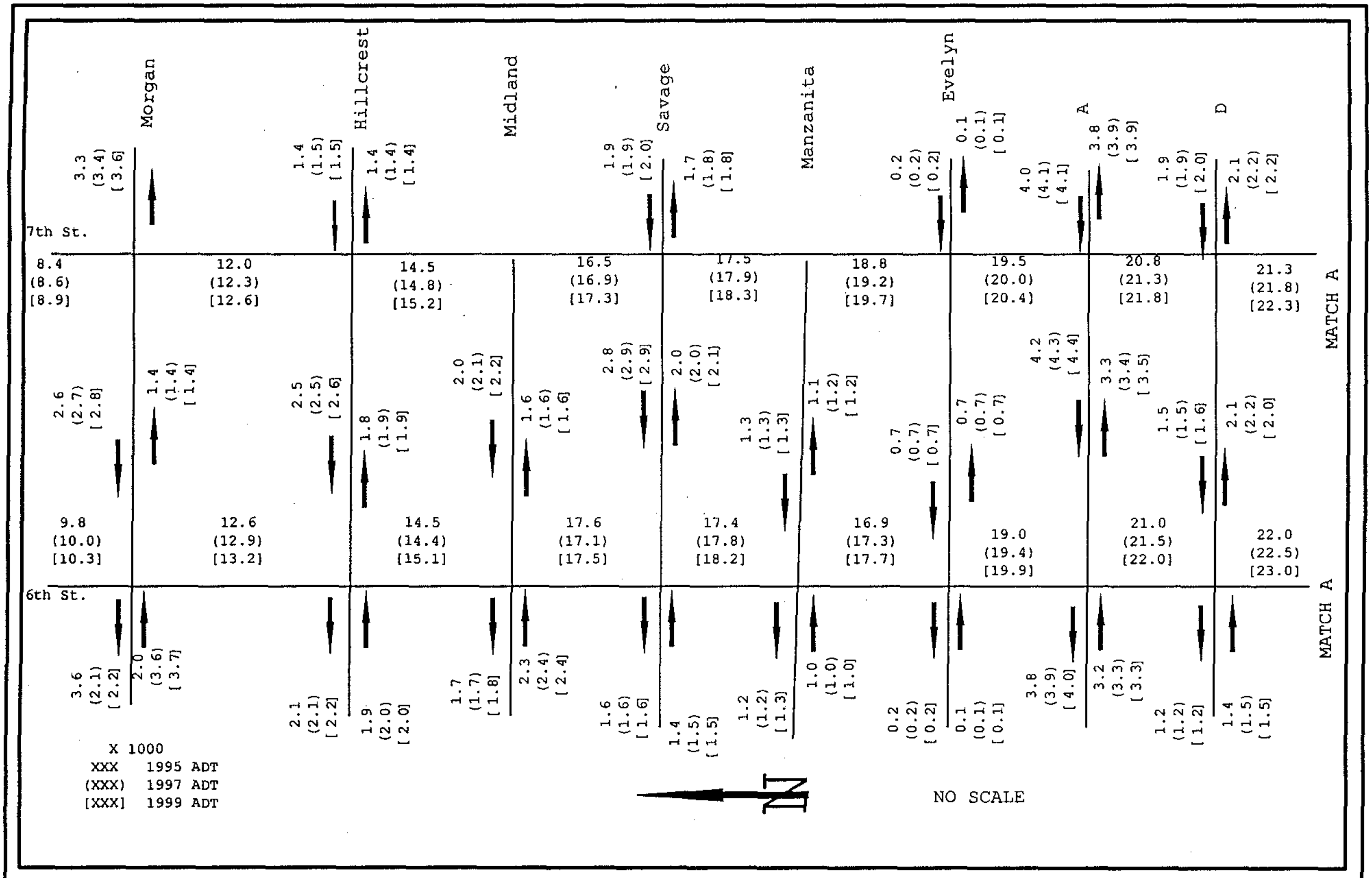
FUTURE NO BUILD

Future year traffic projections are typically performed through the use of cumulative analysis, historical growth trends, or transportation models. The method used in an area depends on the type and availability of information. At the time of analysis the best available information was a transportation model of Grants Pass.

Growth rates were calculated from traffic volumes provided by the 1995 and 2015 transportation models. The resulting growth rate is 1.18% per year. This growth rate was used to project the base year design traffic to 2015 design traffic volumes. See figures 6,7,8, and 9 for future year daily design and peak hour design volumes.

FUTURE BUILD

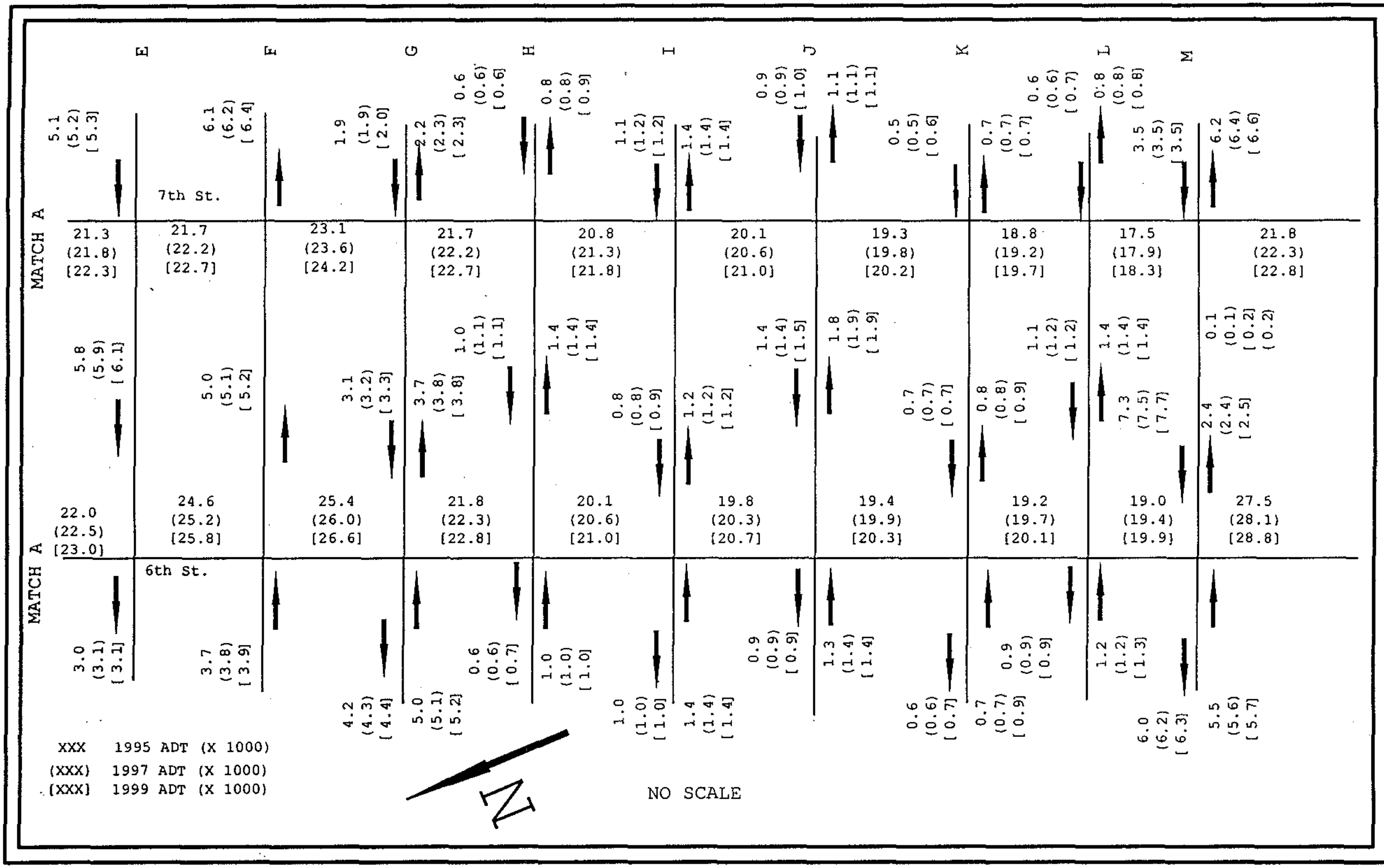
The proposed build option consists of three travel lanes on both 6th and 7th streets. A future year model run was made which reflected the impacts of having three lanes on 6th and 7th streets. The data from the build model shows a slight decrease in traffic on 6th and 7th streets when compared to the no-build model data. The actual difference between the build and no-build volumes varies between 3% and 7%. No-build to build factors were calculated and applied to the no-build 2015 traffic volumes, which resulted in the 2015 build traffic volumes. See figures 10,11,12, and 13 for future year build daily design and peak hour design volumes.



OREGON DEPARTMENT OF TRANSPORTATION

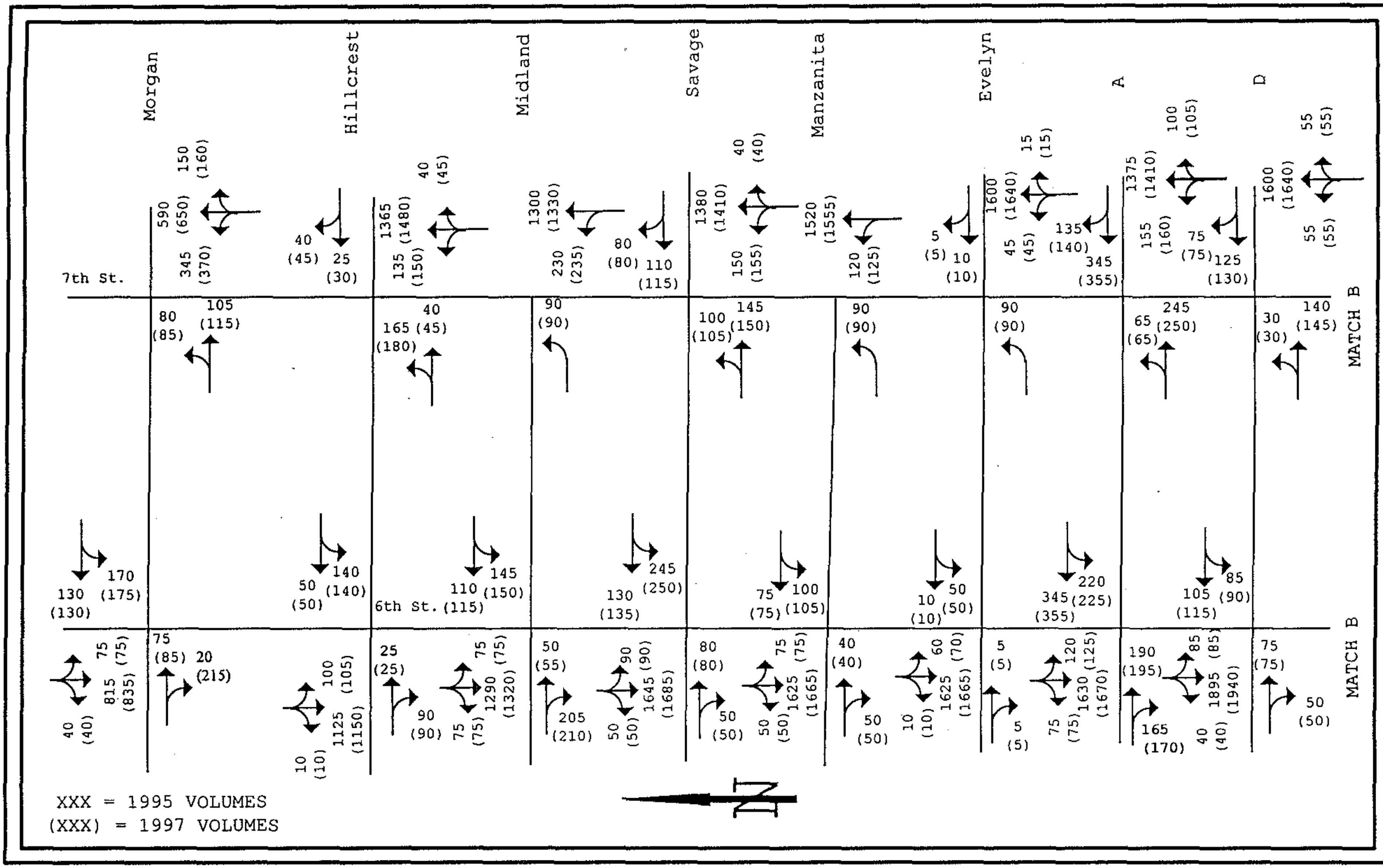
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet Average Daily Traffic Volumes (ADT) No-Build Grants Pass	FILE: FRAME.PPT July 29, 1997	FIGURE 2



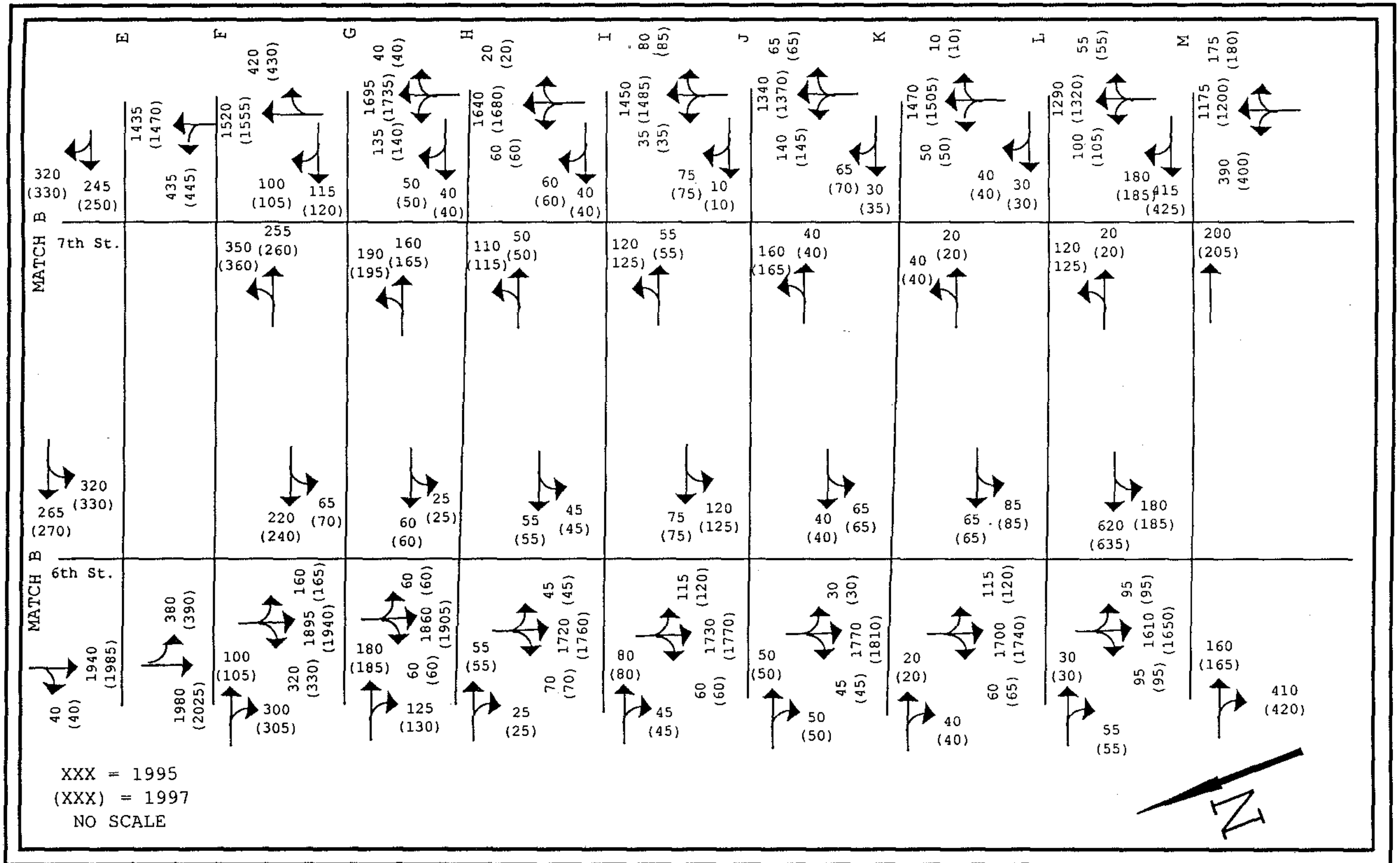
OREGON DEPARTMENT OF TRANSPORTATION TPAU **TRANSPORTATION PLANNING ANALYSIS UNIT**

6TH AND 7TH STREET COUPLET AVERAGE DAILY TRAFFIC (ADT) GRANTS PASS NO BUILD	FILE: FRAME.PPT July 29, 1997	FIGURE 3



OREGON DEPARTMENT OF TRANSPORTATION TPAU **TRANSPORTATION PLANNING ANALYSIS UNIT**

6TH AND 7TH STREET COUPLET PEAK HOUR VOLUMES GRANTS PASS NO BUILD	GRNATP.PPT July 29, 1997	FIGURE 4

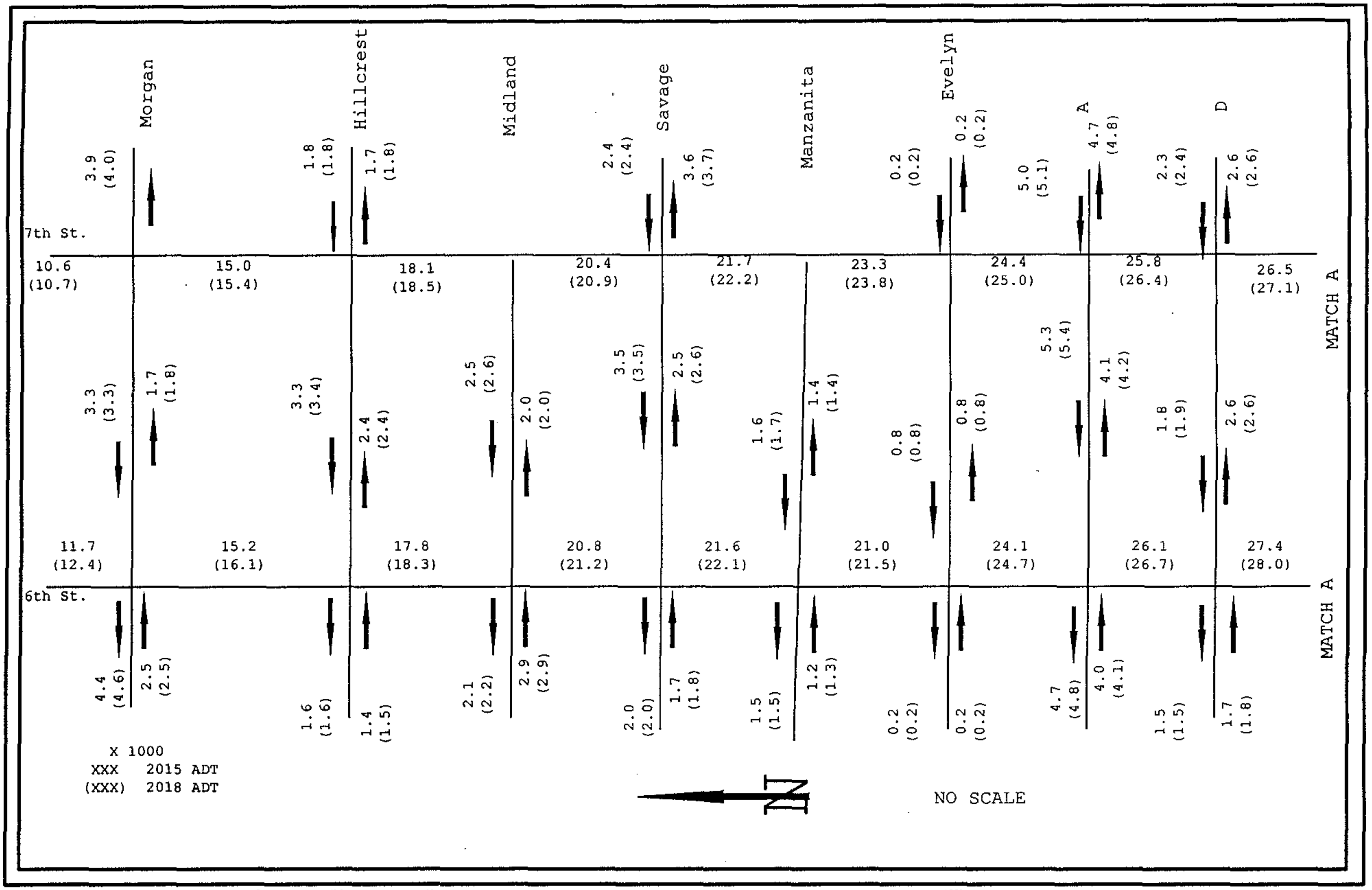


OREGON DEPARTMENT OF TRANSPORTATION

TPAU

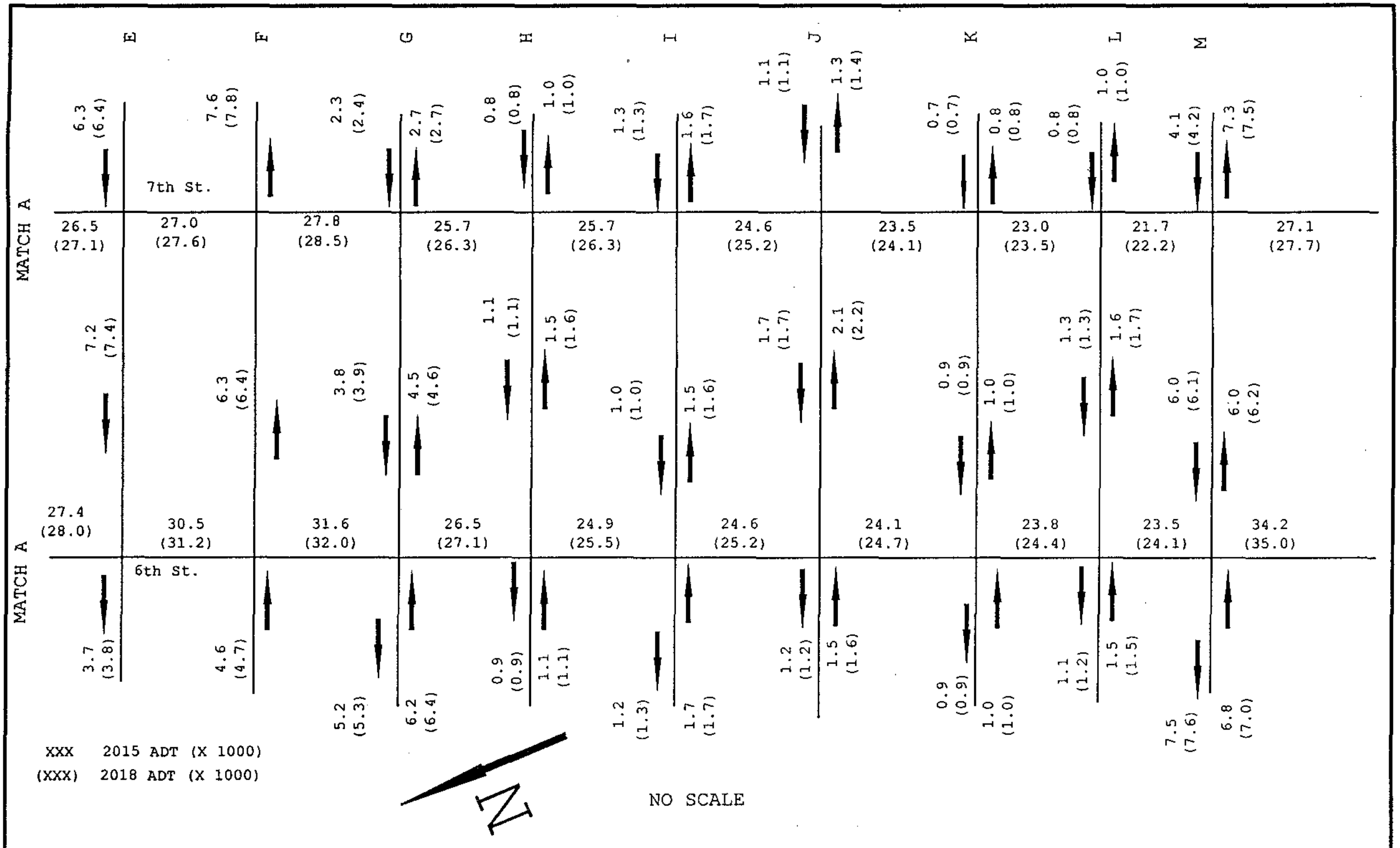
TRANSPORTATION PLANNING ANALYSIS UNIT

6TH AND 7TH STREET COUPLET PEAK HOUR TRAFFIC VOLUMES GRANTS PASS NO BUILD	GRNATP.PPT July 29, 1997	FIGURE 5



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet Average Daily Traffic Volumes (ADT) No-Build Grants Pass	FILE: FRAME.PPT July 29, 1997	FIGURE 6



OREGON DEPARTMENT OF TRANSPORTATION

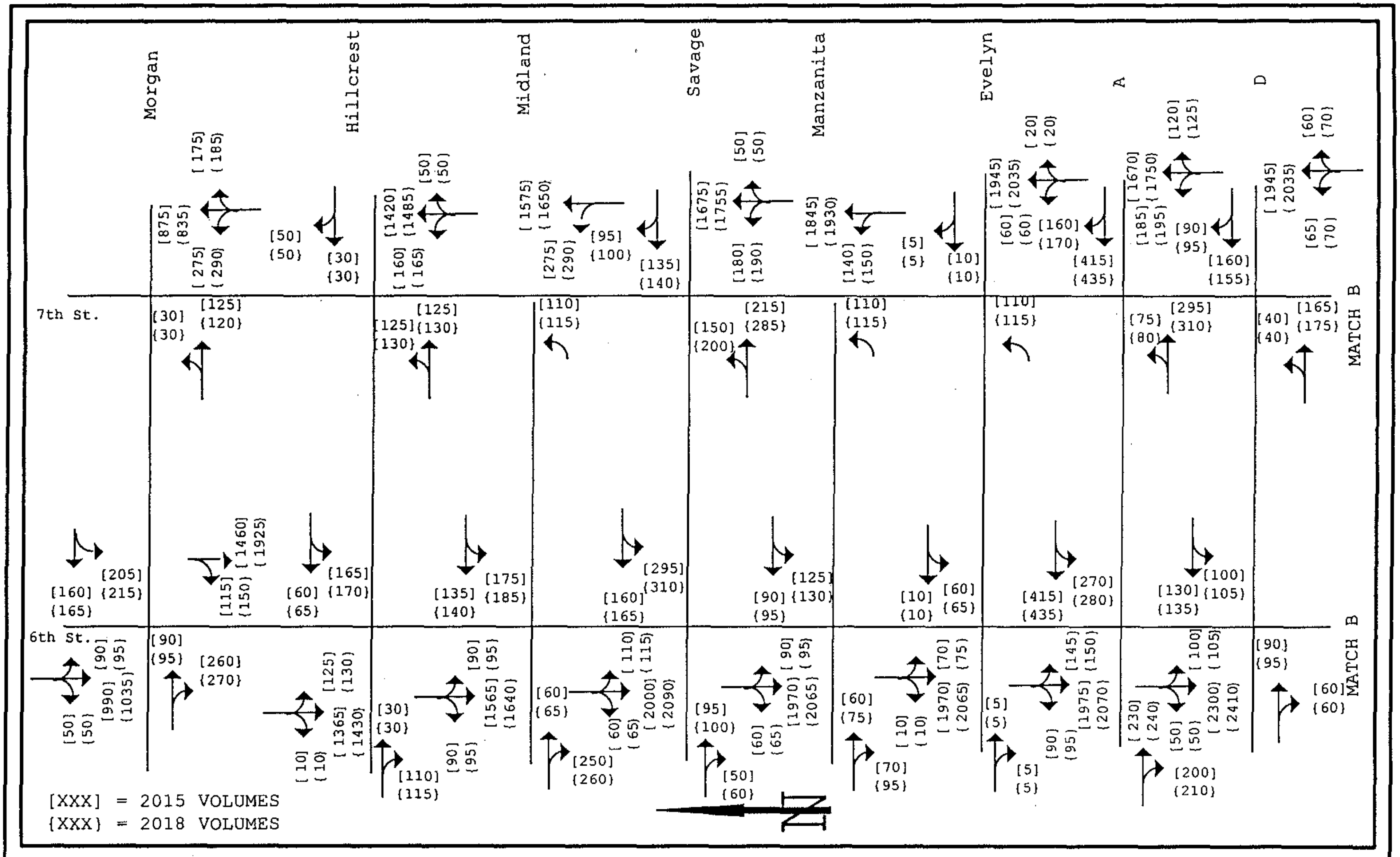
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6TH AND 7TH STREET COUPLET AVERAGE DAILY TRAFFIC (ADT)
GRANTS PASS NO BUILD

FILE: FRAME.PPT

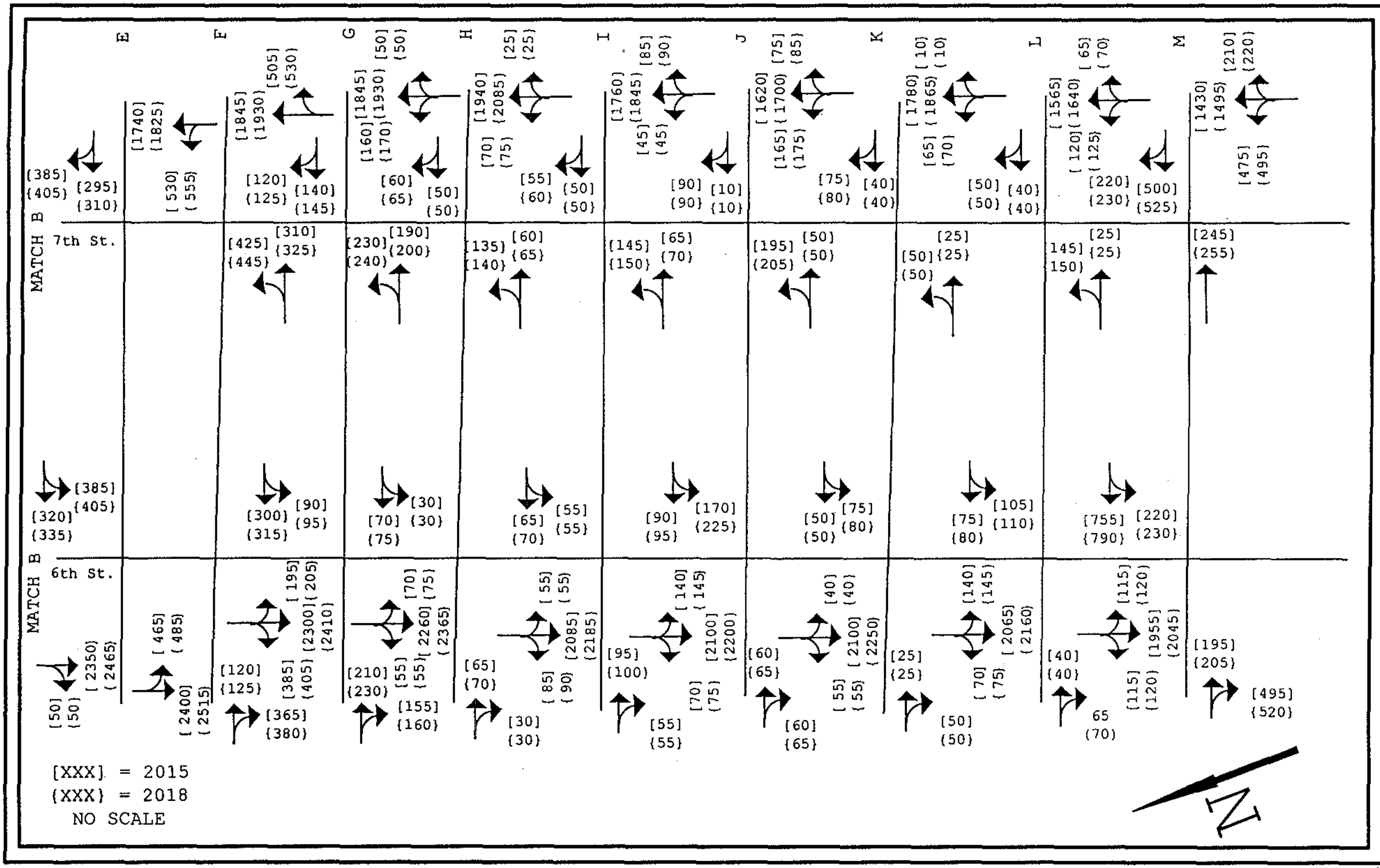
July 29, 1997

FIGURE 7



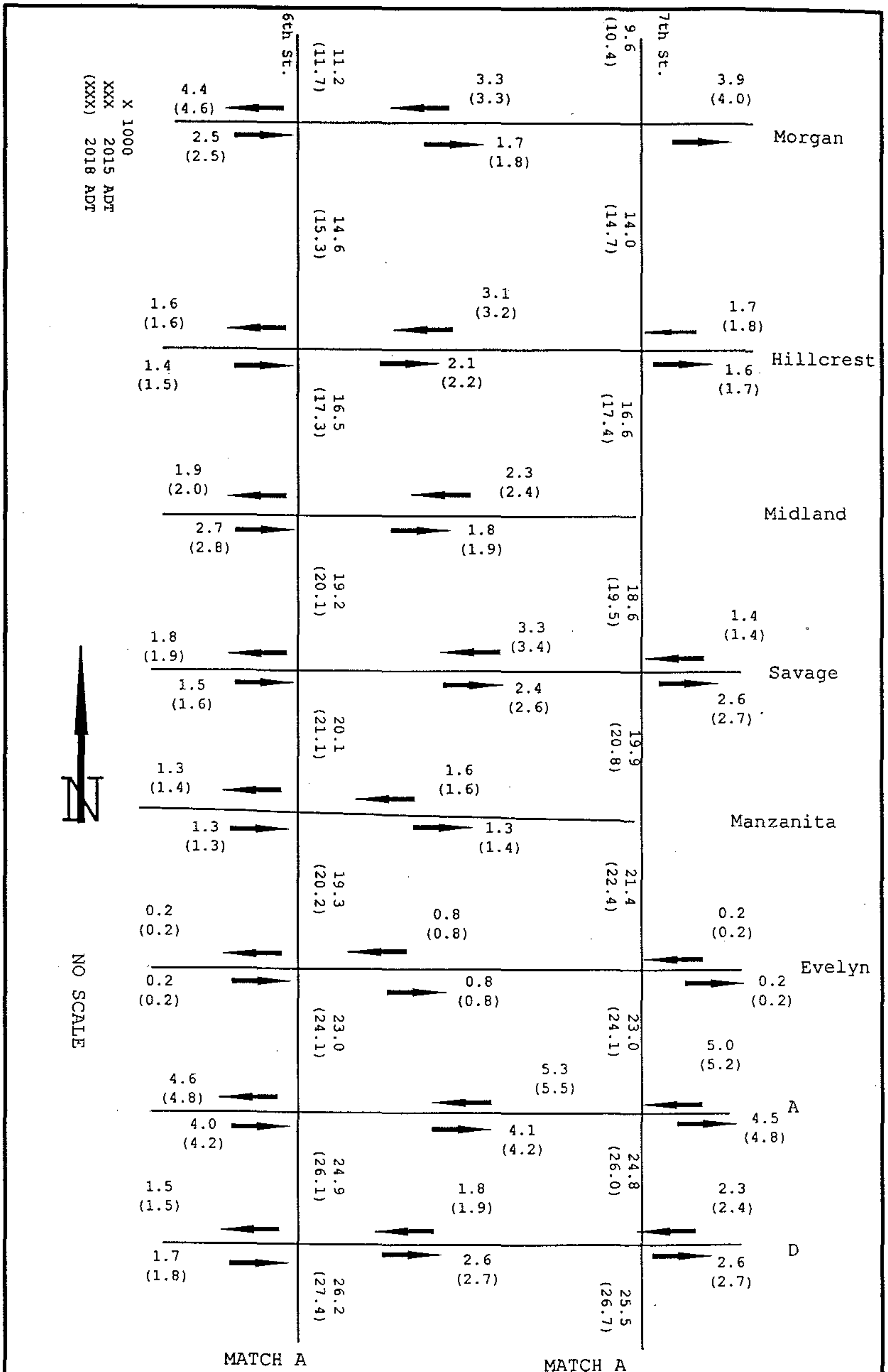
OREGON DEPARTMENT OF TRANSPORTATION TPAU

6TH AND 7TH STREET COUPLET PEAK HOUR VOLUMES GRANTS PASS NO BUILD	GRNATP.PPT July 29, 1997	FIGURE 8



OREGON DEPARTMENT OF TRANSPORTATION TPAU **TRANSPORTATION PLANNING ANALYSIS UNIT**

6TH AND 7TH STREET COUPLET PEAK HOUR TRAFFIC VOLUMES GRANTS PASS NO BUILD	GRNATP.PPT July 29, 1997	FIGURE 9



OREGON DEPARTMENT OF TRANSPORTATION

TPAU

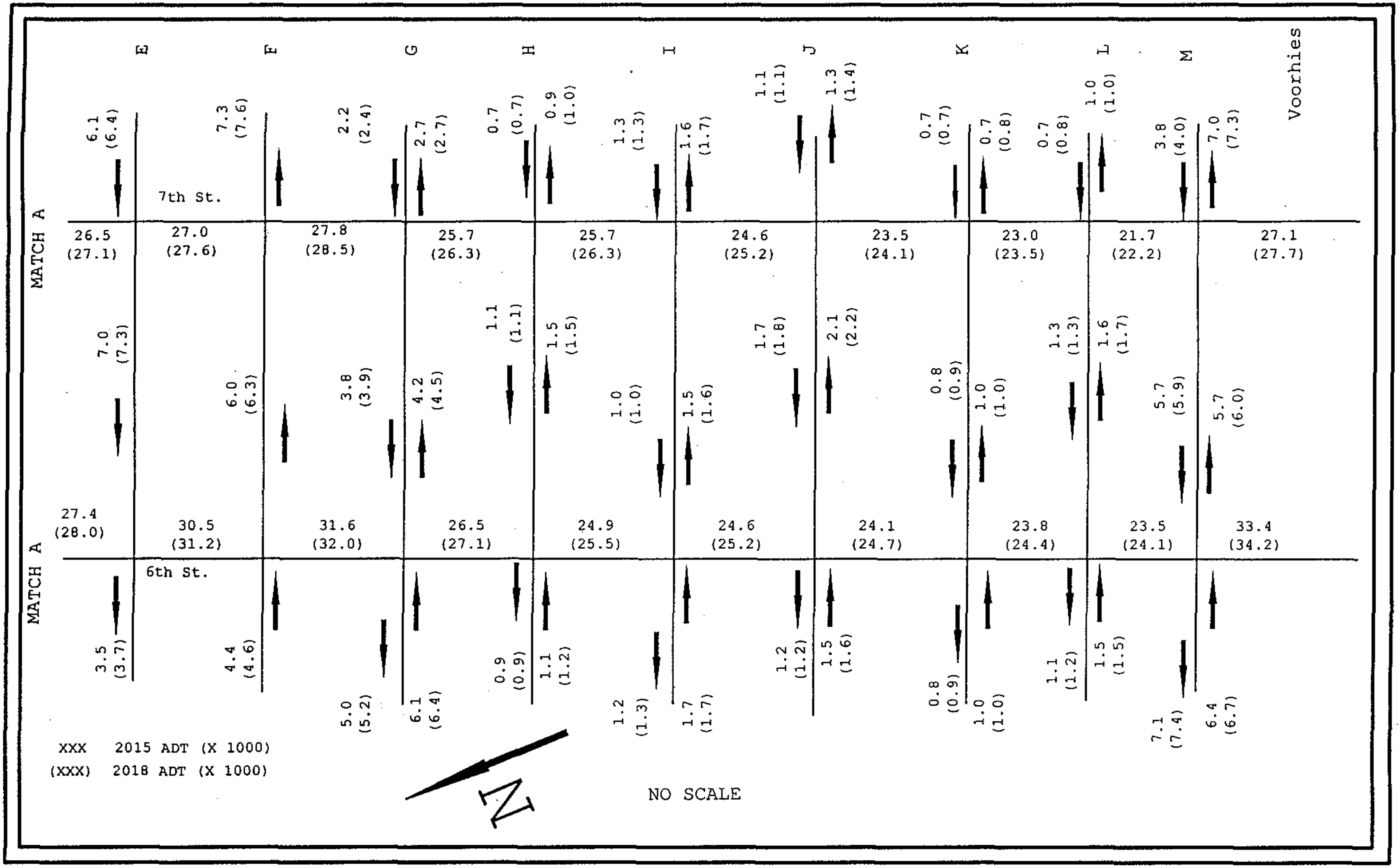
TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet Average Daily Traffic Volumes (ADT) Build
Grants Pass

FILE: FRAME.PPT

July 29, 1997

FIGURE 10

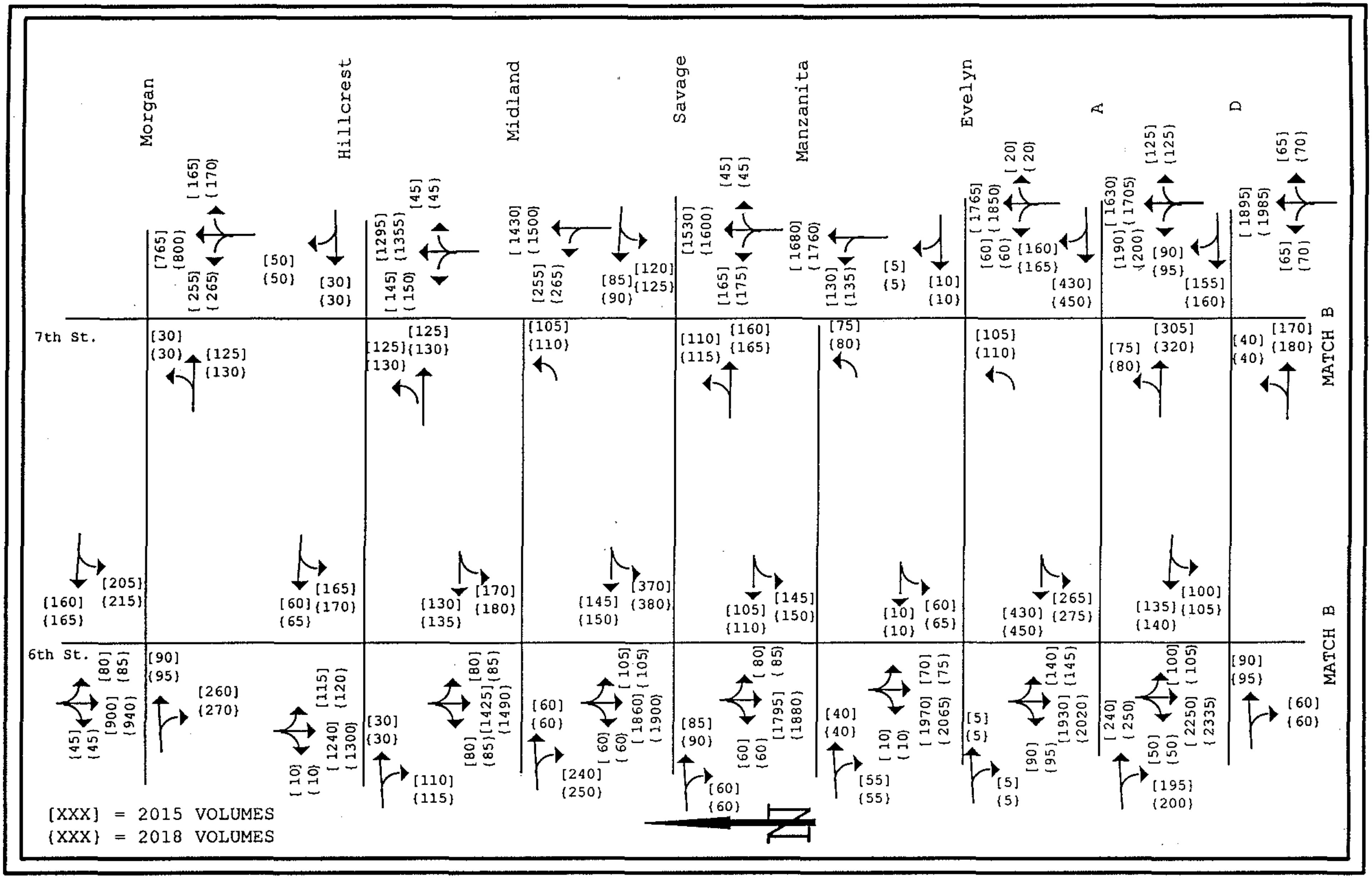


OREGON DEPARTMENT OF TRANSPORTATION TPAU **TRANSPORTATION PLANNING ANALYSIS UNIT**

6TH AND 7TH STREET COUPLET AVERAGE DAILY TRAFFIC (ADT)
GRANTS PASS BUILD

FILE: FRAME.PPT
July 29, 1997

FIGURE 11



OREGON DEPARTMENT OF TRANSPORTATION

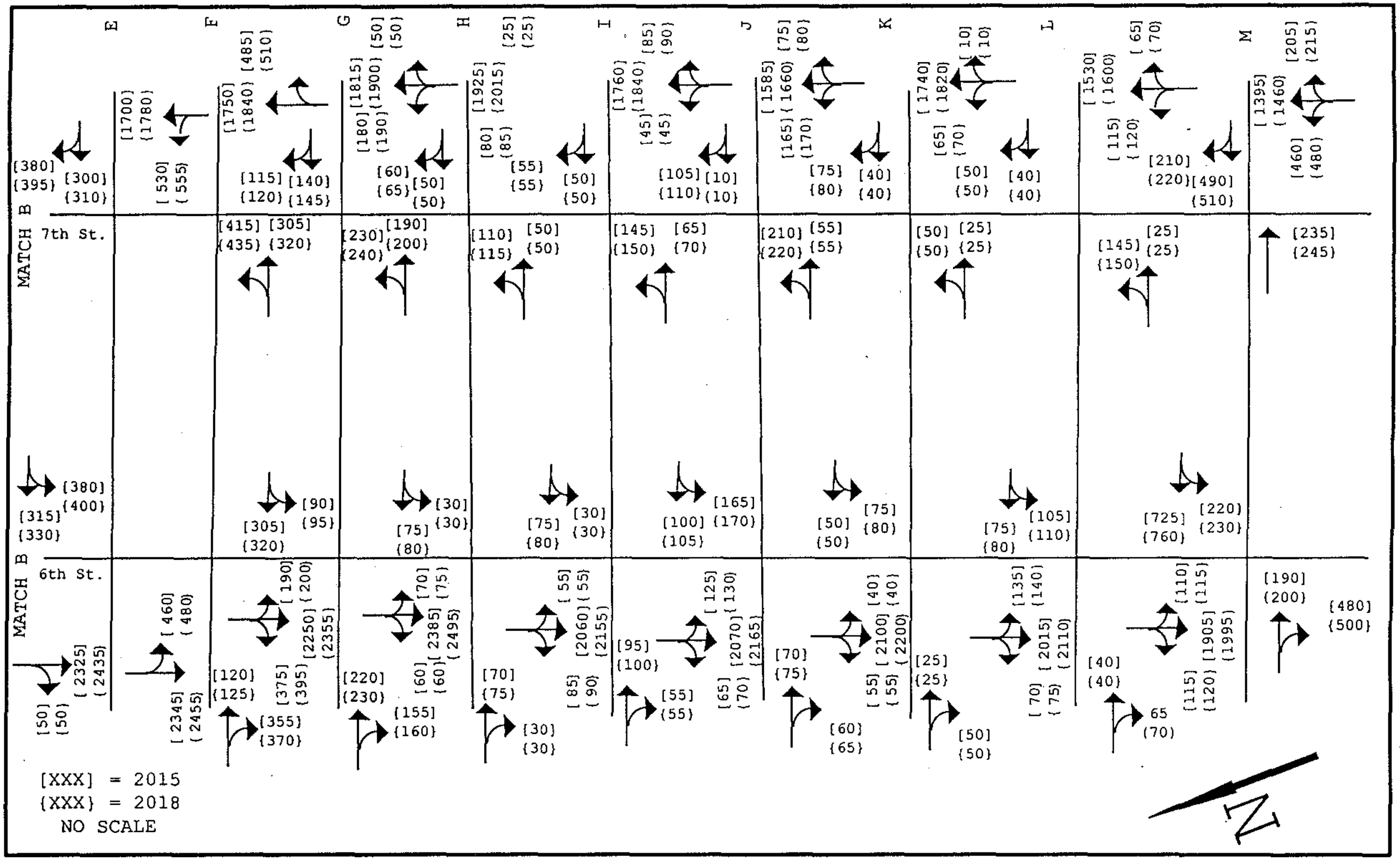
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6TH AND 7TH STREET COUPLET PEAK HOUR VOLUMES
GRANTS PASS - BUILD

GRNATP.PPT

July 29, 1997

FIGURE 12



[XXX] = 2015
{XXX} = 2018
NO SCALE

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6TH AND 7TH STREET COUPLET PEAK HOUR TRAFFIC VOLUMES
GRANTS PASS BUILD

GRNATF.PPT
July 29, 1997

FIGURE 13

ANALYSIS METHODOLOGY

The Levels of Service (LOS) for intersections on 6th and 7th were analyzed using SIGCAP2, an Oregon Department of Transportation (ODOT) computerized analysis program. SIGCAP2 is based on critical movement analysis. The signalized intersection LOS is a quantitative measure of the ratio between the existing or projected volumes, to the capacity of the roadway at a given location. This ratio is known as Volume to Capacity (V/C). The V/C ratios are broken into six levels and each is given a letter designation, from A to F, for identification purposes. The LOS A designation represents the most desirable driving conditions, while LOS F represents the least desirable condition. See appendix A for more details on signalized LOS designation.

The storage lengths required at the signalized intersections is provided by SIGCAP2, and are consistent with the methodologies found in the NCHRP Report 348, "Access Management Guidelines for Activity Centers." The storage lengths referred to are the distance that the cars are expected to stack up in the lanes during the red signal phase. When storage lengths can not be met, the intersection can not operate as expected.

The peak hour volumes at unsignalized intersections were analyzed using UNSIG10. This is an ODOT computerized program that uses reserve capacity of a lane to determine the LOS. The reserve capacity is equal to the capacity of a lane at an unsignalized intersection minus the demand volume for that lane. The reserve capacities are broken into six levels and each is given a letter designation, from A through F, for identification purposes. The level of service designation "A" represents the most desirable traffic conditions, while the level "F" represents the least desirable conditions. The LOS designation for unsignalized intersections generally applies only to the left turning vehicle from a minor road. Through traffic on the mainline does not necessarily operate at the designated unsignalized LOS. See appendix A for further unsignalized LOS descriptions.

NO-BUILD

EXISTING NETWORK

Highway 25, the Redwood Highway, is designated as statewide level of importance. Highway 25 begins at the north end where it intersects with Interstate 5, (Hwy.1), and continues south into California to Crescent City. Grants Pass has two interchanges on Interstate 5. They are designated as the north and the south interchanges. Highway 25 connects to the north interchange. The couplet begins at the north end where highway 25 joins highway 1 and continues south across the Rogue River. 6th street provides the southbound movement and 7th street provides the northbound movement. The number of travel lanes on 6th street varies from two lanes in the north section to four lanes in the

Central Business District, and reduces to two lanes south of the CBD to cross the Caveman Bridge. The width of the travel lanes varies from a substandard nine feet to a standard of twelve feet. The number of travel lanes on 7th varies from two lanes on the north section, to three lanes in the CBD. Traffic enters the three-lane section on 7th Street from a two-lane bridge. The couplet is heavily signalized in the central business district and the surrounding land use is mostly commercial. The spacing of the signals varies from 280 feet in the CBD, to a quarter of a mile at the north end of the project.

A new bridge crossing the Rogue River was opened in 1991. The bridge is part of a new route from the south interchange that connects with Highway 25 south of the river. This new route is known as the Redwood Highway Spur, and provides the alternate route for through traffic.

The usage of the travel lanes at the intersection of 6th and M was questioned. This intersection is in the CBD and has four lanes approaching and leaving the intersection on 6th street. 6th street narrows from four to two lanes just south of this intersection to cross the two-lane Caveman Bridge. A videotape was made of this intersection during the peak hour to study the distribution of the traffic within the four lanes. Analysis from the video shows that 85% of the traffic uses the two center lanes, 10% use the left most lane and 5% use the right most lane.

FUTURE NETWORK

In the future traffic volumes are expected to increase. The lane usage on 6th street approaching M Avenue is expected to remain the same with 85% of the traffic using the two center lanes.

ODOT Region 3 has proposed to reduce the level of importance of this section of highway from statewide to regional or district.

There are two projects that propose to install signals on the Redwood Highway, one at Dowell Road, and another at Allen Creek Road. These signal installations are out of the project area and are not expected to impact the project.

ANALYSIS RESULTS

Signalized Intersections

Table 3 - Existing Level of Service - 1995

	6th street	V/C Ratio	7th street	V/C Ratio
Morgan	C	0.69	B	0.50
Hillcrest	A	0.48	C	0.60
Midland	D	0.74	C	0.63
Savage	B	0.58	C/D	0.71
Evelyn	A	0.44	C	0.66
A	D	0.75	C/D	0.72
D	B	0.51	B	0.56
E	B	0.57	C	0.64
F	C	0.61	C	0.67
G	C	0.66	C	0.69
H	A	0.48	B	0.58
I	B	0.50	NA	NA
J	B	0.50	B	0.54
L	A	0.47	B	0.49
M	E	0.90	D	0.81

* Shaded areas indicate poor Level of Service or storage problems.

According to the current Oregon Highway Plan, for a statewide level of importance highway, we are to provide a twenty-year design life at level of service C or better. The PDT can elect to reduce the design Level of Service to a D.

From examining the LOS shown in Table 3, the only intersection that is currently operating at an unacceptable Level of Service is the intersection at 6th and M. The analysis for this intersection was done using the lane usage split derived from the peak hour video.

The CBD generally has about 200 feet of storage distance available at the intersections. The required storage distance exceeds the available storage distance at the intersections on 6th street at G and F streets, and on 7th street at F and G streets. This indicates that these intersections are probably operating at a lower Level of Service than indicated in the table.

Table 4 – No-Build 2018 Level of Service

	6th street	V/C Ratio	7th street	V/C Ratio
Morgan	D	0.83	B	0.58
Hillcrest	B	0.58	C/D	0.73
Midland	E	0.91	D	0.74
Savage	B	0.56	E	0.88
Evelyn	B	0.50	D	0.79
A	E	0.90	E/F	0.98
D	C	0.62	C	0.68
E	C	0.69	D	0.78
F	D	0.74	D	0.82
G	D	0.80	D	0.80
H	C	0.64	C	0.63
I	B	0.56	NA	NA
J	C	0.61	C	0.65
L	B	0.53	B	0.49
M	F	1.09	D	0.77

* Shaded area indicates a poor Level of Service or storage problems.

Midland and 6th and Savage and 7th

The data in Table 4 shows that in 20 years these intersections will operate at unacceptable Levels of Service. Both of these intersections have two approach lanes from the north or south, and are expected to have three approach lanes in the build option.

6th and M

The operation of this intersection is expected to worsen from the existing base year to the future year. It is expected to reach failing conditions by the 2018 design year. The future year V/C ratio at this intersection is 1.09, which indicates that traffic demand has exceeded the capacity of the road.

6th and E, F, and G streets, and 7th and E, F, and G streets

Table 4 shows these intersections as operating at acceptable Levels of Service in the future 2018 design year. However, the required storage distance exceeds the available storage distance. The lack of storage distance means that these intersections will be approaching unacceptable Level of Service.

6th and A

This intersection is expected to operate at an unacceptable LOS E by the year 2018. The critical moves are the through moves on 6th and the left turns onto 6th from A street.

7th and A

This intersection is expected to operate at an unacceptable LOS E/F by the year 2018. The critical movements are the through moves on 7th and the left turns from A street to 7th street.

7th and M

Table 4 indicates that the intersection is expected to operate at an acceptable Level of Service in the future year 2018. The expected operation of this intersection is different from the intersection at 6th and M streets for several reasons.

- There are no left turn movements from M street onto 7th street, so no signal time is given to a protected left turn. This gives more signal time to the other movements.
- Traffic is coming from a bottleneck on the bridge, to a wider three-lane facility, so all travel lanes are being used.

BUILD ALTERNATIVES

ALTERNATE 1

This alternate consists of three lanes on both 6th and 7th streets from Morgan to just south of M Street. Several different scenarios consisting of various side street improvements and main route improvements were studied.

Scenario 1

Consists of three travel lanes on 6th and 7th streets, with no cross street improvements, and no turn pockets on 6th or 7th streets. See Figure 14 for the typical three-lane configuration.

Scenario 2

Consists of three travel lanes on 6th and 7th streets, with improvements on the cross streets and turn pockets on 6th and 7th streets (See Figure 14).

Scenarios 2A and 2B

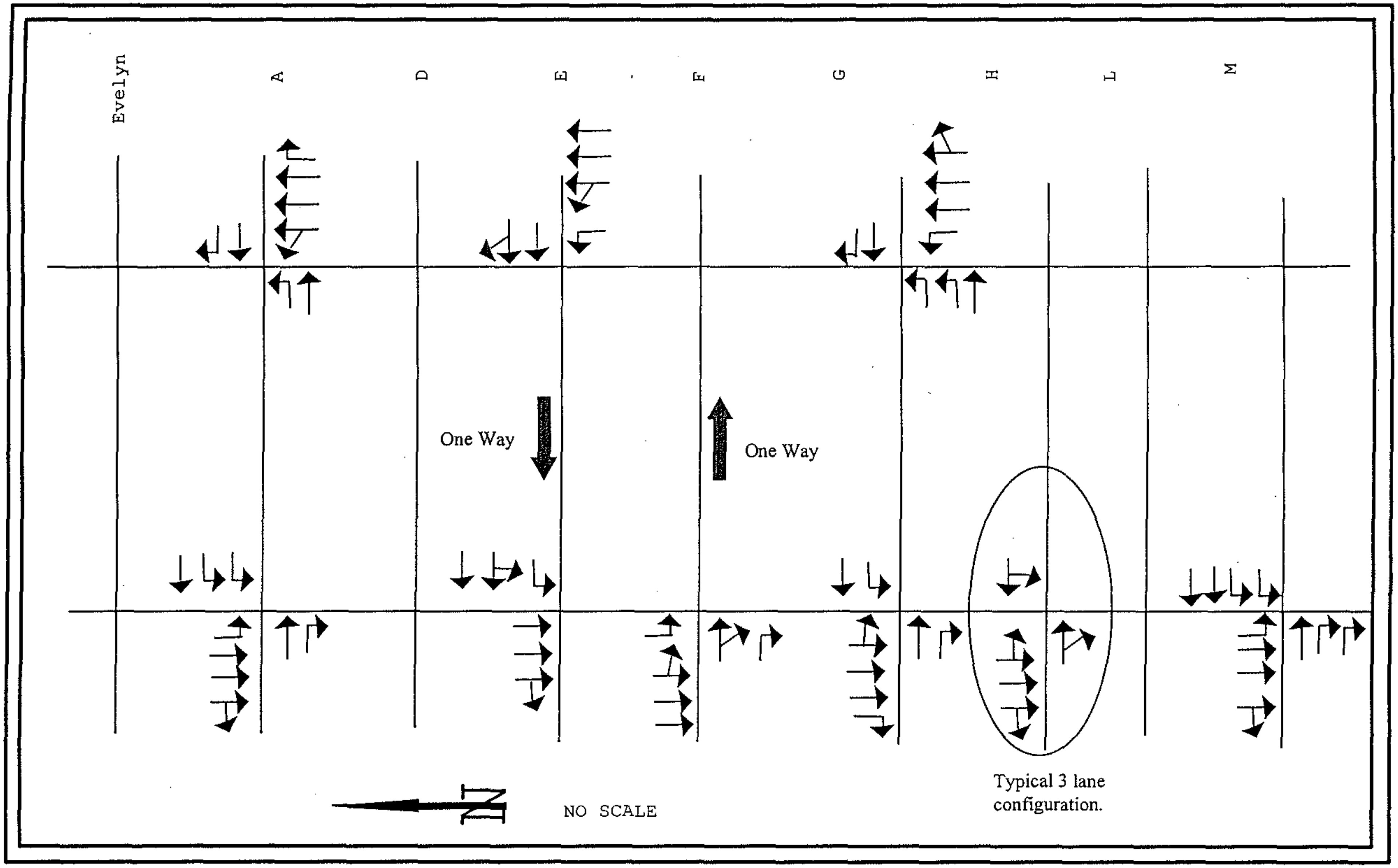
These two scenarios are Scenario 2 without some of the lane improvements

Scenario 2C

This is Scenario selected by the CAC. It is a variation of scenario 2 (See Figure 15).

ALTERNATE 2

This alternate consists of three lanes from Morgan to A, then four lanes from A to south of M on 6th street. 7th street still has three lanes the length of the project. This alternate was dropped because it would remove some on street parking.



OREGON DEPARTMENT OF TRANSPORTATION

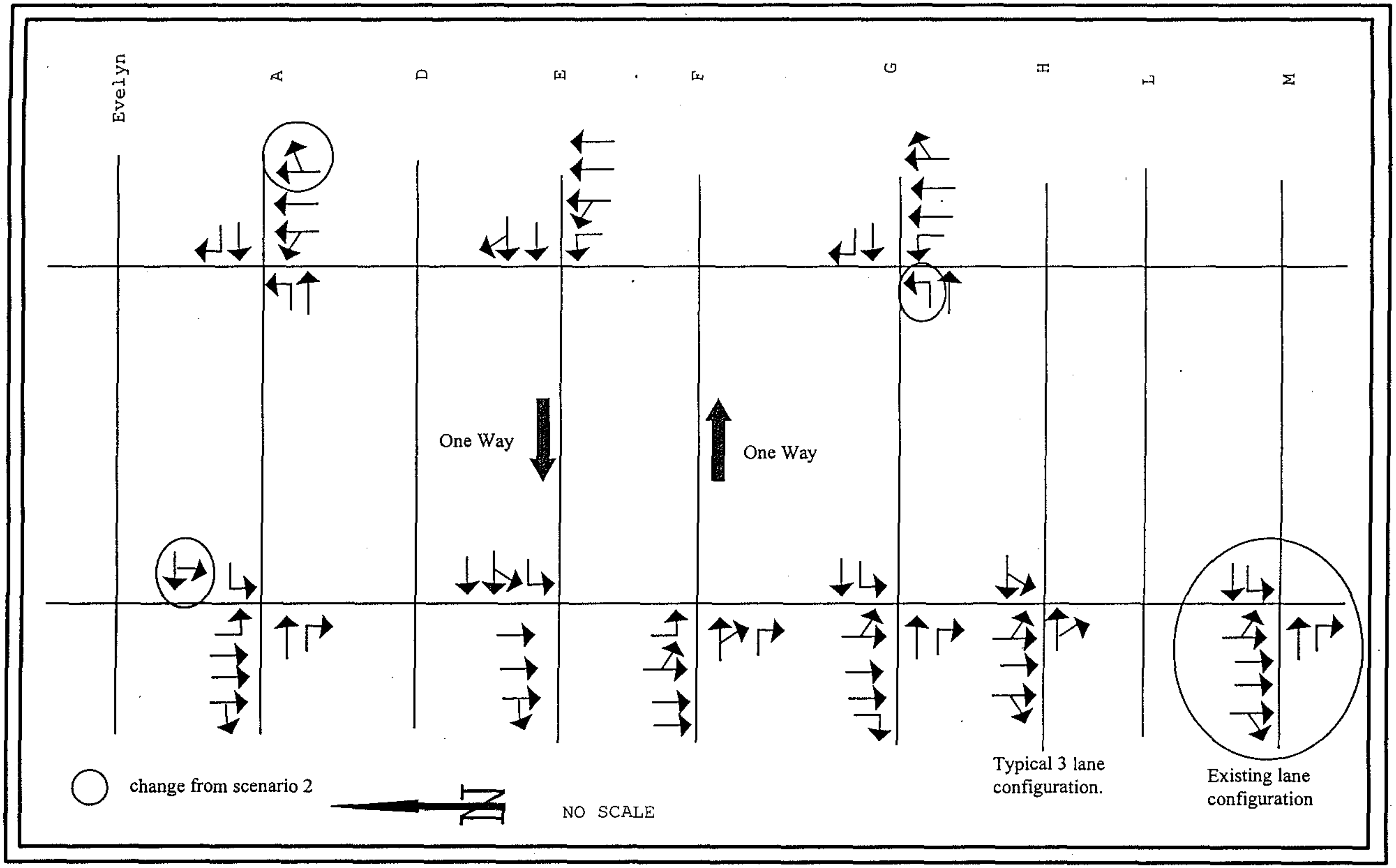
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet
Scenario 2 Intersection Approach Lane Configurations

FILE: FRAME.PPT

July 31, 1997

FIGURE 14



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

6th and 7th Street Couplet
Scenario 2C Intersection Approach Lane Configurations

FILE: FRAME.PPT

July 31, 1997

FIGURE 15

OTHER ALTERNATIVES

TDM measures were considered. Region 3 studied the employment in the area to see if TDM measures could make a difference in the peak hour volumes on 6th and 7th streets. It was found that no employers were large enough to significantly impact the peak hour traffic volumes.

ANALYSIS RESULTS

Table 4 - Scenario 1- 2018 LOS and V/C Ratios

	6th street		7th street	
Morgan	D	0.79	B	0.49
Hillcrest	B	0.56	B	0.55
Midland	D	0.74	B	0.53
Savage	C	0.66	C	0.64
Evelyn	C	0.60	B	0.56
A	E/F	1.0	E/F	0.98
D	C/D	0.73	C	0.67
E	D	0.80	D	0.77
F	D/E	0.86	D	0.80
G	E	0.93	D	0.79
H	C	0.69	B	0.58
I	C	0.64	NA	NA
J	C/D	0.73	C	0.67
L	C	0.67	C/D	0.71
M	F	1.07	D	0.79

*Shaded areas indicate poor Level of Service or storage problems.

Table 5 - Scenario 2- 2018 LOS and V/C Ratios

	6th street		7th street	
Morgan	D	0.79	B	0.49
Hillcrest	B	0.56	B	0.55
Midland	D	0.74	B	0.53
Savage	C	0.66	C	0.64
Evelyn	C	0.60	B	0.56
A	D	0.81	D	0.76
D	C/D	0.73	C	0.67
E	C/D	0.71	C	0.67
F	C/D	0.71	D	0.80
G	D	0.77	C/D	0.70
H	C	0.69	B	0.58
I	C	0.64	NA	NA
J	C/D	0.73	C	0.67
L	C	0.67	C/D	0.71
M	E	0.88	D	0.79

* Shaded areas indicate poor Level of Service or storage problems.

Table 6 - Scenario 2C- 2018 LOS and V/C Ratio

	6th street		7th street	
Morgan	D	0.79	B	0.49
Hillcrest	B	0.56	B	0.55
Midland	D	0.74	B	0.53
Savage	C	0.66	C	0.64
Evelyn	C	0.60	B	0.56
A	E	0.95	D	0.79
D	C/D	0.73	C	0.67
E	C/D	0.71	D	0.77
F	C/D	0.71	D	0.80
G	D	0.77	D	0.76
H	C	0.69	B	0.58
I	C	0.64	NA	NA
J	C/D	0.73	C	0.67
L	C	0.67	C/D	0.71
M	F	1.07	D	0.79

* Shaded areas indicate poor Level of Service or storage problems.

6th and Midland

The operation of this intersection is improved from the no-build to the three-lane build. This is because there are currently two lanes approaching the intersection from the north, and the build option would increase the number of lanes to three.

6th and A

This intersection currently has four approach lanes from the north. The build alternate, Alternate 1-Scenario 1, requires that the capacity of the intersection be reduced by reducing the number of lanes from four to three. This results in a worse Level of Service for the build option than the no-build option.

Adding capacity to A street can mitigate the impacts of the lane reduction required in Scenario 1. The build option with improvements to A street is Scenario 2. The suggested lane configurations for Scenario 2 are shown in Figure 14. The final lane configuration agreed on by the CAC is Scenario 2C. The suggested lane configurations consist of a double left from A street to 6th street. The approved lane configuration, shown in Scenario 2C, Figure 15, consists of a combination through and left turn lane and an exclusive left turn lane on A street. The approved configuration necessitates the need for the signal phasing to be direction separated. Direction separated phasing means that each leg has its own signal phase and generally results in a worse Level of Service than other types of phasing. The resulting Level of Service for Scenario 2C is LOS E, which is slightly better than Scenario 1, which is LOS E/F.

6th and E

The required storage lengths for future year 2018 can not be met at this intersection if the number of travel lanes is reduced from four to three lanes. The analysis results given in Table 4 seem to indicate that the Level of Service at this intersection is acceptable with three lanes for Scenario 1. However, since the storage distance can not be provided, the intersection can not operate as expected. Turn lane additions were suggested to meet the required storage distances in Scenario 2. The additional of turn lanes eliminated the storage problem in Scenario 2C.

6th and G, 6th and F

The suggested lane configurations of Scenario 2 were adopted for these two intersections. The suggested lane configurations are shown in figure 14. The Level of Service was improved at the intersection of 6th and G from an unacceptable LOS E in Scenario 1, to an acceptable LOS D in Scenarios 2 and 2C. The intersection of 6th and F is improved from an unacceptable LOS D/E in Scenario 1, to an acceptable LOS C/D in Scenarios 2 and 2C.

6th and M

This intersection was analyzed with the same lane usage as the no-build. This means that the two center lanes are expected carry 85% of the traffic, while the outer lanes carry 15% of the traffic. The intersection is expected to fail at LOS F in both the build and no-build future year scenarios. If capacity is added to M Street and turn pockets are added to 6th street, the intersection will operate at an unacceptable LOS E. The proposed build lane configurations are shown in Figure 14. The approved scenario 2C has no improvements made to the intersection of M and 6th street.

In order to improve Level of Service at the intersection of 6th and M Street, more than two through lanes on 6th Street have to be effective. The Caveman Bridge, which is two lanes, causes the problems at the 6th and M street intersection. Motorists are converging into the two center lanes on 6th Street well north of the bridge in preparation of the lane reduction. Widening for additional capacity on the Caveman Bridge would allow for better operation of the 6th and M street intersection.

7th and A

This intersection will operate at an unacceptable LOS E/F in the future year 2018 in Scenario 1. Turn pockets were added to 6th street, and capacity was added to A street in Scenario 2 and Scenario 2C. The suggested lane configurations for Scenario 2 are shown in Figure 14. Figure 15 shows the approved lane configurations for Scenario 2C. The adopted lane configuration is similar to the suggested lane configuration and results in an acceptable LOS D in the 2018 design year.

7th and E

The intersection configuration of Scenario 1 does not provide the required storage distance. The Level of Service shown in Table 4 seems to be an acceptable LOS D, however, this intersection will not operate as expected because the required storage distance can not be provided. Additional intersection capacity was added in Scenario 2 to provide the required storage distance. The proposed lane configuration improves the intersection to LOS C. Double left turn lanes from 7th onto E Street was proposed in Scenario 2. Scenario 2C has a single left turn lane from 7th Street to E Street. The storage requirements will not be met in Scenario 2C, so the intersection will not operate at LOS D as expected.

7th and G

The intersection lane configuration of Scenario 1 does not provide the required storage distance. Table 4 shows an acceptable LOS D for this intersection, however, since the storage distance can not be provided, the intersection will not operate as expected. An intersection lane configuration was proposed in Scenario 2 that would provide the required storage distance. The approved lane configuration of Scenario 2C is shown in Figure 15. The approved lane configuration does not provide the required storage distance, so the intersection will not operate at an acceptable LOS D as shown in Table 6.

ENVIRONMENTAL DATA

Table 7 – List of Figures

	Link Number	ADT	DHV
No-Build 1995,1997	Figure 16	Figures 2 & 3	Figures 4 & 5
No-Build 2015, 2018	Figure 16	Figures 6 & 7	Figures 8 & 9
Build Alternate 1	Figure 16	Figures 10 & 11	Figures 12 & 13

Analysis years requested by Environmental Section.

Table 8 – No-Build

	1997	V/C	1999	V/C	2015	V/C
6th and G	C	0.67	C	0.68	D	0.77
6th and H	A	0.48	B	0.49	B	0.53
7th and G	C/D	0.71	C/D	0.72	D	0.77
7th and H	B	0.56	B	0.56	C	0.63

Table 9 - Build

	1999	V/C	2015	V/C
6th and G	C	0.65	D	0.83
6th and H	C	0.60	C	0.67
7th and G	B	0.59	C	0.68
7th and H	B	0.53	C	0.60

RECOMMENDATIONS/CONCLUSION

The proposed project does satisfy the goals of the project in that the streets will be rebuilt with wider travel lanes, and the signals will be replaced.

In the north part of the project, the two lane sections on both 6th and 7th Streets will be replaced with three lane sections. This is expected to improve the operations of these intersections.

The intersections at 6th and A, and 6th and M are expected to have operational problems, and the intersection at 6th and M is expected to fail. The motorist will experience very slow speeds and have to wait through several signal cycles before they can pass through the intersection. The congestion at the intersection of M and 6th Street would be improved if the Caveman Bridge were widened.

On 7th Street from G through E streets, storage distances can not be met. This will cause slow speeds in this section.

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Aug 6, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
6th north of Morgan																		
001	0.06	1997	10000	0	35	950	950	0	0	35	830	55	35	0	0	0	0	35
001	0.06	1999	10300	0	35	980	980	0	0	35	860	57	35	0	0	0	0	35
001	0.06	2015	11700	0	35	1150	1150	0	0	35	1010	67	35	0	0	0	0	35
6th from Morgan to Hillcres																		
002	0.27	1997	12900	0	35	1250	1250	0	0	35	1180	67	35	0	0	0	0	35
002	0.27	1999	13200	0	35	1280	1280	0	0	35	1210	69	35	0	0	0	0	35
002	0.27	2015	16100	0	35	1520	1520	0	0	35	1440	82	35	0	0	0	0	35
6th from Hillcrest to Midland																		
003	0.21	1997	14700	0	35	1430	1430	0	0	35	1320	47	35	0	0	0	0	35
003	0.21	1999	15100	0	35	1460	1460	0	0	35	1340	48	35	0	0	0	0	35
003	0.21	2015	17800	0	35	1680	1680	0	0	32	1550	56	35	0	0	0	0	35
6th from Midland to Savage																		
004	0.25	1997	17100	0	35	1750	1750	0	0	35	1640	48	35	0	0	0	0	35
004	0.25	1999	17500	0	35	1790	1790	0	0	35	1680	49	35	0	0	0	0	35
004	0.25	2015	20800	0	35	2130	2130	0	0	35	2000	58	35	0	0	0	0	35
6th from Savage to Manzan																		
005	0.12	1997	17800	0	30	1890	1890	0	0	30	1750	42	30	0	0	0	0	30
005	0.12	1999	18200	0	30	1940	1940	0	0	30	1800	43	30	0	0	0	0	30
005	0.12	2015	21600	0	30	2300	2300	0	0	30	2130	51	30	0	0	0	0	30
6th from Manzanita to Evely																		
006	0.37	1997	17300	0	30	1780	1780	0	0	30	1570	47	30	0	0	0	0	30
006	0.37	1999	17700	0	30	1820	1820	0	0	30	1610	48	30	0	0	0	0	30
006	0.37	2015	21000	0	30	2170	2170	0	0	30	1920	57	30	0	0	0	0	30
6th from Evelyn to A																		
007	0.31	1997	19400	0	30	1790	1790	0	0	28	1620	49	30	0	0	0	0	30
007	0.31	1999	19900	0	30	1830	1830	0	0	27	1650	50	30	0	0	0	0	30
007	0.31	2015	24100	0	28	2090	2090	0	0	20	1890	57	25	0	0	0	0	30
6th from A to D																		
008	0.16	1997	21500	0	25	2070	2070	0	0	25	1780	59	25	0	0	0	0	25
008	0.16	1999	22000	0	25	2120	2120	0	0	25	1830	60	25	0	0	0	0	25

ABBREVIATION: SECT = SECTION NUMBER
VOL = TOTAL VOLUME
MTR = MEDIUM TRUCK VOLUM
SP = SPEED OF VEHICLE
AUTO = AUTOMOBILE VOLUME
HTR = HEAVY TRUCK VOLUME

ANALYST: Roxann Rivord
CHECKED BY: ______________
FILE: GPNBLD.MDB

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PAGE: 2
PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
008	0.16	2015	26100	0	25	2500	2500	0	0	24	2150	71	25	0	0	0	0	25
6th from D to E																		
009	0.05	1997	22500	0	25	2000	2000	0	0	25	1720	57	25	0	0	0	0	25
009	0.05	1999	23000	0	25	2100	2100	0	0	25	1800	59	25	0	0	0	0	25
009	0.05	2015	27400	0	25	2500	2500	0	0	25	2140	71	25	0	0	0	0	25
6th from E to F																		
010	0.05	1997	25200	0	25	2360	2360	0	0	25	2020	55	25	0	0	0	0	25
010	0.05	1999	25800	0	25	2420	2420	0	0	25	2080	56	25	0	0	0	0	25
010	0.05	2015	30500	0	25	2870	2870	0	0	24	2460	66	25	0	0	0	0	25
6th from F to G																		
011	0.09	1997	26000	0	25	2380	2380	0	0	25	2070	45	25	0	0	0	0	25
011	0.09	1999	26600	0	25	2440	2440	0	0	25	2120	47	25	0	0	0	0	25
011	0.09	2015	31600	0	25	2890	2890	0	0	24	2510	55	25	0	0	0	0	25
6th from Gto H																		
012	0.06	1997	22300	0	25	2090	2090	0	0	25	1790	46	25	0	0	0	0	25
012	0.06	1999	22800	0	25	2140	2140	0	0	25	1830	48	25	0	0	0	0	25
012	0.06	2015	26500	0	25	2520	2520	0	0	25	2150	56	25	0	0	0	0	25
6th from H to I																		
013	0.06	1997	20600	0	25	1910	1910	0	0	25	1610	44	25	0	0	0	0	25
013	0.06	1999	21000	0	25	1960	1960	0	0	25	1660	45	25	0	0	0	0	25
013	0.06	2015	24900	0	25	2330	2330	0	0	25	1970	53	25	0	0	0	0	25
6th from I to J																		
014	0.06	1997	20300	0	25	1900	1900	0	0	25	1520	41	25	0	0	0	0	25
014	0.06	1999	20700	0	25	1950	1950	0	0	25	1560	42	25	0	0	0	0	25
014	0.06	2015	24600	0	25	2300	2300	0	0	25	1840	50	25	0	0	0	0	25
6th from J to K																		
015	0.06	1997	19900	0	25	1910	1910	0	0	25	1560	34	25	0	0	0	0	25
015	0.06	1999	20300	0	25	1960	1960	0	0	25	1600	35	25	0	0	0	0	25
015	0.06	2015	24100	0	25	2330	2330	0	0	25	1910	42	25	0	0	0	0	25
6th from K to L																		

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ANALYST: Roxann Rivord
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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet | PAGE: 3
LOCATION: Grants Pass | PRINTING DATE: Aug 6, 1997
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th | UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
016	0.06	1997	19700	0	25	1920	1920	0	0	25	1620	36	25	0	0	0	0	25
016	0.06	1999	20100	0	25	1970	1970	0	0	24	1660	37	25	0	0	0	0	25
016	0.06	2015	23800	0	24	2330	2330	0	0	18	1970	43	24	0	0	0	0	25
6th from L to M																		
017	0.13	1997	19400	0	23	1860	1860	0	0	15	1570	35	21	0	0	0	0	25
017	0.13	1999	19900	0	22	1910	1910	0	0	14	1610	35	20	0	0	0	0	25
017	0.13	2015	23500	0	19	2270	2270	0	0	10	1920	42	13	0	0	0	0	25
6th form M to south																		
018	0.13	1997	28100	0	20	2250	2250	0	0	10	1950	45	16	0	0	0	0	25
018	0.13	1999	28800	0	20	2300	2300	0	0	10	1990	46	15	0	0	0	0	25
018	0.13	2015	34200	0	18	2740	2740	0	0	10	2370	55	10	0	0	0	0	25
7th from north to Morgan																		
019	0.13	1997	8600	0	35	740	740	0	0	35	540	28	35	0	0	0	0	35
019	0.13	1999	8900	0	35	750	750	0	0	35	550	28	35	0	0	0	0	35
019	0.13	2015	10600	0	35	880	880	0	0	35	640	33	35	0	0	0	0	35
7th from Morgan to Hillcres																		
020	0.29	1997	12300	0	35	1200	1200	0	0	35	1010	43	35	0	0	0	0	35
020	0.29	1999	12600	0	35	1230	1230	0	0	35	1040	44	35	0	0	0	0	35
020	0.29	2015	15000	0	35	1480	1480	0	0	35	1250	52	35	0	0	0	0	35
7th from Hillcrest to Midland																		
021	0.21	1997	14800	0	35	1390	1390	0	0	35	1390	43	35	0	0	0	0	35
021	0.21	1999	15200	0	35	1420	1420	0	0	35	1420	44	35	0	0	0	0	35
021	0.21	2015	18100	0	32	1690	1690	0	0	28	1690	52	28	0	0	0	0	35
7th from Midland to Savage																		
022	0.25	1997	16900	0	34	1590	1590	0	0	32	1530	41	34	0	0	0	0	35
022	0.25	1999	17300	0	34	1620	1620	0	0	31	1560	42	33	0	0	0	0	35
022	0.25	2015	20400	0	29	1910	1910	0	0	21	1830	50	23	0	0	0	0	35
7th from Savage to Manzan																		
023	0.12	1997	17900	0	34	1630	1630	0	0	30	1570	36	33	0	0	0	0	35
023	0.12	1999	18300	0	33	1670	1670	0	0	29	1610	37	31	0	0	0	0	35
023	0.12	2015	21700	0	28	1970	1970	0	0	19	1900	44	21	0	0	0	0	35

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
7th from Manzanita to Evely																		
024	0.13	1997	19200	0	28	1710	1710	0	0	24	1660	40	26	0	0	0	0	30
024	0.13	1999	19700	0	27	1750	1750	0	0	23	1700	41	24	0	0	0	0	30
024	0.13	2015	23300	0	23	2070	2070	0	0	14	2010	48	16	0	0	0	0	30
7th from Evelyn to A																		
025	0.16	1997	20000	0	30	1620	1620	0	0	30	1540	39	30	0	0	0	0	30
025	0.16	1999	20400	0	30	1650	1650	0	0	30	1570	39	30	0	0	0	0	30
025	0.16	2015	24400	0	28	2070	2070	0	0	24	1970	49	26	0	0	0	0	30
7th from A to D																		
026	0.16	1997	21300	0	30	1710	1710	0	0	30	1480	43	30	0	0	0	0	30
026	0.16	1999	21800	0	30	1750	1750	0	0	30	1520	44	30	0	0	0	0	30
026	0.16	2015	25800	0	30	2070	2070	0	0	30	1800	52	30	0	0	0	0	30
7th from D to E																		
027	0.05	1997	21800	0	25	1780	1780	0	0	25	1490	37	25	0	0	0	0	25
027	0.05	1999	22300	0	25	1820	1820	0	0	25	1520	38	25	0	0	0	0	25
027	0.05	2015	26500	0	25	2150	2150	0	0	25	1800	45	25	0	0	0	0	25
7th from E to F																		
028	0.05	1997	22200	0	25	1910	1910	0	0	25	1630	36	25	0	0	0	0	25
028	0.05	1999	22700	0	25	1960	1960	0	0	25	1680	37	25	0	0	0	0	25
028	0.05	2015	27000	0	25	2330	2330	0	0	25	1990	44	25	0	0	0	0	25
7th from F to G																		
029	0.09	1997	23600	0	25	2010	2010	0	0	25	1770	53	25	0	0	0	0	25
029	0.09	1999	24200	0	25	2050	2050	0	0	25	1810	54	25	0	0	0	0	25
029	0.09	2015	27800	0	25	2330	2330	0	0	25	2060	62	25	0	0	0	0	25
7th from G to H																		
030	0.06	1997	22200	0	25	1880	1880	0	0	25	1700	48	25	0	0	0	0	25
030	0.06	1999	22700	0	25	1930	1930	0	0	25	1740	49	25	0	0	0	0	25
030	0.06	2015	25700	0	25	2170	2170	0	0	24	1960	55	25	0	0	0	0	25
7th from H to I																		
031	0.06	1997	21300	0	25	1720	1720	0	0	25	1550	39	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
031	0.06	1999	21800	0	25	1760	1760	0	0	25	1590	40	25	0	0	0	0	25
031	0.06	2015	25700	0	25	2070	2070	0	0	25	1870	47	25	0	0	0	0	25
7th from I to J																		
032	0.06	1997	20600	0	25	1610	1610	0	0	25	1480	32	25	0	0	0	0	25
032	0.06	1999	21000	0	25	1640	1640	0	0	25	1500	33	25	0	0	0	0	25
032	0.06	2015	24600	0	25	1940	1940	0	0	25	1780	39	25	0	0	0	0	25
7th from J to K																		
033	0.06	1997	19800	0	25	1600	1600	0	0	25	1470	29	25	0	0	0	0	25
033	0.06	1999	20200	0	25	1630	1630	0	0	25	1490	30	25	0	0	0	0	25
033	0.06	2015	23500	0	25	1870	1870	0	0	25	1710	34	25	0	0	0	0	25
7th from K to L																		
034	0.06	1997	19200	0	25	1530	1530	0	0	25	1410	24	25	0	0	0	0	25
034	0.06	1999	19700	0	25	1560	1560	0	0	25	1440	24	25	0	0	0	0	25
034	0.06	2015	23000	0	25	1850	1850	0	0	25	1700	29	25	0	0	0	0	25
7th from L to M																		
035	0.13	1997	17900	0	25	1430	1430	0	0	25	1240	20	25	0	0	0	0	25
035	0.13	1999	18300	0	25	1470	1470	0	0	25	1270	20	25	0	0	0	0	25
035	0.13	2015	21700	0	25	1740	1740	0	0	25	1510	24	25	0	0	0	0	25
7th from M to south																		
036	0.13	1997	22300	0	25	1780	1780	0	0	25	1540	35	25	0	0	0	0	25
036	0.13	1999	22800	0	25	1820	1820	0	0	25	1570	36	25	0	0	0	0	25
036	0.13	2015	27100	0	25	2160	2160	0	0	21	1870	43	25	0	0	0	0	25
Morgan west to 6th																		
037	0.03	1997	5700	0	25	470	470	0	0	25	470	37	25	0	0	0	0	25
037	0.03	1999	5900	0	25	480	480	0	0	25	480	37	25	0	0	0	0	25
037	0.03	2015	6900	0	23	570	570	0	0	21	570	44	21	0	0	0	0	25
Morgan 6th to 7th																		
038	0.09	1997	4100	0	25	410	410	0	0	25	400	19	25	0	0	0	0	25
038	0.09	1999	4200	0	25	420	420	0	0	25	410	20	25	0	0	0	0	25
038	0.09	2015	5000	0	25	500	500	0	0	25	480	24	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Jul 29, 1997
UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
Morgan 7th to east																		
039	0.13	1997	3400	0	40	250	250	0	0	40	230	15	40	0	0	0	0	40
039	0.13	1999	3600	0	40	250	250	0	0	40	230	15	40	0	0	0	0	40
039	0.13	2015	3900	0	40	310	310	0	0	40	280	18	40	0	0	0	0	40
Hillcrest west to 6th																		
040	0.14	1997	2600	0	30	180	180	0	0	30	150	2	30	0	0	0	0	30
040	0.14	1999	2600	0	30	190	190	0	0	30	150	2	30	0	0	0	0	30
040	0.14	2015	3000	0	30	210	210	0	0	30	170	2	30	0	0	0	0	30
Hillcrest 6th to 7th																		
041	0.09	1997	4400	0	30	340	340	0	0	30	280	3	30	0	0	0	0	30
041	0.09	1999	4500	0	30	350	350	0	0	30	290	3	30	0	0	0	0	30
041	0.09	2015	5700	0	30	460	460	0	0	24	370	4	30	0	0	0	0	30
Hillcrest 7th to east																		
042	0.14	1997	2900	0	30	200	200	0	0	30	160	2	30	0	0	0	0	30
042	0.14	1999	2900	0	30	210	210	0	0	28	170	2	30	0	0	0	0	30
042	0.14	2015	3500	0	30	250	250	0	0	20	200	2	30	0	0	0	0	30
Midland west to 6th																		
043	0.07	1997	4100	0	25	450	450	0	0	21	390	6	25	0	0	0	0	25
043	0.07	1999	4200	0	25	460	460	0	0	20	400	6	25	0	0	0	0	25
043	0.07	2015	5000	0	22	550	550	0	0	13	480	8	19	0	0	0	0	25
Midland 6th to 7th																		
044	0.12	1997	3700	0	19	360	360	0	0	10	280	5	13	0	0	0	0	25
044	0.12	1999	3800	0	19	370	370	0	0	10	280	5	13	0	0	0	0	25
044	0.12	2015	4500	0	18	430	430	0	0	10	330	6	10	0	0	0	0	25
Savage west to 6th																		
045	0.07	1997	3100	0	35	320	320	0	0	35	310	7	35	0	0	0	0	35
045	0.07	1999	3100	0	35	320	320	0	0	35	310	7	35	0	0	0	0	35
045	0.07	2015	3700	0	35	390	390	0	0	35	380	8	35	0	0	0	0	35
Savage 6th to 7th																		
046	0.09	1997	4900	0	30	540	540	0	0	30	490	10	30	0	0	0	0	30
046	0.09	1999	5000	0	30	560	560	0	0	30	510	11	30	0	0	0	0	30

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ANALYST: Roxann Rivord
CHECKED BY:
FILE: GPNBLD.MDB

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

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UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
046	0.09	2015	6000	0	30	650	650	0	0	27	590	12	30	0	0	0	0	30
Savage 7th to east																		
047	1.60	1997	3700	0	30	390	390	0	0	30	360	8	30	0	0	0	0	30
047	1.60	1999	3800	0	30	400	400	0	0	30	370	8	30	0	0	0	0	30
047	1.60	2015	4500	0	28	470	470	0	0	23	440	9	26	0	0	0	0	30
Manzanita west to 6th																		
048	0.07	1997	2200	0	25	220	220	0	0	22	170	2	25	0	0	0	0	25
048	0.07	1999	2300	0	25	230	230	0	0	20	180	2	25	0	0	0	0	25
048	0.07	2015	2700	0	24	270	270	0	0	14	210	3	24	0	0	0	0	25
Manzanita 6th to 7th																		
049	0.09	1997	2500	0	20	260	260	0	0	10	240	3	10	0	0	0	0	30
049	0.09	1999	2500	0	20	260	260	0	0	10	240	3	10	0	0	0	0	30
049	0.09	2015	3000	0	20	310	310	0	0	10	280	3	10	0	0	0	0	30
Evelyn west to 6th																		
050	0.07	1997	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
050	0.07	1999	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
050	0.07	2015	400	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
Evelyn 6th to 7th																		
051	0.09	1997	1300	0	25	140	140	0	0	25	140	2	25	0	0	0	0	25
051	0.09	1999	1400	0	25	150	150	0	0	25	150	3	25	0	0	0	0	25
051	0.09	2015	1600	0	25	170	170	0	0	25	170	3	25	0	0	0	0	25
Evelyn 7th to east																		
052	0.08	1997	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
052	0.08	1999	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
052	0.08	2015	400	0	20	40	40	0	0	16	40	0	16	0	0	0	0	25
A street west to 6th																		
053	0.07	1997	7200	0	25	800	800	0	0	25	690	10	25	0	0	0	0	25
053	0.07	1999	7300	0	25	820	820	0	0	25	710	11	25	0	0	0	0	25
053	0.07	2015	8700	0	25	960	960	0	0	21	830	12	25	0	0	0	0	25
A street 6th to 7th																		

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TRANSPORTATION PLANNING ANALYSIS UNIT
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PROJECT: 6th and 7th street couplet
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			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
054	0.07	1997	7700	0	25	860	860	0	0	25	720	18	25	0	0	0	0	25
054	0.07	1999	7900	0	25	880	880	0	0	25	730	18	25	0	0	0	0	25
054	0.07	2015	9400	0	25	1040	1040	0	0	20	870	22	25	0	0	0	0	25
A street 7th to east																		
055	0.07	1997	8000	0	25	850	850	0	0	25	710	18	25	0	0	0	0	25
055	0.07	1999	8000	0	25	890	890	0	0	25	740	19	25	0	0	0	0	25
055	0.07	2015	9700	0	25	1020	1020	0	0	21	850	21	25	0	0	0	0	25
D street west to 6th																		
056	0.07	1997	2700	0	25	280	280	0	0	25	260	4	25	0	0	0	0	25
056	0.07	1999	2700	0	25	280	280	0	0	25	260	4	25	0	0	0	0	25
056	0.07	2015	3200	0	25	330	330	0	0	25	310	4	25	0	0	0	0	25
D street 6th to 7th																		
057	0.07	1997	3700	0	25	360	360	0	0	25	350	6	25	0	0	0	0	25
057	0.07	1999	3800	0	25	370	370	0	0	25	360	6	25	0	0	0	0	25
057	0.07	2015	4400	0	25	430	430	0	0	25	420	7	25	0	0	0	0	25
D street 7th to east																		
058	0.07	1997	4100	0	25	410	410	0	0	25	410	5	25	0	0	0	0	25
058	0.07	1999	4200	0	25	420	420	0	0	25	420	5	25	0	0	0	0	25
058	0.07	2015	4900	0	25	490	490	0	0	25	490	6	25	0	0	0	0	25
E street west to 6th																		
059	0.07	1997	3100	0	20	310	310	0	0	20	250	6	20	0	0	0	0	20
059	0.07	1999	3100	0	20	310	310	0	0	20	250	6	20	0	0	0	0	20
059	0.07	2015	3700	0	20	380	380	0	0	20	300	8	20	0	0	0	0	20
E street 6th to 7th																		
060	0.07	1997	5900	0	20	640	640	0	0	20	530	13	20	0	0	0	0	20
060	0.07	1999	6100	0	20	660	660	0	0	20	550	14	20	0	0	0	0	20
060	0.07	2015	7200	0	20	780	780	0	0	20	650	16	20	0	0	0	0	20
E street 7th west																		
061	0.07	1997	5200	0	25	580	580	0	0	25	460	16	25	0	0	0	0	25
061	0.07	1999	5300	0	25	600	600	0	0	25	480	17	25	0	0	0	0	25
061	0.07	2015	6300	0	25	700	700	0	0	25	560	19	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Jul 29, 1997
UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
F street from west to 6th																		
062	0.07	1997	3800	0	20	410	410	0	0	20	340	9	20	0	0	0	0	20
062	0.07	1999	3900	0	20	420	420	0	0	20	350	9	20	0	0	0	0	20
062	0.07	2015	4600	0	20	510	510	0	0	20	430	11	20	0	0	0	0	20
F street from 6th to 7th																		
063	0.07	1997	5100	0	20	550	550	0	0	20	460	11	20	0	0	0	0	20
063	0.07	1999	5200	0	20	570	570	0	0	20	480	12	20	0	0	0	0	20
063	0.07	2015	6300	0	20	670	670	0	0	18	560	14	20	0	0	0	0	20
F street from 7th to east																		
064	0.07	1997	6200	0	25	700	700	0	0	25	580	15	25	0	0	0	0	25
064	0.07	1999	6400	0	25	710	710	0	0	25	590	15	25	0	0	0	0	25
064	0.07	2015	7600	0	25	840	840	0	0	23	700	18	25	0	0	0	0	25
G street from west to 6th																		
065	0.07	1997	9400	0	25	900	900	0	0	25	780	12	25	0	0	0	0	25
065	0.07	1999	9600	0	25	920	920	0	0	25	800	12	25	0	0	0	0	25
065	0.07	2015	11400	0	25	1080	1080	0	0	23	930	14	25	0	0	0	0	25
G street from 6th to 7th																		
066	0.07	1997	7000	0	25	660	660	0	0	25	590	9	25	0	0	0	0	25
066	0.07	1999	7100	0	25	670	670	0	0	25	600	9	25	0	0	0	0	25
066	0.07	2015	8300	0	25	780	780	0	0	24	690	10	25	0	0	0	0	25
G street from 7th to east																		
067	0.14	1997	4200	0	25	430	430	0	0	23	350	6	25	0	0	0	0	25
067	0.14	1999	4300	0	25	440	440	0	0	22	360	6	25	0	0	0	0	25
067	0.14	2015	5000	0	24	510	510	0	0	16	420	7	23	0	0	0	0	25
H street from west to 6th																		
068	0.07	1997	1700	0	25	200	200	0	0	25	200	4	25	0	0	0	0	25
068	0.07	1999	1800	0	25	210	210	0	0	25	210	4	25	0	0	0	0	25
068	0.07	2015	2100	0	25	220	220	0	0	25	220	4	25	0	0	0	0	25
H street from 6th to 7th																		
069	0.07	1997	2500	0	25	240	240	0	0	25	230	4	25	0	0	0	0	25

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ANALYST: Roxann Rivord
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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

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PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
069	0.07	1999	2500	0	25	240	240	0	0	25	230	4	25	0	0	0	0	25
069	0.07	2015	2600	0	25	280	280	0	0	25	270	5	25	0	0	0	0	25
H street from 7th to east																		
070	0.07	1997	1400	0	25	160	160	0	0	25	160	3	25	0	0	0	0	25
070	0.07	1999	1500	0	25	170	170	0	0	25	170	3	25	0	0	0	0	25
070	0.07	2015	1800	0	25	200	200	0	0	25	190	4	25	0	0	0	0	25
I street from west to 6th																		
071	0.07	1997	2500	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
071	0.07	1999	2500	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
071	0.07	2015	2900	0	25	310	310	0	0	25	250	4	25	0	0	0	0	25
I street from 6th to 7th																		
072	0.07	1997	2000	0	25	250	250	0	0	25	220	5	25	0	0	0	0	25
072	0.07	1999	2100	0	25	250	250	0	0	25	220	5	25	0	0	0	0	25
072	0.07	2015	2500	0	25	290	290	0	0	25	250	6	25	0	0	0	0	25
I street from 7th to east																		
073	0.07	1997	2600	0	25	250	250	0	0	25	200	3	25	0	0	0	0	25
073	0.07	1999	2600	0	25	250	250	0	0	25	200	3	25	0	0	0	0	25
073	0.07	2015	2900	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
J street from west to 6th																		
074	0.07	1997	2300	0	25	250	250	0	0	25	200	3	25	0	0	0	0	25
074	0.07	1999	2300	0	25	250	250	0	0	25	200	3	25	0	0	0	0	25
074	0.07	2015	2700	0	25	290	290	0	0	25	230	3	25	0	0	0	0	25
J street from 6th to 7th																		
075	0.07	1997	3300	0	25	360	360	0	0	25	350	6	25	0	0	0	0	25
075	0.07	1999	3400	0	25	370	370	0	0	25	360	6	25	0	0	0	0	25
075	0.07	2015	3800	0	25	440	440	0	0	25	430	7	25	0	0	0	0	25
J street from 7th to east																		
076	0.07	1997	2000	0	25	190	190	0	0	25	150	2	25	0	0	0	0	25
076	0.07	1999	2100	0	25	200	200	0	0	25	160	2	25	0	0	0	0	25
076	0.07	2015	2400	0	25	230	230	0	0	25	180	3	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
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PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 no build 4 lanes, adj. lanes @ M and 6th

PRINTING DATE: Aug 6, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
K street from west to 6th																		
077	0.07	1997	1500	0	25	150	150	0	0	25	120	2	25	0	0	0	0	25
077	0.07	1999	1600	0	25	160	160	0	0	25	130	2	25	0	0	0	0	25
077	0.07	2015	1900	0	25	180	180	0	0	25	140	2	25	0	0	0	0	25
K street from 6th to 7th																		
078	0.07	1997	1500	0	25	150	150	0	0	25	150	2	25	0	0	0	0	25
078	0.07	1999	1600	0	25	160	160	0	0	25	160	2	25	0	0	0	0	25
078	0.07	2015	1900	0	25	190	190	0	0	25	180	2	25	0	0	0	0	25
K street from 7th to east																		
079	0.07	1997	1200	0	25	130	130	0	0	25	100	1	25	0	0	0	0	25
079	0.07	1999	1300	0	25	140	140	0	0	25	110	1	25	0	0	0	0	25
079	0.07	2015	1500	0	25	160	160	0	0	25	130	2	25	0	0	0	0	25
L street from west to 6th																		
080	0.07	1997	2100	0	25	210	210	0	0	25	170	3	25	0	0	0	0	25
080	0.07	1999	2200	0	25	220	220	0	0	25	180	3	25	0	0	0	0	25
080	0.07	2015	2600	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
L street from 6th to 7th																		
081	0.07	1997	2600	0	25	290	290	0	0	25	270	4	25	0	0	0	0	25
081	0.07	1999	2600	0	25	290	290	0	0	25	270	4	25	0	0	0	0	25
081	0.07	2015	2900	0	25	350	350	0	0	25	320	5	25	0	0	0	0	25
L street from 7th to east																		
082	0.07	1997	1400	0	25	150	150	0	0	25	120	2	25	0	0	0	0	25
082	0.07	1999	1500	0	25	160	160	0	0	25	130	2	25	0	0	0	0	25
082	0.07	2015	1800	0	25	190	190	0	0	25	150	2	25	0	0	0	0	25
M from West to 6th																		
083	0.07	1997	11800	0	30	1320	1320	0	0	22	1100	28	30	0	0	0	0	30
083	0.07	1999	12000	0	30	1350	1350	0	0	20	1130	28	29	0	0	0	0	30
083	0.07	2015	14300	0	26	1600	1600	0	0	11	1330	33	21	0	0	0	0	30
M from 6th to 7th																		
084	0.07	1997	9900	0	30	1050	1050	0	0	23	880	22	30	0	0	0	0	30
084	0.07	1999	10200	0	30	1080	1080	0	0	22	900	23	30	0	0	0	0	30

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			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
084	0.07	2015	12000	0	26	1280	1280	0	0	12	1070	27	22	0	0	0	0	30
M street from 7th to east																		
085	0.07	1997	9400	0	30	990	990	0	0	30	860	20	30	0	0	0	0	30
085	0.07	1999	9600	0	30	1020	1020	0	0	29	880	20	30	0	0	0	0	30
085	0.07	2015	11400	0	29	1200	1200	0	0	22	1040	24	28	0	0	0	0	30

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ANALYST: Roxann Rivord
CHECKED BY:
FILE: GPNBLD.MDB

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

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PRINTING DATE: Jul 29, 1997
UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	TRKS	SP	PEAK HOUR VOL	AUTO	MTR	HTR	SP	AVERAGE HOUR VOL	TRKS	SP	PEAK TRUCK HOUR VOL	AUTO	MTR	HTR	SP
6th north of Morgan																		
001	0.06	1999	9600	0	35	880	880	0	0	35	770	51	35	0	0	0	0	35
001	0.06	2015	11200	0	35	1050	1050	0	0	35	920	61	35	0	0	0	0	35
6th from Morgan to Hillcres																		
002	0.27	1999	12500	0	35	1170	1170	0	0	35	1110	63	35	0	0	0	0	35
002	0.27	2015	14600	0	35	1400	1400	0	0	35	1320	75	35	0	0	0	0	35
6th from Hillcrest to Midland																		
003	0.21	1999	14100	0	35	1330	1330	0	0	35	1220	44	35	0	0	0	0	35
003	0.21	2015	16500	0	35	1590	1590	0	0	35	1460	53	35	0	0	0	0	35
6th from Midland to Savage																		
004	0.25	1999	16400	0	35	1630	1630	0	0	35	1530	44	35	0	0	0	0	35
004	0.25	2015	19200	0	35	1950	1950	0	0	35	1830	53	35	0	0	0	0	35
6th from Savage to Manzan																		
005	0.12	1999	17200	0	30	1790	1790	0	0	30	1660	40	30	0	0	0	0	30
005	0.12	2015	20100	0	30	2130	2130	0	0	30	1980	47	30	0	0	0	0	30
6th from Manzanita to Evely																		
006	0.37	1999	16500	0	30	1690	1690	0	0	30	1490	45	30	0	0	0	0	30
006	0.37	2015	19300	0	30	2010	2010	0	0	30	1770	53	30	0	0	0	0	30
6th from Evelyn to A																		
007	0.31	1999	19700	0	30	1750	1750	0	0	26	1580	47	30	0	0	0	0	30
007	0.31	2015	23000	0	26	2090	2090	0	0	17	1890	57	22	0	0	0	0	30
6th from A to D																		
008	0.16	1999	19600	0	25	2050	2050	0	0	25	1770	58	25	0	0	0	0	25
008	0.16	2015	23400	0	25	2440	2440	0	0	23	2100	69	25	0	0	0	0	25
6th from D to E																		
009	0.05	1999	22400	0	25	2050	2050	0	0	25	1760	58	25	0	0	0	0	25
009	0.05	2015	26200	0	25	2440	2440	0	0	25	2090	69	25	0	0	0	0	25
6th from E to F																		
010	0.05	1999	25100	0	25	2380	2380	0	0	25	2040	55	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

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UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	TRKS	SP	PEAK HOUR VOL	AUTO	MTR	HTR	SP	AVERAGE HOUR VOL	TRKS	SP	PEAK TRUCK HOUR VOL	AUTO	MTR	HTR	SP
010	0.05	2015	29200	0	25	2830	2830	0	0	21	2430	66	25	0	0	0	0	25
6th from F to G																		
011	0.09	1999	25500	0	25	2380	2380	0	0	25	2070	45	25	0	0	0	0	25
011	0.09	2015	30400	0	25	2830	2830	0	0	21	2460	54	25	0	0	0	0	25
6th from Gto H																		
012	0.06	1999	21700	0	25	2130	2130	0	0	25	1820	47	25	0	0	0	0	25
012	0.06	2015	25900	0	25	2540	2540	0	0	25	2170	56	25	0	0	0	0	25
6th from H to I																		
013	0.06	1999	21500	0	25	1970	1970	0	0	25	1660	45	25	0	0	0	0	25
013	0.06	2015	25600	0	25	2340	2340	0	0	24	1980	53	25	0	0	0	0	25
6th from I to J																		
014	0.06	1999	20400	0	25	1890	1890	0	0	25	1510	41	25	0	0	0	0	25
014	0.06	2015	24300	0	25	2250	2250	0	0	25	1800	49	25	0	0	0	0	25
6th from J to K																		
015	0.06	1999	20100	0	25	1930	1930	0	0	25	1580	35	25	0	0	0	0	25
015	0.06	2015	23900	0	25	2300	2300	0	0	25	1880	41	25	0	0	0	0	25
6th from K to L																		
016	0.06	1999	19400	0	25	1910	1910	0	0	25	1610	35	25	0	0	0	0	25
016	0.06	2015	22600	0	25	2280	2280	0	0	19	1920	42	25	0	0	0	0	25
6th from L to M																		
017	0.13	1999	19200	0	23	1850	1850	0	0	15	1560	34	21	0	0	0	0	25
017	0.13	2015	22200	0	20	2210	2210	0	0	10	1870	41	14	0	0	0	0	25
6th form M to south																		
018	0.13	1999	27900	0	20	2240	2240	0	0	10	1940	45	16	0	0	0	0	25
018	0.13	2015	34200	0	18	2670	2670	0	0	10	2310	53	10	0	0	0	0	25
7th from north to Morgan																		
019	0.13	1999	8300	0	35	680	680	0	0	35	500	25	35	0	0	0	0	35
019	0.13	2015	9600	0	35	810	810	0	0	35	590	30	35	0	0	0	0	35
7th from Morgan to Hillcres																		

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TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
020	0.29	1999	12000	0	35	1140	1140	0	0	35	960	40	35	0	0	0	0	35
020	0.29	2015	14000	0	35	1360	1360	0	0	35	1150	48	35	0	0	0	0	35
7th from Hillcrest to Midland																		
021	0.21	1999	14200	0	35	1300	1300	0	0	35	1300	40	35	0	0	0	0	35
021	0.21	2015	16600	0	35	1540	1540	0	0	35	1540	48	35	0	0	0	0	35
7th from Midland to Savage																		
022	0.25	1999	15900	0	35	1470	1470	0	0	35	1410	38	35	0	0	0	0	35
022	0.25	2015	18600	0	35	1750	1750	0	0	35	1680	45	35	0	0	0	0	35
7th from Savage to Manzan																		
023	0.12	1999	17000	0	35	1500	1500	0	0	35	1450	33	35	0	0	0	0	35
023	0.12	2015	19900	0	35	1790	1790	0	0	35	1730	40	35	0	0	0	0	35
7th from Manzanita to Evely																		
024	0.13	1999	18300	0	30	1580	1580	0	0	30	1530	37	30	0	0	0	0	30
024	0.13	2015	21400	0	30	1890	1890	0	0	30	1840	44	30	0	0	0	0	30
7th from Evelyn to A																		
025	0.16	1999	19700	0	30	1590	1590	0	0	30	1510	38	30	0	0	0	0	30
025	0.16	2015	24400	0	30	1900	1900	0	0	30	1810	45	30	0	0	0	0	30
7th from A to D																		
026	0.16	1999	21200	0	30	1700	1700	0	0	30	1480	43	30	0	0	0	0	30
026	0.16	2015	24800	0	30	2030	2030	0	0	30	1760	51	30	0	0	0	0	30
7th from D to E																		
027	0.05	1999	21800	0	25	1790	1790	0	0	25	1500	37	25	0	0	0	0	25
027	0.05	2015	25500	0	25	2130	2130	0	0	25	1780	45	25	0	0	0	0	25
7th from E to F																		
028	0.05	1999	22100	0	25	1890	1890	0	0	25	1620	36	25	0	0	0	0	25
028	0.05	2015	25800	0	25	2250	2250	0	0	25	1920	42	25	0	0	0	0	25
7th from F to G																		
029	0.09	1999	22400	0	25	1890	1890	0	0	25	1670	50	25	0	0	0	0	25
029	0.09	2015	26200	0	25	2250	2250	0	0	25	1990	60	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
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PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

PRINTING DATE: Jul 29, 1997
UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
7th from G to H																		
030	0.06	1999	20900	0	25	1760	1760	0	0	25	1590	44	25	0	0	0	0	25
030	0.06	2015	24900	0	25	2100	2100	0	0	25	1900	53	25	0	0	0	0	25
7th from H to I																		
031	0.06	1999	20900	0	25	1700	1700	0	0	25	1530	38	25	0	0	0	0	25
031	0.06	2015	25000	0	25	2030	2030	0	0	25	1830	46	25	0	0	0	0	25
7th from I to J																		
032	0.06	1999	20300	0	25	1620	1620	0	0	25	1490	33	25	0	0	0	0	25
032	0.06	2015	24200	0	25	1930	1930	0	0	25	1770	39	25	0	0	0	0	25
7th from J to K																		
033	0.06	1999	18900	0	25	1580	1580	0	0	25	1450	29	25	0	0	0	0	25
033	0.06	2015	22200	0	25	1890	1890	0	0	25	1730	35	25	0	0	0	0	25
7th from K to L																		
034	0.06	1999	18700	0	25	1520	1520	0	0	25	1400	24	25	0	0	0	0	25
034	0.06	2015	21900	0	25	1810	1810	0	0	25	1670	28	25	0	0	0	0	25
7th from L to M																		
035	0.13	1999	17500	0	25	1420	1420	0	0	25	1230	20	25	0	0	0	0	25
035	0.13	2015	20800	0	25	1690	1690	0	0	25	1460	23	25	0	0	0	0	25
7th from M to south																		
036	0.13	1999	22200	0	25	1770	1770	0	0	25	1530	35	25	0	0	0	0	25
036	0.13	2015	26000	0	25	2110	2110	0	0	22	1830	42	25	0	0	0	0	25
Morgan west to 6th																		
037	0.03	1999	5800	0	25	480	480	0	0	25	480	37	25	0	0	0	0	25
037	0.03	2015	6900	0	23	570	570	0	0	21	570	44	21	0	0	0	0	25
Morgan 6th to 7th																		
038	0.09	1999	4200	0	25	410	410	0	0	25	400	19	25	0	0	0	0	25
038	0.09	2015	4900	0	25	490	490	0	0	25	480	23	25	0	0	0	0	25
Morgan 7th to east																		
039	0.13	1999	3300	0	40	260	260	0	0	40	240	15	40	0	0	0	0	40

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TRANSPORTATION PLANNING ANALYSIS UNIT
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LOCATION: Grants Pass
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UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
039	0.13	2015	3900	0	40	310	310	0	0	40	280	18	40	0	0	0	0	40
Hillcrest west to 6th																		
040	0.14	1999	2500	0	30	180	180	0	0	30	150	2	30	0	0	0	0	30
040	0.14	2015	3000	0	30	220	220	0	0	30	180	2	30	0	0	0	0	30
Hillcrest 6th to 7th																		
041	0.09	1999	4400	0	30	390	390	0	0	30	320	3	30	0	0	0	0	30
041	0.09	2015	5200	0	30	460	460	0	0	30	370	4	30	0	0	0	0	30
Hillcrest 7th to east																		
042	0.14	1999	2900	0	30	210	210	0	0	30	170	2	30	0	0	0	0	30
042	0.14	2015	3300	0	30	250	250	0	0	30	200	2	30	0	0	0	0	30
Midland west to 6th																		
043	0.07	1999	3900	0	25	430	430	0	0	25	370	6	25	0	0	0	0	25
043	0.07	2015	4600	0	25	520	520	0	0	25	450	7	25	0	0	0	0	25
Midland 6th to 7th																		
044	0.12	1999	3500	0	25	340	340	0	0	25	260	5	25	0	0	0	0	25
044	0.12	2015	4100	0	25	410	410	0	0	25	310	6	25	0	0	0	0	25
Savage west to 6th																		
045	0.07	1999	2900	0	35	300	300	0	0	35	290	6	35	0	0	0	0	35
045	0.07	2015	3300	0	35	350	350	0	0	35	340	7	35	0	0	0	0	35
Savage 6th to 7th																		
046	0.09	1999	4900	0	30	530	530	0	0	30	480	10	30	0	0	0	0	30
046	0.09	2015	5700	0	30	640	640	0	0	27	580	12	30	0	0	0	0	30
Savage 7th to east																		
047	1.60	1999	3300	0	30	340	340	0	0	30	320	7	30	0	0	0	0	30
047	1.60	2015	3900	0	30	410	410	0	0	30	380	8	30	0	0	0	0	30
Manzanita west to 6th																		
048	0.07	1999	2200	0	25	220	220	0	0	22	170	2	25	0	0	0	0	25
048	0.07	2015	2600	0	25	260	260	0	0	16	200	3	25	0	0	0	0	25
Manzanita 6th to 7th																		

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SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
049	0.09	1999	2500	0	20	250	250	0	0	10	230	3	10	0	0	0	0	30
049	0.09	2015	2900	0	20	290	290	0	0	10	260	3	10	0	0	0	0	30
Evelyn west to 6th																		
050	0.07	1999	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
050	0.07	2015	400	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
Evelyn 6th to 7th																		
051	0.09	1999	1300	0	25	140	140	0	0	25	140	2	25	0	0	0	0	25
051	0.09	2015	1500	0	25	170	170	0	0	25	170	3	25	0	0	0	0	25
Evelyn 7th to east																		
052	0.08	1999	300	0	25	30	30	0	0	25	30	0	25	0	0	0	0	25
052	0.08	2015	400	0	20	40	40	0	0	16	40	0	16	0	0	0	0	25
A street west to 6th																		
053	0.07	1999	7400	0	25	820	820	0	0	25	710	11	25	0	0	0	0	25
053	0.07	2015	8600	0	25	980	980	0	0	22	850	13	25	0	0	0	0	25
A street 6th to 7th																		
054	0.07	1999	7900	0	25	890	890	0	0	25	740	19	25	0	0	0	0	25
054	0.07	2015	9300	0	25	1060	1060	0	0	19	880	22	25	0	0	0	0	25
A street 7th to east																		
055	0.07	1999	8200	0	25	870	870	0	0	25	730	18	25	0	0	0	0	25
055	0.07	2015	9500	0	25	1040	1040	0	0	20	870	22	25	0	0	0	0	25
D street west to 6th																		
056	0.07	1999	2700	0	25	290	290	0	0	25	270	4	25	0	0	0	0	25
056	0.07	2015	3200	0	25	340	340	0	0	25	320	4	25	0	0	0	0	25
D street 6th to 7th																		
057	0.07	1999	3800	0	25	370	370	0	0	25	360	6	25	0	0	0	0	25
057	0.07	2015	4400	0	25	440	440	0	0	25	430	7	25	0	0	0	0	25
D street 7th to east																		
058	0.07	1999	4200	0	25	410	410	0	0	25	410	5	25	0	0	0	0	25
058	0.07	2015	4900	0	25	490	490	0	0	25	490	6	25	0	0	0	0	25

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TRANSPORTATION PLANNING ANALYSIS UNIT
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			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
E street west to 6th																		
059	0.07	1999	3000	0	20	310	310	0	0	20	250	6	20	0	0	0	0	20
059	0.07	2015	3500	0	20	370	370	0	0	20	290	7	20	0	0	0	0	20
E street 6th to 7th																		
060	0.07	1999	6000	0	20	660	660	0	0	20	550	14	20	0	0	0	0	20
060	0.07	2015	7000	0	20	780	780	0	0	19	650	16	20	0	0	0	0	20
E street 7th west																		
061	0.07	1999	5200	0	25	570	570	0	0	25	450	16	25	0	0	0	0	25
061	0.07	2015	6100	0	25	680	680	0	0	25	540	19	25	0	0	0	0	25
F street from west to 6th																		
062	0.07	1999	3800	0	20	410	410	0	0	20	340	9	20	0	0	0	0	20
062	0.07	2015	4400	0	20	490	490	0	0	20	410	10	20	0	0	0	0	20
F street from 6th to 7th																		
063	0.07	1999	5100	0	20	560	560	0	0	20	470	12	20	0	0	0	0	20
063	0.07	2015	6000	0	20	660	660	0	0	18	550	14	20	0	0	0	0	20
F street from 7th to east																		
064	0.07	1999	6200	0	25	680	680	0	0	25	570	14	25	0	0	0	0	25
064	0.07	2015	7300	0	25	810	810	0	0	25	680	17	25	0	0	0	0	25
G street from west to 6th																		
065	0.07	1999	9500	0	25	900	900	0	0	25	780	12	25	0	0	0	0	25
065	0.07	2015	11100	0	25	1070	1070	0	0	24	930	14	25	0	0	0	0	25
G street from 6th to 7th																		
066	0.07	1999	6900	0	25	660	660	0	0	25	590	9	25	0	0	0	0	25
066	0.07	2015	8000	0	25	780	780	0	0	25	690	10	25	0	0	0	0	25
G street from 7th to east																		
067	0.14	1999	4200	0	25	430	430	0	0	23	350	6	25	0	0	0	0	25
067	0.14	2018	4900	0	24	510	510	0	0	16	420	7	23	0	0	0	0	25
H street from west to 6th																		
068	0.07	1999	1700	0	25	200	200	0	0	25	200	4	25	0	0	0	0	25

ABBREVIATION: SECT = SECTION NUMBER
VOL = TOTAL VOLUME
MTR = MEDIUM TRUCK VOLUM
SP = SPEED OF VEHICLE
AUTO = AUTOMOBILE VOLUME
HTR = HEAVY TRUCK VOLUME

ANALYST: Roxann Rivord
CHECKED BY: ________________
FILE: FINBLD.MDB

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

PRINTING DATE: Jul 29, 1997
UNIT: English

SECT	DIST	YEAR	AVERAGE DAY VOL	AVERAGE DAY TRKS	AVERAGE DAY SP	PEAK HOUR VOL	PEAK HOUR AUTO	PEAK HOUR MTR	PEAK HOUR HTR	PEAK HOUR SP	AVERAGE HOUR VOL	AVERAGE HOUR TRKS	AVERAGE HOUR SP	PEAK TRUCK HOUR VOL	PEAK TRUCK HOUR AUTO	PEAK TRUCK HOUR MTR	PEAK TRUCK HOUR HTR	PEAK TRUCK HOUR SP
068	0.07	2015	2000	0	25	240	240	0	0	25	240	4	25	0	0	0	0	25
H street from 6th to 7th																		
069	0.07	1999	2100	0	25	210	210	0	0	25	200	4	25	0	0	0	0	25
069	0.07	2015	2500	0	25	250	250	0	0	25	240	5	25	0	0	0	0	25
H street from 7th to east																		
070	0.07	1999	1400	0	25	150	150	0	0	25	150	3	25	0	0	0	0	25
070	0.07	2015	1600	0	25	180	180	0	0	25	170	3	25	0	0	0	0	25
I street from west to 6th																		
071	0.07	1999	2500	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
071	0.07	2015	2900	0	25	310	310	0	0	25	250	4	25	0	0	0	0	25
I street from 6th to 7th																		
072	0.07	1999	2100	0	25	250	250	0	0	25	220	5	25	0	0	0	0	25
072	0.07	2015	2600	0	25	290	290	0	0	25	250	6	25	0	0	0	0	25
I street from 7th to east																		
073	0.07	1999	2500	0	25	140	140	0	0	25	110	2	25	0	0	0	0	25
073	0.07	2015	2900	0	25	170	170	0	0	25	140	2	25	0	0	0	0	25
J street from west to 6th																		
074	0.07	1999	2500	0	25	250	250	0	0	25	200	3	25	0	0	0	0	25
074	0.07	2015	2800	0	25	300	300	0	0	25	240	4	25	0	0	0	0	25
J street from 6th to 7th																		
075	0.07	1999	3300	0	25	390	390	0	0	25	380	6	25	0	0	0	0	25
075	0.07	2015	3900	0	25	460	460	0	0	25	450	7	25	0	0	0	0	25
J street from 7th to east																		
076	0.07	1999	2100	0	25	200	200	0	0	25	160	2	25	0	0	0	0	25
076	0.07	2015	2500	0	25	240	240	0	0	25	190	3	25	0	0	0	0	25
K street from west to 6th																		
077	0.07	1999	1600	0	25	150	150	0	0	25	120	2	25	0	0	0	0	25
077	0.07	2015	1800	0	25	180	180	0	0	25	140	2	25	0	0	0	0	25
K street from 6th to 7th																		

ABBREVIATION: SECT = SECTION NUMBER; VOL = TOTAL VOLUME; MTR = MEDIUM TRUCK VOLUM; SP = SPEED OF VEHICLE; AUTO = AUTOMOBILE VOLUME; HTR = HEAVY TRUCK VOLUME

ANALYST: Roxann Rivord
CHECKED BY: ____________
FILE: FINBLD.MDB

TRANSPORTATION PLANNING ANALYSIS UNIT
EIS TRAFFIC DATA

PROJECT: 6th and 7th street couplet
LOCATION: Grants Pass
ALTERNATIVE: 2018 build - 3 lanes CAC improvements

PAGE: 9
PRINTING DATE: Jul 29, 1997
UNIT: English

			AVERAGE DAY			PEAK HOUR					AVERAGE HOUR			PEAK TRUCK HOUR				
SECT	DIST	YEAR	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP	VOL	TRKS	SP	VOL	AUTO	MTR	HTR	SP
078	0.07	1999	1600	0	25	160	160	0	0	25	160	2	25	0	0	0	0	25
078	0.07	2015	1800	0	25	190	190	0	0	25	180	2	25	0	0	0	0	25
K street from 7th to east																		
079	0.07	1999	1200	0	25	120	120	0	0	25	90	1	25	0	0	0	0	25
079	0.07	2015	1400	0	25	150	150	0	0	25	120	2	25	0	0	0	0	25
L street from west to 6th																		
080	0.07	1999	2200	0	25	220	220	0	0	25	180	3	25	0	0	0	0	25
080	0.07	2015	2600	0	25	260	260	0	0	25	210	3	25	0	0	0	0	25
L street from 6th to 7th																		
081	0.07	1999	2500	0	25	290	290	0	0	25	270	4	25	0	0	0	0	25
081	0.07	2015	2900	0	25	340	340	0	0	25	310	4	25	0	0	0	0	25
L street from 7th to east																		
082	0.07	1999	1500	0	25	160	160	0	0	25	130	2	25	0	0	0	0	25
082	0.07	2015	1700	0	25	190	190	0	0	25	150	2	25	0	0	0	0	25
M from west to 6th																		
083	0.07	1999	11500	0	28	1300	1300	0	0	17	1080	27	27	0	0	0	0	30
083	0.07	2015	13500	0	24	1540	1540	0	0	10	1280	32	18	0	0	0	0	30
M from 6th to 7th																		
084	0.07	1999	9700	0	30	1040	1040	0	0	23	870	22	30	0	0	0	0	30
084	0.07	2015	11400	0	27	1240	1240	0	0	14	1030	26	24	0	0	0	0	30
M from 7th to east																		
085	0.07	1999	9200	0	30	970	970	0	0	30	840	19	30	0	0	0	0	30
085	0.07	2015	10800	0	30	1140	1140	0	0	24	990	23	30	0	0	0	0	30

ABBREVIATION: SECT = SECTION NUMBER; VOL = TOTAL VOLUME; MTR = MEDIUM TRUCK VOLUM; SP = SPEED OF VEHICLE; AUTO = AUTOMOBILE VOLUME; HTR = HEAVY TRUCK VOLUME

ANALYST: Roxann Rivord
CHECKED BY: ____________
FILE: FINBLD.MDB

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	____ sec.
North to South	____ sec.
North to West	____ sec.
South to West	18.4 sec.
South to North	18.4 sec.
South to East	18.4 sec.

East - West

	Red Time
West to North	51.6 sec.
East to South	____ sec.
West to East	51.6 sec.
East to West	51.6 sec.
West to South	____ sec.
East to North	51.6 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	~~_____ sec.~~
North to South	~~_____ sec.~~
North to West	~~_____ sec.~~
South to West	18.0 sec.
South to North	18.0 sec.
South to East	18.0 sec.

East - West

	Red Time
West to North	~~_____ sec.~~
East to South	52.0 sec.
West to East	52.0 sec.
East to West	52.0 sec.
West to South	52.0 sec.
East to North	~~_____ sec.~~

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	____ sec.
North to South	____ sec.
North to West	____ sec.
South to West	27.1 sec.
South to North	27.1 sec.
South to East	27.1 sec.

East - West

	Red Time
West to North	42.9 sec.
East to South	____ sec.
West to East	42.9 sec.
East to West	42.9 sec.
West to South	____ sec.
East to North	42.9 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	____ sec.
North to South	____ sec.
North to West	____ sec.
South to West	27.4 sec.
South to North	27.4 sec.
South to East	27.4 sec.

East - West

	Red Time
West to North	42.6 sec.
East to South	____ sec.
West to East	42.6 sec.
East to West	42.6 sec.
West to South	____ sec.
East to North	42.6 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 2015

Project: 6th and 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) ~~8~~ 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	13.6 sec.
North to South	13.6 sec.
North to West	13.6 sec.
South to West	____ sec.
South to North	____ sec.
South to East	____ sec.

East - West

	Red Time
West to North	____ sec.
East to South	56.4 sec.
West to East	56.4 sec.
East to West	56.4 sec.
West to South	56.4 sec.
East to North	____ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	15.0 sec.
North to South	15.0 sec.
North to West	15.0 sec.
South to West	___ sec.
South to North	___ sec.
South to East	___ sec.

East - West

	Red Time
West to North	___ sec.
East to South	55.0 sec.
West to East	55.0 sec.
East to West	55.0 sec.
West to South	55.0 sec.
East to North	___ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 12 seconds/cycle

North - South

	Red Time
North to East	26.3 sec.
North to South	26.3 sec.
North to West	26.3 sec.
South to West	____ sec.
South to North	____ sec.
South to East	____ sec.

East - West

	Red Time
West to North	____ sec.
East to South	58.5 sec.
West to East	55.3 sec.
East to West	47.7 ~~55.3~~ sec.
West to South	55.3 sec.
East to North	____ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	21.4 sec.
North to South	21.4 sec.
North to West	21.4 sec.
~~South to West~~	___ sec.
~~South to North~~	___ sec.
~~South to East~~	___ sec.

East - West

	Red Time
~~West to North~~	___ sec.
East to South	48.6 sec.
West to East	48.6 sec.
East to West	48.6 sec.
West to South	48.6 sec.
~~East to North~~	___ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: 6

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
~~North to East~~	___ sec.
~~North to South~~	___ sec.
~~North to West~~	___ sec.
South to West	30.1 sec.
South to North	30.1 sec.
South to East	30.1 sec.

East - West

	Red Time
West to North	39.9 sec.
~~East to South~~	___ sec.
West to East	39.9 sec.
East to West	39.9 sec.
~~West to South~~	___ sec.
East to North	39.9 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

North to East	North to South	North to West
Red Time ___ sec.	Red Time ___ sec.	Red Time ___ sec.

South to West	South to North	South to East
Red Time 28.7 sec.	Red Time 28.7 sec.	Red Time 28.7 sec.

East - West

West to North	East to South
Red Time 41.3 sec.	Red Time ___ sec.

West to East	East to West
Red Time 41.3 sec.	Red Time 41.3 sec.

West to South	East to North
Red Time ___ sec.	Red Time 41.3 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1997

Project: 6th & 7th street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

North to East	North to South	North to West
Red Time ____ sec.	Red Time ____ sec.	Red Time ____ sec.

South to West	South to North	South to East
Red Time 28.8 sec.	Red Time 28.8 sec.	Red Time 28.8 sec.

East - West

West to North	East to South
Red Time 41.2 sec.	Red Time ____ sec.

West to East	East to West
Red Time 41.2 sec.	Red Time 41.2 sec.

West to South	East to North
Red Time ____ sec.	Red Time 41.2 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	28.1 ~~28.9~~ sec.
North to South	28.1 ~~37.9~~ sec.
North to West	28.1 ~~37.9~~ sec.
South to West	____ sec.
South to North	____ sec.
South to East	____ sec.

East - West

	Red Time
West to North	____ sec.
East to South	41.9 sec.
West to East	41.9 sec.
East to West	41.9 sec.
West to South	41.9 sec.
East to North	____ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	28.4 sec.
North to South	28.4 sec.
North to West	28.4 sec.
~~South to West~~	~~sec.~~
~~South to North~~	~~sec.~~
~~South to East~~	~~sec.~~

East - West

	Red Time
~~West to North~~	~~sec.~~
East to South	41.6 sec.
West to East	41.6 sec.
East to West	41.6 sec.
West to South	41.6 sec.
~~East to North~~	~~sec.~~

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1997

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: G

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	28.3 sec.
North to South	28.3 sec.
North to West	28.3 sec.
South to West	~~sec.~~
South to North	~~sec.~~
South to East	~~sec.~~

East - West

	Red Time
West to North	~~sec.~~
East to South	41.7 sec.
West to East	41.7 sec.
East to West	41.7 sec.
West to South	41.7 sec.
East to North	~~sec.~~

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO - BUILD 1997

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	18.5 sec.
North to South	18.5 sec.
North to West	18.5 sec.
South to West	sec.
South to North	sec.
South to East	sec.

East - West

	Red Time
West to North	sec.
East to South	51.5 sec.
West to East	51.5 sec.
East to West	51.5 sec.
West to South	51.5 sec.
East to North	sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1999

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

North to East	North to South	North to West
Red Time 18.2 sec.	Red Time 18.2 sec.	Red Time 18.2 sec.

South to West	South to North	South to East
Red Time ~~51.8~~ sec.	Red Time ~~51.8~~ sec.	Red Time ____ sec.

East - West

West to North	East to South
Red Time ____ sec.	Red Time 51.8 sec.

West to East	East to West
Red Time 51.8 sec.	Red Time 51.8 sec.

West to South	East to North
Red Time 51.8 sec.	Red Time ____ sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 6th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	16.7 sec.
North to South	16.7 sec.
North to West	16.7 sec.
~~South to West~~	~~____ sec.~~
~~South to North~~	~~____ sec.~~
~~South to East~~	~~____ sec.~~

East - West

	Red Time
~~West to North~~	~~____ sec.~~
East to South	53.3 sec.
West to East	53.3 sec.
East to West	53.3 sec.
West to South	53.3 sec.
~~East to North~~	~~____ sec.~~

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 2015

Project: 6th & 7th Street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

	Red Time
North to East	___ sec.
North to South	___ sec.
North to West	___ sec.
South to West	20.7 sec.
South to North	20.7 sec.
South to East	20.7 sec.

East - West

	Red Time
West to North	49.3 sec.
East to South	___ sec.
West to East	49.3 sec.
East to West	49.3 sec.
West to South	___ sec.
East to North	49.3 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1999

Project: 6th & 7th street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

North to East	North to South	North to West
Red Time ____ sec.	Red Time ____ sec.	Red Time ____ sec.

South to West	South to North	South to East
Red Time 20.0 sec.	Red Time 20.0 sec.	Red Time 20.0 sec.

East - West

West to North	East to South
Red Time 50.0 sec.	Red Time ____ sec.

West to East	East to West
Red Time 50.0 sec.	Red Time 50.0 sec.

West to South	East to North
Red Time ____ sec.	Red Time 50.0 sec.

Transportation Development Branch

Planning Section - Transportation Planning Analysis Unit

Signalized Intersection Data

NO-BUILD 1997

Project: 6th & 7th street Couplet

Location: Grants Pass

Intersection Street Names

North - South: 7th

West - East: H

Analyst: Roxann Rivord Date: 7/31/97

Signal Timing Information

Average Cycle Length 70 seconds

Clearance Time Lost (Amber) 4 seconds/phase

Total Lost Time (Amber) 8 seconds/cycle

North - South

North to East	North to South	North to West
Red Time ~~___ sec.~~	Red Time ~~___ sec.~~	Red Time ~~___ sec.~~

South to West	South to North	South to East
Red Time 20.3 sec.	Red Time 20.3 sec.	Red Time 20.3 sec.

East - West

West to North	East to South
Red Time 49.7 sec.	Red Time ~~___ sec.~~

West to East	East to West
Red Time 49.7 sec.	Red Time 49.7 sec.

West to South	East to North
Red Time ~~___ sec.~~	Red Time 49.7 sec.

APPENDIX A

LEVEL OF SERVICE DESIGN CRITERIA

The concept of Level of Service (LOS) is a qualitative measure of the ratio between the volume of the roadway to the capacity. This ratio is known as the Volume to Capacity (V/C) ratio. The V/C ratios are broken down into six levels and each level is assigned a letter designation. The letter designations are from "A" to "F" with "A" being the most desirable and "F" being the least desirable. Table 1 describes the LOS designations for signalized intersections.

TABLE 1
Level of Service Designations for Signalized Intersections

Level of Service	Traffic Flow	Comments	Maneuverability
A Desirable	Free	Traffic flows freely with no delays.	Drivers can maneuver easily and find freedom in operation.
B Desirable	Stable	Traffic still flows smoothly with few delays.	Some drivers feel somewhat restricted within groups of vehicles.
C Desirable	Stable	Traffic generally flows smoothly but occasionally vehicles may be delayed through one signal cycle. Desired urban area design level.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D Acceptable	Approaching Unstable	Traffic delays may be more than one signal cycle during peak hours but excessive back-ups do not occur. Considered acceptable urban area design level.	Maneuverability is limited during short peak periods due to temporary back-ups.
E Unsatisfactory	Unstable	Delay may be great and up to several signals cycles. Short periods of this level may be tolerated during peak hours.	There are typically long queues of vehicles waiting to enter the intersection.
F Unsatisfactory	Forced	Excessive delay causes reduced capacity. Always considered unsatisfactory. May be tolerated in recreational areas where occurrence is rare.	Traffic is backed up from other locations and may prevent movement of vehicles at the intersection.

LEVEL OF SERVICE DESIGNATION FOR UNSIGNALIZED INTERSECTIONS

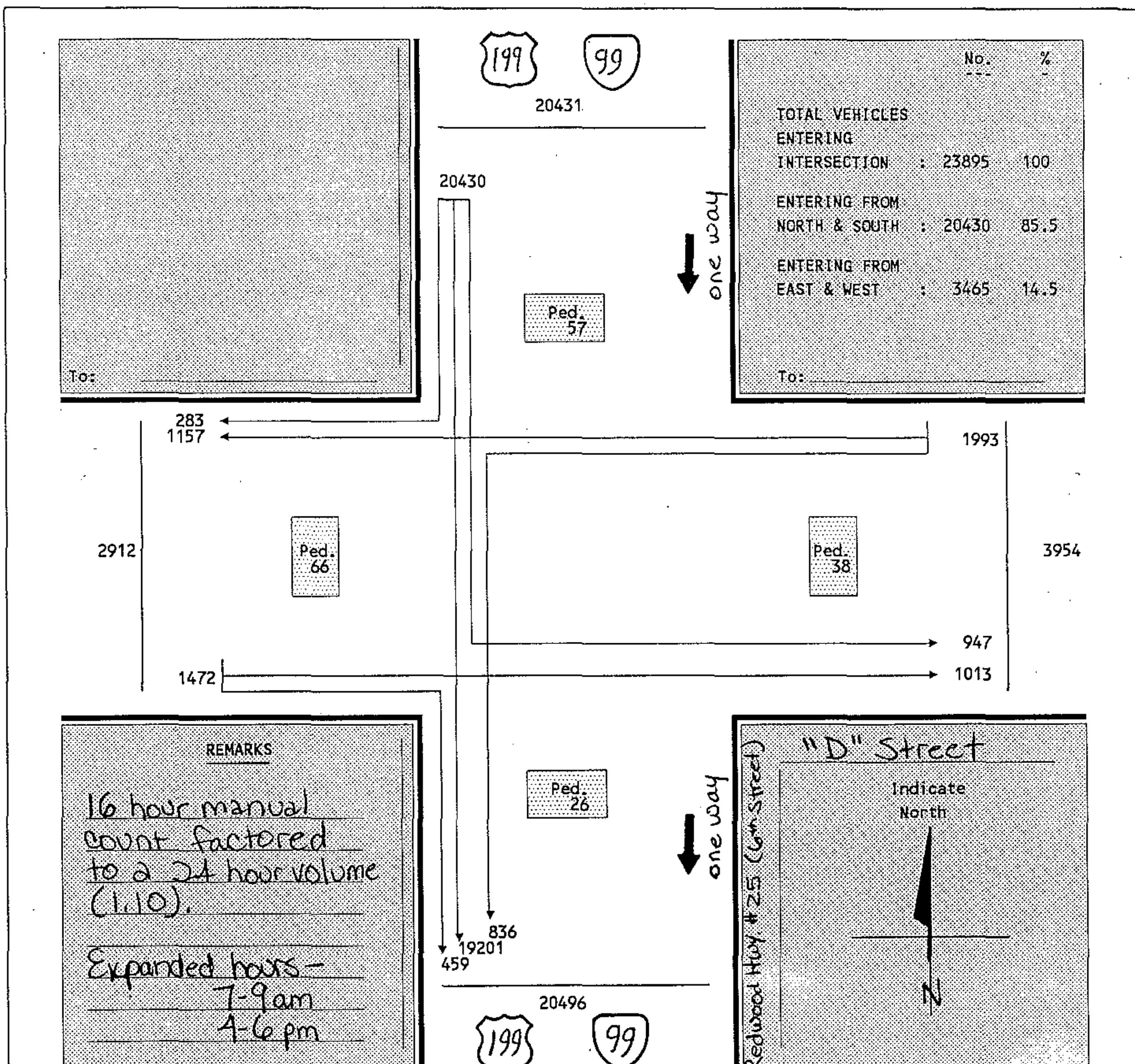
Peak hour volumes at unsignalized intersections were analyzed to determine a level of service (LOS) for each location. The concept of level of service is a quantitative measure using the Reserve Capacity of the intersection. Reserve Capacity is equal to the capacity of a lane at an unsignalized intersection minus the demand volume for that lane. The Reserve Capacities are broken down into six levels and each level is given a letter designation, from A through F, for identification purposes. The level of service designation "A" represents the best level of service while "F" is the worst. All volumes are stated in passenger cars per hour (pcph). The table below shows the LOS designations for unsignalized intersections.

Level of Service Designations for Unsignalized Intersections

Level of Service	Comments	Reserve Capacity
A Desirable	Little or no traffic delays.	Reserve Capacity is greater than 400 pcph.
B Desirable	Short traffic delays.	Reserve Capacity is between 300 and 399 pcph.
C Desirable	Average traffic delays.	Reserve Capacity is between 200 and 299 pcph.
D Acceptable	Long Traffic delays.	Reserve Capacity is between 100 and 199 pcph.
E Tolerable	Very long traffic delays.	Reserve Capacity is between 99 and 0 pcph.
F Unsatisfactory	Extreme traffic delays. Demand volume has exceeded lane capacity, and queuing may cause congestion affecting other traffic movements in the intersection.	No Reserve Capacity.

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : 8/16 & 18/1993	CITY or COUNTY : GRANTS PASS
DAY WEEK : MON.(PM), WED.(AM)	INTERSECTION OF: REDWOOD HWY. #25 (6TH ST.-US199-ORE99)(ONE-WAY COUPLET SB)
ACT COUNT: 16	@ "D" STREET
HRS COUNT: 16, 6:00 AM - 10:00 PM	
PED COUNT: 16	MILE POST: X0.99 (HWY. #25)
HRS COUNT: 16, 6:00 AM - 10:00 PM	CLASSIFICATION : All vehicles
WEATHER : CLEAR/CLOUDY	



*NOTE - ON DIRECTIONS N-E, N-W + N-S, COUNTER COUNTED 11:00-12:30 (under 11:00-12:00)

#17-16 KM

9-8-93

Dgm_1716

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : 8/16 & 18/1993 DAY : MON.(PM), WED.(AM) COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 16, 6:00 AM - 10:00 PM WEATHER: CLEAR/CLOUDY INTERSECTION OF: REDWOOD HWY. #25 (6TH ST.-US199-ORE99)(ONE-WAY COUPLET SB)
@ "D" STREET
Tab by: Chk. by: MILE POST : X0.99 (HWY. #25)

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A	7	294	2		12	17					18	4	354	303	85.6	51	14.4	303	29		22
07:00-08:00A	15	597	11		21	59					45	15	763	623	81.7	140	18.3	623	80		60
08:00-09:00A	51	748	19		35	63					63	25	1004	818	81.5	186	18.5	818	98		88
09:00-10:00A	60	1173	19		37	63					56	39	1447	1252	86.5	195	13.5	1252	100		95
10:00-11:00A	66	1152	23		51	47					50	20	1409	1241	88.1	168	11.9	1241	98		70
11:00-12:00A	108	2054	27		49	66					89	27	2420	2189	90.5	231	9.5	2189	115		116
12:00-01:00P	44	716	16		77	112					91	33	1089	776	71.3	313	28.7	776	189		124
01:00-02:00P	79	1499	34		73	104					79	43	1911	1612	84.4	299	15.6	1612	177		122
02:00-03:00P	82	1427	22		89	84					58	31	1793	1531	85.4	262	14.6	1531	173		89
03:00-04:00P	72	1610	25		79	100					69	50	2005	1707	85.1	298	14.9	1707	179		119
04:00-05:00P	78	1700	25		74	73					89	43	2082	1803	86.6	279	13.4	1803	147		132
05:00-06:00P	59	1498	12		46	91					72	34	1812	1569	86.6	243	13.4	1569	137		106
06:00-07:00P	51	950	11		39	54					56	20	1181	1012	85.7	169	14.3	1012	93		76
07:00-08:00P	35	710	6		30	41					37	18	877	751	85.6	126	14.4	751	71		55
08:00-09:00P	29	740	1		24	44					33	10	881	770	87.4	111	12.6	770	68		43
09:00-10:00P	25	587	4		24	34					16	5	695	616	88.6	79	11.4	616	58		21
TOTAL COUNT	861	17455	257		760	1052					921	417	21723	18573	85.5	3150	14.5	18573	1812		1338
24HR FACTOR	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10									
24HR VOLUME	947	19201	283		836	1157					1013	459	23896	20430	85.5	3465	14.5	20430	1993		1472

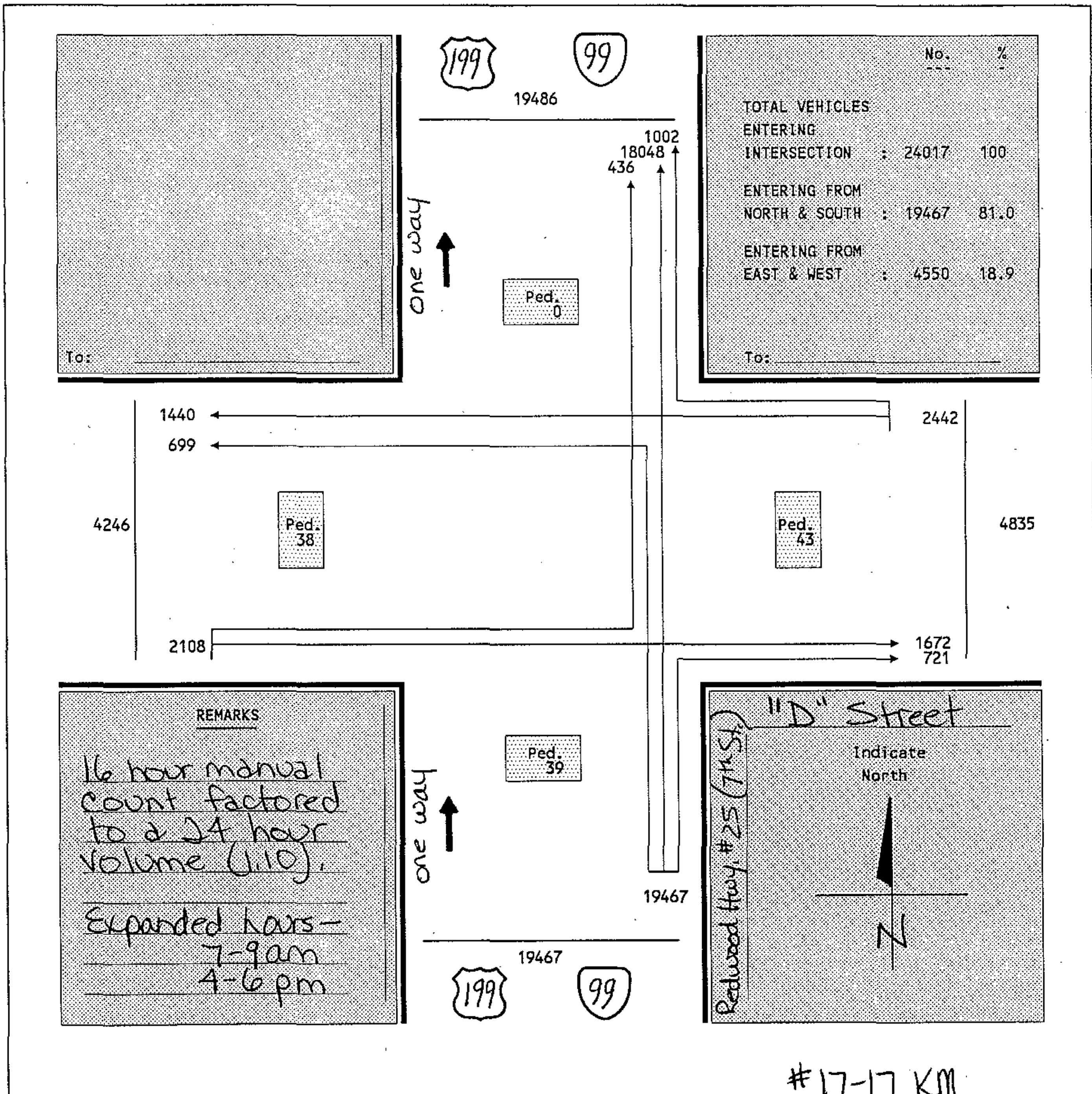
North and South is: REDWOOD HWY. #25 (6TH ST.-US199-ORE99)(ONE-WAY COUPLET SB) East and West is: "D" STREET

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : 8/23 & 25/1993
DAY WEEK : MON.(PM), WED.(AM)
ACT COUNT: 16
HRS COUNT: 16, 6:00 AM - 10:00 PM
PED COUNT: 16
HRS COUNT: 16, 6:00 AM - 10:00 PM
WEATHER : CLEAR

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. #25 (7TH ST.-US199-ORE99)(ONE WAY COUPLET NB)
@ "D" STREET

MILE POST: X1.04N (HWY. #25)
CLASSIFICATION : All vehicles



#17-17 KM

9-8-93

Dgm_1717

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : 8/23 & 25/1993 DAY : MON.(PM), WED.(AM) COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 16, 6:00 AM - 10:00 PM WEATHER: CLEAR INTERSECTION OF: REDWOOD HWY. #25 (7TH ST.-US199-ORE99)(ONE WAY COUPLET NB)
@ "D" STREET
Tab by: Chk. by: MILE POST : X1.04N (HWY. #25)

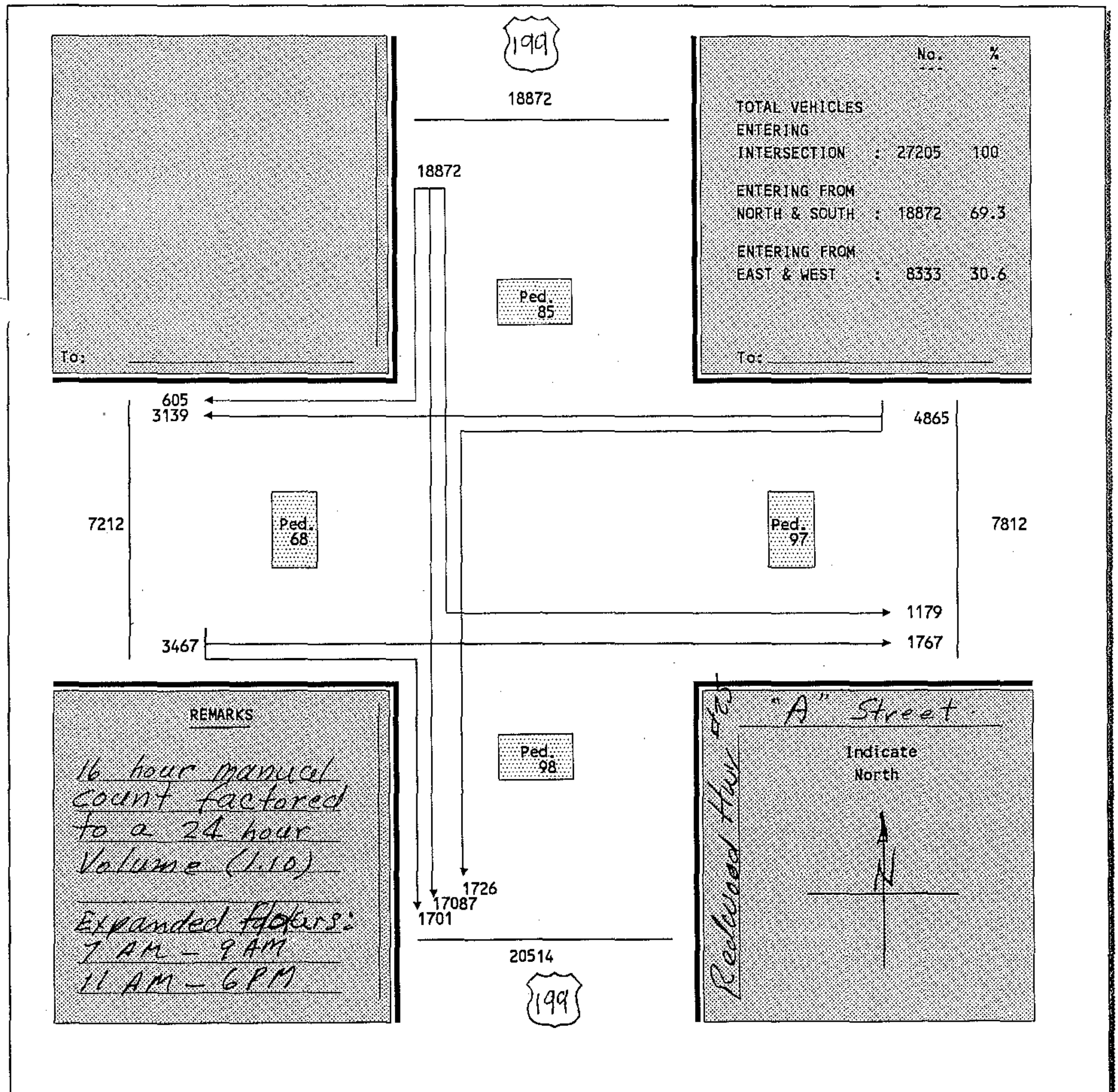
TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A				11		23	507	20	15	6	21		603	542	89.9	61	10.1		34	542	27
07:00-08:00A				28		63	744	17	51	11	63		977	812	83.1	165	16.9		91	812	74
08:00-09:00A				35		59	986	30	50	27	79		1266	1066	84.2	200	15.8		94	1066	106
09:00-10:00A				47		64	1011	40	40	25	90		1317	1091	82.8	226	17.2		111	1091	115
10:00-11:00A				67		75	1130	50	49	31	119		1521	1229	80.8	292	19.2		142	1229	150
11:00-12:00A				58		87	1180	52	49	34	124		1584	1281	80.9	303	19.1		145	1281	158
12:00-01:00P				78		130	1409	61	56	44	145		1923	1526	79.4	397	20.6		208	1526	189
01:00-02:00P				101		92	1499	72	67	39	103		1973	1638	83.0	335	17.0		193	1638	142
02:00-03:00P				95		123	1417	66	45	42	139		1927	1528	79.3	399	20.7		218	1528	181
03:00-04:00P				72		119	1388	52	47	34	126		1838	1487	80.9	351	19.1		191	1487	160
04:00-05:00P				82		147	1279	48	56	30	124		1766	1383	78.3	383	21.7		229	1383	154
05:00-06:00P				79		89	1205	44	38	32	173		1660	1287	77.5	373	22.5		168	1287	205
06:00-07:00P				51		75	851	25	27	17	81		1127	903	80.1	224	19.9		126	903	98
07:00-08:00P				45		61	698	36	21	10	62		933	755	80.9	178	19.1		106	755	72
08:00-09:00P				30		48	615	26	15	7	39		780	656	84.1	124	15.9		78	656	46
09:00-10:00P				32		54	488	16	9	7	32		638	513	80.4	125	19.6		86	513	39
TOTAL COUNT				911		1309	16407	655	635	396	1520		21833	17697	81.1	4136	18.9		2220	17697	1916
24HR FACTOR	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10									
24HR VOLUME				1002		1440	18048	721	699	436	1672		24018	19467	81.1	4550	18.9		2442	19467	2108

North and South is: REDWOOD HWY. #25 (7TH STREET) East and West is: "D" STREET SUM_1717

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : 9/20-21/93
DAY WEEK : MONDAY/TUESDAY
ACT COUNT: 16
HRS COUNT: 16 HRS EXPANDED
PED COUNT: 16
HRS COUNT: 16 HRS EXPANDED
WEATHER : CLEAR

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY #25 (6TH ST US 199-ORE99)
@ "A" STREET
MILE POST: X 1.15
CLASSIFICATION : All vehicles



11-16-93

DGM_1718

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : 9/20-21/93 | DAY : MONDAY/TUESDAY | COUNTY : JOSEPHINE | CITY: GRANTS PASS

HOURS : 16 HRS EXPANDED | WEATHER: CLEAR | INTERSECTION OF: REDWOOD HWY #25 (6TH ST US 199-ORE99) @ "A" STREET

Tab by: | Chk. by: | MILE POST : X 1.15

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A	14	243			30	57					17	44	405	257	63.5	148	36.5	257	87		61
07:00-08:00A	43	532	33		153	189					128	88	1166	608	52.1	558	47.9	608	342		216
08:00-09:00A	55	778	45		105	211					58	96	1348	878	65.1	470	34.9	878	316		154
09:00-10:00A	47	890	30		114	135					91	120	1427	967	67.8	460	32.2	967	249		211
10:00-11:00A	49	668	12		64	122					78	42	1035	729	70.4	306	29.6	729	186		120
11:00-12:00P	83	1252	43		116	186					100	114	1894	1378	72.8	516	27.2	1378	302		214
12:00-12:00P	95	1398	44		121	209					118	124	2109	1537	72.9	572	27.1	1537	330		242
01:00-02:00P	105	1618	67		111	243					140	157	2441	1790	73.3	651	26.7	1790	354		297
02:00-03:00P	92	1325	57		128	282					190	113	2187	1474	67.4	713	32.6	1474	410		303
03:00-04:00P	108	1482	67		177	308					174	150	2466	1657	67.2	809	32.8	1657	485		324
04:00-05:00P	100	1619	49		174	260					172	179	2553	1768	69.3	785	30.7	1768	434		351
05:00-06:00P	102	1467	48		101	260					139	126	2243	1617	72.1	626	27.9	1617	361		265
06:00-07:00P	39	653	8		48	95					40	37	920	700	76.1	220	23.9	700	143		77
07:00-08:00P	62	729	24		40	143					77	70	1145	815	71.2	330	28.8	815	183		147
08:00-09:00P	48	524	12		70	100					48	56	858	584	68.1	274	31.9	584	170		104
09:00-10:00P	30	356	11		17	54					36	30	534	397	74.3	137	25.7	397	71		66
TOTAL COUNT	1072	15534	550		1569	2854					1606	1546	24731	17156	69.4	7575	30.6	17156	4423		3152
24HR FACTOR	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10									
24HR VOLUME	1179	17087	605		1726	3139					1767	1701	27204	18872	69.4	8332	30.6	18872	4865		3467

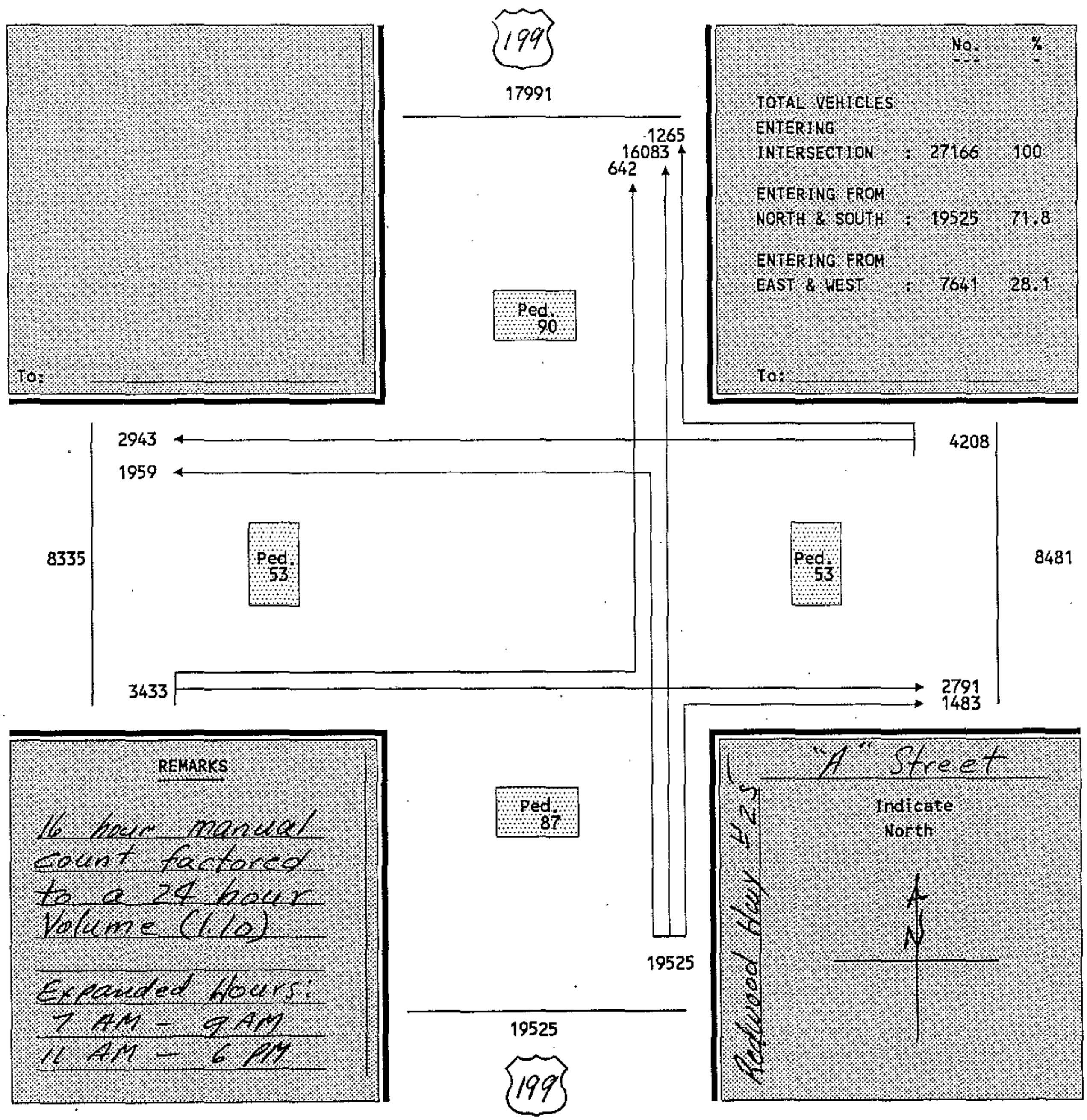
North and South is: REDWOOD HWY #25 (6TH ST US 199-ORE 99) East and West is: "A" STREET Sum_1718

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : 9/22-23/93
DAY WEEK : WEDNESDAY/THURSDAY
ACT COUNT: 16
HRS COUNT: 16 HRS EXPANDED
PED COUNT: 16
HRS COUNT: 16 HRS EXPANDED
WEATHER : CLEAR

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY #25 (7TH ST - NORTHBOUND ONEWAY - US199-OR99)
@ E "A" STREET

MILE POST: X 1.21 N
CLASSIFICATION : All vehicles



	No.	%
TOTAL VEHICLES ENTERING INTERSECTION :	27166	100
ENTERING FROM NORTH & SOUTH :	19525	71.8
ENTERING FROM EAST & WEST :	7641	28.1

REMARKS

16 hour manual count factored to a 24 hour Volume (1.10)

Expanded Hours:
7 AM - 9 AM
11 AM - 6 PM

KEM

DGM_1719

11-16-93

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : 9/22-23/93 DAY : WEDNESDAY/THURSDAY COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 16 HRS EXPANDED WEATHER: CLEAR INTERSECTION OF: REDWOOD HWY #25 (7TH ST - NORTHBOUND ONEWAY - US199-OR99)
@ E "A" STREET
Tab by: Chk. by: MILE POST : X 1.21 N

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A				23		42	422	35	40	7	54		623	497	79.8	126	20.2		65	497	61
07:00-08:00A				48		246	722	151	93	22	227		1509	966	64.0	543	36.0		294	966	249
08:00-09:00A				86		193	933	65	137	32	96		1542	1135	73.6	407	26.4		279	1135	128
09:00-10:00A				58		161	935	80	107	34	147		1522	1122	73.7	400	26.3		219	1122	181
10:00-11:00A				58		87	672	123	108	34	86		1168	903	77.3	265	22.7		145	903	120
11:00-12:00P				83		180	1399	88	185	36	200		2171	1672	77.0	499	23.0		263	1672	236
12:00-12:00P				102		183	1248	83	136	54	200		2006	1467	73.1	539	26.9		285	1467	254
01:00-02:00P				98		216	1224	121	144	60	185		2048	1489	72.7	559	27.3		314	1489	245
02:00-03:00P				74		154	1262	84	98	42	187		1901	1444	76.0	457	24.0		228	1444	229
03:00-04:00P				121		309	1226	90	136	61	224		2167	1452	67.0	715	33.0		430	1452	285
04:00-05:00P				94		238	1144	97	164	49	245		2031	1405	69.2	626	30.8		332	1405	294
05:00-06:00P				87		234	1178	94	123	51	256		2023	1395	69.0	628	31.0		321	1395	307
06:00-07:00P				57		111	645	53	98	28	154		1146	796	69.5	350	30.5		168	796	182
07:00-08:00P				47		133	651	57	86	27	116		1117	794	71.1	323	28.9		180	794	143
08:00-09:00P				86		122	549	97	65	22	100		1041	711	68.3	330	31.7		208	711	122
09:00-10:00P				28		66	411	30	61	25	60		681	502	73.7	179	26.3		94	502	85
TOTAL COUNT				1150		2675	14621	1348	1781	584	2537		24696	17750	71.9	6946	28.1		3825	17750	3121
24HR FACTOR	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10									
24HR VOLUME				1265		2943	16083	1483	1959	642	2791		27166	19525	71.9	7641	28.1		4208	19525	3433

North and South is: REDWOOD HWY #25 (7TH ST-NORTHBOUND ONEWAY - US199-OR99) East and West is: EAST "A" STREET

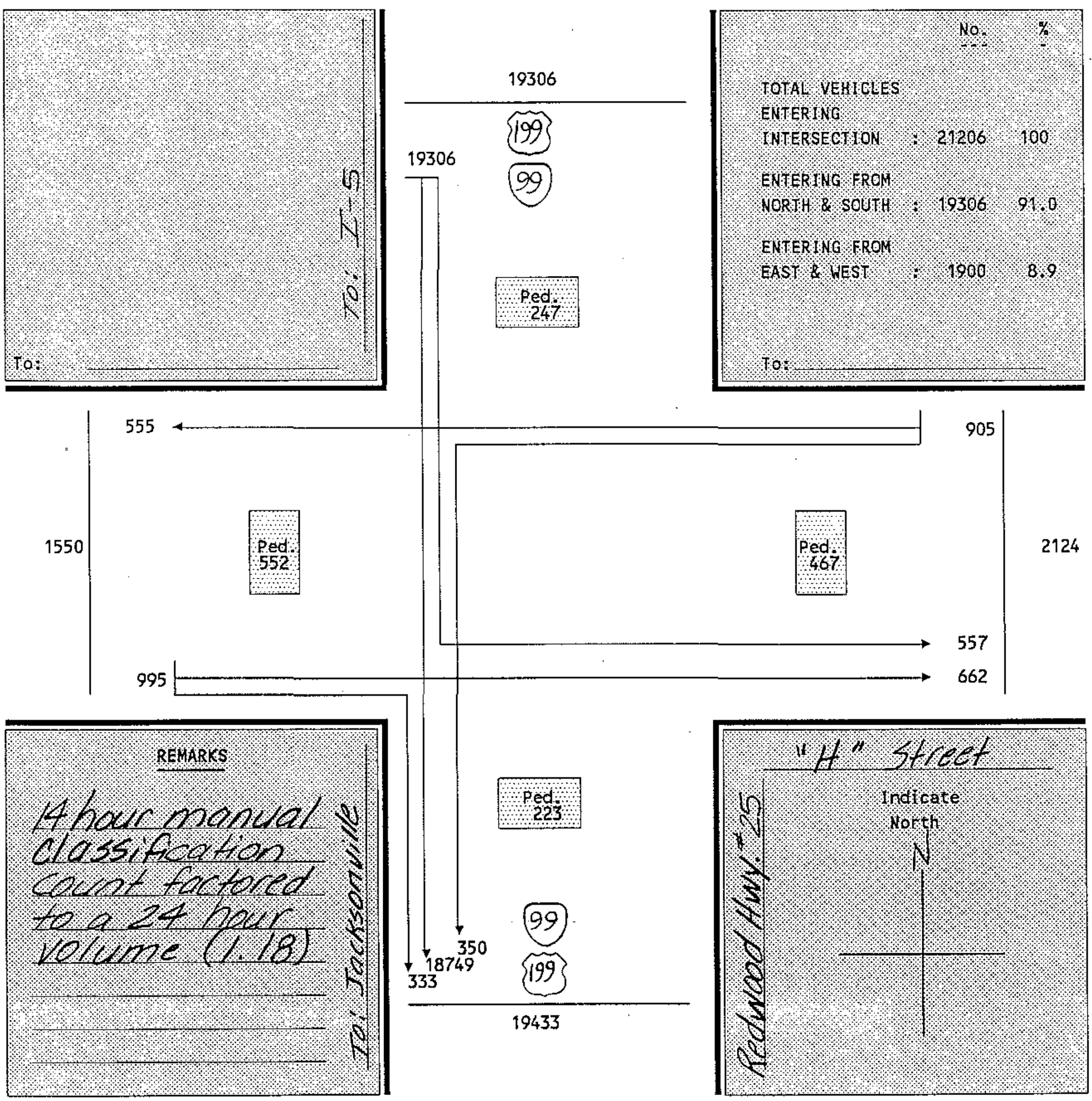
TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : JAN/25 -26/1995
DAY WEEK : WED & THURS
ACT COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
PED COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
WEATHER : CLOUDY/RAIN

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. NO. 025 (SB ONEWAY ON 6TH ST. - US199 & OR99) @ "H" STREET
MILE POST: XO.75
CLASSIFICATION : All vehicles

	No.	%
TOTAL VEHICLES ENTERING INTERSECTION	21206	100
ENTERING FROM NORTH & SOUTH	19306	91.0
ENTERING FROM EAST & WEST	1900	8.9

To:



REMARKS

14 hour manual classification count factored to a 24 hour volume (1.18)

DGM_1702

2-15-95

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : JAN/25 -26/1995 | DAY : WED & THURS | COUNTY : JOSEPHINE | CITY: GRANTS PASS
HOURS : 6AM - 8PM EXP. | WEATHER: CLOUDY/RAIN | INTERSECTION OF: REDWOOD HWY. NO. 025 (SB ONEWAY ON 6TH ST. - US199 & OR99) @ "H" STREET
Tab by: | Chk. by: | MILE POST : XO.75

TIME OF DAY	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL	NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS NORTH	EAST	SOUTH	WEST
06:00-07:00A	9	253			2	10					3	2	279	262	93.9	17	6.1	262	12		5
07:00-08:00A	7	614			9	11					7	10	658	621	94.4	37	5.6	621	20		17
08:00-09:00A	10	816			5	25					16	6	878	826	94.1	52	5.9	826	30		22
09:00-10:00A	36	1054			20	49					35	13	1207	1090	90.3	117	9.7	1090	69		48
10:00-11:00A	38	830			21	15					36	16	956	868	90.8	88	9.2	868	36		52
11:00-12:00P	32	1306			38	31					57	33	1497	1338	89.4	159	10.6	1338	69		90
12:00-01:00P	53	1517			39	41					64	42	1756	1570	89.4	186	10.6	1570	80		106
01:00-02:00P	61	1442			26	59					59	31	1678	1503	89.6	175	10.4	1503	85		90
02:00-03:00P	60	1602			44	53					63	30	1852	1662	89.7	190	10.3	1662	97		93
03:00-04:00P	59	1716			30	43					58	30	1936	1775	91.7	161	8.3	1775	73		88
04:00-05:00P	52	1763			22	54					50	24	1965	1815	92.4	150	7.6	1815	76		74
05:00-06:00P	24	1573			28	42					49	27	1743	1597	91.6	146	8.4	1597	70		76
06:00-07:00P	16	758			10	21					54	16	875	774	88.5	101	11.5	774	31		70
07:00-08:00P	15	645			3	16					10	2	691	660	95.5	31	4.5	660	19		12
TOTAL COUNT	472	15889			297	470					561	282	17971	16361	91.0	1610	9.0	16361	767		843
24HR FACTOR	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18									
24HR VOLUME	557	18749			350	555					662	333	21206	19306	91.0	1900	9.0	19306	905		995

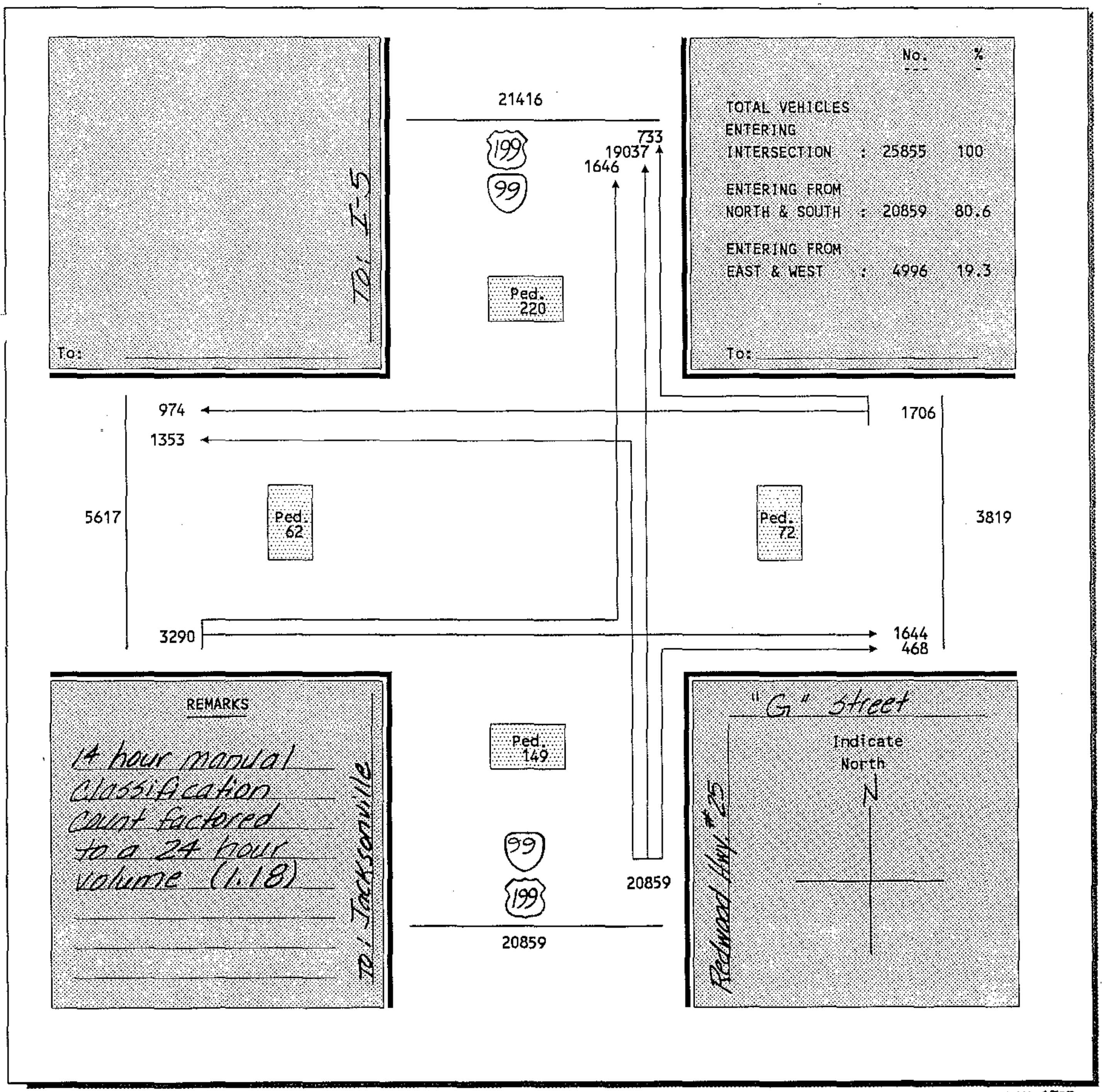
North and South is: REDWOOD HWY. NO. 025 (SBONEWAY ON 6TH ST. - US199 & OR99) East and West is: "H" STREET

SUM_1702

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : JAN/23 - 24/1995
DAY WEEK : MON & TUES
ACT COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
PED COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
WEATHER : FOG/CLOUDY

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) @ "G" STREET
MILE POST: X0.86N
CLASSIFICATION : All vehicles



DGM_1703

[2-16-95]

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : JAN/23 - 24/1995 DAY : MON & TUES COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 6AM - 8PM EXP. WEATHER: FOG/CLOUDY INTERSECTION OF: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) @ "G" STREET
Tab by: Chk. by: MILE POST : X0.86N

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A				2		3	434	4	18	13	46		520	456	87.7	64	12.3		5	456	59
07:00-08:00A				12		27	1084	13	62	33	65		1296	1159	89.4	137	10.6		39	1159	98
08:00-09:00A				21		36	1246	25	42	44	68		1482	1313	88.6	169	11.4		57	1313	112
09:00-10:00A				37		42	1196	21	85	58	70		1509	1302	86.3	207	13.7		79	1302	128
10:00-11:00A				26		36	1048	27	75	79	64		1355	1150	84.9	205	15.1		62	1150	143
11:00-12:00P				66		68	1417	38	135	123	119		1966	1590	80.9	376	19.1		134	1590	242
12:00-01:00P				73		87	1468	43	125	117	137		2050	1636	79.8	414	20.2		160	1636	254
01:00-02:00P				64		70	1492	37	98	288	149		2198	1627	74.0	571	26.0		134	1627	437
02:00-03:00P				48		78	1396	31	91	142	163		1949	1518	77.9	431	22.1		126	1518	305
03:00-04:00P				72		97	1538	41	143	120	154		2165	1722	79.5	443	20.5		169	1722	274
04:00-05:00P				91		106	1541	39	122	173	148		2220	1702	76.7	518	23.3		197	1702	321
05:00-06:00P				65		97	1207	43	87	103	128		1730	1337	77.3	393	22.7		162	1337	231
06:00-07:00P				22		39	584	18	46	50	48		807	648	80.3	159	19.7		61	648	98
07:00-08:00P				22		39	482	17	18	52	34		664	517	77.9	147	22.1		61	517	86
TOTAL COUNT				621		825	16133	397	1147	1395	1393		21911	17677	80.7	4234	19.3		1446	17677	2788
24HR FACTOR	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18									
24HR VOLUME				733		974	19037	468	1353	1646	1644		25855	20859	80.7	4996	19.3		1706	20859	3290

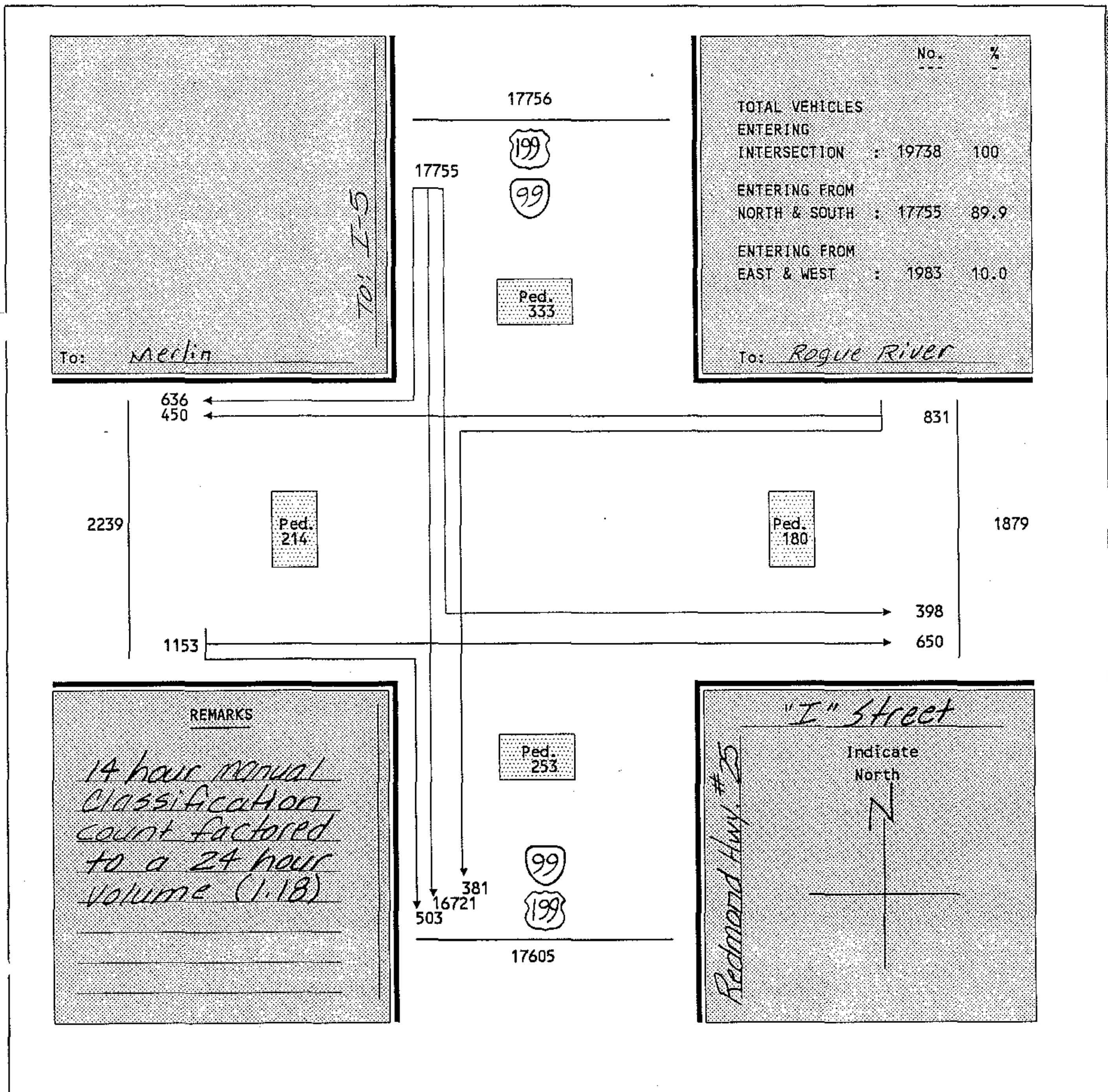
North and South is: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) East and West is: "G" STREET

SUM_1703

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : FEB/1 - 2/1995
DAY WEEK : WED & THURS
ACT COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
PED COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
WEATHER : CLOUDY

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. NO. 025 (6TH ST. - SB ONEWAY - US199 & OR99) @ "I" STREET
MILE POST: X0.69
CLASSIFICATION : All vehicles



DGM_1705

2-13-95

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : FEB/1 - 2/1995 DAY : WED & THURS COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 6AM - 8PM EXP. WEATHER: CLOUDY INTERSECTION OF: REDWOOD HWY. NO. 025 (6TH ST. - SB ONEWAY - US199 & OR99) @ "I" STREET
Tab by: Chk. by: MILE POST : X0.69

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A	4	188	2			6					6	2	208	194	93.3	14	6.7	194	6		8
07:00-08:00A	11	587	14			18					25	10	665	612	92.0	53	8.0	612	18		35
08:00-09:00A	18	698	30		11	31					16	16	820	746	91.0	74	9.0	746	42		32
09:00-10:00A	24	940	28		16	17					25	11	1061	992	93.5	69	6.5	992	33		36
10:00-11:00A	22	1068	53		25	32					47	23	1270	1143	90.0	127	10.0	1143	57		70
11:00-12:00P	40	1176	47		40	33					58	46	1440	1263	87.7	177	12.3	1263	73		104
12:00-01:00P	41	1311	62		35	38					47	51	1585	1414	89.2	171	10.8	1414	73		98
01:00-02:00P	46	1303	58		49	37					61	55	1609	1407	87.4	202	12.6	1407	86		116
02:00-03:00P	36	1353	51		34	31					56	61	1622	1440	88.8	182	11.2	1440	65		117
03:00-04:00P	31	1764	86		38	53					74	44	2090	1881	90.0	209	10.0	1881	91		118
04:00-05:00P	40	1561	63		39	51					71	41	1866	1664	89.2	202	10.8	1664	90		112
05:00-06:00P	29	1603	42		36	23					54	63	1850	1674	90.5	176	9.5	1674	59		117
06:00-07:00P	15	1012	31		16	26					32	21	1153	1058	91.8	95	8.2	1058	42		53
07:00-08:00P	5	637	11		7	13					19	13	705	653	92.6	52	7.4	653	20		32
TOTAL COUNT	362	15201	578		346	409					591	457	17944	16141	90.0	1803	10.0	16141	755		1048
24HR FACTOR	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10									
24HR VOLUME	398	16721	636		381	450					650	503	19739	17755	89.9	1984	10.1	17755	831		1153

North and South is: REDWOOD HWY. NO. 025 (6TH ST. - SB ONEWAY - US199 & OR99) East and West is: "I" STREET

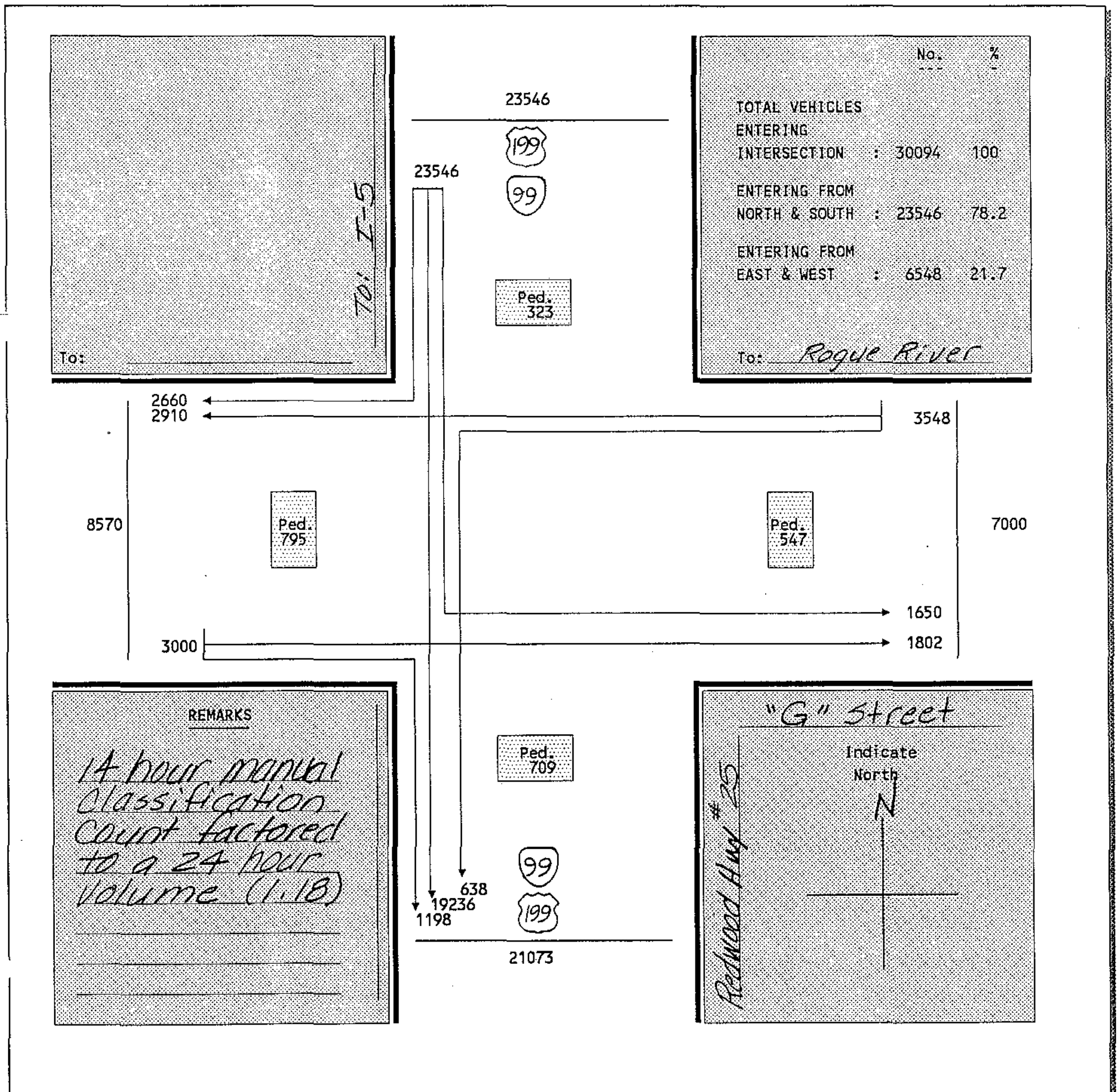
SUM_1705

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : FEB/1 - 2/1995
DAY WEEK : WED & THURS
ACT COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
PED COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
WEATHER : CLOUDY/CLEAR

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. NO. 025 (SB ONEWAY ON 6TH ST. - US199 & OR99) @ "G" STREET

MILE POST: X0.79
CLASSIFICATION : All vehicles



DGM_1707

1 2-24-95 1

SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : FEB/1 - 2/1995 | DAY : WED & THURS | COUNTY : JOSEPHINE | CITY: GRANTS PASS

HOURS : 6AM - 8PM EXP. | WEATHER: CLOUDY/CLEAR | INTERSECTION OF: REDWOOD HWY. NO. 025 (SB ONEWAY ON 6TH ST. - US199 & OR99) @ "G" STREET

Tab by: | Chk. by: | MILE POST : X0.79

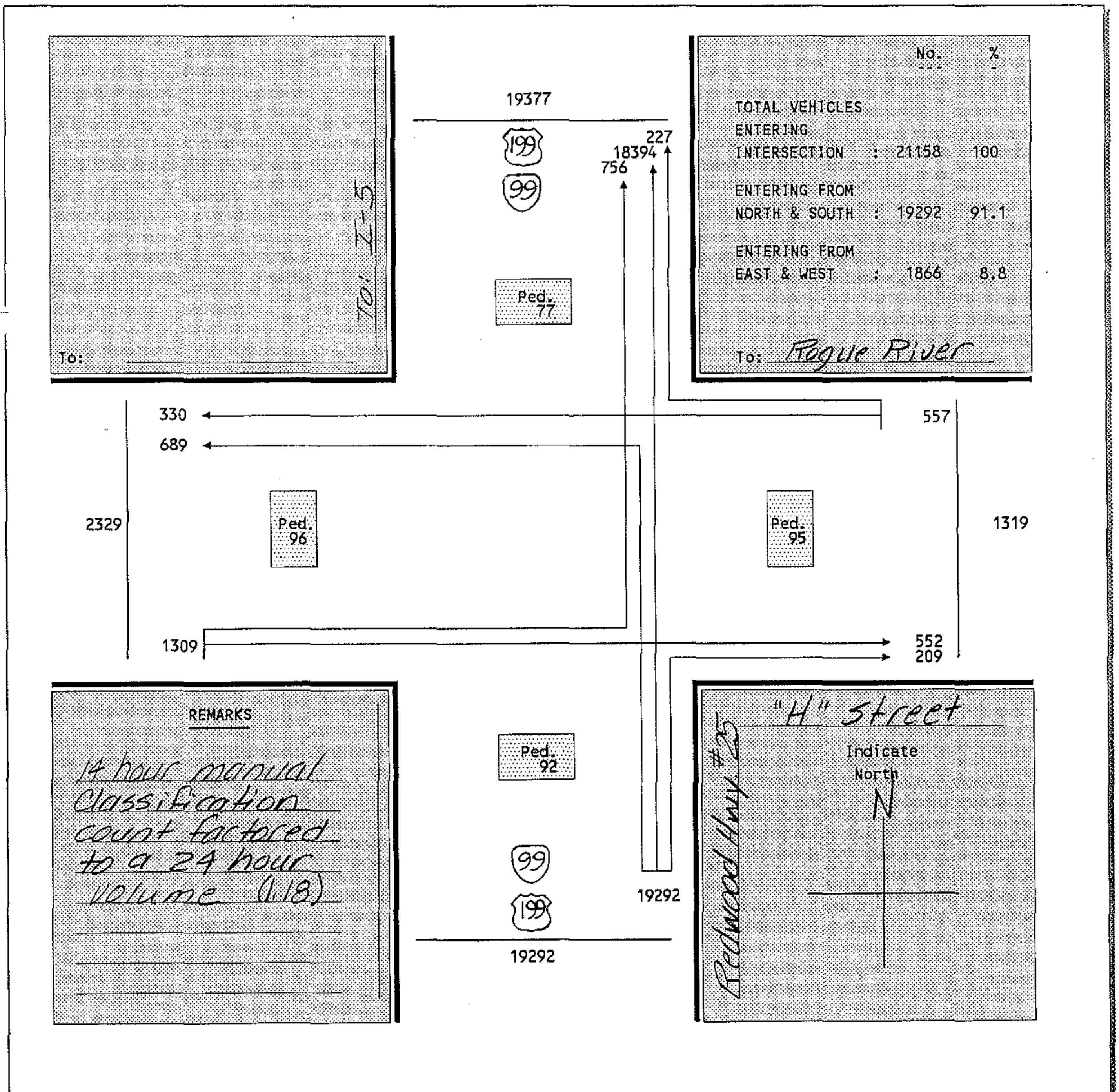
TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A	14	209	13		3	28					36	20	323	236	73.1	87	26.9	236	31		56
07:00-08:00A	37	652	50		9	48					64	32	892	739	82.8	153	17.2	739	57		96
08:00-09:00A	76	785	94		19	97					85	49	1205	955	79.3	250	20.7	955	116		134
09:00-10:00A	89	1115	125		30	148					85	53	1645	1329	80.8	316	19.2	1329	178		138
10:00-11:00A	79	904	119		32	171					89	65	1459	1102	75.5	357	24.5	1102	203		154
11:00-12:00P	108	1390	230		35	255					153	70	2241	1728	77.1	513	22.9	1728	290		223
12:00-01:00P	165	1551	227		60	294					164	92	2553	1943	76.1	610	23.9	1943	354		256
01:00-02:00P	171	1543	196		60	344					148	92	2554	1910	74.8	644	25.2	1910	404		240
02:00-03:00P	132	1584	275		55	202					129	103	2480	1991	80.3	489	19.7	1991	257		232
03:00-04:00P	152	1756	279		63	222					156	126	2754	2187	79.4	567	20.6	2187	285		282
04:00-05:00P	158	1722	308		67	227					165	112	2759	2188	79.3	571	20.7	2188	294		277
05:00-06:00P	148	1651	163		61	229					117	100	2469	1962	79.5	507	20.5	1962	290		217
06:00-07:00P	37	767	69		26	126					72	56	1153	873	75.7	280	24.3	873	152		128
07:00-08:00P	32	673	106		21	75					64	45	1016	811	79.8	205	20.2	811	96		109
TOTAL COUNT	1398	16302	2254		541	2466					1527	1015	25503	19954	78.2	5549	21.8	19954	3007		2542
24HR FACTOR	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18									
24HR VOLUME	1650	19236	2660		638	2910					1802	1198	30094	23546	78.2	6548	21.8	23546	3548		3000

North and South is: REDWOOD HWY. NO. 025 (SB ONEWAY ON 6TH ST. - US199 & OR99) East and West is: "G" STREET

TRANSPORTATION DEVELOPMENT BRANCH
TRANSPORTATION SYSTEM MONITORING UNIT
VEHICULAR VOLUME

DATE : FEB/6 - 7/1995
DAY WEEK : MON & TUES
ACT COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
PED COUNT: 14
HRS COUNT: 6AM - 8PM EXP.
WEATHER : CLOUDY

CITY or COUNTY : GRANTS PASS
INTERSECTION OF: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) @ "H" STREET
MILE POST: X0.80N
CLASSIFICATION : All vehicles



SUMMARY OF TRAFFIC COUNT
TRANSPORTATION DEVELOPMENT BRANCH - RESEARCH SECTION

DATE : FEB/6 - 7/1995 DAY : MON & TUES COUNTY : JOSEPHINE CITY: GRANTS PASS
HOURS : 6AM - 8PM EXP. WEATHER: CLOUDY INTERSECTION OF: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) @ "H" STREET
Tab by: Chk. by: MILE POST : X0.80N

TIME OF DAY	SUMMARY BY MOVEMENTS													NORTH AND SOUTH	PERCENT OF TOTAL	EAST AND WEST	PERCENT OF TOTAL	ENTERING VOLUMES BY LEGS			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S	TOTAL					NORTH	EAST	SOUTH	WEST
06:00-07:00A						2	447	3	6	4	4		466	456	97.9	10	2.1		2	456	8
07:00-08:00A				1		9	1013	3	14	7	9		1056	1030	97.5	26	2.5		10	1030	16
08:00-09:00A				9		10	1161	6	35	11	16		1248	1202	96.3	46	3.7		19	1202	27
09:00-10:00A				5		17	1116	20	35	35	27		1255	1171	93.3	84	6.7		22	1171	62
10:00-11:00A				21		18	1208	23	51	62	48		1431	1282	89.6	149	10.4		39	1282	110
11:00-12:00P				16		26	1260	21	51	80	44		1498	1332	88.9	166	11.1		42	1332	124
12:00-01:00P				17		30	1350	16	74	71	46		1604	1440	89.8	164	10.2		47	1440	117
01:00-02:00P				21		27	1421	22	56	59	66		1672	1499	89.7	173	10.3		48	1499	125
02:00-03:00P				18		27	1315	16	48	70	58		1552	1379	88.9	173	11.1		45	1379	128
03:00-04:00P				14		41	1468	11	56	68	52		1710	1535	89.8	175	10.2		55	1535	120
04:00-05:00P				28		38	1398	18	58	74	44		1658	1474	88.9	184	11.1		66	1474	118
05:00-06:00P				33		17	1079	12	41	56	28		1266	1132	89.4	134	10.6		50	1132	84
06:00-07:00P				6		11	835	3	45	19	16		935	883	94.4	52	5.6		17	883	35
07:00-08:00P				3		7	517	3	14	25	10		579	534	92.2	45	7.8		10	534	35
TOTAL COUNT				192		280	15588	177	584	641	468		17930	16349	91.2	1581	8.8		472	16349	1109
24HR FACTOR	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18									
24HR VOLUME				227		330	18394	209	689	756	552		21157	19292	91.2	1866	8.8		557	19292	1309

North and South is: REDWOOD HWY. NO. 025 (NB ONEWAY ON 7TH ST. - US199 & OR99) East and West is: "H" STREET

SUM_1708

ROUTE OR HWY. No. REDWOOD HIGHWAY NO. 25

COUNTY Josephine WEATHER CLOUDY & WARM

DATE: SET OUT 08 / 12 / 92 DAY WED.

PICK UP 08 / 13 / 92 DAY THURS.

OREGON STATE HIGHWAY DIVISION
TRAFFIC UNIT
PLANNING SURVEY

Sheet 3 of 8 PORTABLE RECORDER COUNT RECORD SHEET

Mile Post	Location		Time	Reading	Volume	Remarks	1990 Prev. ADT
X2.56N	0.01 mile north of N.W. Morgan Lane.	Pick up		28,970	9,280		
		Set out	9:01 A	19,690			7,400
X2.36N	0.10 mile north of Hillcrest Drive.	Pick up		116,440	16,550		
		Set out	8:51 A	99,890			15,500
X2.05N	0.01 mile north of Midland Avenue.	Pick up		67,660	14,260		
		Set out	8:46 A	53,400			15,100
X1.80N	0.01 mile south of Savage Street.	Pick up		85,220	18,700		
		Set out	8:39 A	66,520			16,200
X1.22N	0.01 mile north of N.E. "A" Street.	Pick up		55,490	19,720		
		Set out	8:31 A	35,770			17,100
X1.20N	0.01 mile south of N.E. "A" Street.	Pick up		61,830	19,240		
		Set out	8:25 A	42,590			17,600
X1.01N	0.01 mile north of Redwood Highway Spur ("E" Street).	Pick up		49,440	21,170		
		Set out	8:17 A	28,270			19,700
X0.95N	0.01 mile north of Redwood Highway Spur ("F" Street).	Pick up		48,810	20,070		
		Set out	8:12 A	28,740			20,000
X0.87N	0.01 mile north of "G" Street.	Pick up		108,600	~~19,280~~		
		Set out	8:01 A	87,510	21,090		18,200
X0.72N	0.01 mile north of "J" Street.	Pick up		95,010	19,610		
		Set out	7:50 A	75,400			19,500

734-3531 (6-81)

RECORDER Bob Sechler

ROUTE OR HWY. NO. REDWOOD HIGHWAY NO. 25

COUNTY Josephine WEATHER CLOUDY & WARM

DATE: SET OUT 08/12/92 DAY WED.

PICK UP 08/13/92 DAY THURS.

Sheet 1 of 8

OREGON STATE HIGHWAY DIVISION
TRAFFIC UNIT
PLANNING SURVEY

PORTABLE RECORDER COUNT RECORD SHEET

MILE POST	LOCATION		TIME	READING	VOLUME	REMARKS	1990 PREV. ADT
X2.46	0.01 mile north of N.W. Morgan Lane.	PICK UP		91,000	10,420		
		SET OUT	5:51 A	80,580			10,000
X2.26	0.10 mile north of Hillcrest Drive.	PICK UP		98,240	16,850		
		SET OUT	5:59 A	81,390			14,200
X1.96	0.01 mile north of Midland Avenue.	PICK UP		111,210	17,370		
		SET OUT	6:05 A	93,840			15,600
X1.70	0.01 mile south of Savage Street.	PICK UP		27,965	18,295		
		SET OUT	6:15 A	9,670			16,300
X1.16	0.01 mile north of N.W. "A" Street.	PICK UP		82,680	18,330		
		SET OUT	6:22 A	64,350			17,000
X1.14	0.01 mile south of N.W. "A" Street.	PICK UP		28,690	20,650		
		SET OUT	6:27 A	8,040			18,100
X0.94	0.01 mile north of Rogue River Loop Highway and Redwood Highway Spur ("E" Street).	PICK UP		56,415	20,625		
		SET OUT	6:33 A	35,790			18,800
X0.88	0.01 mile north of Rogue River Loop Highway and Redwood Highway Spur ("F" Street).	PICK UP		92,000	21,180		
		SET OUT	6:38 A	70,820			21,000
X0.80	0.01 mile north of "G" Street.	PICK UP		26,200	18,860		
		SET OUT	6:46 A	7,340			20,400
X0.64	0.01 mile north of "J" Street.	PICK UP		73,480	19,420		
		SET OUT	6:54 A	54,060			20,300

734-3531 (6-81)

RECORDER Bob Sechler

Environmental Quality Commission

☒ Rule Adoption Item
☐ Action Item
☐ Information Item

Agenda Item G
October 1, 1999 Meeting

Title:

Expansion of the Rogue Basin Open Burning Control Area

Summary:

This rulemaking proposes that the Environmental Quality Commission adopt a rule amendment to expand the Rogue Basin Open Burning Control Area. The expansion will reduce fine particulate emissions in the Grants Pass "bowl", an area identified as being at risk of violating the new fine particulate public health standard (PM2.5). The expansion is one of five measures recommended by the Grants Pass Air Quality Advisory Committee to prevent fine particulate pollution. Within the control area, commercial and industrial open burning is prohibited at all times and residential open burning is limited to days with adequate ventilation to maintain healthy air. PM2.5 is smaller, lighter and will drift further than PM10 during wintertime inversion conditions. The area of influence for PM2.5 is defined by local topography and is the bowl area created by the ring of 3000 foot peaks that surround Grants Pass. The existing control area includes only half of the bowl. The expanded area covers the remainder of the bowl and is primarily rural residential. The number of wintertime days available to these residents to burn outdoors will be reduced by approximately fifty percent. Public response to the proposed expansion was mixed, but generally reflected confusion about the impact on individuals. A community meeting was held in the area following the public hearing to educate the residents about current open burning restrictions, changes that will result from the proposed expansion, and managing outdoor burning in general.

Department Recommendation:

The Department recommends that the Environmental Quality Commission adopt the rule amendment as a revision to the federal Clean Air Act State Implementation Plan, as presented in Attachment A of the Department's staff report.

Report Author	Division Administrator	Director

Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum

Date: September 13, 1999

To: Environmental Quality Commission

From: Langdon Marsh

Subject: Agenda Item G, EQC Meeting October 1, 1999

Background

On June 14, 1999 the Director authorized the Air Quality Division to proceed to a rulemaking hearing on a proposed rule amendment to expand the Rogue Basin Open Burning Control Area.

Pursuant to the authorization, hearing notice was published in the Secretary of State's Bulletin on July 1, 1999. On June 15, 1999, the Hearing Notice and informational materials were mailed to the mailing list of those persons who have asked to be notified of rulemaking actions, and to a mailing list of persons known by the Department to be interested in the proposed rulemaking action on the Rogue Basin Open Burning Control Area. A postcard mailing was also delivered to residents and businesses along the major rural delivery routes within the proposed expanded area notifying them of the proposal and public hearing.

A Public Hearing was held July 22, 1999 with Keith Tong serving as Presiding Officer. Written comment was received through July 27, 1999. The Presiding Officer's Report (Attachment C) summarizes the oral testimony presented at the hearing and lists all the written comments received. (A copy of the comments is available upon request.)

Department staff have evaluated the comments received (Attachment D). Based upon that evaluation, no modifications to the initial rulemaking proposal are being recommended by the Department; however, the implementation plan was developed based on the comments received. The implementation planis included as Attachment G.

The following sections summarize the issue that this proposed rulemaking action is intended to address, the authority to address the issue, the process for development of the rulemaking proposal including alternatives considered, a summary of the rulemaking proposal presented for public hearing, a summary of the significant public comments and the changes proposed in response to those comments, a summary of how the rule will work and how it is proposed to be implemented, and a recommendation for Commission action.

Acronyms and Keywords Used in this Package

$PM_{2.5}$: Fine particulate or particles measuring less than 2.5 microns in diameter and known to aggravate upper respiratory health conditions.

PM_{10} : Coarse and fine particulate or particles measuring less than 10 microns in diameter, also known to aggravate upper respiratory health conditions.

Issue this Proposed Rulemaking Action is Intended to Address

Particulate pollution has been a problem in Grants Pass for many years, mainly due to high concentrations of woodsmoke during cold air inversions in the winter. A voluntary woodsmoke curtailment program, limits on backyard burning, and efforts to burn wood more efficiently have all contributed to a significant reduction in particulate levels in the Grants Pass area in recent years. These programs were designed to meet the public health standard for particles measuring less than 10 microns in diameter (PM_{10}). PM_{10} monitors in Grants Pass show that the area has met both the daily and annual PM_{10} public health standards since 1990.

In 1997, EPA adopted new public health standards for particles measuring less than 2.5 microns in diameter ($PM_{2.5}$). Health studies over the past decade show that these smaller particles are inhaled deeper into the lungs and can potentially cause more damage. It is estimated that nationally, the new fine particulate standard will prevent approximately 15,000 premature deaths per year and hundreds of thousands of cases of aggravated asthma in children and adults. Asthma is now the leading chronic illness among children.

The new $PM_{2.5}$ standards include a daily standard and an annual standard*. There are no long-term historic measurements of $PM_{2.5}$ in the Grants Pass area. DEQ made a preliminary assessment based on historical PM_{10} data collected in the area and correlations with $PM_{2.5}$ data from other areas. DEQ concluded that the Grants Pass area will likely comply with the daily $PM_{2.5}$ standard, but the annual standard for $PM_{2.5}$ will be more difficult to meet than the pre-existing annual standard for PM_{10}. DEQ will install a $PM_{2.5}$ monitor (Federal Reference Method) in Grants Pass in the fall of

* The daily standard is 65 micrograms per cubic meter. This standard is met when the three-year average of the 98th percentile at each monitoring site is less than or equal to 65. The annual standard is 15 micrograms per cubic meter. The annual standard is met when the three-year average of the annual average is less than or equal to 15.

1999 to begin measuring daily concentrations of $PM_{2.5}$. Since compliance with the $PM_{2.5}$ standards is based on three years of data, the compliance status for Grants Pass will not be determined until 2002.

The advisory committee recommended that steps be taken now to lower $PM_{2.5}$ emissions prior to 2002 in order to protect public health and avoid a nonattainment designation and the prescriptive control requirements that will likely accompany a nonattainment designation. In the interest of pollution prevention, the committee worked with DEQ to identify measures to begin reducing $PM_{2.5}$ levels in the Grants Pass area. The committee recommended adding several new prevention strategies to the ongoing successful PM_{10} programs begun in 1990. Since $PM_{2.5}$ is lighter and tends to disperse over a broader area, the measures address woodburning activities in a larger geographic area.

The new recommended strategies are:

* Expand the voluntary woodsmoke curtailment program to the entire Grants Pass valley
* Offer incentives for voluntary removal of uncertified woodstoves and replacement with certified woodstoves or alternate heat source
* Require removal of uncertified woodstoves upon sale of home
* **Expand the open burning control area to the entire Grants Pass valley**
* Promote alternative yard debris disposal and composting.

This rulemaking addresses the expansion of the open burning control area. The Rogue Basin Open Burning Control Area is defined by Oregon administrative rule and currently encompasses about half of the valley surrounding Grants Pass. The proposed rule amendment would expand the boundary to the remainder of the valley. Within the open burning control area, industrial and commercial open burning is prohibited year-round, and residential open burning is prohibited on days when DEQ issues a burn advisory due to poor ventilation. Advisories are available through the local news media and Josephine County maintains a recorded telephone message with advisory updates.

The remaining four pollution prevention measures recommended by the Advisory Committee will be adopted and/or administered locally. DEQ secured a pollution prevention grant from EPA for Jospehine County Public Health Department to expand its education and outreach program from the Urban Growth Boundary to the valley for both open burning and voluntary woodstove curtailment. A copy of the advisory committee's complete report is included in Attachment F.

Relationship to Federal and Adjacent State Rules

The Environmental Protection Agency will determine which areas meet the new $PM_{2.5}$ standards in

2002. There are no federal requirements to conduct pollution prevention prior to area designations.

Authority to Address the Issue

ORS 468.015, 468.035, 468A.035, 468A.085

Process for Development of the Rulemaking Proposal (including Advisory Committee and alternatives considered)

DEQ staff worked with an advisory committee in Grants Pass to develop $PM_{2.5}$ pollution prevention measures for the Grants Pass area, including the expansion of the open burning control area. A list of the advisory committee members and the Committee's report is included in Attachment F. Five pollution prevention measures were finally recommended by the advisory committee for immediate implementation. Four alternative measures were considered by the committee and were eventually included in the pollution prevention plan as contingency measures. These contingency measures will be implemented if $PM_{2.5}$ monitors reveal elevated levels of $PM_{2.5}$.

A public workshop was held on April 5, 1999 to gauge public support for the open burning control area expansion. Although the workshop was broadly advertised, attendance was low. There were no comments about expanding the open burning control area. DEQ staff also met with the Josephine County Commissioners, Grants Pass City Council, and the Josephine County Board of Health to brief them on the pollution prevention measures being considered by the advisory committee.

Summary of Rulemaking Proposal Presented for Public Hearing and Discussion of Significant Issues Involved.

This rulemaking proposes that the Environmental Quality Commission adopt a rule amendment to expand the Rogue Basin Open Burning Control Area. There are approximately 3,000 households in the expanded area and a small number of businesses. These households will be prohibited from burning yard debris on those days when DEQ issues an open burning advisory. Such advisories are issued when meteorological conditions prevent adequate dispersion of smoke -- usually cold, windless days. Over the past few years, the frequency of "no burn" advisories in the Rogue Basin Open Burning Control Area averaged three out of four days during the winter months. Residents are allowed to burn yard debris on those days when a "no burn" advisory is not in effect.

Open burning rules prohibit all commercial, industrial, construction and demolition open burning in the control area, except by special letter permit from DEQ. Since the expanded area is predominantly rural residential, there will be little if any business impact, with the exception of those involved in clearing land for land improvement. DEQ issues letter permits if no viable alternative is available. Alternatives include chipping, hauling debris to a waste collection site, or piling the debris for natural decomposition.

Summary of Significant Public Comment and Changes Proposed in Response

Several residents at the northernmost end of the proposed expanded area commented that emissions from open burning in their local area do not impact ambient concentrations of particulate in other portions of the area. One resident just north of the proposed expanded area commented that the expansion should extend further north.

The issue is the technical justification for the $PM_{2.5}$ boundary. In the case of Grants Pass, the particulate problem is driven by topography and not population. The Grants Pass Urban Growth Boundary lies within a bowl, ringed by a circle of 3,000' mountain peaks. The boundary of the proposed expanded open burning control area is designed to include this bowl area. Because $PM_{2.5}$ is lighter, fine particles remain suspended longer and travel further. Therefore, all smoke emissions within the bowl have the potential to impact ambient concentrations of $PM_{2.5}$. The Department is not proposing to make any changes to the original proposal. The implementation plan reflects the need to educate residents in the expanded area and provide ongoing assistance with open burning questions.

Summary of How the Proposed Rule Will Work and How it Will be Implemented

The expansion of the Rogue Basin Open Burning Control Area will be enforced through the DEQ Medford office existing air quality program. The Josephine County Public Health Department will educate households and businesses in the expanded area about burning restrictions and where to find daily advisories. DEQ will provide maps and legal descriptions of the expanded area to local jurisdictions to use in determining if a household or business is within the control area.

Recommendation for Commission Action

It is recommended that the Commission adopt the rule amendment to expand the Rogue Basin Open Burning Control Area as an amendment to the federal Clean Air Act State Implementation Plan, as presented in Attachment A of the Department Staff Report.

Attachments

A. Amendment Proposed for Adoption
B. Supporting Procedural Documentation:
   1. Legal Notice of Hearing
   2. Fiscal and Economic Impact Statement
   3. Land Use Evaluation Statement

4. Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements
5. Cover Memorandum from Public Notice

C. Presiding Officer's Report on Public Hearing
D. Department's Evaluation of Public Comment
E. Detailed Changes to Original Rulemaking Proposal made in Response to Public Comment
F. Advisory Committee Membership and Report
G. Rule Implementation Plan

<u>Reference Documents (available upon request)</u>

Written Comments Received (listed in Attachment C)

Approved:

Section: Annette Liebe

Division: Andrew Ginsburg

Report Prepared By: Patti Seastrom

Phone: (503) 229-5581

Date Prepared: August 13, 1999

Oregon Administrative Rules
Chapter 340

DIVISION 264*

OPEN BURNING PROHIBITIONS

Open Burning Control Areas

340-264-0200* Generally areas around the more densely populated locations in the state and valleys or basins which restrict atmospheric ventilation are designated open burning control areas. The practice of open burning may be more restrictive in open burning control areas than in other areas of the state. The specific open burning restrictions associated with these Open Burning Control Areas are listed in OAR 340-264-0100 through 340-264-0170 by county. The general locations of Open Burning Control Areas are depicted in **Figures 2** through **5**. The Open Burning Control Areas of the state are defined as follows:

(1) All areas in or within three miles of the incorporated city limit of all cities with a population of 4,000 or more.

(2) The Coos Bay Open Burning Control Area is located in Coos County with boundaries as generally depicted in **Figure 3** of this rule. The area is enclosed by a line beginning at a point approximately 4-1/2 miles WNW of the City of North Bend, at the intersection of the north boundary of T25S, R13W, and the coastline of the Pacific Ocean; thence east to the NE corner of T25S, R12W; thence south to the SE corner of T26S, R12W; thence west to the intersection of the south boundary of T26S, R14W and the coastline of the Pacific Ocean, thence northerly and easterly along the coastline of the Pacific Ocean to its intersection with the north boundary of T25S, R13W, the point of beginning.

(3) The Rogue Basin Open Burning Control Area is located in Jackson and Josephine Counties with boundaries as generally depicted in **Figure 4**. The area is enclosed by a line beginning at a point approximately 4-1/2 miles NE of the City of Shady Cove at the NE corner of T34S, R1W, Willamette Meridian, thence south along the Willamette Meridian to the SW corner of T37S, R1W; thence east to the NE corner of T38S, R1E; thence south to the SE corner of T38S, R1E; thence east to the NE corner of T39S, R2E; thence south to the SE corner of T39S, R2E; thence west to the SW corner of T39S, R1E; thence NW along a line to the NW corner of T39S, R1W; thence west to the SW corner of T38S, R2W; thence north to the SW corner of T36S, R2W; thence west to the SW corner of T36S, R4W; thence south to the SE corner of T37S, R5W; ~~thence west to the SW corner of T37S, R6W; thence north to the NW corner of T36S, R6W;~~ <u>thence west to the SW corner of Section 36 of T37S, R7W; thence north to the SW corner of Section 1 of T37S, R7W; thence west to the SW corner of Section 4 of T37S, R7W; thence north to the NW corner of Section 28 of T34S, R7W; thence east to the NE corner of Section 29 of T34S, R5W; thence south to the SW corner of Section 33 of T35S, R5W;</u> thence east to the SW corner of T35S, R1W; thence north to the NW corner of T34S, R1W; thence east to the point of beginning.

(4) The Umpqua Basin Open Burning Control Area is located in Douglas County with boundaries as generally depicted in **Figure 5**. The area is enclosed by a line beginning at a point approximately four miles ENE of the City of Oakland, Douglas County, at the NE corner of T25S, R5W, Willamette Meridian, thence south to the SE corner of T25S, R5W; thence east to the NE Corner of T26S, R4W; thence south to the SE corner of T27S, R4W; thence west to the SE corner

of T27S, R5W; thence south to the SE corner of T30S, R5W; thence west to the SW corner of T30S, R6W; thence north to the NW corner of T29S, R6W; thence west to the SW corner of T28S, R7W thence north to the NW corner of T27S, R7W; thence east to the NE corner of T27S, R7W; thence north to the NW corner of T26, R6W; thence east to the NE corner of T26S, R6W; thence north to the NW corner of T25S, R5W; thence east to the point of beginning.

(5) The boundaries of the Willamette Valley Open Burning Control Area are generally depicted in **Figures 1** and **2**. The area includes all of Benton, Clackamas, Linn, Marion, Multnomah, Polk, Washington and Yamhill Counties and that portion of Lane County east of Range 7 West.

(6) Special control areas are established around cities within the Willamette Valley Open Burning Control Area. The boundaries of these special control areas are determined as follows:

(a) Any area in or within three miles of the boundary of any city of more than 1,000 but less than 45,000 population;

(b) Any area in or within six miles of the boundary of any city of 45,000 or more population;

(c) Any area between areas established by this rule where the boundaries are separated by three miles or less;

(d) Whenever two or more cities have a common boundary, the total population of these cities will determine the applicability of subsection (a) or (b) of this section and the municipal boundaries of each of the cities shall be used to determine the limit of the special control area.

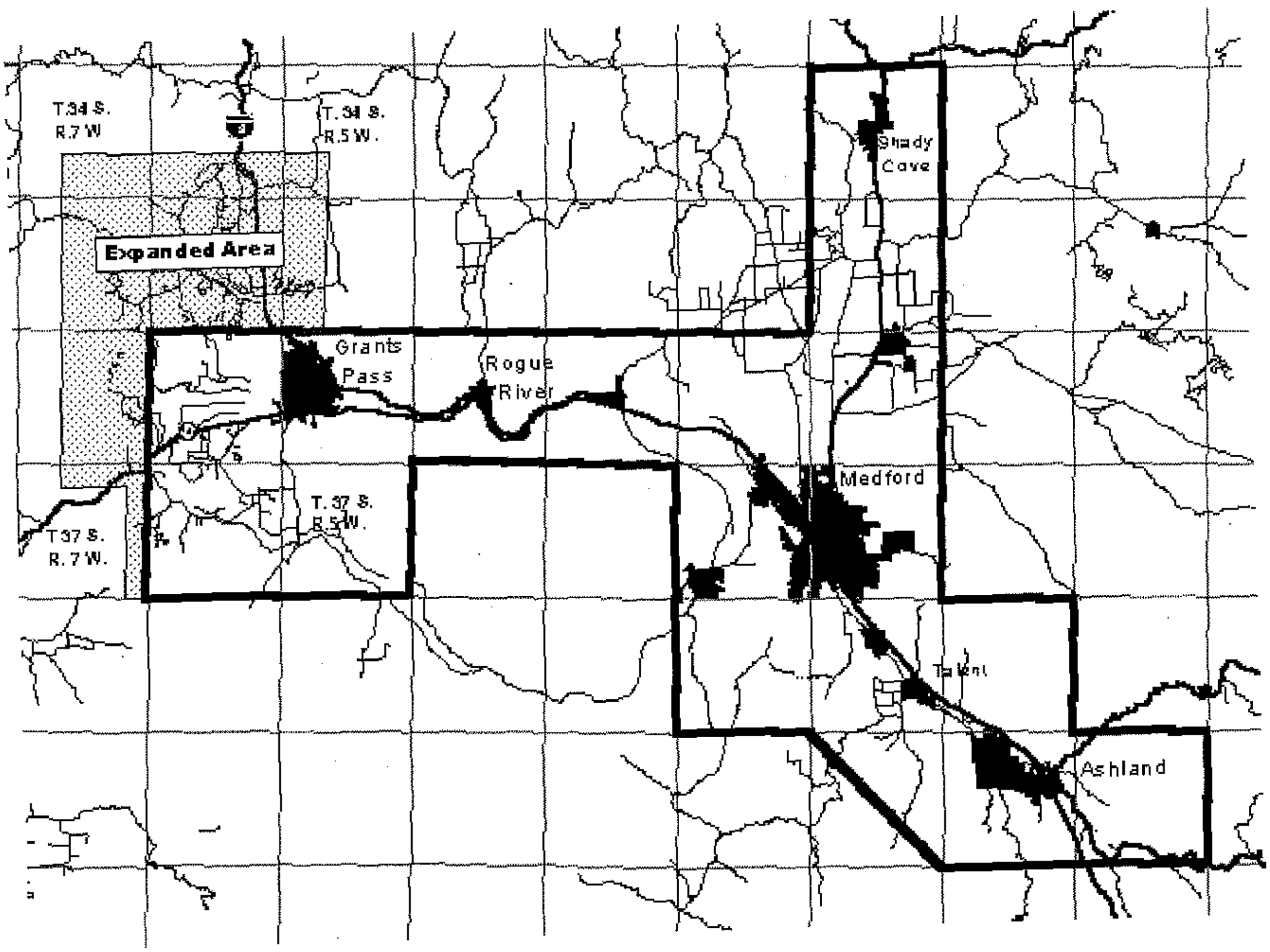
(7) A domestic burning ban area around the Portland metropolitan area is generally depicted in **Figure 1A**. This area encompasses parts of the special control area in Clackamas, Multnomah and Washington Counties. Specific boundaries are listed in OAR 340-264-0120(5), 340-264-0130(5) and 340-264-0140(5). Domestic burning is prohibited in this area except as allowed pursuant to OAR 340-23-100.

[**Note**: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 27-1981, f. & ef. 9-8-81; DEQ 10-1984, f. 5-29-84, ef. 6-16-84; DEQ 4-1993, f. & cert. ef. 3-10-93; renumbered from OAR 340-023-0115.

**(Formerly Division 31, OAR 340-031-0520. Renumbering is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

Rogue Basin Open Burning Control Area



340-264-0200

Figure 4

Oregon Administrative Rules
Chapter 340

DIVISION 200*

GENERAL AIR POLLUTION PROCEDURES AND DEFINITIONS

340-200-0040*
State of Oregon Clean Air Act Implementation Plan

(1) This implementation plan, consisting of Volumes 2 and 3 of the State of Oregon Air Quality Control Program, contains control strategies, rules and standards prepared by the Department of Environmental Quality and is adopted as the state implementation plan (SIP) of the State of Oregon pursuant to the federal Clean Air Act, Public Law 88-206 as last amended by Public Law 101-549.

(2) Except as provided in section (3) of this rule, revisions to the SIP shall be made pursuant to the Commission's rulemaking procedures in Division 11 of this Chapter and any other requirements contained in the SIP and shall be submitted to the United States Environmental Protection Agency for approval.

(3) Notwithstanding any other requirement contained in the SIP, the Department is authorized to submit to the Environmental Protection Agency any permit condition implementing a rule that is part of the federally-approved SIP as a source-specific SIP revision after the Department has complied with the public hearings provisions of 40 CFR 51.102 (July 1, 1992).

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-200-0040. Revisions to the State of Oregon Clean Air Act Implementation Plan become federally enforceable upon approval by the United States Environmental Protection Agency. If any provision of the federally approved Implementation Plan conflicts with any provision adopted by the Commission, the Department shall enforce the more stringent provision.]

[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468.020

Stat. Implemented: ORS Ch. 468A.035

Hist.: DEQ 35, f. 2-3-72, ef. 2-15-72; DEQ 54, f. 6-21-73, ef. 7-1-73; DEQ 19-1979, f. & ef. 6-25-79; DEQ 21-1979, f. & ef. 7-2-79; DEQ 22-1980, f. & ef. 9-26-80; DEQ 11-1981, f. & ef. 3-26-81; DEQ 14-1982, f. & ef. 7-21-82; DEQ 21-1982, f. & ef. 10-27-82; DEQ 1-1983, f. & ef. 1-21-83; DEQ 6-1983, f. & ef. 4-18-83; DEQ 18-1984, f. & ef. 10-16-84; DEQ 25-1984, f. & ef. 11-27-84; DEQ 3-1985, f. & ef. 2-1-85; DEQ 12-1985, f. & ef. 9-30-85; DEQ 5-1986, f. & ef. 2-21-86; DEQ 10-1986, f. & ef. 5-9-86; DEQ 20-1986, f. & ef. 11-7-86; DEQ 21-1986, f. & ef. 11-7-86; DEQ 4-1987, f. & ef. 3-2-87; DEQ 5-1987, f. & ef. 3-2-87; DEQ 8-1987, f. & ef. 4-23-87; DEQ 21-1987, f. & ef. 12-16-87; DEQ 31-1988, f. 12-20-88, cert. ef. 12-23-88; DEQ 2-1991, f. & cert. ef. 2-14-91; DEQ 19-1991, f. & cert. ef. 11-13-91; DEQ 20-1991, f. & cert. ef. 11-13-91; DEQ 21-1991, f. & cert. ef. 11-13-91; DEQ 22-1991, f. & cert. ef. 11-13-91; DEQ 23-1991, f. & cert. ef. 11-13-91; DEQ 24-1991, f. & cert. ef. 11-13-91; DEQ 25-1991, f. & cert. ef. 11-13-91; DEQ 1-1992, f. & cert. ef. 2-4-92; DEQ 3-1992, f. & cert. ef. 2-4-92; DEQ 7-1992, f. & cert. ef. 3-30-92; DEQ 19-1992, f. & cert. ef. 8-11-92; DEQ 20-1992, f. & cert. ef. 8-11-92; DEQ 25-1992, f. 10-30-92, cert. ef. 11-1-92; DEQ 26-1992, f. & cert. ef. 11-2-92; DEQ 27-1992, f. &cert. ef. 11-12-92; DEQ 4-1993, f. & cert. ef. 3-10-93; DEQ 8-1993, f. & cert. ef. 5-11-93; DEQ 12-1993, f. & cert. ef. 9-24-93; DEQ 15-1993, f. & cert. ef. 11-4-93; DEQ 16-1993, f. & cert. ef. 11-4-93; DEQ 17-1993, f. & cert. ef. 11-4-93; DEQ 19-1993, f. & cert. ef. 11-4-93; DEQ 1-1994, f. & cert. ef. 1-3-94; DEQ 5-1994, f. & cert. ef. 3-21-94; DEQ 14-1994, f. & cert. ef. 5-31-94; DEQ 15-1994, f. 6-8-94, cert. ef. 7-1-94; DEQ

25-1994, f. & cert. ef. 11-2-94; DEQ 9-1995, f. & cert. ef. 5-1-95; DEQ 10-1995, f. & cert. ef. 5-1-95; DEQ 14-1995, f. & cert. ef. 5-25-95; DEQ 17-1995, f. & cert. ef. 7-12-95; DEQ 19-1995, f. & cert. ef. 9-1-95; DEQ 20-1995 (Temp), f. & cert. ef. 9-14-95; DEQ 8-1996(Temp), f. & cert. ef. 6-3-96; DEQ 15-1996, f. & cert. ef. 8-14-96; DEQ 19-1996, f. & cert. ef. 9-24-96; DEQ 22-1996, f. & cert. ef. 10-22-96; DEQ 23-1996, f. & cert. ef. 11-4-96; DEQ 24-1996, f. & cert. ef. 11-26-96; DEQ 10-1998, f. & cert ef. 6-22-98; DEQ 15-1998, f. & cert. ef. 9-23-98; DEQ 16-1998, f. & cert. ef. 9-23-98; DEQ 17-1998, f. & cert. ef. 9-23-98; DEQ 20-1998, f. & cert. ef. 10-12-98; DEQ 21-1998, f. & cert. ef. 10-14-98; DEQ 1-1999, f. & cert. ef. 1-25-99; DEQ 2-1999, f. & cert. ef. 3-25-99; DEQ 6-1999, f. & cert. ef. 5-21-99; DEQ 10-1999, f. & cert. ef. 7-1-99; renumbered from OAR 340-020-0047.

* *(Formerly OAR 340-020-0047. Renumbering is scheduled for EQC adoption at the October 1, 1999 meeting as agenda item 'E'.)*

Secretary of State

NOTICE OF PROPOSED RULEMAKING HEARING

A Statement of Need and Fiscal Impact accompanies this form.

DEQ – Air Quality Division	Chapter 340
Agency and Division	Administrative Rules Chapter Number
Susan M. Greco	(503) 229-5213
Rules Coordinator	Telephone

811 S.W. 6th Avenue, Portland, OR 97213
Address

Hearing Date	Time	Location	Hearings Officer
July 22, 1999	4:30–6:30 p.m.	Council Chambers 101 NW 'A' Street, Grants Pass	Keith Tong

Are auxiliary aids for persons with disabilities available upon advance request?
☒ Yes ☐ No

RULEMAKING ACTION

AMEND:

OAR 340-020-0047, 340-022-0470, 340-023-0115, 340-031-0520, 340-031-0530

RENUMBER*:
From OAR 340-020-0047 to 340-200-0400 [State Implementation Plan]
From OAR 340-022-0470 to 340-258-0130 [Oxygenated Gasoline Control Areas]
From OAR 340-023-0115 to 340-264-0200 [Open Burning Control Areas]
From OAR 340-031-0520 to 340-204-0030 [Designation of Nonattainment Areas]
From OAR 340-031-0530 to 340-204-0040 [Designation of Maintenance Areas]

*In a separate rulemaking action, DEQ is assigning new rule numbers to all Air Quality rules in a newly restructured system of organization. Therefore, it is likely that the rules being amended will also be renumbered as shown.

Stat. Auth.: ORS 468.015, 468.035
Stats. Implemented: ORS 468A.035, 468A.085, 468A.420

RULE SUMMARY

The Department of Environmental Quality is proposing that the Environmental Quality Commission adopt a maintenance plan and rule amendments regarding carbon monoxide in Grants Pass. The proposal, if adopted by the Environmental Quality Commission, will:

1. Establish a carbon monoxide maintenance plan for Grants Pass;
2. Request that the Environmental Protection Agency redesignate the Grants Pass Central Business District to an area that meets the National Ambient Air

Quality Standards for carbon monoxide;

3. Change the state designation of the Grants Pass Central Business District to a carbon monoxide maintenance area;
4. Establish a transportation conformity budget for the Grants Pass Central Business District; and
5. Eliminate the oxygenated fuel requirement for the Grants Pass area.

The maintenance plan (and its associated appendices, including the emission inventory), the request for redesignation, and elimination of the oxygenated fuel requirement, if adopted, will be submitted to the U.S. Environmental Protection Agency as a revision to the Oregon State Implementation Plan as required by the Clean Air Act. These rulemakings will take effect upon approval by the Environmental Protection Agency.

Additionally, the Department of Environmental Quality is proposing a rule amendment relating to fine particulate ($PM_{2.5}$) pollution prevention in Grants Pass. This proposal, if adopted by the Environmental Quality Commission, will expand the Rogue Basin Open Burning Control Area and will be submitted to the Environmental Protection Agency as a revision to the Oregon State Implementation Plan. The expansion of the Rogue Basin Open Burning Control Area will take effect upon adoption by the Environmental Quality Commission and filing with the Secretary of State.

Copies of the proposals are available for review at DEQ Headquarters, 11th Floor (address above); DEQ's Grants Pass Office, 510 NW 4th Street, Room 76, Grants Pass; or by calling (503) 229-5581.

July 27, 1999 at 5:00 p.m.
Last Day for Public Comment

Susan Greco
Authorized Signer and Date

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Expansion of the Rogue Basin Open Burning Control Area

Fiscal and Economic Impact Statement

Introduction

The rulemaking regarding fine particulate proposes to expand the Rogue Basin Open Burning Control Area. This rulemaking will affect households and a small number of industrial and commericial interests in the expanded area. There will be no significant economic impact.

General Public

Expanding the Rogue Basin Open Burning Control Area to include all households that will impact fine particulate concentrations in Grants Pass will add approximately 3,000 households to the control area. These households will be subject to the same requirements as their neighbors to the south and east – no outdoor burning on those days when DEQ issues a burn advisory. These households will be permitted to burn on days when no advisory is issued; therefore, there will be no economic impact to the households.

Small Business

Once the open burning control area is expanded, burning commercial, industrial, demolition, or construction waste will only be allowed by letter permit from DEQ. The expanded area is primarily rural residential. There will be minimal business activities impacted by this rule amendment. Examples of commercial open burning can include waste material from offices, wholesale or retail yards and outlets, warehouses, restaurants, mobile home parks, and multiple housing units. Demolition burning includes waste from land clearing for land improvement. Letter permits from DEQ are free, but are only issued if the applicant has no viable alternative. Alternatives can include chipping woody debris, hauling the debris to a waste collection site, or piling the debris for natural decomposing. A free waste collection site is located in Murphy, at the southern end of the open Burning control area.

Large Business

There are only a handful of large businesses within the expanded area. None are involved in open burning activities. The businesses include a trailer manufacturer, electronics firms, and computer firms.

Local Governments

Local fire districts and county and city offices will experience a small increase in inquiries from households to confirm if they are located within the expanded boundary.

State Agencies

DEQ is also responsible for enforcing the open burning controls in the Rogue Basin Open Burning Control Area. The proposed expansion of the Rogue Basin Open Burning Control Area will add approximately 3,000 households to this existing program. This is an increase of about 15 percent. DEQ Medford Office does not plan to add additional resources for this relatively minor expansion to the existing program. The Oregon Department of Forestry will also experience a small increase in inquiries from households to confirm if they are located within the expanded boundary.

Assumptions

It is assumed that industrial or commercial businesses will have the means to haul debris to a collection site in considering that option as an alternative to open burning.

Housing Cost Impact Statement

The Department has determined that this proposed rulemaking will have no effect on the cost of development of a 6,000 square foot parcel and the construction of a 1,200 square foot detached single family dwelling on that parcel. New housing in the expanded control area will be subject to exactly the same regulation as existing housing.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Expansion of the Rogue Basin Open Burning Control Area

Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

Expansion of the Rogue Basin Open Burning Control Area is a pollution prevention measure designed to reduce emissions of fine particulate ($PM_{2.5}$) to assure compliance with the new federal public health standard for $PM_{2.5}$.

2. Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program? ☐ **Yes** ☒ **No**

a. If yes, identify existing program/rule/activity:

n/a

b. If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules? ☐ **Yes** ☐ **No (if no, explain):**

n/a

c. If no, apply the following criteria to the proposed rules.

Staff should refer to Section III, subsection 2 of the SAC document in completing the evaluation form. Statewide Goal 6 - Air, Water and Land Resources is the primary goal that relates to DEQ authorities. However, other goals may apply such as Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources; Goal 11 - Public Facilities and Services; Goal 16 - Estuarine Resources; and Goal 19 - Ocean Resources. DEQ programs and rules that relate to statewide land use goals are considered land use programs if they are:

1. Specifically referenced in the statewide planning goals; or

2. Reasonably expected to have significant effects on
   a. resources, objectives or areas identified in the statewide planning goals, or
   b. present or future land uses identified in acknowledged comprehensive plans.

In applying criterion 2 above, two guidelines should be applied to assess land use significance:

- The land use responsibilities of a program/rule/action that involved more than one agency, are considered the responsibilities of the agency with primary authority.

- A determination of land use significance must consider the Department's mandate to protect public health and safety and the environment.

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

DEQ has applied the criteria below to the open burning activities an determined they do not present significant effects on resources, objectives or areas identified in the statewide planning goals, or to future land uses identified in the local comprehensive plans. This determination remains applicable to the proposed rules and is consistent with the Department's Division 18 – State Agency Coordination rules.

3. **If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.**

Not applicable.

Gregory A. Gr

Division

Intergovernmental Coordinator

6/9/99

Date

Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

1. Are there federal requirements that are applicable to this situation? If so, exactly what are they?

Yes, the Environmental Protection Agency established new health standards for $PM_{2.5}$ (particulate matter 2.5 microns in diameter and smaller). Compliance determinations will be made in 2002. The expansion of the Rogue Basin Open Burning Control Area is a pollution prevention measure designed to reduce $PM_{2.5}$ emissions in an effort to comply with the standard when EPA makes its determinations. There is no federal requirement to pursue pollution prevention measures.

2. Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?

The federal requirements are performance based. Compliance will be based on monitored ambient concentrations of $PM_{2.5}$.

3. Do the applicable federal requirements specifically address the issues that are of concern in Oregon? Was data or information that would reasonably reflect Oregon's concern and situation considered in the federal process that established the federal requirements?

No, the federal $PM_{2.5}$ standards do not address prevention. DEQ and the Grants Pass Air Quality Advisory Committee are voluntarily pursuing pollution prevention for $PM_{2.5}$ in Grants Pass in the interest of public health and complying with the standard by 2002.

4. Will the proposed requirement improve the ability of the regulated community to comply in a more cost effective way by clarifying confusing or potentially conflicting requirements (within or cross-media), increasing certainty, or preventing or reducing the need for costly retrofit to meet more stringent requirements later?

Yes. Voluntary pollution prevention allows greater flexibility to design measures that are low cost and reflect local conditions.

5. Is there a timing issue which might justify changing the time frame for implementation of federal requirements?

EPA will make compliance determinations starting in 2002. There is no federal requirement to pursue pollution prevention prior to those determinations.

6. Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?

The expansion of the open burning control area will help prevent a future violation of the new $PM_{2.5}$ health standard and will thereby help to accommodate future growth of sources that emit $PM_{2.5}$.

7. Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)

The expansion of the open burning control area is one of several pollution prevention measures being implemented in the Grants Pass area. The measures collectively address the major sources of $PM_{2.5}$, which are residential in nature. The other measures will be implemented by local jurisdictions.

8. Would others face increased costs if a more stringent rule is not enacted?

The proposed rule amendment to expand the Rogue Basin Open Burning Control Area is designed to avoid a violation of the new $PM_{2.5}$ annual standard. A violation will mean prescriptive control requirements from the Environmental Protection Agency that will likely be more costly than voluntary control measures.

9. Does the proposed requirement include procedural requirements, reporting or monitoring requirements that are different from applicable federal requirements? If so, Why? What is the "compelling reason" for different procedural, reporting or monitoring requirements?

No.

10. Is demonstrated technology available to comply with the proposed requirement?

Households will simply put off outdoor burning until DEQ advisories permit. The alternatives available to industrial and commercial businesses rely on existing technology (chipping, disposal at a collection site, piling).

11. Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost-effective environmental gain?

The expansion of the open burning control area is designed as a pollution prevention measure.

State of Oregon
Department of Environmental Quality **Memorandum**

Date: June 15, 1999

To: Interested and Affected Public

Subject: Rulemaking Proposal and Rulemaking Statements - Expansion of the Rogue Basin Open Burning Control Area

This memorandum contains information on a proposal by the Department of Environmental Quality for a rule amendment relating to fine particulate pollution prevention in Grants Pass. Pursuant to ORS 183.335, this memorandum also provides information about the Environmental Quality Commission's intended action to amend the Oregon Administrative Rules.

This proposal, if adopted by the Environmental Quality Commission, will expand the Rogue Basin Open Burning Control Area and will be submitted to the Environmental Protection Agency as a revision to the Oregon State Implementation Plan. The expansion of the Rogue Basin Open Burning Control Area would take effect upon adoption by the Environmental Quality Commission and filing with the Secretary of State. DEQ has the statutory authority to address open burning under ORS 468A.085.

Acronyms and Keywords Used in this Package

$PM_{2.5}$ Fine particulate or particles measuring less than 2.5 microns in diameter and known to aggravate upper respiratory health conditions. The period at the end of this sentence is about 500 microns.

PM_{10} Fine particulate or particles measuring less than 10 microns in diameter, also known to aggravate upper respiratory health conditions.

What's in this Package?

Attachments to this memorandum provide details on the proposal as follows:

- Attachment A The official statement describing the fiscal and economic impact of the proposed rule amendment. (required by ORS 183.335)
- Attachment B A statement providing assurance that the proposed rule amendment is consistent with statewide land use goals and compatible with local land use plans.
- Attachment C Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

Attachment D The proposed rule amendment.

Attachment E Grants Pass Air Quality Advisory Committee $PM_{2.5}$ Pollution Prevention Plan

Hearing Process Details

DEQ is conducting a drop-in public hearing at which comments will be accepted either orally or in writing. DEQ staff will be available to informally and individually answer questions and discuss issues throughout the public hearing. Public testimony may be presented to the hearings officer at any time during the two-hour time period. The hearing will be held as follows:

Date: Thursday, July 22, 1999
Time: Between 4:30 p.m. and 6:30 p.m. on a drop-in basis
Place: Grants Pass City Hall, 101 NW 'A' Street, Council Chambers, Grants Pass

Deadline for submittal of Written Comments: 5:00 p.m., Tuesday, July 27, 1999
(This is not a postmark date, written comments must be received at the address below by this date.)

Keith Tong will be the Presiding Officer at the hearing.

Written comments can be presented at the hearing or to DEQ any time prior to the date above. Comments should be sent to: **Department of Environmental Quality, Attn: Patti Seastrom, 811 SW Sixth Avenue, Portland, Oregon 97204-1390.**

In accordance with ORS 183.335(13), no comments from any party can be accepted after the deadline for submission of comments has passed. Thus if you wish for your comments to be considered by DEQ in the development of the plan and rules, your comments must be **received** prior to the close of the comment period. DEQ recommends that comments be submitted as early as possible to allow adequate review and evaluation of the comments submitted.

What Happens After the Public Comment Period Closes

Following close of the public comment period, the Presiding Officer will prepare a report that summarizes the oral testimony presented and identifies written comments submitted. The Environmental Quality Commission (EQC) will receive a copy of the Presiding Officer's report. The public hearing will be tape recorded, but the tape will not be transcribed.

DEQ will review and evaluate the rulemaking proposal in light of all information received during the comment period. Following the review, the rule may be presented to the EQC as originally proposed or with modifications made in response to public comments received.

The EQC will consider DEQ's recommendation for rule adoption during one of the Commission's regularly scheduled public meetings. The targeted meeting date for consideration of this rulemaking proposal is October 1, 1999. This date may be delayed if needed to provide additional time for evaluation and response to testimony received in the hearing process.

You will be notified of the time and place for final EQC action if you present oral testimony at the hearing or submit written comment during the comment period. Otherwise, if you wish to be kept advised of this proceeding, you should request that your name be placed on the mailing list. Make requests to: *Patti Seastrom, Oregon Department of Environmental Quality, 811 SW Sixth Avenue, Portland, OR 97204-1390, (503) 229-5581 or toll free in Oregon (800) 452-4011.*

Background on Development of the Rulemaking Proposal

<u>Why is there a need for the rule?</u>

Particulate pollution has been a problem in Grants Pass for many years, mainly due to high concentrations of woodsmoke during cold air inversions in the winter. A voluntary woodsmoke curtailment program, limits on backyard burning, and efforts to burn wood more efficiently have all contributed to a significant reduction in particulate levels in the Grants Pass area in recent years. These programs were designed to meet the public health standard for particles measuring less than 10 microns in diameter (PM_{10}).

In 1997, EPA adopted new public health standards for particles measuring less than 2.5 microns in diameter ($PM_{2.5}$). Health studies over the past decade show that these smaller particles are inhaled deeper into the lungs and can potentially cause more damage. It is estimated that nationally, the new fine particulate standard will prevent approximately 15,000 premature deaths per year and hundreds of thousands of cases of aggravated asthma in children and adults. Asthma is now the leading chronic illness among children.

Although there are no historic measurements of $PM_{2.5}$ levels in the Grants Pass area, the Department of Environmental Quality anticipates that the new annual standard for $PM_{2.5}$ will be more difficult to meet than the previous standard for PM_{10}. This assessment is based on historical PM_{10} data collected in the area and correlations with $PM_{2.5}$ data from other areas. DEQ will install a $PM_{2.5}$ monitor in Grants Pass in the fall of 1999 to begin to measure daily concentrations of $PM_{2.5}$. Since the $PM_{2.5}$ annual standard is based on an average of three years of data, the compliance status for Grants Pass will not be determined until 2002.

The advisory committee recommended that $PM_{2.5}$ emissions be lowered prior to 2002 in order to avoid a nonattainment designation for $PM_{2.5}$ and the prescriptive control requirements that will likely accompany a nonattainment designation. In the interest of pollution prevention, the committee worked with DEQ to identify pollution prevention measures to begin reducing $PM_{2.5}$ levels in the Grants Pass area. The committee recommended adding several new prevention strategies to the ongoing successful programs begun in 1990. The measures address woodburning activities and expand the geographic area of focus because PM2.5 is lighter and tends to disperse over a broader area.

The new recommended strategies are:

* Expand the voluntary woodsmoke curtailment program to the entire Grants Pass valley
* Offer incentives for voluntary removal of uncertified woodstoves and replacement with certified woodstoves or alternate heat source
* Require removal of uncertified woodstoves upon sale of home
* **Expand the open burning control area to the entire Grants Pass valley**
* Promote alternative yard debris disposal and composting.

The open burning control area is defined by Oregon administrative rule. The proposed rule amendment would prohibit open burning within this expanded area on days when DEQ issues a burn advisory. The remaining four pollution prevention measures will be adopted and/or administered locally. A copy of the advisory committee's complete report is included as Attachment E.

<u>How was the rule developed?</u>

DEQ and the advisory committee reviewed estimates of $PM_{2.5}$ ambient concentrations that were developed by DEQ technical staff. The advisory committee evaluated the need for preventive measures to reduce $PM_{2.5}$ emissions. The estimates of $PM_{2.5}$ concentrations were developed using historic PM_{10} monitored concentrations from Grants Pass, nephelometer readings from Grants Pass, and correlations between $PM_{2.5}$ concentrations and nephelometer readings from other Southern Oregon locations ($PM_{2.5}$ has never been measured in Grants Pass). The resulting estimate showed that Grants Pass might violate the annual public health standard. The advisory committee recommended that pollution prevention measures be put into place to prevent a violation of the annual standard. One of the five measures recommended is to expand the Rogue

Basin Open Burning Control Area. The Rogue Basin Open Burning Control Area is defined by Oregon Administrative Rule and a rule amendment to expand the area is included in this rulemaking proposal.

Copies of the documents relied upon in the development of this rulemaking proposal can be reviewed at the Department of Environmental Quality's office at 811 SW 6th Avenue, Portland, Oregon. Please contact Patti Seastrom at (503) 229-5581 to schedule a time to review the documents. These documents include the Control Strategy for the Grants Pass PM_{10} Nonattainment Area, November 1990 and the addendum for the Grants Pass PM_{10} Nonattainment Area, November 1991.

Who does this rule affect including the public, regulated community or other agencies, and how does it affect these groups?

The expansion of the Rogue Basin Open Burning Control Area will affect households located within the expanded area, the Oregon Department of Forestry, and local fire districts. Households within the expanded area will no longer be able to burn outside on days when DEQ issues a burning advisory. DEQ prohibits open burning when the daily maximum ventilation index does not meet minimum criteria for adequate smoke dispersion. Forestry and local fire districts that issue burn permits in the expanded area will need to know the legal description of the expanded area. Although the expanded area is primarily rural residential, the expansion will also prohibit industrial, commercial, and demolition burning in the expanded area, except by letter permit from DEQ. Of the three nonhousehold burning activities, demolition burning is the only activity currently taking place within the affected area to any significant degree. Demolition burning includes the burning of waste material resulting from tearing down a structure or clearing land for improvements. If a letter permit is denied, alternatives to burning include chipping, hauling waste to a nearby collection site, or piling material for natural decomposition.

How will the rule be implemented?

The expanded open burning area will be implemented through the DEQ Medford office air quality staff. The Josephine County Public Health Department will educate households and businesses in the expanded open Burning control area about burning restrictions. DEQ will provide maps and legal descriptions of the expanded area to local jurisdictions.

Are there time constraints?

The Environmental Protection Agency will determine which areas meet the new $PM_{2.5}$ standards in 2002. Based on DEQ's estimate of annual $PM_{2.5}$ concentrations, the advisory committee recommended that measures be taken now to reduce the public health risk and to insure compliance in 2002.

Contact for More Information

If you would like more information on this rulemaking proposal, please contact:

Patti Seastrom
Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 972004-1390
(503) 229-5581 or toll free in Oregon (800) 452-4011

This publication is available in alternate format (e.g. large print, Braille) upon request. Please contact DEQ Public Affairs at 503-229-5317 to request an alternate format.

State of Oregon
Department of Environmental Quality — Memorandum

Date: July 23, 1999

To: Environmental Quality Commission

From: Keith Tong

Subject: Presiding Officer's Report for Rulemaking Hearing

Hearing Date and Time:	July 22, 1999, beginning at 4:30 p.m.
Hearing Location:	Grants Pass City Hall, Council Chambers
Title of Proposal:	Expansion of the Rogue Basin Open Burning Control Area

The rulemaking hearing on the above titled proposal was convened at 4:30 p.m. People were asked to sign witness registration forms if they wished to present testimony. People were also advised that the hearing was being recorded and of the procedures to be followed.

35 people were in attendance, 11 people signed up to give testimony.

Prior to receiving testimony, Annette Liebe, Patti Seastrom and Keith Tong, briefly explained the specific rulemaking proposal, the reason for the proposal, and responded to questions from the audience.

Summary of Oral Testimony

Gretchen Horn Ms. Horn stated that the open burn control area should be expanded to include the Sunny Valley area that is just north of the proposed expansion. Bill Bonville Mr. Bonville stated that he opposes the expansion. DEQ is treating farms the same as they treat cities. This is an unnecessary thing and farming is threatened by such actions. It is contradictory to expand the open burning control area and discontinue oxygenated gas at the same time. Thoburn D. Downes Mr. Downes stated that after 22 years in the military protecting our freedoms, he feels this is taking freedom from the people and he is very opposed to the rules. Mr. Downes has lived in the Hugo area since 1945 and hasn't seen burning in the expansion area affect the Grants Pass area. Jeanette Downes Ms. Downes stated that she is a retired registered nurse and that asthma sufferers' problems are only from intense smoke such as forest fires and big slash burns. Open burning or burning of trash by the public has no affect on asthma sufferers and the wind seldom blows from Hugo to Grants Pass. John Tracy Mr. Tracy stated that he has lived here for only 4 years but has seen no smoke problem. The meeting is a sham because DEQ will not use his testimony for changing or to affect the rules that are proposed. "This is a done deal!" Robert C. Waldron Mr. Waldron stated that he has known people with problems that have been going to doctors for 14 years and the doctors have never suggested there is an air quality problem in the area. This is just another bureaucratic grab for power. George E Noyes III Mr. Noyes stated that this puts an undue hardship on people in the area doing land clearing for pasture or other purposes. They will have to truck burnable debris out past Medford on Highway 140 for disposal. Wayne McKy Mr. McKy stated that as chairman for the Hugo Neighborhood Association he suspects that wood stoves will be added later. No one needs this for the Hugo area; it is just not necessary. One concern is that piles burning for several days may enter a no burn period and what do you do? This creates more problems than good by having to put out and re-light fires. More trash will be piling up along roads because there will be less opportunity for burning. Mr. McKy feels that unless smoke goes into Grants Pass there is no problem. If this is a problem for the city and the smoke does get there from Hugo then maybe the smoke needs to be dealt with, but Mr. McKy hasn't seen proof that the smoke is getting to Grants Pass from Hugo. Michael Butowitsch Mr. Butowitsch stated that during the past several months he has seen no public notice that an air quality workshop was held and he hasn't seen evidence of any need for control of open burning. Mr. Butowitsch stated that other issues are more serious than private residence burning but that a finding of fact showing otherwise may change his mind. John Blosser Mr. Blosser stated that he is opposed to placing open burn controls on a small area, but would be agreeable to a county or statewide rule controlling open burning. Peter Sparacino Mr. Sparacino stated that he seldom open burns, but uses a chipper/shredder to dispose of his burnable debris. He is concerned that the machinery he uses puts more pollutants into the air than open burning would. He would not want everyone to have to use chipper/shredders, because this would exacerbate the problem and counter effect the rules. Mr. Sparacino would like to see data projecting use of machinery versus open burning. Mr. Sparacino is not for or against the new rule proposal, but feels there needs to be more investigation to determine the best way to reduce pollution.

There was no further testimony and the hearing was closed at 6:30 p.m.

Written Testimony

The following written comments were received by the Department prior to the close of the public comment period on July 27, 1999.

William Bonville, e-mail received July 24, 1999.
Mike Kohn, Home Comfort Hearth & Patio, letter received June 26, 1999.
Ernest McDonald, letter received July 18, 1999.
Jim Smith, e-mail received July 27, 1999.

Attachment D

State of Oregon
Department of Environmental Quality

Rulemaking Proposal
Rogue Basin Open Burning Control Area Expansion

Department Response to Public Comment

Comment: There is no practical reason to extend the open burning control area to the north end of the valley. Hugo/Merlin smoke emissions have no impact on Grants Pass. The wind does not blow in that direction. (Bonville, Smith, Downes, McKy, Butowitsch)

Response: Wind direction is not the significant factor in the movement of fine particulate on no-burn days. In the open burning control area, burning is not allowed on days when the winds are still and there is a layer of cold air creating an inversion. On these days, pollutants build up under the inversion layer and drift throughout the valley. Fine particulate (PM 2.5) is especially light, travels farther than $PM_{10,}$ and can persist in the air for days or weeks (Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, EPA, July 1996).

Comment: The proposal is self-contradictory. Why is oxygenated fuel being eliminating while the open burning control area is being expanded? (Bonville)

Response: Oxygenated fuel reduces carbon monoxide emissions and the open burning control area is designed to reduce particulate emissions. The interaction between these two pollutants is minor. $PM_{2.5}$ will transport over a broad region, whereas carbon monoxide is a more localized pollutant. The main source of carbon monoxide emissions is vehicles. The oxygenated fuel requirement is no longer needed because improvements in motor vehicle technology have reduced carbon monoxide emissions significantly. Vehicle use results in some particulate emissions from exhaust and road dust, but the use of oxygenated fuel has no effect on particulate emissions.

Comment: The city is forcing DEQ to regulate the north end of the valley as a part of the city's annexation plan. (Bonville)

Response: DEQ has not had any discussions with the City of Grants Pass about possible annexation to the north. The sole purpose of the expansion of the Rogue Basin Open Burning Control Area is to protect public health by reducing fine particulate emissions in the valley and prevent a violation of the public health standard.

Comment: No one from the Hugo community was a part of the advisory committee. (Bonville)

Response: Hugo's participation on the advisory committee would have been helpful. DEQ's requests of the city and county to nominate citizen members were unsuccessful. There will likely be additional work to do in the near future and Hugo citizen participation will be welcomed.

Comment: Given the 50 to 60 inches of rain in Hugo between November and May, there would be an increase of particulates due to burning wet materials on approved days, since there would not be an opportunity to select the best opportunities for burning. (Bonville)

Response: Burn piles should be covered with plastic during rainy weather until burning can be completed.

Comment: Open burning of legal materials is not the problem, but rather the burning of garbage. (McDonald)

Response: Burning of garbage is a problem and it is illegal, not only in the open burning control area, but statewide because of the nuisance odor problem and the potential release of toxins into the air. In the open burning control areas of the state, including the Rogue Basin, burning is further restricted because in these areas particulate emissions accumulate to unhealthy levels under cold air inversion conditions. Industrial and commercial burning is prohibited in the open burning control area and residential burning is limited to those days with adequate air movement, as determined by DEQ and local meteorologists.

Comment: When more science is conducted on this area of $PM_{2.5}$, it is believed that the source of pollution will be pointed in different directions. Are there sources other than wood smoke addressed by the committee? (Kohn)

Response: The committee considered all sources of $PM_{2.5}$ and recommended that pollution prevention efforts focus on the most primary sources. Research shows that the primary sources of fine particulate are combustion of coal, oil, gasoline, diesel, and wood (EPA, July, 1996). A DEQ emissions inventory of PM_{10} in the Grants Pass Urban Growth Boundary shows that residential wood burning emissions are the primary source of particulate. DEQ will be further analyzing sources of $PM_{2.5}$ in the Grants Pass area as monitors are installed and data is collected.

Comment: The open burning area should be extended further north to include the Sunny Valley area. (Horn)

Response: Sunny Valley lies outside of the Josephine County portion of the Rogue Valley. The boundary for the expansion was based on topography. It was designed to include all inhabited areas within the ring of 3,000 foot peaks that create the valley surrounding Grants Pass. Sunny Valley is on the other side of the 3,000 foot mountains. It is unlikely that emissions from Sunny Valley would drift over those mountains and down into the valley during inversion conditions.

Comment: DEQ is treating farms the same as they treat cities. Farming is threatened by such actions. (Bonville)

Response: All emissions from any type of burning anywhere in the valley have the potential to contribute to unhealthy accumulations of particulate elsewhere in the valley. The expansion of the Rogue Basin Open Burning Control Area will prohibit industrial and commercial open burning throughout the valley and will limit residential open burning to those days with adequate air movement to prevent an accumulation of particles. Under current state law, agricultural open burning is exempt from open burning control area restrictions in the Rogue Valley and most other areas of the state. Agricultural open burning includes any waste material generated or used on land that is used primarily for profit by raising, harvesting and selling crops or raising and selling livestock or poultry. DEQ is working with agricultural land owners to voluntarily limit open burning on "no burn" days.

Comment: Restricting open burning days will only compound the problem on legal days. (McDonald)

Response: If DEQ has not issued a burning advisory on a given day, it means that based on the meteorological predictions there is no inversion and the winds are blowing. Under these conditions, emissions from burning will disperse in the atmosphere and not accumulate to unhealthy levels.

Comment: Asthma sufferers' problems are only from intense smoke such as forest fires and big slash burns. Open burning or burning of trash by the public has no effect on asthma sufferers. (Downes)

Response: Accumulation of fine particulate occurs in the winter months when cold air inversions are common. The most common source of particulate during the winter months is from residential wood burning. Forest fires occur during the summer months and slash burns typically are done during the spring and fall. DEQ is working with the Oregon Department of Forestry and the Federal Land Managers to reduce the impacts of prescribed burning on populated areas. The expansion of the open burning control area is designed to reduce the health impacts of fine particulates resulting from open burning. The new fine particulate health standard is expected to prevent approximately 15,000 premature deaths per year and hundreds of thousands of cases of aggravated asthma in children and adults.

Comment: DEQ will not use testimony to change the rules that are proposed. (Tracy)

Response: Testimony that presents factual information not already considered in DEQ's analysis can result in a change to the proposal.

Comment: The doctors have never suggested there is an air quality problem in the area. This is another bureaucratic grab for power. (Waldron)

Response: Epidemiological studies show consistent associations between exposure to particulate matter and health effects. Fine particles are more consistently associated with health risks than coarse particles. Individuals with cardiovascular or pulmonary disease, especially if they are elderly, are more likely to suffer severe health effects (death or hospitalization) related to particulate exposure. Children and asthmatics are also susceptible to particulate effects such as increased respiratory symptoms and decreased lung function. (EPA, Air Quality Criteria for Particulate Matter, April 1996) The Grants Pass area exceeded the pubic health standard for PM_{10} throughout the 1980's. While PM_{10} levels have improved during the last decade, data from air quality monitors measuring PM_{10} and particle fractions show that levels of fine fraction particulate may exceed the new annual public health standard for $PM_{2.5}$. The expansion of the open burning control area is designed to reduce $PM_{2.5}$ in order to reduce health risks throughout the valley.

Comment: The expansion puts an undue hardship on people in the area doing land clearing for pasture or other purposes. They will have to truck burnable debris out past Medford for disposal. (Noyes)

Response: Reasonably sized burn piles can be adequately managed for burning on those days when burning is allowed. There is also a disposal facility available in Murphy and a replacement for the Jogrow facility in Grants Pass is planned. On-site chipping or natural decomposition are other alternatives.

Comment: Piles burning for several days may enter a no burn period and then what? (McKy)

Response: When a burn pile burns into a second day or multiple days, it is a violation of State Fire Marshall rules. No burning is allowed anywhere in the state after dark. The pile may be the allowable size (as determined by the local fire district for safety reasons), but it may contain dense material such as a stump that will not completely combust prior to nightfall.

Comment: Control should not be placed on a small area. There should be a county or statewide rule controlling open burning. (Blosser)

Response: Open burning is controlled where there are threats to public health from accumulations of particulate. In Oregon, this happens where the topography is such that inversion layers occur over valleys, trapping the particulate and allowing it to accumulate to unhealthy levels. In the areas of Oregon where this is known to occur, open burning is controlled to only allow burning on days with adequate ventilation.

Comment: What would be the impact from running chippers if people switched from burning to chipping?

Response: Chippers commonly run on 4-cycle gasoline engines. If everyone in Josephine County used a chipper or stump grinder to dispose of woody debris, the annual particulate emissions (PM_{10} and smaller) would be minimal, almost zero. If everyone in Josephine County burned the same amount of woody debris, the annual particulate emissions would be over 250 tons. The carbon monoxide emissions from chipping would be 23 tons per year, compared to 1,350 tons per year from burning. (DEQ Technical Services estimates, based on "Non-Road

Engine Emission Inventories for Carbon Monoxide and Ozone Nonattainment Boundaries, EPA".)

Other Comments Not Directly Related to Proposed Rulemaking

Comment: The expansion will lead to more controls on woodstove use. (Bonville, McKy)

Response: It is true that woodstove use is a major source of fine particulate in the valley. The Air Quality Advisory Committee also recommended expanding the current voluntary woodstove curtailment program from the Grants Pass Urban Growth Boundary to the remainder of the valley. The woodstove curtailment program remains voluntary because it has been successful as a voluntary program. Open burning has been regulated by state rule in the Rogue Basin since 1981. Even with a regulatory program in place for open burning, DEQ receives numerous complaints about people burning illegally.

Comment: The potential emission reductions from woodstove changeouts are understated. (Kohn)

Response: The preliminary estimates used in the advisory committee report are conservative and are based on PM_{10} emissions. Emission factors for $PM_{2.5}$ are not available yet. The estimates of potential fine particulate emission reductions can be revised and updated as the woodstove programs are further developed and implemented.

Comment: No one from the hearth products industry was represented on the advisory committee. The hearth products industry supports woodstove changeout and can provide valuable input on how to make this kind of program work effectively. (Kohn)

Response: There is more work to be done on the woodstove program in the Grants Pass area and participation by the hearth products industry will be sought out.

Attachment E

State of Oregon
Department of Environmental Quality

Rulemaking Proposal for
Grants Pass Carbon Monoxide Maintenance Plan/Redesignation Request

Detailed Changes in Response to Comments

Comments received did not technically support changing the proposal; however, comments indicated that residents in the north county area need more information to better understand the nature of $PM_{2.5}$ and how to manage burning under restricted conditions. The implementation plan, included as Attachment 'G', incorporates these changes.

Attachment F

Grants Pass Air Quality Advisory Committee Members

Kimberly Sellers, Committee Chair, Owner - Tierra del Sol
Mark Amrhein, City of Grants Pass
Vince Carrow, Oregon Department of Transportation
Roy Childers, U.S. Forest Industries
Tyler Deke, Rogue Valley Council of Governments
Dwight Ellis, Grants Pass Chamber of Commerce
Greg Gilpin, Oregon Department of Forestry
Gary Grimes, Timber Products Co.
Steve Hodge, Josephine County Public Works
Dennis Krois, Copeland Paving
Bill Olson, Josephine County Public Health Department
Dr. Bob Palzer, Sierra Club
Rob Pochert, SOREDI
Chris Sorensen, Three Rivers Community Hospital

Grants Pass Pollution Prevention Planning for $PM_{2.5}$

A plan for meeting the national ambient air quality standards for PM2.5

Grants Pass Air Quality Advisory Committee
Final Report

May 1999

Attachment F

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Chris Sorensen, Three Rivers Community Hospital

Oregon Department of Environmental Quality Project Staff

Annette Liebe, Manager, Airshed Planning
Patti Seastrom, Airshed Planning
John Becker, Manager, Medford Office
Keith Tong, Medford Office

Introduction

This report represents the work accomplished by the Grants Pass Air Quality Advisory Committee from June 1998 through May 1999 with the Oregon Department of Environmental Quality in its efforts to address particulate pollution in the Grants Pass area. The committee's charge was to evaluate the need for pollution prevention measures in Grants Pass in response to the new federal public health standard for $PM_{2.5}$ (particles 2.5 microns and smaller). The Grants Pass Air Quality Advisory Committee supports $PM_{2.5}$ pollution prevention. This report presents the committee's recommended methods for reducing $PM_{2.5}$ pollution in the Grants Pass area.

$PM_{2.5}$ Pollution Prevention Overview

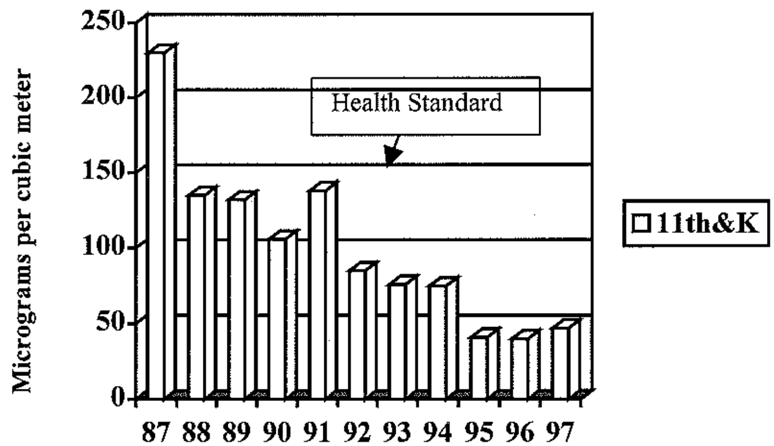
Several areas in Oregon are predicted to be at possible risk for violating the new $PM_{2.5}$ public health standard. While there has been a recent trend of lower levels of PM_{10} in most areas of the state, new public health standards for $PM_{2.5}$ regulate these smaller particles at a more stringent level than prior PM_{10} standards. Particles of this smaller size lodge more deeply into lung tissue, causing premature deaths, aggravated asthma attacks, and heart and lung disease. Designation as a nonattainment area for these potential problem areas would mean there is a demonstrated public health risk. In addition, the associated regulatory requirements would impose a major economic responsibility on state agencies, local governments, private business and the public. Proactive prevention efforts to reduce emissions from all contributing sources are a priority for the Department of Environmental Quality under its strategic plan and performance partnership agreement with the Environmental Protection Agency.

DEQ is developing prevention plans for four areas of the state with the greatest assessed risk for violating the $PM_{2.5}$ standard. The prevention planning effort emphasizes partnering with local jurisdictions in order to leverage established programs and improve the pollution prevention potential. The incentive to move ahead with the proposed pollution prevention measures is to maintain healthy air and to avoid a return to regulatory control that would be required under a nonattainment designation.

History of Particulate Pollution in Grants Pass

Fine particulate pollution has been a problem in Grants Pass for many years, mainly due to high concentrations of woodsmoke during cold air inversions in the winter. A voluntary woodsmoke curtailment program, limits on backyard burning, and efforts to burn wood more efficiently have all contributed to a significant reduction in particulate levels in the Grants Pass area in recent years, as show in Figure 1 below.

Figure 1 Measuring Particulate Levels in Grants Pass (PM10)



Throughout the late 1970's and most of the early to mid-1980's, Grants Pass exceeded the public health standard for particulate during the winter months. The Environmental Protection Agency (EPA) designated the Grants Pass area as not meeting the public health standards for particulate in 1987. In 1990, Grants Pass adopted a plan to reduce fine particulate emissions. Strategies focussed on industrial emissions and residential wood combustion. Industrial sources reduced emissions of particulate by 55 percent. Residential woodburning strategies were projected to decrease emissions by 35 percent. Woodburning strategies included voluntary woodburning curtailment program, woodstove certification program, open burning restrictions and public education. These programs continue today.

$PM_{2.5}$ Health Standard

Children with asthma, the elderly and people with cardiovascular or respiratory disease are especially at risk from particulate pollution. When inhaled into the lungs, fine particles can take weeks or months to be expelled. Until recently, the federal public health standard for particulate addressed particles 10 microns in diameter or smaller. (The period at the end of this sentence is about 500 microns.) The Grants Pass area has met the public health standard for this size of particle since 1990.

In 1997, EPA adopted new public health standards for particles measuring less than 2.5 microns in diameter (PM2.5). Health studies over the past decade show that these smaller particles are inhaled deeper into the lungs and can potentially cause more damage. It is estimated that nationally, the new fine particulate standard will prevent approximately 15,000 premature deaths per year and hundreds of thousands of cases of aggravated asthma in children and adults. Asthma is now the leading chronic illness among children.

$PM_{2.5}$ Pollution Prevention in Grants Pass

An advisory committee of local stakeholders was formed in Grants Pass in June, 1998 to advise DEQ on pollution prevention measures that would be effective in reducing $PM_{2.5}$ emissions in the area. The committee is committed to preventing a return to unhealthy air in the area. The Grants Pass Air Quality Advisory Committee supports adding several new prevention strategies to the current successful particulate measures. Since PM2.5 is lighter and tends to disperse over a broader area, the new measures focus on woodburning and expand the geographical area of focus. DEQ will install a PM2.5 monitor in Grants Pass in the fall of 1999 to measure daily concentrations of PM2.5. The new strategies are listed below. Descriptions of these measures and proposed implementation steps are detailed in the following section. A contingency plan is presented at the end. The final attachment is a letter from the committee to the Oregon Department of Forestry in support of reducing the impacts from prescribed burning in southern Oregon.

$PM_{2.5}$ Pollution Prevention Measures

→ Expand the voluntary woodsmoke curtailment program to the entire Grants Pass valley

→ Offer incentives for voluntary removal of uncertified woodstoves and replacement with certified woodstoves or alternate heat source and home weatherization

→ Require removal of uncertified woodstoves upon sale of home

→ Expand the open burning control area to the entire Grants Pass valley

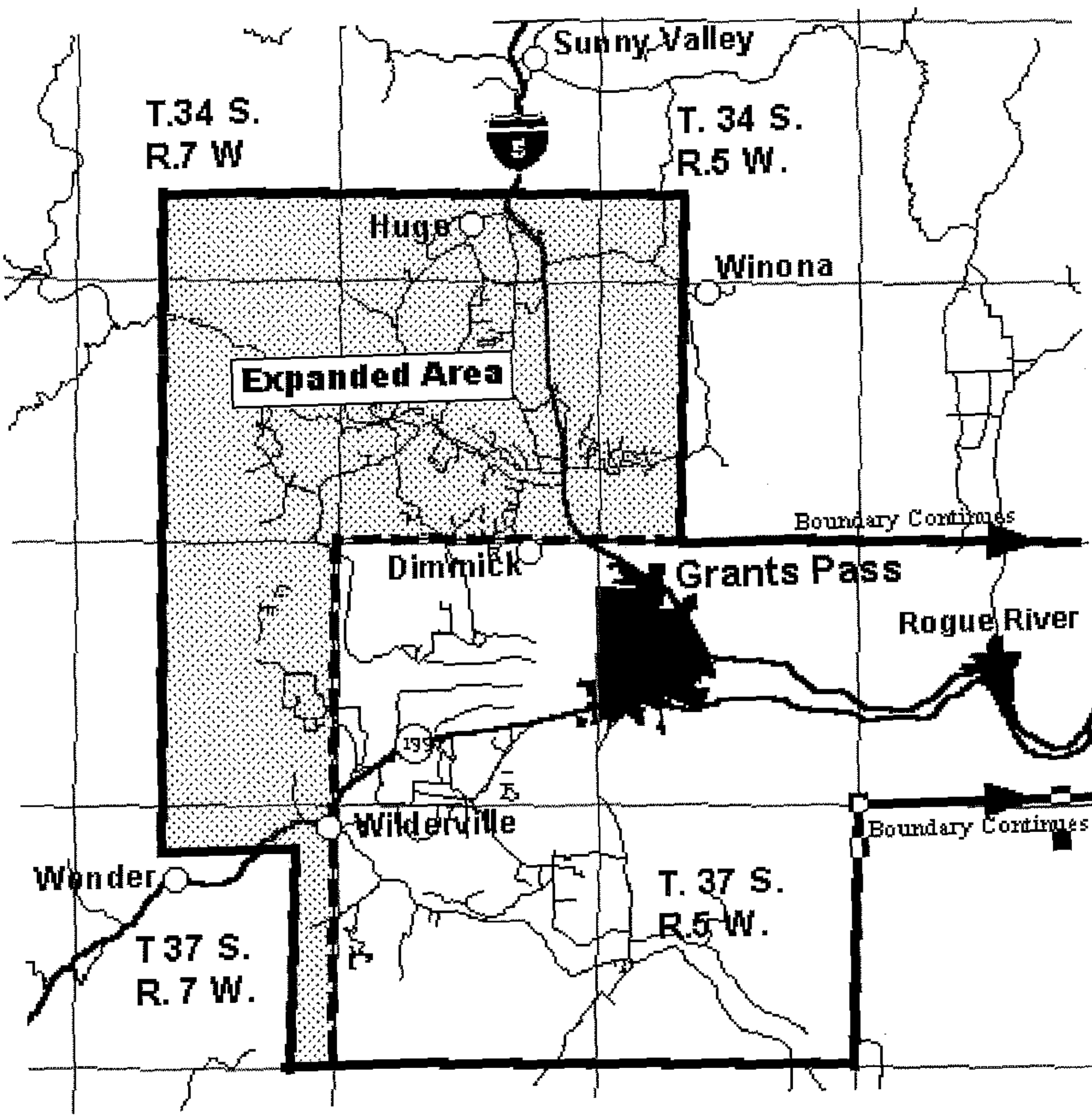
→ Promote alternative yard debris disposal and composting

Summary of $PM_{2.5}$ Pollution Prevention Strategy Implementation

Strategy	Lead	Timing	Geographic Area	Benefit	Cost/ Funding
Expand voluntary woodsmoke curtailment area	Josephine County Public Health	Fall 1999	valley*	8,000 households	$2,000/ EPA Pollution Prevention Grant
Voluntary woodstove changeout/ weatherization	Josephine County Housing & Community Development	Upon grant award	valley	400 households	$1,000 – 2,000/ per home HUD Community Development Block Grant
Ordinance – removal of non-certified woodstove upon sale of home	City/County	Fall 1999	UGB	100 households per year in UGB	$ no significant cost to administer/ (cost to seller for removal/disposal)
Expand Rogue Valley Open Burn Control Area	DEQ, Josephine County Public Health Oregon, Department of Forestry	Fall 1999	valley	3,000 households	$2,000/ EPA Pollution Prevention Grant
Expand/promote alternative debris disposal	City with Josephine County Public Health and Department of Forestry	2000	UGB or valley	4,000 to 8,000 households	$2,000 for promotion/ EPA Pollution Prevention Grant

*The "valley" is generally defined as the bowl created by the 3000' ridgetops surrounding Grants Pass. See map on following page.

Proposed Expansion of the Rogue Basin Open Burning Control Area



Strategy: Expand Voluntary Woodsmoke Curtailment Program to Valley

Lead agency:	Josephine County Public Health Department
Start date:	Fall, 1999
Geographical area:	Valley
Benefit:	8,000 additional households
Estimated Cost:	$2,000
Funding source:	Shift focus within existing DEQ grant w/ possible supplement from EPA pollution prevention grant

How it works: All ongoing woodstove curtailment activities under existing DEQ contract with Josephine County Public Health would be extended to include households throughout the valley. Activities include providing a daily woodsmoke curtailment advisory to the public, promoting cleaner woodburning practices through the media, and monitoring compliance with the voluntary woodstove curtailment program. An education focus should be taken during periods when there are no curtailments. This strategy is best coordinated with two other strategies: "expansion of the open burning control area" and "promotion of alternatives to open burning".

Who does it: Josephine County Public Health Department is best suited to manage the expanded curtailment program through its existing air quality program. A slight shift in focus from the existing program to this expanded effort may be possible in order to meet resource needs.

How much pollution will it save: Approximately 8,000 additional households would be brought into this existing program, which currently includes about 12,000 households. Because no curtailment days have been called in the last several years, little immediate emission reductions will occur from including more households in the curtailment program. Once the basis for determining curtailment days is adjusted to reflect $PM_{2.5}$, this strategy is likely to have a greater impact. The immediate potential to reduce emissions from these additional households will come from educating them about cleaner woodburning practices. Total estimated woodsmoke emissions from these 8,000 households is 85 tons per year. A percentage of these total emissions will be reduced through cleaner woodburning practices, however, there are no studies to indicate exactly how much.

How much will it cost: The current Josephine County Public Health air quality program is budgeted at $16,722. This includes $8,200 from DEQ. DEQ has also submitted a grant proposal to EPA for pollution prevention work in Grants Pass and Medford. The proposal specifically addresses expansion of the woodstove curtailment program and open burning public education. The requested funding level is $13,000 to split between Grants Pass and Medford. The estimated cost for the expanded woodsmoke curtailment portion is $2,000.

How do we get there:
1. EPA awards pollution prevention grants. *(DEQ, April, 1999)*
2. If successful, DEQ writes contract with Josephine County Public Health Department. *(DEQ, May, 1999)*
   If not successful, continue to research grant opportunities. (*DEQ, Josephine County Public Health Department, ongoing)*
3. Plan and conduct media outreach to inform households of the expanded voluntary curtailment program. Coordinate with outreach for "expanded open burning control area". *(Josephine County Public Health Department, Fall, 1999)*
3. DEQ renew ongoing contract with Josephine County Public Health Department. *(Fall, 1999)*

Strategy: Voluntary Woodstove Change-out with Home Weatherization

Lead agency:	Josephine County Housing & Community Development
Start date:	Upon grant award
Geographical area:	UGB, extend to valley as funds or interest in program allows
Benefit:	100-400 households
Estimated Cost:	$1000-2000 per dwelling
Funding source:	HUD/CDBG Housing Rehabilitation Grant

How it works: Low to moderate income households apply for a zero-interest loan to remove a non-certified woodstove and replace it with a certified woodstove or a non-wood heat source (gas, pellet stove) and weatherize the home. Loans are repaid monthly or upon sale of home. HUD may require that loans only be made for owner-occupied single-family housing. A rental duplex may be eligible if the other unit is occupied by the owner and the rental unit is occupied by a low or moderate income tenant. Outright grants to homeowners may be considered. HUD grants are for two-year projects. Weatherization should be coordinated with Josephine County Community Services ACCESS weatherization program (Aging Coordinated Community Enterprises & Supportive Services, the local Community Action Program), the Oregon Department of Energy's weatherization rebate and low-interest loan program, and WP Natural Gas' rebate program for gas appliances.

Who does it: The CDBG grant application must be made by a city or county. Josephine County Housing & Community Development has applied for and received CDBG funds in the past, although for a different category of funds. It is recommended that this experience be capitalized upon through the County coordinating this strategy, with support from Josephine Housing Council, ACCESS, and WP Natural Gas.

How much pollution will it save: Only low and moderate income households will be eligible. The approximate total potential is 400 households in the UGB. If the interest level within the UGB is not high, the program can be extended to the valley. Certified woodstoves burn about 50 percent cleaner than non-certified stoves. The estimated particulate emission reduction from changing out 400 non-certified stoves to certified stoves is 1 ton per year. All of these savings would not accrue in the first year since the replacement of non-certified stoves would take place over two years.

How much will it cost: The total approximate cost to remove a non-certified stove, replace it with a certified stove or non-wood heat source, and weatherize the home ranges from $1,000 to 2,000 per home. Administrative costs can be covered through the grant.

How do we get there:

1. City/county watch for announcement of 1999 grant application forms from Oregon Economic Development Department (OEDD administers Oregon program for HUD). *(Josephine County Community Development, Approx. April, 1999)*
2. Committee of City, Housing & Community Development, Housing Council, ACCESS, and WP Natural Gas meet to develop program details and responsibilities; complete grant application. *(Spring, 1999)*
3. County submits grant application. *(application deadline TBD)*
4. If successful, open program to accept applications (*Josephine County Housing & Community Development, upon grant award)*
5. If not successful, continue search for grant funds. *(DEQ and Josephine County Housing & Community Development, ongoing)*

Strategy: Ordinance requiring removal of non-certified woodstove upon sale of home

Lead agency:	City/County
Start date:	1999
Geographical area:	UGB
Benefit:	(100 households per year in UGB) (working on emission factor)
Estimated Cost:	no significant cost to administer
Funding source:	City/County

How it works: This strategy would require through ordinance the removal of non-certified woodstoves or fireplace inserts when a dwelling is sold in the UGB. It would not apply to dwellings where the sole source of heat is a non-certified stove or fireplace insert. The responsibility for disclosure and removal of the non-certified stove or insert would be with the seller. Real estate agents would facilitate disclosure and verification of removal through commonly used disclosure statements and close of escrow transactions. Records documenting compliance would be filed through existing city/county procedures for recording sale of property.

Who does it: It is recommended that this strategy be implemented by City and/or County ordinance. The City has the authority to regulate new construction throughout the UGB, but does not have authority to regulate existing housing stock outside of the City limits. Either the County could adopt one ordinance to cover the entire UGB, or the City and the County could each adopt an ordinance governing their respective areas. The applicability of a County ordinance could extend beyond the UGB boundary to include the entire valley, increasing the benefits of this strategy.

How much pollution will it save: Approximately 1100 households have non-certified woodstoves in the UGB. The 1997 housing turnover rate in the UGB was approximately 10%. The potential number of households in which non-certified stoves could be removed is approximately 110 households per year. If the removed stoves are replaced with certified stoves, the savings would be about one-half ton of particulate each year. If the stoves are not replaced, the savings would be about 1 ton of particulate each year. These would be cumulative savings year-to-year.

How much will it cost: The cost to the real estate industry could be as minimal as amending an existing disclosure statement form. The cost to local government to verify compliance through documents would be negligible. The cost to the seller to remove and dispose of the woodstove or insert would depend upon the seller removing the unit or hiring someone. Labor required is approximately two hours for removal of the unit and transport to a disposal site (approximately $100). If the removed unit is taken to a scrap metal dealer, there would be no cost for disposal.

How do we get there:

1. Work with City and County officials to decide appropriate jurisdiction and geographical area. *(DEQ staff and City committee member and County committee member, Spring, 1999)*
2. Meet with local board of realtors to discuss feasibility of ordinance language. *(DEQ staff and a committee member, Spring, 1999)*
3. Finalize and adopt ordinance. *(City staff/County staff, Summer/ Fall, 1999)*
4. Press release to UGB; specific notice and outreach to real estate agents. *(City staff/County staff, Summer/Fall, 1999)*

Strategy: Expand Rogue Valley Open Burn Control Area	
Lead agency:	DEQ, Josephine County Public Health Department
Start date:	Fall, 1999
Geographical area:	Valley
Benefit:	3000 households in expanded area
Estimated Cost:	No significant cost for rule amendment; $2,000 for public education
Funding source:	Shift focus within existing DEQ grant activities/ possible supplement from EPA Pollution Prevention grant

How it works: DEQ will amend the state rule that defines the boundary of the Rogue Valley Open Burn Control Area. Public hearings will be held on the proposed change. The rule amendment will be presented to the Oregon Environmental Quality Commission for adoption in August, 1999. Outreach to both the general public and local jurisdictions will follow. (The proposed expanded boundary description is included as Attachment 2. The description was prepared by the Josephine County Assessor's Office.)

Once the Rogue Basin Open Burning Boundary is expanded, the effectiveness of the boundary change will depend almost entirely on education. The new boundary will need to be provided to ODF, fire districts, city and county offices, and any other agencies that receive open burning inquiries from the public. The new households brought into the boundary will need to be notified of the new boundary and educated on the air quality concerns leading to the expansion. Local media will be an effective and affordable means of reaching these households. Direct mailings or billing inserts are also recommended, as funding allows.

Who does it: DEQ will expand the boundary through State rule modification (Oregon Administrative Rule 340-023-0115). DEQ will provide new boundary descriptions to all jurisdictions with an explanation of air quality benefits. It is recommended that Josephine County Public Health Department, with support from ODF, rely on its existing air quality program to educate the newly added households.

How much pollution will it save: There are approximately three thousand households within the area of the valley that is outside of the current Rogue Basin Open Burn Control Area boundary. Based on the number of "no burn" days called in the last few years, "burn days" for these households would be reduced by about 75 percent during the winter season. Public outreach will enhance the effectiveness of the open burning boundary expansion and boost the compliance rate dramatically. This strategy will clearly reduce daily particulate emissions. Annual emissions may not be reduced by this measure alone (education about alternatives will reduce annual emissions), however, the dispersion of particulate emissions will be greater on days when these households are allowed to burn. The resulting impact will be a reduction in the ambient concentration of particulate, leading to a lower annual average concentration of $PM_{2.5}$.

How much will it cost: The rule amendment will be done concurrently with the adoption of the Grants Pass Carbon Monoxide maintenance plan at a minimal added cost. $2,000 is the estimated cost to provide initial education to the public about the expanded boundary, in addition to expanding the existing Josephine County Public Health Department open burning program to include these additional households in its ongoing advisory program. There will be some cost savings by coordinating public education efforts with the expanded woodsmoke curtailment strategy, in addition to educational efforts for the next strategy, promoting alternative yard debris disposal.

How do we get there:
1. Adopt rule amendment. *(DEQ, August, 1999)*
2. Provide ODF, fire districts, other local jurisdictions with expanded boundary description and an explanation of air quality benefits. *(DEQ, September, 1999)*
3. Provide technical assistance to Josephine County Public Health Department on public education (see next strategy). *(DEQ, ongoing)*
4. Design and conduct media outreach plan, coordinated with outreach designed for the expansion of the voluntary woodsmoke curtailment program and alternative yard debris disposal program. *(Josephine County Public Health Department, in cooperation with ODF, Fall, 1999)*

Strategy:	Expand/promote alternative yard debris disposal and composting
Lead agency:	City
Start date:	1999
Geographical area:	UGB or valley
Benefit:	4,000 UGB households or 8,000 valley households
Estimated Cost:	$2,000
Funding source:	City, ODF, DEQ contract, Pollution Prevention Grant

How it works: This strategy is recommended as a cooperative effort between several agencies to educate households about alternatives to burning and to develop and promote disposal options for wood and yard debris. The focus is to begin to educate households about the impacts of open burning and immediately available options such as composting, while efforts continue to develop alternative debris disposal options. The City is currently working to establish a new permanent disposal facility. Localized collection sites and collection events will be needed for households outside of the UGB.

Who does it: Since the City is working to replace the JOGROW facility, it is recommended that the City act as the coordinating agency to identify and further develop disposal options for households. The City, ODF, Josephine County Pubic Health Department, Southern Oregon Sanitation, and Biomass working together may be able to provide new localized opportunities for yard debris disposal or special collection events. It may be possible to coordinate with developing efforts in the Medford-Ashland area to organize a "special collection event" to attract woody materials from rural areas. The promotional work can be tied to the open burning educational work by the Josephine County Public Health Department and the Oregon Department of Forestry. DEQ can provide initial literature for distribution with open burning permits. DEQ can also update the literature with specific locations for disposal as they become available.

How much pollution will it save: 12,000 households are in the UGB, 4,000 of which are outside of the city limits where burning is not limited by City ordinance. An additional 8,000 households are in the valley outside of the UGB and can backyard burn any day of the year outside of fire season or DEQ burn advisory days. There is potential to reduce open burning by all of these households. If 5 percent of all households used an alternative method of disposing of woody yard debris, the emission reduction would be 1 ton per year.

How much will it cost: The cost to locate additional localized collection sites or provide special collection events will vary considerably. A one-time weekend collection dumpster is approximately $100. The promotional work to educate and encourage households to use available alternatives is estimated at $2,000 and can be funded in part by the DEQ contract to Josephine County Public Health, and potentially supplemented with an EPA pollution prevention grant. DEQ can supply copies of the "Outdoor Burning in Oregon" brochure, and can provide updates listing additional alternatives as they develop.

How do we get there:
1. City, ODF, Public Health, Southern Oregon Sanitation and Biomass meet to brainstorm localized disposal alternatives, special collection events, long term permanent site(s). *(Spring, 1999)*
2. ODF and Josephine County Public Health identify ways to educate households about disposal options through ongoing outreach efforts. *(Spring/Summer, 1999)*
3. ODF begins promotional work by distributing "Outdoor Burning in Oregon" to households seeking a burning permit. *(June, 1999)*
4. Josephine County Public Health includes information on alternatives to open burning in regular press releases and other outreach activities. *(Fall, 1999)*
5. DEQ updates "Outdoor Burning in Oregon" as alternative disposal sites or collection events are established. *(as needed)*

Contingency Plan

The committee agreed to establish two levels of contingency measures in the event that elevated levels of $PM_{2.5}$ are recorded at the DEQ monitor.

First level contingency:

1. Extend year-round open burn ban to the urban growth boundary.
2. Require certified fireplaces in new homes.

Second level contingency:

1. Ban open burning in the valley.
2. Mandatory woodstove curtailment (if voluntary program does not reach an acceptable level of compliance).

The first level contingency measures would be triggered after one exceedance of the $PM_{2.5}$ annual standard. An exceedance is an annual average greater than 15 micrograms per cubic meter. If a violation of the $PM_{2.5}$ annual standard occurs, the second level of contingency measures would be triggered. A violation is a three-year average of the annual values that is greater than 15 micrograms per cubic meter. The committee will reconvene if either trigger occurs in order to design and carry out implementation of the appropriate measures.

These contingency measures will not go into effect if it is determined that the exceedance or violation of the standard was caused by increased prescribed burning. (See the attached letter from the Advisory Committee to the Oregon Department of Forestry supporting the recommendations of the Southwest Oregon Prescribed Fire Work Group on the Smoke Management Plan.)

July 28, 1999

Charlie Stone
Assistant State Forester
Protection from Fire Program
Oregon Department of Forestry
State Forester's Office
2600 State Street
Salem, OR 97310

Re: Southwest Oregon Prescribed Fire Work Group Recommendations

Dear Mr. Stone:

The Grants Pass Air Quality Advisory Committee has met for the past year to discuss, among other air quality issues, the challenge of meeting the new $PM_{2.5}$ health standard. The committee is recommending the adoption of several local programs to reduce contributions from residential woodburning, both inside the home and outdoors. These new programs are in addition to efforts that have been made for years by local residents to reduce particulate air pollution from residential woodburning. Increases in prescribed burning, even at minor levels, will quickly eradicate air quality improvements made by local residents.

In a June 2, 1999 letter, the Southwest Oregon Prescribed Fire Work Group delivered to you several recommendations for consideration in the upcoming review of the Smoke Management Plan. These recommendations included:

- Improve Interstate Smoke Management Coordination with Northern California.
- Increase use of Non-Burning Alternatives and Emission Reduction Techniques.
- Revise (if necessary) Smoke Drift Restrictions in OAR 629-43-043. (In southwest Oregon, the Medford-Ashland area and Grants Pass are protected as "designated areas." The smoke management plan rule (OAR 629-43-043) contains criteria for burning upwind of designated areas in the state.)
- Develop special Smoke Management Guidance for Understory Burning.
- Full use of the new SW Oregon Monitoring Network.

We support the efforts of this workgroup and their recommendations.

The Grants Pass Air Quality Advisory Committee urges the Department of Forestry, wherever feasible, to increase the use of non-burning alternatives and emission reduction techniques, and identify new ways to address potential smoke problems that may arise from increased burning and a greater reliance on understory burning.

Please call me if you have questions at (541) 476-2622.

Sincerely,

Kimberly Sellers

Kimberly Sellers
Chair, Grants Pass Air Quality Advisory Committee
Owner, Tierra del Sol
129 SW "G" Street
Grants Pass, OR 97526

Attachment G

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Expansion of the Rogue Basin Open Burning Control Area

Rule Implementation Plan

Summary of the Proposed Rule

The proposed expansion of the Rogue Basin Open Burning Control Area would increase the area in size by about 50 percent, bringing approximately 3,000 additional households in the control area. On days when DEQ issues a "no-burn" advisory, open burning is prohibited in the control area. On days when burning is allowed, households are allowed to burn yard debris. Industrial, commercial, and construction and demolition burning is prohibited at all times, except by special letter permit from DEQ.

Proposed Effective Date of the Rule

The expansion of the Rogue Basin Open Burning Control Area will become effective upon adoption by the Environmental Quality Commission and filing with the Secretary of State.

Proposal for Notification of Affected Persons

Local media and direct mail will be used to notify household and businesses in the expanded area. The Josephine County Public Health Department manages an annual public education effort aimed at woodsmoke reduction. The County will focus its efforts this year on reaching households in the expanded area.

Proposed Implementing Actions

DEQ's Medford office air quality program will enforce open burning restrictions in the expanded area as it does now in the current open burning control area. Local jurisdictions will assist by fielding inquiries about the expanded area boundaries.

Proposed Training/Assistance Actions

Maps and legal descriptions of the expanded area will be provided to local jurisdictions, including fire protection agencies, to help answer inquiries from households or businesses wanting to know if they are within the expanded area. DEQ staff and others arranged for a town hall meeting with the Hugo community to further discuss the health impacts of $PM_{2.5}$, clarify the existing open burning restrictions and what will change if the expansion is adopted, and offer residents techniques and strategies for managing open burning.

STATE OF OREGON AIR QUALITY CONTROL PROGRAM,

VOLUME 3: STATE IMPLEMENTATION PLAN APPENDICES

SECTION 4.53: GRANTS PASS

Appendix D4: Grants Pass Carbon Monoxide
D4-4: Emission Inventory and Forecast

STATE OF OREGON

1993 Attainment Year
SIP Emission Inventory
for
Carbon Monoxide

Grants Pass UGB

9 September, 1999

Oregon Department of Environmental Quality
Air Quality Division
Technical Services
811 SW 6th Avenue
Portland, Oregon 97204

EXECUTIVE SUMMARY

The Grants Pass Carbon Monoxide (CO) Nonattainment Area has met the National Ambient Air Quality Standards (NAAQS) for carbon monoxide. In accordance with the 1990 Federal Clean Air Act Amendments (CAAA), the area can now redesignate to attainment status through a process which involves developing a Redesignation Request / Maintenance Plan. This attainment year emission inventory is for 1993, and is provided as part of the maintenance plan package to show compliance with published EPA requirements. The principal components for development and documentation have been addressed in this inventory, which includes stationary point sources, stationary area sources, non-road mobile sources, on-road mobile sources, quality assurance implementation, and emissions summaries. The geographic focus for this 1993 emission inventory is the Grants Pass CO Nonattainment Area, which has the same boundary as the Grants Pass Urban Growth Boundary.

During the average winter 1993 day, on-road mobile sources contribute 78% of the total carbon monoxide (CO) air emissions in the Grants Pass UGB. Gasoline vehicles contribute 92% of the CO emissions within the on-road mobile category, whereas diesel vehicles contribute 8% of the on-road mobile category.

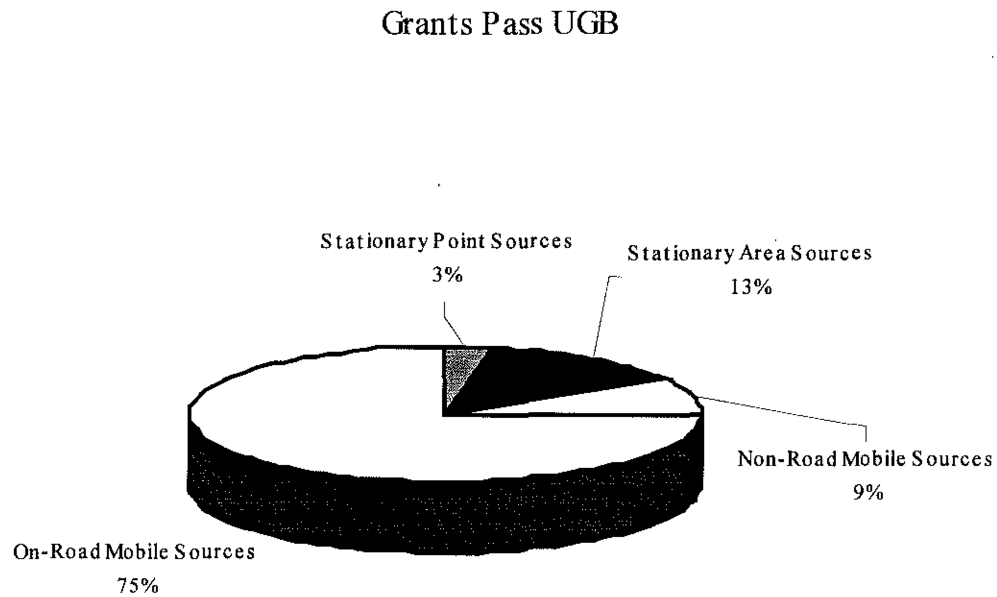
Stationary area sources comprise 15% of the total CO air emissions in the Grants Pass UGB on a winter carbon monoxide season day. Within the area source category, residential wood combustion accounts for 96% of the emissions. Wood combustion in fireplaces account for about 20% of the total area source emissions, and wood combustion in wood and pellet stoves account for about 76% of the CO area source emissions.

Non-road mobile sources contribute 3% of the total CO on an average winter day. Within this category, 4-cycle engines comprise 86% of the total emissions, 2-cycle-engines contribute a little over 8%, and diesel engines account for about 6%.

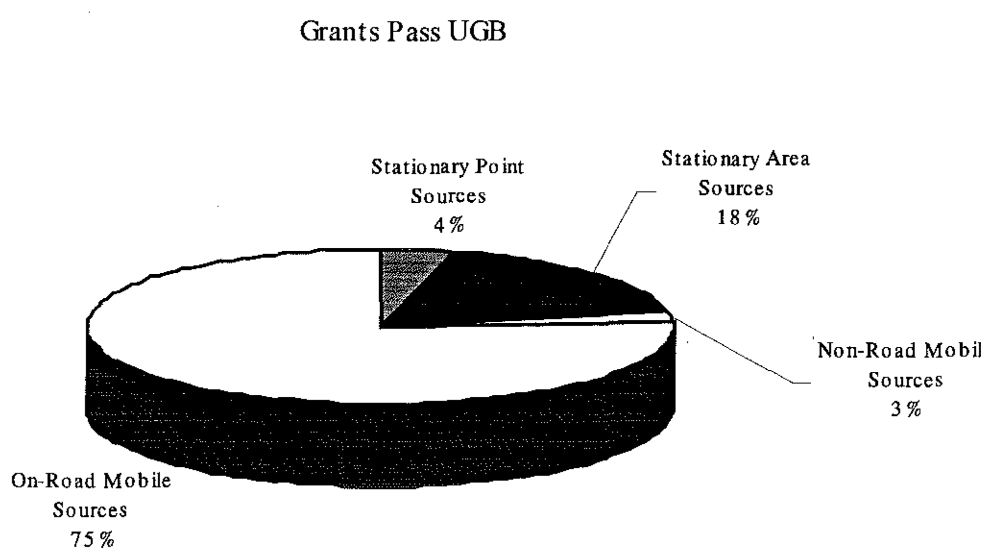
Stationary point sources comprise 4% of the CO air emissions in the Grants Pass UGB on an average winter season day. This category includes only those stationary sources with annual CO emissions greater than 100 tons per year. There were three such large point sources within the Grants Pass UGB and 25-mile buffer zone in 1993.

Details of the Oregon 1993 Grants Pass UGB CO NAA Attainment Year SIP Emission Inventory from point, area, non-road, and on-road mobile sources are presented in the following document. The relative percentage of annual and CO season CO emissions from stationary point, stationary area, non-road mobile, and on-road mobile sources are shown in the Executive Summary Figures a and b.

Executive Summary Figure a: Annual CO emissions in 1993 by category



Executive Summary Figure b: Seasonal CO emissions in 1993 by category



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Part 1: INTRODUCTION TO THE REPORT

1.1 INTRODUCTION

1.2 1.1.1 PURPOSE OF REPORT

The Clean Air Act Amendments (CAAA) of 1990 authorized the U.S. Environmental Protection Agency (EPA) to designate nonattainment areas with respect to the National Ambient Air Quality Standards (NAAQS). Under the 1990 CAAA, pre-enactment carbon monoxide nonattainment areas were classified according to the severity of nonattainment. Each state was required to submit a list designating nonattainment areas within the state.

Oregon submitted a list of areas that were in nonattainment to EPA on 15 March 1991. The area within the Grants Pass Central Business District was listed as nonattainment for carbon monoxide (Grants Pass UGB / NAA). The nonattainment area had a design value of 7.5 parts per million (ppm) for carbon monoxide, and exceeded the NAAQS in the period 1977 through 1991. The NAAQS limit is 9 ppm, but it must reach 9.5 ppm to be considered an exceedance. The highest recorded CO value measured in Grants Pass was 13.3 ppm at the Wing building site in 1981. However, the CO concentrations measured in Grants Pass have not exceeded the NAAQS since 1990.

According to EPA letter of approval dated January 23, 1992, the emission inventory area for the Grants Pass CO nonattainment area was delineated as the Grants Pass UGB in the *Inventory Preparation Plan* (IPP) submitted July 29, 1998. The Oregon CO IPP was approved by EPA Region X on September 9, 1998 by letter from Ms. Joan Cabreza.
This document fulfills the EPA requirements for preparing the 1993 attainment Year and 2015 maintenance Year emission inventories, specified in the provisions of the 1990 CAAA, and EPA guidance documents.

1.1.2 DESCRIPTION OF INVENTORY AND AREA COVERED

The 1993 Attainment Year inventory covers carbon monoxide emissions for the Grants Pass Urban Growth Boundary (UGB) nonattainment area. Emissions are reported in this inventory for two representative time periods: Annual Emissions (in units of "tons per year") that represent CO emissions generated over the 1993 Attainment Year of January 1 through December 31; and Seasonal Emissions (in units of "pounds per day") that represent CO emissions generated in a three-month period - called the CO season - when ambient CO accumulations are typically the highest. For the Grants Pass UGB, the CO Season is defined as the period of three months: December 1st through 31st of 1992 and January 1st through February 28th of 1993.
The geographic area of the Grants Pass UGB is shown in Figure 1. Figure 2 shows the 25-mile extension or buffer to the Grants Pass UGB area. The shaded area shows an area within a 25-mile radius of Grants Pass and excludes the area of overlap of the adjacent 25-mile buffer area of the Medford emission inventory, which was completed prior to this inventory. The Grants Pass 25-mile buffer includes incorporated and unincorporated Josephine County and southern Douglas County, and excludes the part of Josephine County covered by the Medford 25-mile buffer. The

purpose of the 25-mile buffer is to inventory major point sources of CO that are located outside of the urban growth boundary/ non-attainment area but may influence the ambient air quality of the area.

Figure 1: Grants Pass Urban Growth Boundary

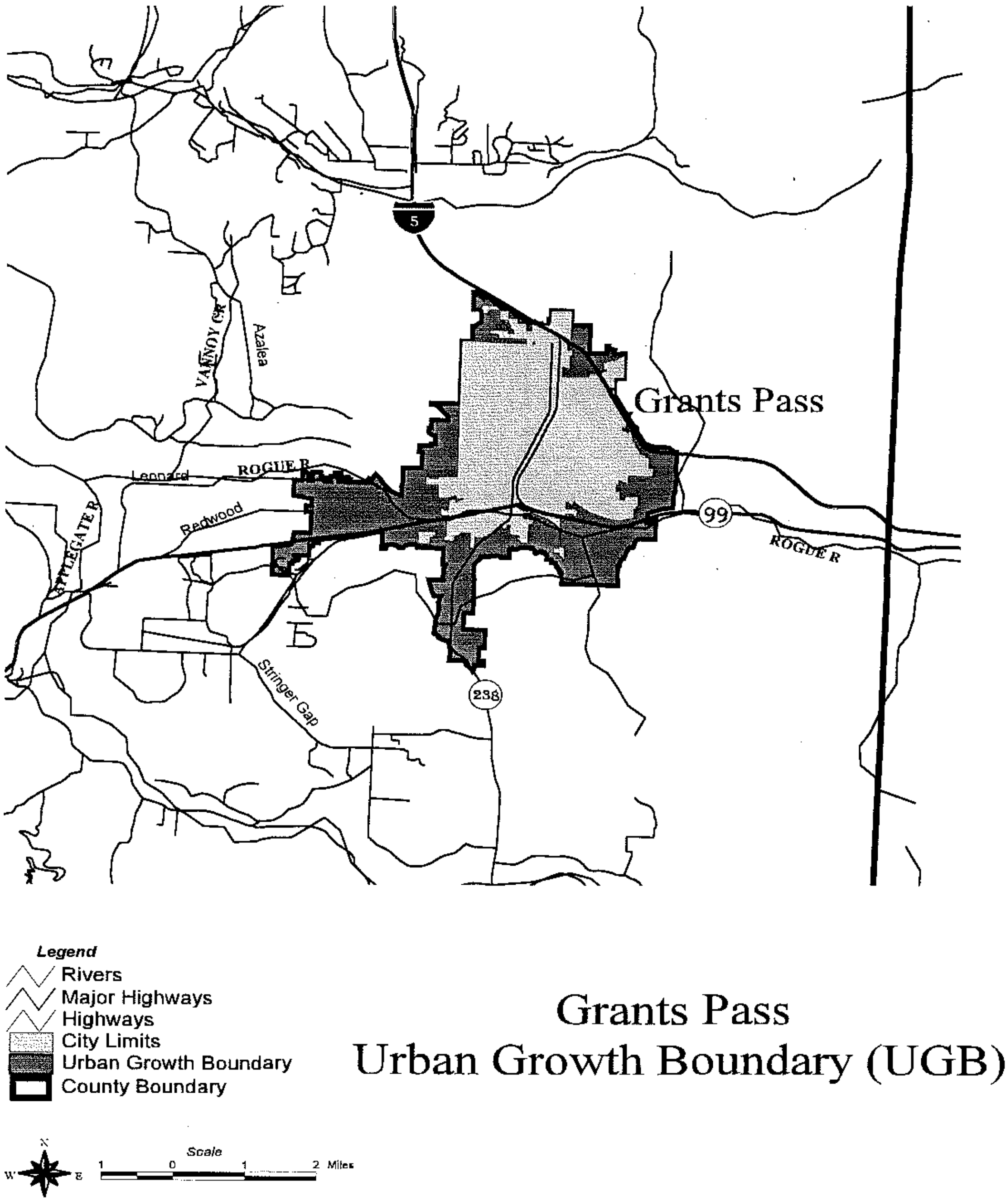
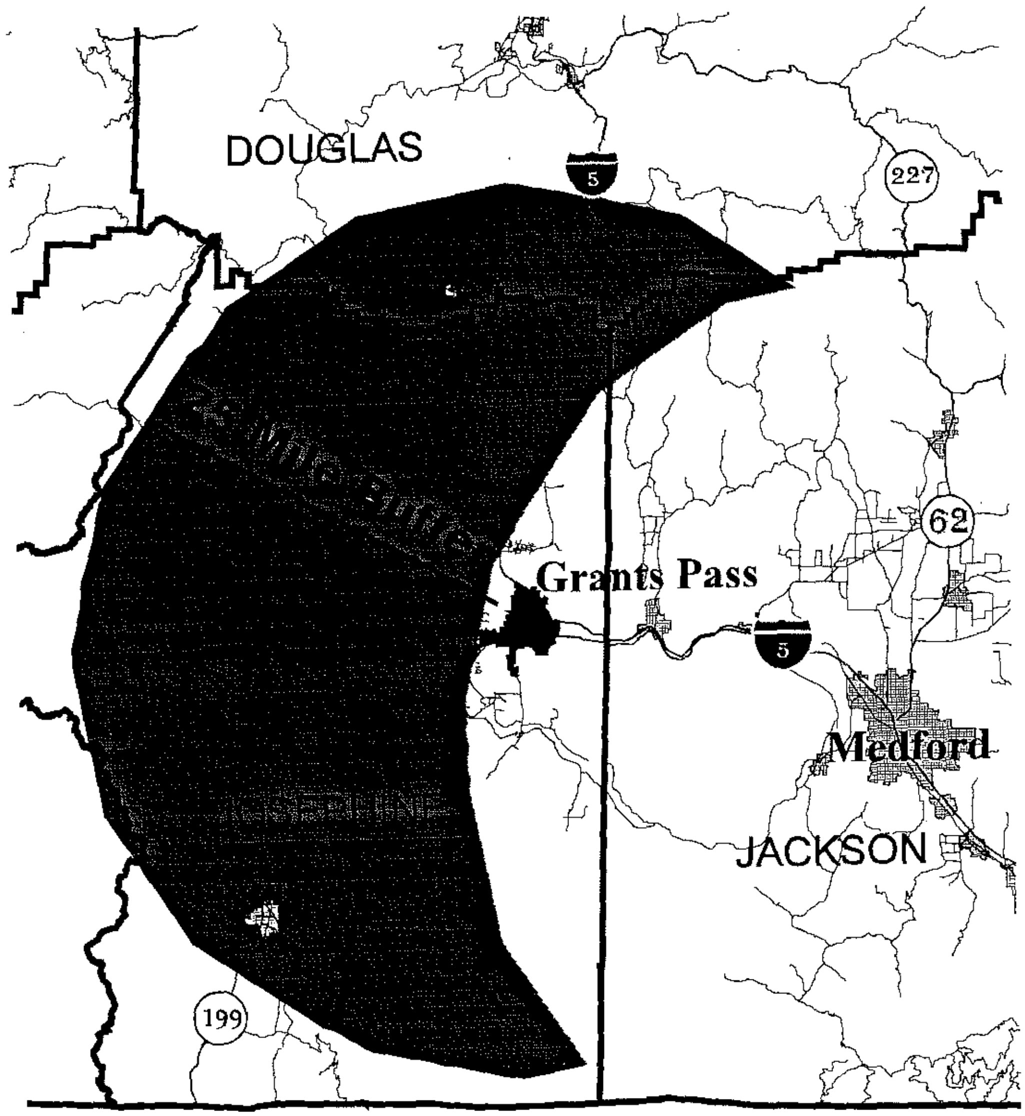


Figure 2: Grants Pass 25-Mile Buffer for CO Sources >100 tons/year



25-Mile Buffer From Grants Pass
Urban Growth Boundary (UGB)
(Excludes Medford 25-Mile Buffer Overlap)

1.1.3 CONTENTS

The Report is divided into the following parts:

Part 1:	Introduction to the Report
Part 2:	Grants Pass CO 1993 Attainment Year Emission Inventory
Part 3:	Quality Assurance and Quality Control
Part 4:	References
Part 5:	Appendices

- Part 1 provides an introduction to this Report and its purpose. Contents of the Report are briefly described. Information concerning automated systems and a description of the Oregon DEQ Air Contaminant Source Information System (ACSIS) are included. Sources, which were excluded from the inventory, are described with rationale for the exclusions. EPA procedure and guidance documents used in preparing the inventory are described. Finally, information on the personnel responsible for the preparation of the inventory is outlined.

- Part 2 describes in detail the methodologies and approaches taken to estimate emissions in the Grants Pass UGB for the 1993 Attainment Year inventory. Part 2 is divided into sections describing the inventory process and the types of emission sources that are addressed in the inventory, as follows:

  - Section 1.0 provides a map of the Grants Pass UGB inventory area and 25-Mile Buffer and a written description of the area.

  - Section 2.0 contains summary tables for stationary point, stationary area, non-road mobile, and on-road mobile sources in the Grants Pass UGB.

  - Section 3.0 contains a discussion of the stationary point source emission category methodology and emissions estimate approach. Tables summarizing point source emissions estimates follow the discussion.

  - Section 4.0 addresses stationary area sources and contains a discussion of the approaches used in estimating emissions. Each area source category inventoried is described in detail, including the methodology used in making the calculations. Tables summarizing stationary area source emissions estimates follow the discussion.

- Section 5.0 provides a discussion of the approach and methodology used in evaluating emissions from non-road mobile sources. Tables summarizing non-road mobile source emissions estimates follow the discussion.

- Section 6.0 provides a description of the approach and methodology used in evaluating emissions from on-road mobile sources. Tables summarizing on-road mobile source emissions estimates follow the discussion.

- Section 7.0 describes future year growth rates and their associated assumptions through the year 2015.

- Part 3 describes the quality assurance procedures utilized in preparing the 1993 inventory.

- Part 4 contains an extensive list of references utilized for the Grants Pass CO emission inventory.

- Part 5 includes appendices with supplemental data used to estimate emissions.

Tables and figures for each emission category are located at the end of the discussion section for that category. For example, summary emission tables for all stationary point source types in the Grants Pass UGB are located at the end of Part 2, Section 3. Please note that the references listed in the tables are numbered as 'DEQ master references' (See Part 5 for this classification at the end of each entry).

1.1.4 DISCUSSION OF AUTOMATED SYSTEMS

1.1.4.1 DEQ Emission Inventory System

The inventory has been assembled by the staff of the Technical Services Section, Air Quality Division of the Oregon Department of Environmental Quality (DEQ). The point source emissions are specifically drawn from the DEQ Air Contaminant Source Information System (ACSIS). The ACSIS data is used for tracking compliance with plant site emission limits and for reporting compliance status to the EPA AIRS system. ACSIS is also used to store actual emission data also reported to AIRS. ACSIS contains annual emission levels for each permitted point source as well as, emission factors, and annual activity levels (fuel use and production levels).

1.1.5 SOURCES NOT INVENTORIED

All sources in the Grants Pass UGB nonattainment area were considered for inclusion into the emission inventory. Sources were rejected for one of the following reasons: 1) point source emitted less than 100 tons of CO per year, 2) point sources were identified in Medford section of the State Implementation Plan area, 3) point, area, non-road, or mobile sources did not emit significant CO during the winter CO season. Major stationary point sources were included if they were within a 25-mile buffer of Grants Pass, except for point sources that were included in Medford EI. Point sources inside the Grants Pass UGB that contributed less than 100 tons of CO and over 5 tons per year were included in the Area Source – Small Point Source category of this inventory.

1.1.6 GUIDANCE DOCUMENTS

The inventory was conducted using all current and applicable EPA procedure and guidance documents. Two primary documents utilized were *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I*[3], hereinafter referred to as the EPA Procedures Document and *Emission Inventory Requirements for Carbon Monoxide State Implementation Plans*[1]. Emission factors were taken from the EPA Procedures Document[3], the *Compilation of Air Pollutant Emission Factors*[8,216], hereinafter referred to as AP-42, and in some instances from the *FIRE Version 5 SCC Code and Emission Factor Listings For Criteria Air Pollutants* [318]. Localized emission factors were used when documentation existed to support their accuracy (e.g., source test reports). These and other information sources are cited in the text, as appropriate.

1.1.7 CONTACT PERSONNEL FOR THE INVENTORY

ODEQ personnel Steven Aalbers, Svetlana Lazarev, and Wes Risher performed most of the required source calculations. For transportation (on-road mobile) sources, outside assistance was obtained from the Rogue Valley Council of Governments (RVCOG) and the Oregon Department of Transportation.

The abbreviated list of those conducting this Grants Pass 1993 Attainment Year SIP emission inventory is shown below:

ODEQ :
Greg Green
Air Quality Division Administrator

Gerry Preston,
Technical Services Manager
Emission Inventory
Steven Aalbers, Emission Inventory Specialist
Wendy Andeson, Emission Inventory Specialist
Anthony Barnak, Emission Inventory Specialist
Svetlana Lazarev, Emission Inventory Specialist
Wesley Risher, Emission Inventory Specialist
Quality Assurance
Brian Fields, Emission Inventory Specialist
Kevin McGillivray, Emission Inventory Specialist

Annette Liebe,
Airshed Planning Manager
Howard Harris, Transportation Control Program Coordinator
Patti Seastrom, Airshed Planning

John Becker, Air Quality Manager
DEQ Western Region (Medford Office)
Keith Tong, Air Quality Engineer

Rogue Valley Council of Governments
Mary DeLaMare-Schaefer, Executive Director

Bart Benthul, Transportation System Analyst
Tyler Deke, Associate Planner

Oregon State Department of Transportation
Environmental Services
Transportation Development Branch
Transportation Planning Analysis Unit
William Upton, Manager
Mike Gillett, Transportation Engineer

Part 2: GRANTS PASS CARBON MONOXIDE ATTAINMENT AREA INVENTORY

Part 2.1 ATTAINMENT AREA DESCRIPTION

2.1.1 ATTAINMENT AREA MAPS

A map outlining the Grants Pass UGB Carbon Monoxide inventory area can be found in Part 1, Figure 1. A map outlining the UGB in addition to the 25-mile buffer zone can be found above in Figure 2. The Grants Pass Area Domestic Open Burning Boundary is defined by the Grants Pass city boundary and can be seen in Figure 1. Finally, the vehicle inspection boundary, which is the same as the Grants Pass UGB is shown in Figure 1.

2.1.2 LEGAL DESCRIPTIONS

2.1.2.1 Legal Description of Grants Pass Urban Growth Boundary / CO Inventory Area

Legal description of the Grants Pass Urban Growth Boundary Attainment Area as adopted by Oregon DEQ define the boundaries as shown in Figure 1 and can be found in Oregon Administrative Rules (OAR) 340, Division 31.

Legal Description of Grants Pass Urban Growth Boundary (340-031-0500(8))

(8)"Grants Pass UGB" as shown on the Plan and Zoning maps for the City of Grants Pass as of Feb. 1, 1988 is the area within the bounds beginning at the NW corner of Sec. 7, T36S, R5W; thence south to the SW corner of Sec. 7; thence west along the southern boundary of Sec. 12, T36S, R5W approx. 2000 feet; thence south approx. 100 feet to the northern right of way of the Southern Pacific Railroad Line (SPRR Line); thence southeasterly along said right of way approx. 800 feet; thence south approx. 400 feet; thence west approx. 1100 feet; thence south approx. 700 feet to the intersection with the Hillside Canal; thence west approx. 100 feet; thence south approx. 550 feet to the intersection with Upper River Road; thence southeasterly along Upper River Road and continuing east along Old Upper River Road approx. 700 feet; thence south approx. 1550 feet; thence west approx. 350 feet; thence south approx. 250 feet; thence west approx. 1000 feet; thence south approx. 600 feet to the north end of Roguela Lane; thence east approx. 400 feet; thence south approx. 1400 feet to the intersection with Lower River Road; thence west along Lower River Road approx. 1400 feet; thence south approx. 1350 feet; thence west approx. 25 feet; thence south approx. 1200 feet to the south bank of the Rogue River; thence northwesterly along said bank approx. 2800 feet; thence on a line southwesterly and parallel to Parkhill Place approx. 600 feet; thence northwesterly at a 90 degree angle approximately 300 feet to the intersection with Parkhill Place; thence southwesterly along Parkhill Place approx. 250 feet; thence on a line southeasterly forming a 90 degree angle approximately 300 feet to a point even with Leonard Road; thence west approx. 1500 feet along Leonard Road; thence north approx. 200 feet; thence west to the west side of Schroeder Lane; thence north approx. 150 feet; thence west approx. 200 feet; thence south to the intersection with Leonard Road; thence west along Leonard Road approx. 450 feet; thence north approx. 300 feet; thence east approx. 150 feet; thence north approx. 400 feet; thence west approx. 500 feet; thence south approx. 300 feet; thence west to the intersection with Coutant Lane; thence south along Coutant Lane to the intersection with Leonard Road; thence west along Leonard Road to the intersection with Buena Vista Lane; thence north along the west side of Buena Vista Lane approx. 200 feet; thence west approx. 150 feet; thence north approx. 150 feet; thence west approx. 200 feet; thence north approx. 400 feet; thence west approx. 600 feet to the intersection with the western boundary of Sec. 23, T36S, R6W; thence south to the intersection with Leonard Road; thence west along Leonard Road approx. 300 feet; thence north approx. 600 feet to the intersection with Darneille Lane; thence northwesterly along Darneille Lane approx. 200 feet; thence west approx. 300 feet; thence south approx. 600 feet to the intersection with Leonard Road; thence west along Leonard Road approx. 700 feet; thence south approx. 1350 feet; thence east approx. 1400 feet to the intersection with Darneille Lane; thence south along Darneille Lane approx. 600 feet; thence west approx. 300 feet; thence south to the intersection with Redwood Avenue; thence east along Redwood Avenue to the intersection with Hubbard Lane and the western boundary of Sec. 23, T36S, R6W; thence south along Hubbard Lane approx. 1850 feet; thence west approx. 1350 feet ; thence south to the south side of U.S. Highway 199; thence westerly along U.S. 199 approx. 1600 feet to the intersection with the north-south midpoint of Sec. 27, T36S, R6W; thence south approx. 2200 feet; thence east approx. 1400 feet; thence north approx. 1000 feet; thence east approx. 300 feet; thence north approx. 250 feet to the intersection with the Highline Canal; thence northerly along the Highline Canal approx. 900 feet; thence east to the intersection with Hubbard Lane; thence north along Hubbard Lane approximately 600 feet; thence east approx. 200 feet; thence north approx. 400 feet to a point even with Canal Avenue; thence east approx. 550 feet; thence north to the south side of U.S. 199; thence easterly along the southern edge of U.S. 199 to the intersection with Willow Lane; thence south along Willow Lane to the intersection with Demaray Drive; thence easterly along Demaray Drive and continuing along the southern edge of U.S. 199 to the intersection with Dowell Road; thence south along Dowell Road approx. 550 feet; thence easterly approx. 750 feet; thence north to the intersection with the South Canal; thence easterly along the South Canal to the intersection with Schutzwohl Lane; thence south approx. 1300 feet to a point even with West Harbeck Road; thence east approx. 2000 feet to the intersection with Allen Creek; thence southerly along Allen Creek approx. 1400 feet to a point even with Denton Trail to the west; thence west to the intersection with Highline Canal; thence southerly along Highline Canal to the intersection with the southern boundary of Sec. 25, T36S, R6W; thence east to the intersection with Allen Creek; thence southerly along Allen Creek to the intersection with the western boundary of Sec. 31, T36S, R5W; thence south to the SW corner of Sec. 31; thence east to the intersection with Williams Highway; thence southeasterly along Williams Highway approx. 1300 feet; thence east approx. 200 feet; thence north approx. 400 feet; thence east approx. 700 feet; thence north to the intersection with Espey Road; thence west along Espey Road approx. 150 feet; thence north approx. 600 feet; thence east approx. 300 feet; thence north approx. 2000 feet; thence west approx. 2100 feet; thence north approx. 1350 feet; thence east approx. 800 feet; thence north approx. 2800 feet to the east-west midline of Sec. 30, T36S, R5W; thence on a line due NE approx. 600 feet; thence north approx. 100 feet; thence east approx. 600 feet; thence north approx. 100 feet to the intersection with Highline Canal; thence easterly along Highline Canal approx. 1300 feet; thence south approx. 100 feet; thence east to the intersection with Harbeck Road; thence north along Harbeck Road to the intersection with Highline Canal; thence easterly along Highline Canal to a point approx. 250 feet beyond Skyway Road; thence south to the intersection with Skyway Road; thence east to the intersection with Highline Canal; thence southeasterly along Highline Canal approx. 1200 feet; thence on a line due SW to the intersection with Bluebell Lane; thence southerly along Bluebell Lane approx. 150 feet; thence east to the intersection with Sky Crest Drive; thence southerly along Sky Crest Drive to the intersection with Harper Loop; thence southeasterly along Harper Loop to the intersection with the east-west midline of Sec. 29, T36S, R5W; thence east approx. 400 feet; thence south approx. 1300 feet to a point even with Troll View Road to the east; thence east to the intersection with Hamilton Lane; thence north along Hamilton Lane to the intersection with the Highline Canal; thence northeasterly along the Highline Canal to the northern boundary of Sec. 28, T36S, R5W; thence east approx. 1350 feet to the transmission line; thence north to the intersection with Fruitdale Drive; thence southwesterly along Fruitdale Drive approx. 700 feet; thence north to the northern edge of U.S. 199; thence easterly along the northern edge of U.S. 199 approx. 50 feet; thence north to the north bank of the Rogue River; thence northeasterly along the north bank of the Rogue River approx. 2100 feet to a point even with Ament Road; thence north to Ament Road and following Ament Road to U.S. Interstate Highway 5 (U.S. I-5); thence continuing north to the 1200 foot contour line; thence following the 1200 foot contour line northwesterly approx. 7100 feet to the city limits and a point even with Savage Street to the west; thence north following the city limits approx. 400 feet; thence west to the intersection with Beacon Street; thence north along Beacon Street and the city limits approx. 250 feet; thence east along the city limits approx. 700 feet; thence north along the city limits approx. 2200 feet; thence southwesterly along the city limits approximately 800 feet to the intersection with the 1400 foot contour line; thence northerly and northwesterly along the 1400 foot contour line approx. 900 feet to the intersection with the northern boundary of Sec. 9, T36S, R5W; thence west along said boundary approx. 100 feet to the NW corner of Sec. 9; thence south along the western boundary of Sec. 9 approx. 700 feet; thence west approx. 1400 feet; thence north approx. 2400 feet; thence west approx. 1350 feet; thence north approx. 1100 feet to the city limits; thence following the city limits first west approx. 1550 feet, then south approx. 800 feet, then west approx. 200 feet, then south approx. 200 feet, then east approx. 200 feet, then south approx. 300 feet, and finally westerly approx. 1200 feet to the intersection with the western boundary of Sec. 5, T36S, R5W; thence south along said boundary to the northern side of Vine Avenue; thence northwesterly along the northern side of Vine Avenue approx. 3150 feet to the intersection with the west fork of Gilbert Creek; thence north to the intersection with the southern right of way of U.S. I-5; thence northwesterly along said right of way approx. 1600 feet; thence south to the intersection with Old Highland Avenue; thence northwesterly along Highland Avenue approx. 650 feet; thence west approx. 350 feet; thence south approx. 1400 feet; thence east approx. 700 feet; thence south approx. 1000 feet; thence on a line SW approx. 800 feet; thence south approx. 1400 feet to the intersection with the northern boundary of Sec. 7, T36S, R5W; thence west to the NW corner of Sec. 7, the point of beginning.

2.1.2.2 Legal Description of Grants Pass Area Domestic Open Burning Boundaries

Note: Sections of OAR 340-23 which do not apply to the Grants Pass UGB have been deleted. A complete copy of rule OAR 340-23 may be obtained from Oregon Department of Environmental Quality. See Figure 1 for Grants Pass City boundary

Open Burning Control Areas

340-23-115 Generally areas around the more densely populated locations in the state and valleys or basins which restrict atmospheric ventilation are designated open burning control areas. The practice of open burning may be more restrictive in open burning control areas than in other areas of the state. The specific open burning restrictions associated with these Open Burning Control Areas are listed in OAR 340-23-055 through 340-23-090 by county. The location of the Grants Pass Open Burning Control Areas are the same as the Grants Pass UGB shown in Figure 1. The Open Burning Control Areas of the State are defined as follows:

(1) All areas in or within three miles of the incorporated city limit of all cities with a population of 4,000 or more.

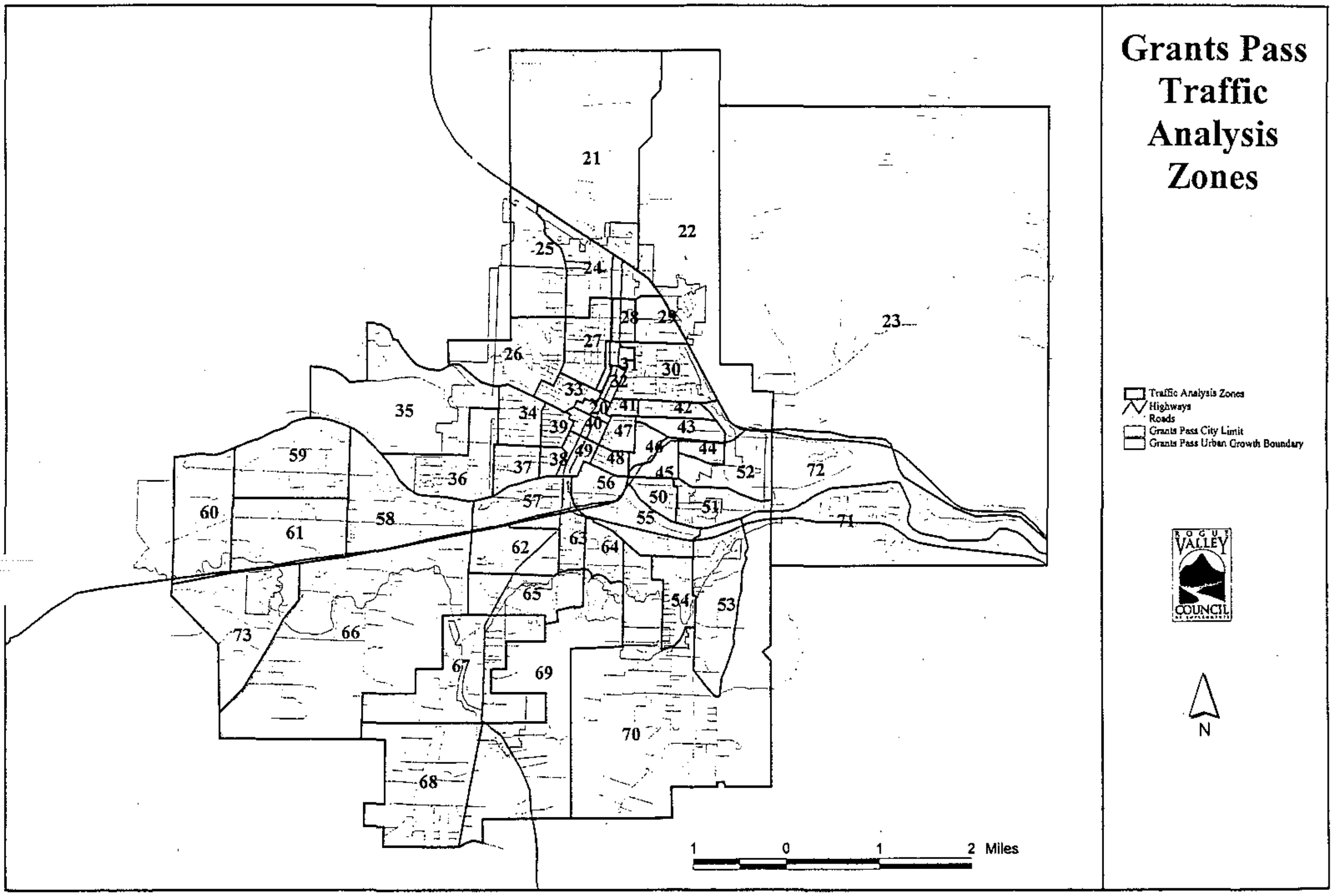
(3) The Rogue Basin Open Burning Control Area is located in Jackson and Josephine Counties. The area is enclosed by a line beginning at a point approximately 4-1/2 miles NE of the City of Shady Cove at the NE corner of T34S, R1W, Willamette Meridian, thence south along the Willamette Meridian to the SW corner of T37S, R1W; thence east to the NE corner of T38S, R1E; thence south to the SE corner of T38S, R1E; thence east to the NE corner of T39S, R2E; thence south to the SE corner of T39S, R2E; thence west to the SW corner of T39S, R1E; thence NW along a line to the NW corner of T39S, R1W; thence west to the SW corner of T38S, R2W; thence north to the SW corner of T36S, R2W; thence west to the SW corner of T36S, R4W; thence south to the SE corner of T37S, R5W; thence west to the SW corner of T37S, R6W; thence north to the NW corner of T36S, R6W; thence east to the SW corner of T35S, R1W; thence north to the NW corner of T34S, R1W; thence east to the point of beginning.

2.1.2.3 Legal Description of Grants Pass PM_{10} Control Area

Legal Description of the Grants Pass PM_{10} Control Area is the same as Grants Pass UGB area shown in Figure 1.

2.1.2.4 Description of Grants Pass Area Transportation Analysis Zone Boundary

Figure 3: Grants Pass Area Transportation Analysis Zone Boundary



Part 2.2 SUMMARY OF EMISSIONS DATA

Summary tables of emission data that are presented here include stationary point sources, stationary area sources, non-road mobile sources, and on-road mobile sources. Summary emissions are expressed as graphs in Figures 4,5,6 and 7.

Table 2.2.1: Summary of 1993 CO Emissions Data

Grants Pass Carbon Monoxide Emissions		
1993 Emissions	*Tons per Year*	*Lbs per Day*
Stationary Point Sources	309	2,386
Stationary Area Sources	1,393	11,379
Non-Road Mobile Sources	917	1684
On-Road Mobile Sources	7,775	48,104
Total	10,394	63,553

Figure 4: Distribution of the 1993 Annual CO Emissions (tons/yr)

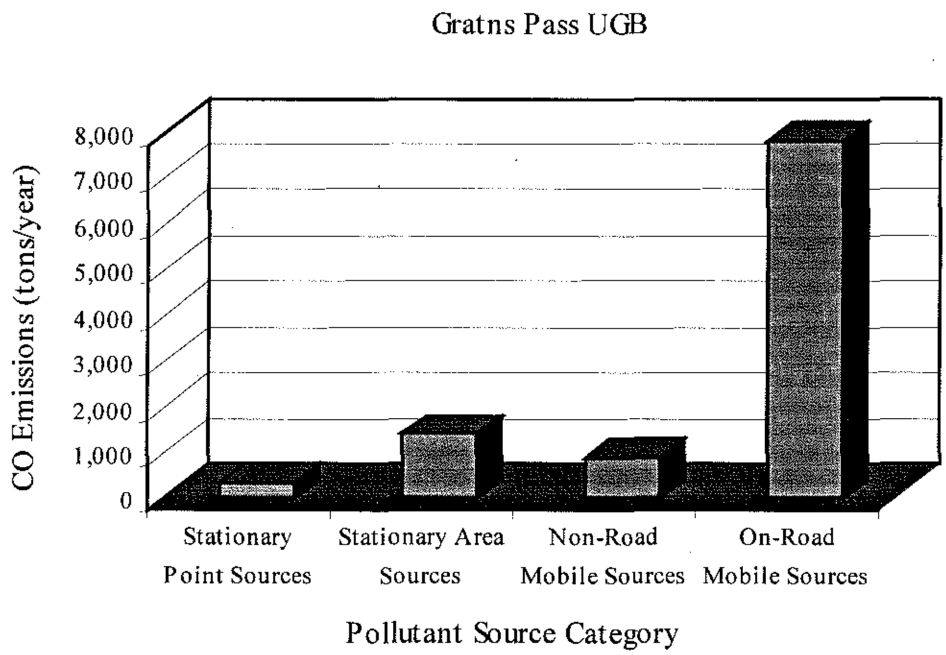


Figure 5: Percentage of CO Annual Emissions for 1993 (tons/yr)

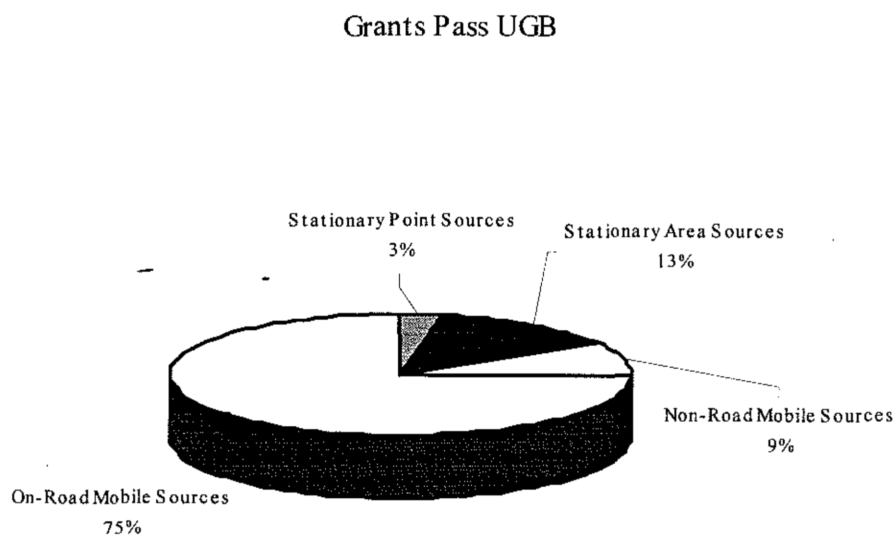


Figure 6: Distribution of the 1993 Seasonal CO Emissions (lbs/day)

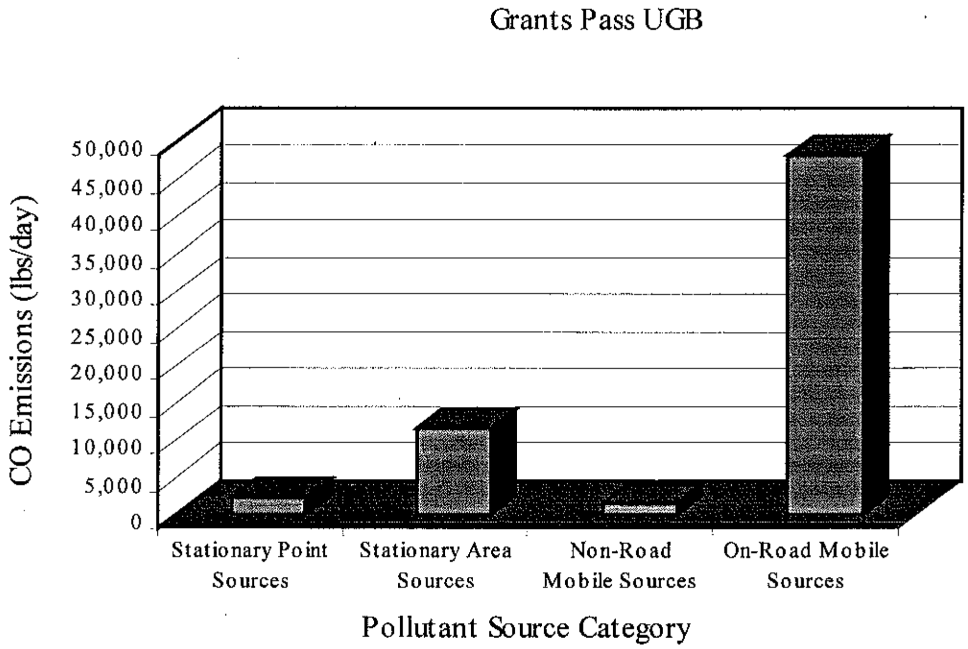
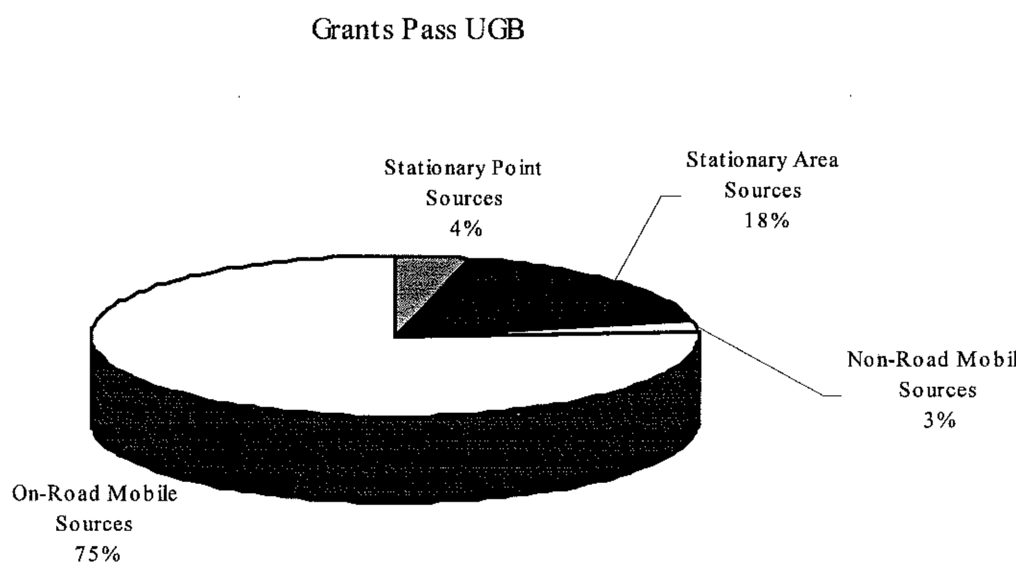


Figure 7: Percentage of CO Seasonal Emissions for 1993 (lbs/day)



Part 2.3 STATIONARY POINT SOURCES

2.3.1 INTRODUCTION AND SCOPE

This is an overview and summary of the stationary point source inventory. Point sources are defined as stationary industrial sources emitting more than 100 tons per year of CO within a 25-mile buffer zone of the Grants Pass UGB. Emission information has been compiled and reported for each applicable individual point source within the Grants Pass UGB and 25-mile buffer zone emitting CO at the levels listed above. Sources inside the Grants Pass UGB which emit less than 100 tons per year of CO are assigned to the appropriate area source category.

Significant CO Point sources operating in the Grants Pass UGB in 1993 include Miller Redwood Co., Tim-Ply Co., and Stone Forest Industries (Currently known as U.S. Forest Industries. Inc.). Calculations and background data for each point source included in this inventory, as shown in Table 2.3.1 through Table 2.3.2 are included in Appendix A.

2.3.2 METHODOLOGY AND APPROACH

Stationary point source emissions and compliance data for the State of Oregon is maintained in a database of permitted sources that includes two major classifications: 1) A2 and/or synthetic minor sources emitting 10 to 99 tons per year, and 2) Title V sources emitting 100 tons or more per year. Point sources in this database were carefully screened in order to select sources located within the Grants Pass UGB, and for sources emitting more than 100 tons per year, located outside the UGB but within the 25-mile buffer surrounding the attainment area.

Initial estimates of emissions were made when an Oregon Air Contaminant Discharge Permit (ACDP), a Synthetic Minor permit, or a Title V permit was issued. Emission factors used to calculate permitted pollutant levels in the various permit types are based on: 1) methods and procedures given in AP-42[11], 2) the result of detailed local studies or experience, 3) source tests, or 4) chemical mass balance calculations. -

2.3.2.1 <u>Annual Emission Calculations</u>

The Emission Inventory Group, Technical Services Section, Air Quality Division of the Oregon DEQ reviews these emission factors during the annual update of the emission inventory. These emission factors, together with the annual production levels, are used to estimate annual emissions. Data used in the estimates includes emission factors, annual throughput or process rate, and operation schedule. These emissions estimates are given in Appendix A of this inventory.

Annual point source emission estimates are calculated and saved in electronic spreadsheet format. Data from the spreadsheets are either manually or electronically entered into the DEQ database (ACSIS) for storage and reporting purposes. Copies of the spreadsheets for point sources are provided in Appendix A.

As required by the EPA guidance document[3], Rule Effectiveness (RE) was applied to the inventory of stationary point sources. The intent of Rule Effectiveness is to accurately estimate emissions by avoiding miscalculations generated by assuming that regulatory programs for stationary sources are being and will continue to be implemented with full effectiveness, achieving all of the reported, required, or intended emission reductions, and maintaining that level over time. RE is applied to the calculation of controlled emissions as follows:

RE Emissions = Uncontrolled Emissions x (1 - (Control Efficiency x RE Factor))

RE is generally applied to emission sources where there is a regulatory program in place requiring an emission reduction to the emission source. Sources exempt from RE include: unregulated uncontrolled sources, sources for which emissions are calculated by means of direct determination, and sources with control achieved by means of an irreversible process change that eliminates the potential for CO emissions. Examples of direct determination include: chemical mass balance, continuous emission monitoring (CEM), and in certain cases stack testing.

Generally, the EPA default of 80 percent rule or control effectiveness is used. To use a factor other than 80 percent, EPA requires a local category-specific evaluation that covers categories representing at least 80 percent of the emissions inventory. EPA has acknowledged that in cases where control efficiencies exceed 95 percent, using an 80 percent RE factor may artificially inflate emission estimates. In these cases, EPA allows a source specific evaluation to derive an alternative factor. The new RE factor can be found by following EPA's Questionnaire Approach, SSCD study, or some other approach approved by the EPA. The Questionnaire Approach was not used in this inventory for CO. Sources that are exempt from RE evaluation were also identified. Documentation of RE can be found in Appendix A.

Control Efficiency is the emission reduction efficiency, and is a percentage value representing the amount of a source category's emissions that are controlled by a control device, process change, or reformulation[321]. Control Efficiencies were found in several ways. The most common way was from the permit, which often references a source test measuring input and output emission quantities. Where a source test was performed only on an output stream, the control efficiency was determined by a ratio of the output emission rate to the uncontrolled emission rate predicted by an emission factor. Control Efficiencies were stated by equipment manufacturers based on previous source tests on similar units, typically subject to verification by future source tests. Control Efficiencies were also determined when factors were used in mass balance calculations. For the case of Grants Pass, no control efficiencies were effective for 1993 and were listed as zero.

Because the CE was zero, the RE emissions equaled the estimated uncontrolled emissions. One source installed CO controls in 1996 and the future year projections accounted for the CE and adjusted emissions based on a local RE.

2.3.2.2 Seasonal Emission Calculations

To determine typical daily emissions from point sources during the CO season, a seasonally adjusted activity level had to be found for each source. The equation for calculating typical daily emissions follows:

$$\textit{Typical CO Season Emissions} = \underset{(tons/yr)}{\textit{Annual Emissions}} \times \frac{SAF}{(\#\ \textit{of Activity Days} \times \#\ \textit{Weeks})}$$

For sources with permits, the typical annual activity levels in days per week and weeks per year were found in the sources' permits. For those sources without permits, an activity level of zero was assumed. Seasonal adjustments of the typical annual activity levels to the CO season for permitted sources inside the Grants Pass UGB was performed using permitted operating times.

2.3.3 Summary of Stationary Point Source Emissions

Stationary point source emissions have been summarized by annual and seasonal emissions by source in Figures 10 through 13. Stationary point source emissions are further summarized by firm and by source category in Tables 2.3.1 through 2.3.3. Since RE is zero for all the point sources in 1993, the rule effected emissions are the same as the uncontrolled emissions. Therefore all three of the tables represente RE emissions.

Figure 8: Distribution of Annual Point Source CO Emissions for 1993

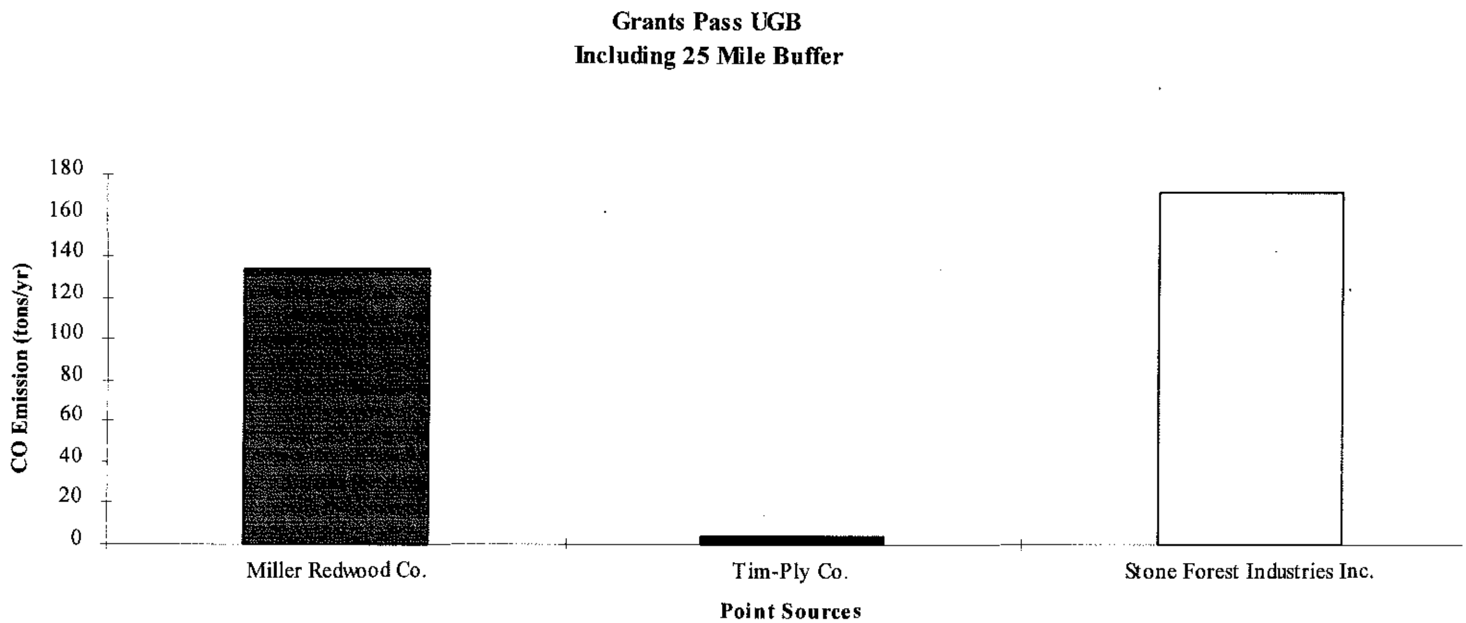


Figure 9: Percentage of Annual Point Source CO Emissions for 1993

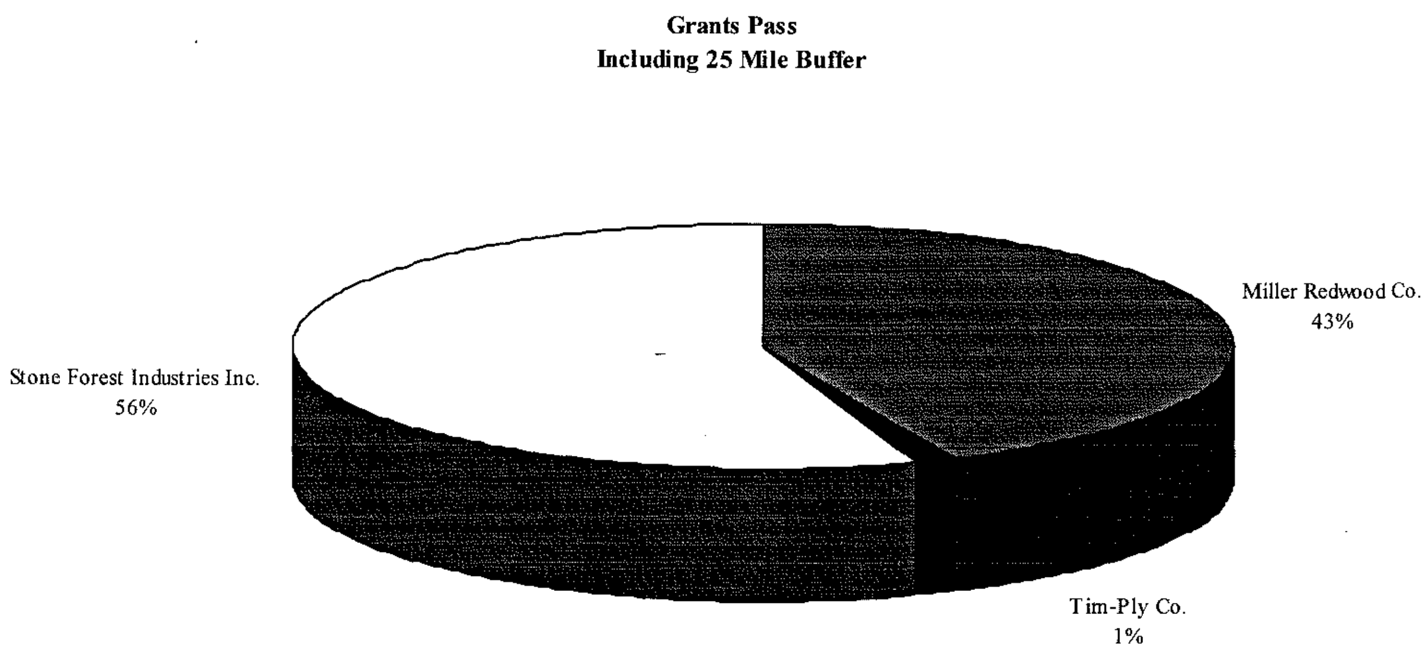


Figure 10: Distribution of Seasonal Point Source CO Emissions for 1993

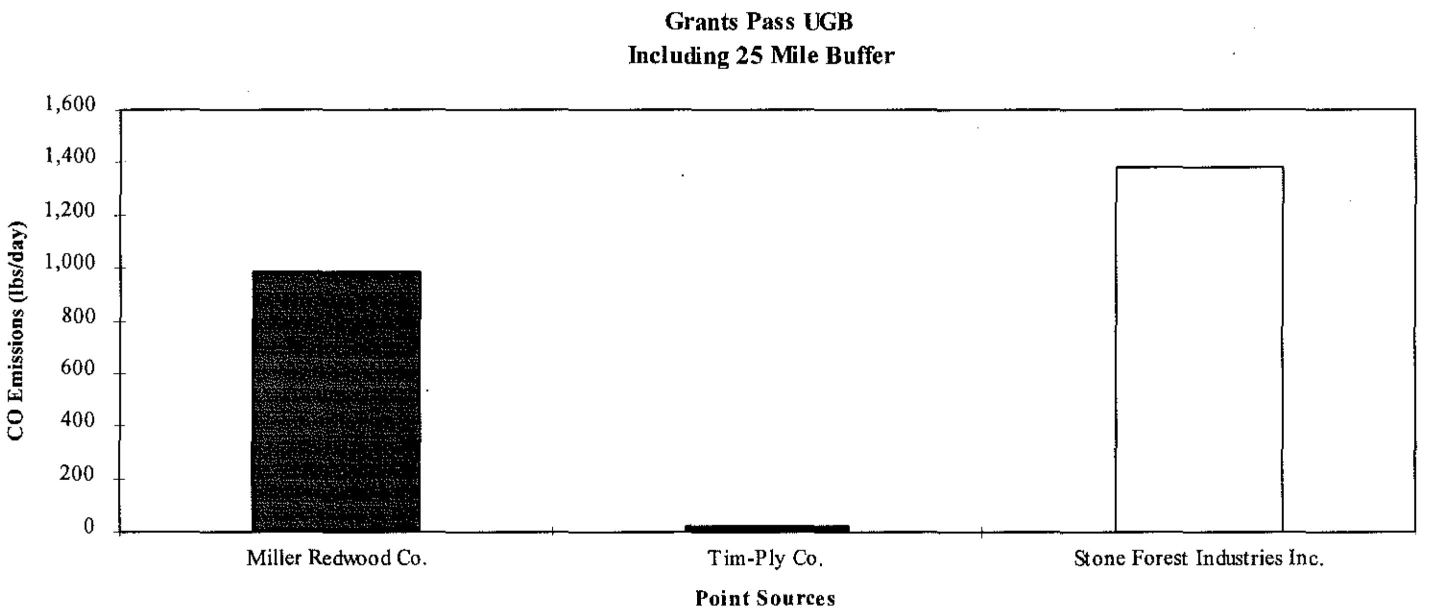
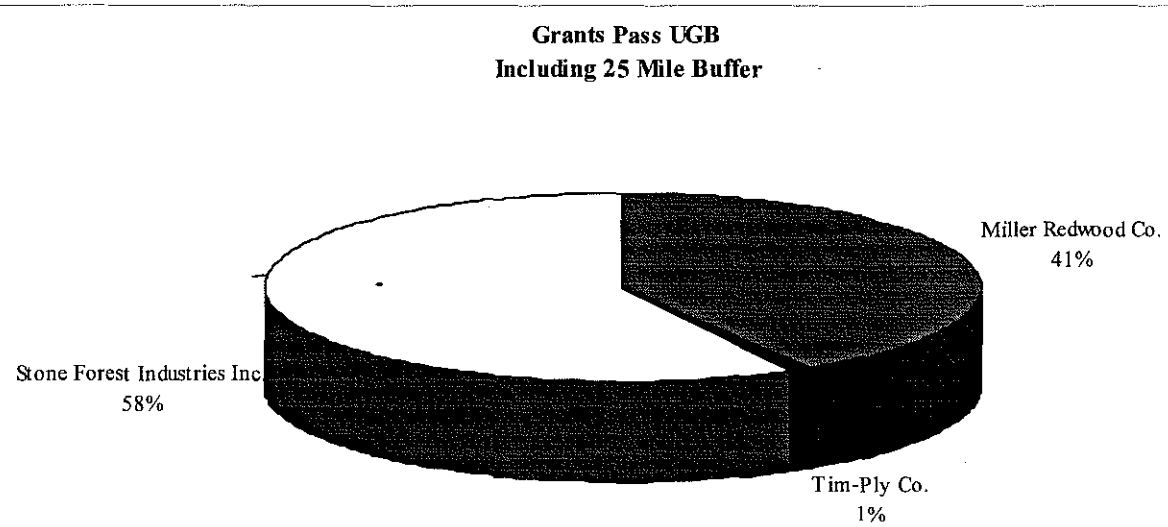


Figure 11: Percentage of Seasonal Point Source CO Emissions for 1993



POINT SOURCE SUMMARIES

Rule Effected point source emissions for both annual and seasonal CO emissions are summarized in Table 2.3.1 by uncontrolled emissions, in Table 2.3.2 by RE emissions and in Table 2.3.3 by RE emissions by source category.

Table 2.3.1: Grants Pass 1993 CO Season: Summary of Point Source Emissions by Firm

Source Number	Company name	(1) Annual (t/yr)	(2) Daily (lbs/dy)
		------CO Emissions-----	
SCC 1-02-006-03, 1-02-006-02 & 3-07-007-13			
17-0023	Miller Redwood Co.	134	984
17-0029	Tim-Ply Co.	4	25
17-0030	Stone Forest Industries Inc.	171	1,377
Total CO (within a 25 mile radius of the Grants Pass UGB)		309	2,386

Notes:

1) The rule effected annual emissions are from the Table 2.3.2 Summary of Rule Effected Point Source Emissions.

2) The rule effected typical daily emissions for 1993 are from the Table 2.3.2 Summary of Rule Effected Point Source Emissions.

Table 2.3.2: Grants Pass UGB CO Season: Summary of Rule Effected Point Source Emissions (Tons/Year, Lbs/Day)

Source Number	SCC	Company name	(1) CE	(2) RE	(3) SAF	(4) CO Activity (d/wk)	(5) CO Activity (d/yr)	(6) No RE Applied CO Emissions (t/yr)	(7) No RE Applied CO Emissions (lbs/dy)	(8) RE Applied CO Emissions (t/yr)	(9) RE Applied CO Emissions (lbs/dy)	(10) PSEL (t/yr)
17-0023	1-02-006-03	Miller Redwood Co.	0%	0%	1.0	7	113	134	984	134	984	Closed
17-0029	1-02-006-02	Tim-Ply Co.	0%	0%	1.0	7	305	4	25	4	25	99
17-0030	3-07-007-13	Stone Forest . Industries Inc.	0%	0%	1.0	7	248	171	1,377	171	1,377	281
Total CO (within a 25 mile radius of the Grants Pass UGB)								309	2,386	309	2,386	380

Notes:

1) None of the sources had CO controls in 1993, subsequently, their 1993 baseline Control Efficiencies(CE) are all zero.
2) Rule Effectiveness(RE) is zero if no controls exist. RE emissions for daily and annual emissions are calculated using EPA-452/R-92-101 *The Guidelines For Estimating and Applying Rule Effectiveness for Ozone/CO SIP Base Year Inventories. (DEQ Ref.165)*
3) Seasonal Adjustment Factors (SAF)_were assumed to be 1 unless a reasonable SAF could be determined using the Emission Statements or some other method. Lbs per Day is Average Winter Day Emissions and is calculated:
   (Tons per Yr) * (2000 Lbs/Ton) * (SAF) / (Days per Year)
4) Activity was pulled directly from the source's permit in effect in 1993.
5) Annual days of operation are taken from the 1993 annual report for each source.
   Days per Year =(Hours per Year)/ (Hours per Day)
6) The annual emissions are calculated in Appendix A, Table-A2 using the following general equation:
   Tons per Year Actual Emissions = (1993 production levels)*(current emission factor)/2000lb./ton.
7) The daily emissions (lb./day actual emissions) are calculated by multiplying the annual emissions by 2000 lb./ton and then dividing by the annual days of operation.
8) The Rule Effected annual emissions are calculated using the equation:
   RE emissions = Uncontrolled Emissions* (1-(CE*RE)).
   Uncontrolled Emissions are calculated by the following equation:
   Uncontrolled Emissions = Actual Emissions/(1-CE)
   For all sources the Actual Emissions = the Uncontrolled Emissions = the Rule Effected Emissions.
9) The Rule Effected seasonal daily Emissions are calculated using the equation:
   RE emissions = Uncontrolled Emissions* (1-(CE*RE)).
   Uncontrolled Emissions are calculated by the following equation:
   Uncontrolled Emissions = Actual Emissions/(1-CE)
   For all sources the Actual Emissions = the Uncontrolled Emissions = the Rule Effected Emissions.
10) The Plant Site Emission Limits are the limits on the current permit (as of 1998).

Miller Redwood Co. ceased operation in November 1993 and did not operate at full production. Its permit was cancelled on 2/8/94.
Tim-Ply modified its permit in 1995 to lower its PSEL from 280.8 tpy to 99 tpy. Due to the fact that Tim -Ply in 1993 had a PSEL greater than 100 t/yr, they have been included in the point source inventory.

Table 2.3.3 Grants Pass UGB 1993 CO Season: Summary of Point Source Rule Effected Emissions by Source Category

	SIC1	SIC2	Source #	Company Name	CO Emissions Annual (tons/yr)	CO Emissions CO season (lbs/day)
SCC 1-02-006-03, 1-02-006-02 & 3-07-007-13						
Millwork, Veneer, Plywood, and Structural Wood Members (243)						
	2435	4961	17-0023	Miller Redwood CO	134	984
	2436	4961	17-0029	Tim-Ply	4	25
	2436		17-0030	Stone Forest Industries, Inc.	171	1,377
	Total				309	2386

Notes:

1) Only point sources with CO greater than 100 ton/yr. and located within the Grants Pass UGB or within 25 miles of the UGB (radius/buffer zone) are included. Sources inside the 25 mile buffer but already inventoried in the Medford CO SIP were not included.
2) Tim - Ply is included in Point Sources Inventory due to the fact that in 1993 it had PSEL greater than 100 ton/yr.
3) Miller Redwood ceased operation on 11/19/93 and canceled its permit on 2/8/94.
4) If a Source Industry Category is not in this Table there were no major sources with the SIC in the Grants Pass UGB inventory (including the 25 mile boundary)

Part 2.4 STATIONARY AREA SOURCES

2.4.1 INTRODUCTION AND SCOPE

This section describes the development of the emissions inventory for carbon monoxide for stationary area sources located in the Grants Pass UGB in the 1993 CO Attainment Year. Area sources included in this inventory are stationary and collectively represent relatively small and numerous individual sources within the inventory area. Included in the area source category are four groups of distinct area source emission contributors: Waste disposal, treatment and recovery (including residential, industrial, and commercial open burning); Small stationary fuel and wood use (including residential, industrial, and commercial combustion); Small point sources (industrial point sources with CO Plant Site Emission Limits (PSEL) less than 100 tons and actual CO emissions greater than 5 tons per); and Miscellaneous (forest fires, structural fires, and slash burning).

Table 2.4.1 lists the procedures used to develop the emission estimates for the various categories of area source CO emissions included in the Grants Pass UGB inventory. Estimated emissions represented in this inventory occur on an average weekday during the three-month CO season of January 1 through February 28, and December 1through December 31, 1993.

2.4.2 METHODOLOGY AND APPROACH

2.4.2.1 <u>Source Category Identification</u>

Discussion of guidance documents and broad methodology used to calculate stationary area source emissions can be found in Part I. The list of stationary area sources included in the inventory was based on the EPA Procedures Document[3] and the *Emissions Inventory Requirements for CO*[1]. These area sources were compared to sources evaluated in the *Portland Metro CO NAA, 1991 SIP CO Inventory*[56], and the annual inventory of point source categories.

Emission factors were taken from the EPA Procedures Document[3], the FIRE Version 5 SCC's and Emission Factors[318], the Compilation of Air Pollution Emission Factors (AP-42)[8], various EPA Surveys, and local studies conducted by the Oregon Department of Environmental Quality or environmental consulting firms. Errors in estimated emissions could occur in the multiplier values used, in the accuracy of calculations, or in mistakes in the construction of equations. Therefore, estimated emissions were checked for reasonableness by a number of approaches: 1) using alternative multiplier values when possible; 2) comparing estimates with the results of earlier area source inventories; and 3) performing independent checks on the accuracy of the multiplier values, the methodologies, and the emission calculations.

Seasonal activity factors were taken from the EPA Procedures Document[3] or were derived by DEQ and based upon season specific activity levels. State regulations applicable to each area source category are outlined in Table 2.4.1; these regulations were used when determining control efficiency and rule penetration. Rule effectiveness for all categories was based upon the default level of 80 percent from EPA's *Guidelines for Estimating and Applying Rule Effectiveness For Ozone / CO State Implementation Plan Base Year Inventories*[165]. Applicable state regulations cited are from Oregon Administrative Rules, Chapter 340, Department of Environmental Quality[32]. These citations are abbreviated using the following format: OAR 340-(Division #)-(Applicable Rule #'s). All rule citations are followed with the effective date of the rule as it was applied in this inventory for historical reasons. This date is important because the rules in effect for this specific inventory year may be subject to changes. When a rule is applied to emission calculations it is assumed to have been in effect throughout the year of the inventory.

2.4.2.2 Prevention of Double Counting

Special care was taken to prevent double counting of emissions sources associated with both area and point sources. First the area sources were reviewed to identify which categories may have been accounted for in the point source inventory. Only two area sources were suspected industrial open burning and industrial fuel consumption. Industrial open burning was not included with the point sources because it is illegal under Oregon rules and would only occur outside of a company's permitted and reported activities. Industrial fuel consumption was only calculated for the Grants Pass UGB industries and is negligible compared to the CO emissions from the TV sources. Where appropriate, industrial fuel consumption from the stationary point sources was subtracted from the area source categories. We believe area sources emissions represent smaller industrial sources, which do not account for CO emissions in their permits.

2.4.3 Summary of Stationary Area Source Emissions

A summary of the stationary area source inventory is shown in Tables 2.4.1 and 2.4.2 for the major area source categories. Annual emissions and daily emissions, adjusted for activity during the CO season, are shown. Summary area source emissions are expressed as graphs in Figures 12 through 17.

2.4.4 Discussion of Area Source Categories

Each of the major area source categories, as shown in Tables 2.4.1 and 2.4.2 is comprised of area source types. Detailed descriptions of the emission estimation methodology for each source type is included in Tables 2.4.3 through 2.4.14 and in Appendix B. The applicable appendix table number is included in the annotations, which accompany the summary table. Discussion of data sources, emission factors, seasonal adjustment factors, and activity levels which affect the area source are included for each area source type. Applicable state regulations affecting a specific area source emission category are included in the notes on each category summary table. If specific area source type emissions were affected by state regulations during the inventory year, control efficiency, rule effectiveness, and rule penetration have been applied[1,3]. Example calculations for emissions estimates are included on individual spreadsheets.

The following sections describe these major categories; subsections corresponding to individual area source types are included.

2.4.4.1 <u>Waste Disposal, Treatment, and Recovery</u>

This category includes disposal, treatment, recovery and clean up of solid and liquid wastes by incineration and open burning.

2.4.4.1.1 Incineration

This category consists of the disposal of solid waste, infectious waste, or crematory incinerator waste from industrial and commercial/institutional sources by combustion. Combustion occurs in a structure or furnace for the purpose of reduction in volume or weight of the waste material.

2.4.4.1.1.1 Industrial Incineration

The Grants Pass UGB does not contain any industrial incineration sources and as such this category has not been inventoried here.

2.4.4.1.1.2 Commercial Incineration

In Oregon, commercial incineration sources are treated as permitted point sources. Because emissions from these smaller "point sources" are below the point source cut-off level used in this inventory, they are included here as part of the area source category. Commercial on-site solid waste incineration tonnage is based upon actual annual emission calculations from Oregon DEQ Air Contaminant Discharge Permits. For the purpose of the area source inventory "commercial" on-site solid waste incineration is restricted to DEQ class A2 and class B permits winnowed for the appropriate commercially related SIC classifications. Commercial incineration activity is assumed to occur 5 days/week and the seasonal adjustment factor is uniform (1.0) as found in EPA Procedures Document[3], Table 5.8-1. Specific incineration rules apply to Infectious Wastes and Crematory Incinerators. Control efficiency, rule effectiveness and rule penetration have been applied to the emissions estimates. Applicable state regulations are from OAR 340-25-850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, and 905 (effective date 3-13-90), and Division 21-025 and 027 (effective date 1-16-84)[22].

Methodology, information sources, and a summary of estimated emissions from commercial incineration are shown in Table 2.4.13.

2.4.4.1.1.3 Residential Incineration

Residential on-site solid waste incineration activity is assumed to be zero. DEQ rules outlining structural requirements, source tests, and continuous emission monitoring, as well as associated permit costs, preclude individual residential construction of incineration devices. Destruction of solid waste and yard debris at residential sites is included in residential open burning calculations.

2.4.4.1.2 Open Burning

This category includes waste material disposal from industrial, commercial / institutional, and residential sources in open outdoor fires, burn barrels or incinerators which do not meet DEQ emission limits, or burn in a manner in which combustion air is not effectively controlled and combustion products do not vent through a stack or chimney.

2.4.4.1.2.1 Industrial Open Burning

Industrial open burning is prohibited in the Grants Pass UGB except by special letter (hardship) permit issued by DEQ's Western Region Office. DEQ permit tracking does not indicate if the hardship burn permit is issued for residential, commercial, or industrial purposes. Emissions were calculated by first allocating the employee population from *County Business Patterns, Oregon 1990*[240] in SIC groups 20 - 39 to the Grants Pass UGB, based upon the percentage of population within the UGB. The loading factor of 160 tons/1,000 employees for industrial open burning is based on the value provided in the EPA Procedures Document[3], Table 4.6-2. The emission factors are from AP-42, Table 2.5-1[8] and are an average of the factors for open burning of wood and refuse. Industrial open burning is assumed to occur five days per week, 52 weeks per year. A DEQ calculated seasonal adjustment factor (1.0) is used which reflects a uniform application of illegal open burning on an annual basis. Since legal open burning is assumed to be zero based on the applicable Oregon Administrative Rules listed below, all open burning is illegal. Under this method, control efficiency, rule effectiveness and rule penetration are inherent in the illegal emissions estimates. Applicable state regulations are from OAR 340-23-022, 025, 030, 035, 040, 042, 043, 045, 065, 070, 075, and 100 (effective date 3-11-92)[22].

Methodology, information sources, and a summary of estimated emissions from industrial open burning are shown in Table 2.4.4.

2. 4.4.1.2.2 Commercial Open Burning

Commercial open burning is also prohibited in the Grants Pass UGB, except by special letter (hardship) permit issued by DEQ's Western Region Office. DEQ permit tracking does not indicate if the hardship burn permit is issued for residential or commercial purposes. Emissions were calculated by first allocating the employee population from *County Business Patterns, Oregon 1990*[240] in SIC groups 50 - 99 to the Grants Pass UGB based upon the percentage of population within the UGB. The loading factor of 24 tons/1,000 employees /year for commercial open burning is based on the value provided in the EPA Procedures Document[3], Table 4.6-2. The emission factors are from AP-42, Table 2.5-1[8] and are an average of the factors for open burning of wood and refuse. Commercial open burning is assumed to occur five days per week, 52 weeks per year. A DEQ calculated seasonal adjustment factor (1.0) is used which reflects a uniform application of illegal open burning on an annual basis. Since legal open burning is assumed to be zero based on the applicable Oregon Administrative Rules listed below, all open burning is illegal. Under this method, control efficiency, rule effectiveness and rule penetration are inherent in the illegal emissions estimates. Applicable state regulations are from OAR 340-23-022, 025, 030, 035, 040, 042, 043, 045, 065, 070, 075, and 100[22].

Methodology, information sources, and a summary of estimated emissions from commercial open burning are shown in Table 2.4.5.

Control efficiency, rule effectiveness and rule penetration are inherent in the estimation of open commercial and industrial open burning since all burning is illegal.

2.4.4.1.2.3 Residential Open Burning

City of Grants Pass prohibits residential open burning inside the City of Grants Pass Burn Ban Boundary (BBB) during the CO season. The BBB is defined by the Grants Pass City boundary, see Figure 1. DEQ prohibits residential open burning in the Rogue Basin Open Burning Control Area on so called " no-burn" days when the ventilation index is below 400. For rural Grants Pass, the Grants Pass Fire District prohibits residential open burning during fire season, typically July 1 through mid-October. Permits are issued for residential open burning in rural parts of the Grants Pass UGB between the fire season and the PM_{10} season on days when the ventilation index is above 400.

In 1993, residential open burning was allowed for a total of 157 days, including 23 days during the CO season in the rural UGB.

Legal Burning

CO emissions were estimated by distinguishing between legal and illegal burning. CO emissions from legal burning were estimated by multiplying the tons of each type of material legally burned by the emission factor for the specific material. The tons of each type of material legally burned were estimated by acquiring the number of open burning permits issued by the Grants Pass fire district[323]. The permits issued were multiplied by a factor (number of legal burns/permit) to estimate actual burns. The factor was estimated by interviewing the Josephine County open burning inspectors and the fire district[323]. The size of the burn piles is assumed to be the legal limit described on the permit application[323]. The pile size is multiplied by a material specific density to obtain weight per burn[8]. The type of material burned was estimated by reviewing the illegal burn violation report for incidences whose only violation was that the ventilation index was below 400[323]. Using these otherwise legal burns should give an indication of what types of materials and how much of each type make up the legal burn piles. Once the pile size, material type and relative amounts, and number of legal open burns are estimated, the number of tons of each type of material burned is calculated. The number of tons of material burned was multiplied by emission factors from AP-42[8] to determine the total legal emissions. To calculate the annual emissions from brush, the equation was:

issued permits * factor * % brush * pile size * density brush pile = amount brush burned.

amount of brush burned * brush CO emission factor = CO emissions.

The '% brush' refers to the relative percentage of legal material burned that may be composed of brush. The other legal materials considered are wood and leaves/grass. Because residential open burning is prohibited during CO Season in the city limits, there was no typical day emissions from legal burning in city limits.

Illegal Burning

CO emissions from illegal burning were estimated by multiplying the tons of each type of material illegally burned by the emission factor for the specific material. The tons of each type of material were estimated by acquiring the violation information for the Grants Pass UGB from Josephine County and the Grants Pass fire district[323]. The number of violations was then multiplied by a factor (illegal open burns/documented violation) to estimate the number of actual illegal burns. This factor came from interviews with Josephine County open burning inspectors and the fire district. The size of the piles and the relative percentage of the material types was taken from the violation records. The pile size was converted from volume to mass by using material densities obtained from the ODEQ Waste, Management, & Cleanup (WMC) division[96]. To calculate the annual emissions for garbage, the equation was:

Reported Violations * % Garbage burned * Factor * avg. Pile Size * density Garbage pile = amount garbage burned.
Amount of garbage burned * Garbage CO Emission Factor = CO emissions.

The '% garbage' refers to the relative percentage of illegal material burned that may be composed of garbage. The other illegal materials considered are wood, brush and leaves/grass.

Some of this otherwise legal material may have been burned out of season, in a prohibited area, in too large a pile, or when the ventilation index was below 400.

The emission factors are from AP-42[8]. The material densities are estimates from the ODEQ, WMC Division, solid waste section[269]. CO season typical day emissions were calculated by multiplying the annual emissions by a ODEQ derived seasonal adjustment factor, then divided by the number of days per week that burning likely occurred.

Rule Effectiveness (RE)
RE applies to residential open burning and is inherent in the estimation method. The category is in fact split into 100% RE (legal burning) and 0% RE (illegal burning).

Applicable state regulations are from OAR 340-23-022, 025, 030, 035, 040, 042, 043, 045, 065, 070, 075, and 100 (effective date 3-11-92)[22].

Methodology, information sources, and a summary of estimated emissions from residential open burning are shown in Table 2.4.10.

2.4.4.2 <u>Small Stationary Fossil Fuel and Wood Use</u>

This category includes small furnaces, heaters, heating units, and cooking devices, which produce emissions less than 100 tons/year. Four main types of fuel are used within the Grants Pass UGB by industrial, commercial/institutional, and residential sources: fuel oils, natural gas, liquefied petroleum gas (LPG), and wood. Wood fuel use is only evaluated for residential sources in which it is primarily used in fireplaces, wood stoves, furnaces, and for cooking. For the purpose of the area source inventory fossil fuel and wood fuel use is evaluated for space heating or cooking purposes only; use of these fuels by industrial and commercial sources for other purposes is included in the point source inventory.

2.4.4.2.1 Fuel Oil Combustion

Fuel oil emissions from industrial and commercial sources are from fuel oil consumption in large or small boilers, furnaces, heaters, space heaters, and other heating devices. Residential fuel oil emission sources are primarily from fuel consumption in furnaces, space heaters, and other heating devices. For this inventory, industrial and commercial fuel oil consumption includes residual oil, distillate oil, and kerosene use; residential fuel oil consumption includes distillate and kerosene use only.

Fuel oil use emissions estimates are based on the U.S. Department of Energy/Energy Information Administration document *State Energy Data Report: Consumption Estimates, 1995*[286], Grants Pass UGB population data, SIC population data and *County Business Patterns, 1993, Oregon*[240]. Fuel oil use estimates for industrial sources have been calculated by using Grants Pass UGB SIC group 20 - 39 employee population (Appendix B, Table B-4). The Grants

Pass Industrial employment number for 1993 came from the Rogue Valley Council of Governments. Industrial fuel oil consumption estimates are summarized in Appendix B, Table B-5. Fuel oil use estimates for commercial sources have been calculated by using Grants Pass UGB SIC group 50 - 99 employee population. Commercial fuel oil consumption estimates are summarized in Appendix B, Table B-5.

These estimates assume that a portion of the commercial and industrial activity within Josephine County occurs within the UGB. Industrial and commercial fuel oil use in this category is assumed to be used for space heating for employees working in a facility. Oregon DEQ Air Contaminant Discharge Permits (ACDPs) are issued based on process related emissions only. Facilities included in the point source inventory report total fuel oil use on an annual basis as part of the ACDP requirements. For this inventory, the fuel oil use reported in the ACDP is assumed to be used for processes related purposes, not for space heating or other uses. Emission factors for industrial and residential sources are from the EPA document *Compilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.3-1. The emission factors for industrial, and commercial/institutional distillate fuel oil are the same. Seasonal adjustment factors and activity levels are taken from the EPA Procedures Document[2], Table 5.8-1.

Fuel oil use emissions estimates for residential sources are calculated using the U.S. Department of Energy/Energy Information Administration document *State Energy Data Report: Consumption Estimates, 1995*[286], Grants Pass UGB population data[325] and *County Business Patterns, 1993, Oregon*[240]. Population estimates can be found in Appendix B, Table B-1. Fuel oil use for residential sources has been estimated by using Grants Pass UGB population number; residential fuel oil consumption estimates are summarized in Appendix B, Table B-5. Emission factors are from the EPA document *Compilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.3-1. Total distillate and kerosene use is combined for emission estimate purposes. While the American Standards for Testing and Materials (ASTM) classify kerosene as Grade 1 and furnace oil as Grade 2, they are both distillate oils and have similar gross heating value. AP-42 does not provide separate emission factors for the two fuels when used in a residential furnace. In addition, use of kerosene as a space heating fuel, particularly in furnaces, is limited in Oregon. Seasonal adjustment factors and activity levels are taken from the EPA Procedures Document[2], Table 5.8-1. A summary of the emission estimates and assumptions for fuel oil use for space heating are shown in Table 2.4.3.

2.4.4.2.2 Natural Gas and Liquefied Gas Combustion

Natural gas and liquefied gas combustion oil emissions from industrial and commercial sources are from natural gas and liquefied petroleum gas (LPG) fuel consumption in large or small boilers, furnaces, heaters, space heaters, and other heating devices. Residential natural gas and liquefied petroleum gas (LPG) fuel emission sources are primarily from fuel consumption in furnaces, space heaters, and other heating devices. For this inventory, industrial and commercial natural gas and liquefied petroleum gas (LPG) fuel oil consumption includes residual oil, distillate oil, and kerosene use; residential fuel oil consumption includes distillate and kerosene use only. Natural gas and liquefied petroleum gas (LPG) fuel use emissions estimates are based on the U.S. Department of Energy/Energy Information Administration document *State Energy Data Report: Consumption Estimates, 1995*[286], Grants Pass UGB population data[325], SIC population data[326] and *County Business Patterns, 1993, Oregon*[240].

Natural gas and liquefied petroleum gas (LPG) fuel use for industrial sources have been estimated by using Grants Pass UGB SIC group 20 - 39 employee population data (Appendix B, Table B-4) provided by the RVCOG. Industrial natural gas and liquefied petroleum gas (LPG) fuel consumption estimates are summarized in Appendix B, Table B-5. Natural gas and liquefied petroleum gas (LPG) fuel use for commercial sources have been estimated by using Grants Pass UGB SIC group 50 - 99 employee population developed by RVCOG. Two source permits included in the stationary point source category mention the use of natural gas; the use included in the stationary point source category has been subtracted to prevent double counting in the industrial natural gas category. Commercial natural gas and liquefied petroleum gas (LPG) fuel consumption estimates are summarized in Appendix B, Table B-5.

These estimates assume that a portion of the commercial/institutional and industrial activity within Josephine County occurs within the UGB. Industrial and commercial natural gas and liquefied petroleum gas (LPG) fuel use in this category is assumed to be used for space heating for employees working in a facility. Oregon DEQ Air Contaminant Discharge Permits (ACDPs) are issued based on process related emissions only. Facilities, which are included in the point source inventory report total natural gas and liquefied petroleum gas (LPG) fuel use on an annual basis as part of the ACDP requirements. For this inventory the natural gas and liquefied petroleum gas (LPG) fuel use reported in the ACDP is assumed to be used for processes related purposes: not for space heating or other uses. Natural gas emission factors for commercial/institutional and industrial sources are from the EPA document C*ompilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.4-1. LPG emission factors for commercial/institutional and industrial sources are from the EPA document C*ompilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.5-1. The emission factors for industrial, commercial/institutional natural gas, and LPG use are the same. Seasonal adjustment factors and activity levels are taken from the EPA Procedures Document[2], Table 5.8-1.

Natural gas and liquefied petroleum gas (LPG) fuel use emissions estimates for residential sources are calculated using the U.S. Department of Energy/Energy Information Administration document *State Energy Data Report: Consumption Estimates*[286] and Grants Pass UGB population data[325]. Population estimates can be found in Appendix B, Table B-1. Natural gas and liquefied petroleum gas (LPG) fuel use estimates for residential sources have been adjusted by proportioning Grants Pass UGB population to state-wide population and applying that ratio to state-wide residential natural gas and liquefied petroleum gas (LPG) fuel use. Residential natural gas and liquefied petroleum gas (LPG) fuel consumption estimates are summarized in Appendix B, Table B-5. This method was chosen due to the lack of Grants Pass specific information for natural gas and liquefied petroleum gas (LPG) fuel heating devices in the UGB. Natural gas emission factors for residential sources are from the EPA document C*ompilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.4-1. LPG emission factors for residential sources are from the EPA document C*ompilation of Air Pollutant Emission Factors,* (AP-42, 5th Edition)[216], Table 1.5-1. Seasonal adjustment factors and activity levels are taken from the EPA Procedures Document[2], Table 5.8-1. No source permits included in the stationary point source category mention the use of LPG; no subtraction to prevent double counting in the industrial natural gas category was conducted.

Because no State regulations apply to residential, commercial/institutional, and industrial natural gas or LPG fuel use for space heating, no control efficiency, rule effectiveness, or rule penetration have been applied to the emission estimate.

A summary of the emissions estimates and assumptions for natural gas and LPG fuel use are shown in Table 2.4.4 and on Table 2.4.5 respectively.

2.4.4.2.3 Residential Wood Combustion

Wood is an important residential space-heating source in Oregon. As a heating source wood contributes a significant percentage of pollutants to the airshed when compared to fuel oil and natural gas. Because the CO season in Grants Pass occurs during the winter months when residential wood combustion is at its height, emissions from residential wood burning are considered to be significant.

Information on wood use for the Grants Pass UGB was taken from the results of a wood heating survey conducted within the Grants Pass area in 1992 - 1993 and covers estimated usage during the 1993 heating season. This survey provided DEQ with information on the percentage of homes in the Grants Pass UGB that used wood stoves and fireplaces, and an estimate of the average number of cords burned during the 1993 heating season in wood stoves and fireplaces. Survey data was restricted to reflect data for Grants Pass zip codes only in order to more closely characterize the wood burning activity within the UGB. Survey data included fuel use information from both certified and non-certified wood stoves. Because the public is generally unable to ascertain what type of emission control their wood stove utilizes, the survey results for certified wood stoves was adjusted to represent a 25% catalytic to 75% non-catalytic stove mix. This conclusion allows the use of different emission factors for catalytic and non-catalytic stoves. The CO emissions from certified stoves, non-certified stoves, and fireplaces was then summed to give the total CO emissions for the residential wood heating category.

When the inventory year is different than the survey year, the average number of cords burned during the inventory year is usually estimated by multiplying the survey values by the ratio of the Inventory Year Heating Degree Days to Survey Year Heating Degree Days. Because the survey year was the same as the inventory year, in this case the result was a 1:1 ratio. Survey results also provided information on wood types burned and allowed a wood density adjustment to be made to determine the tons of wood burned. The number of wood stoves and fireplaces used in 1993 was estimated by multiplying the percentages of wood stoves and fireplaces obtained from the 1992-1993 wood heating survey by the estimated occupied housing units in the Grants Pass UGB in 1993. The number of occupied housing units was then multiplied by the average number of cords burned per device to give the total number of cords burned. The weight of a typical cord of wood, the survey result information on the species of wood burned, and EPA wood density information was used to determine the tons/typical cord burned. The total cords burned by device were multiplied by the tons/cord to give the total wood burned by each device. Finally, a CO emission factor based upon the type of wood burning device was applied to determine CO emissions from the burning of wood in wood stoves, pellet stoves, and fireplaces. Seasonal adjustment of annual emissions to a typical day was based upon EPA seasonal adjustment factor methodology and was based upon a Heating Degree Day ratio of maximum 1993 HDD during the CO season to 1993 average HDD. Because there are existing state regulations influencing the types of wood stoves sold and local policies restricting daily use of wood burning devices, the EPA techniques of applying rule effectiveness (RE), control efficiency (CE), and rule penetration (RP) were applied to the emissions estimates. Adopted State regulations which effect residential wood combustion can be found in OAR 340-34-001, 005, 010, 015, 020, 045, 050, 060, and 070 (effective date 11-13-91)[22].

Example calculations are included on individual spreadsheets. Detailed information about data sources, assumptions, and calculations are shown in Appendix B, Tables B-1, B-6, B-7, and B-8. A summary of the emission estimates and assumptions for residential wood use are shown in Table 2.4.6.

2.4.4.3 Small Point Sources

Emissions from small point sources included permitted stationary point sources within the Grants Pass UGB which emitted CO below the 100 tons/year cutoff level for the stationary point source category. Emissions were calculated by multiplying the emission factors used to generate the PSEL in effect during 1993 and actual 1993 production levels. Seasonal adjustments were assumed to be uniform (1), and activity was assumed to be 7 days/week. There are no rules or control efficiencies that affect this area source category. As such, RE and CE will not be applied.

A summary of the emission estimates and assumptions for area source emissions from small point sources are shown in Table 2.4.14.

2.4.4.4 Miscellaneous Area Sources

The area sources described in this section are combustion sources and may result from anthropogenic activity or natural causes. Source types include agricultural activity, forest wildfires, slash burning, and structural fires.

2.4.4.4.1 Other Combustion

Other combustion sources which contribute to air pollutant levels may be intermittent in nature or may be the result of forestry activity. Intermittent emission sources include forest wild fires and structural fires. Emission sources from forest activity include slash burning from logging or land clearing activities. Prescribed burning designed for forest health or wildlife habitat enhancement is included as part of slash burning.

2.4.4.4.4.1 Forest Wild Fires

Forest wild fires are uncommon in the Grants Pass UGB portion of Josephine County. County and region-wide data for the incidence of forest fires and estimated acres burned is given in the *1993 Oregon Forest Fire Summary*[213c] prepared by the Oregon Department of Forestry. Using USGS maps and comments from state fire officials, the county-wide values were adjusted to estimate the incidence of wildfires occurring within, or in areas adjacent to, the Grants Pass UGB.

There are no recent studies examining fuel load and emission factors for wildfires. The best estimate for fuel loading, however, comes from AP-42[8], Section 13.1, which is primarily based on studies reported from 1970 to 1975. AP-42[8] estimated total CO fuel loading from Pacific Northwest wildfires to be 60 tons per acre. The most recent emission factor available is from Ward[43,44], which lists the CO emissions from material burned at 500 lb./ton.

Forest wild fires are assumed to have an activity of seven days per week. Area specific fire information was obtained from the *1993 Oregon Forest Fire Summary*[213c]; this information was used by DEQ to calculate an appropriate seasonal adjustment factor. Because no state regulations affect this emission category, control efficiency, rule effectiveness, and rule penetration were not applied.

Due to the urban nature of the Grants Pass UGB area, no forest fires were reported for the 1993 emission inventory year. A summary of emissions estimates from forest wild fires and supporting data are given in Table 2.4.7.

2.4.4.4.4.2 Slash Burning

By definition, "slash" means forest debris or woody vegetation to be burned under the Oregon Smoke Management Plan administered by the Oregon Department of Forestry pursuant to OAR 477.515. The burning of slash must be related to the management of forest land used for growing and harvesting timber (OAR 340-23-030). Slash burning of forest materials occurs under controlled conditions to promote good natural resource management and to remove logging residues. Slash burning is not significant within the Grants Pass UGB. Emissions from slash burning fuel loading were estimated using county and region-wide data provided by the Oregon Department of Forestry in the *Oregon Smoke Management Annual Data Report, 1993*[211]. These values were adjusted to reflect estimated slash burning inside or immediately adjacent to the UGB (based on visual examination of USGS maps of Josephine County).

The emission factors for carbon monoxide used in this inventory are based on DEQ estimates and recent regional studies of wildfires and prescribed burning, and are summarized in memoranda from Darold Ward[43,44]. A value of 250 lb./ton, from Ward[43,44], is used for this inventory. An activity level of 5 days per week is used which assumes that most slash burning activity does not occur on weekend days. The 5 days per week is based on the commercial workweek assumed for commercial SIC employee populations. A DEQ specific seasonal adjustment factor is calculated based upon the occurrence of slash burning in 1993. Because slash burning emissions are estimated using actual reported tons of material burned, control efficiency, rule effectiveness, and rule penetration were not applied.

Details of the assumptions used and a summary of the estimated emissions from slash burning are shown in Table 2.4.8.

2.4.4.4.4.3 Structural Fires

Emissions from structural fires were estimated using data obtained directly from the State Fire Marshall's Office[212]. The fuel loading factor of 6.8 tons per fire, and an emission factor of 60 lbs per ton for CO were taken from information provided in the EPA Procedures Document[3], Section 4.8.4. The activity level and seasonal adjustment factor used are from the EPA Procedures Document[3], Table 5.8-1. Because no state regulations affect this emission category, no control efficiency, rule effectiveness, or rule penetration were applied.

Details of the data used and a summary of emission estimates from structural fires are shown in Table 2.4.9.

2.4.5 Stationary Area Source Comparison

Figure 12: Distribution of Annual Area Source Emissions for 1993

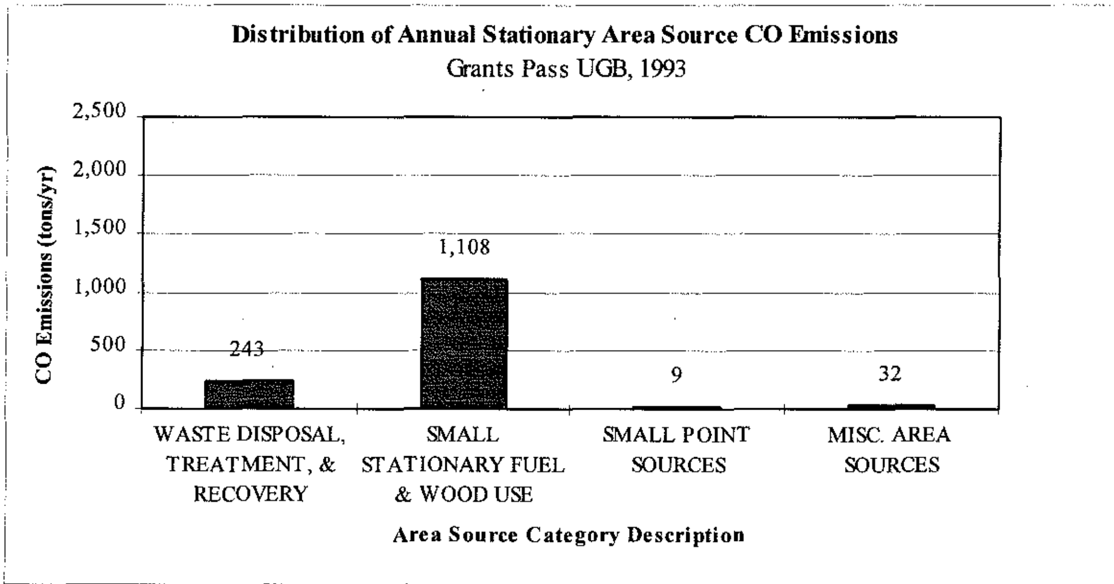


Figure 13: Percentage of Annual Area Source Emissions for 1993

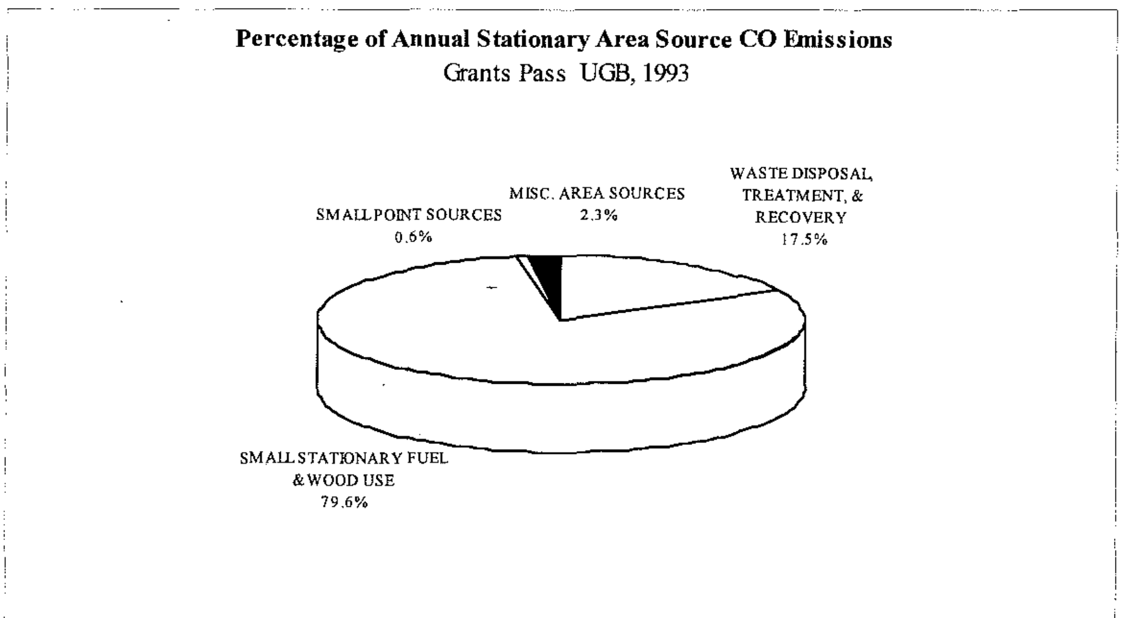


Figure 14: Distributions of Seasonal Area Source Emissions for 1993

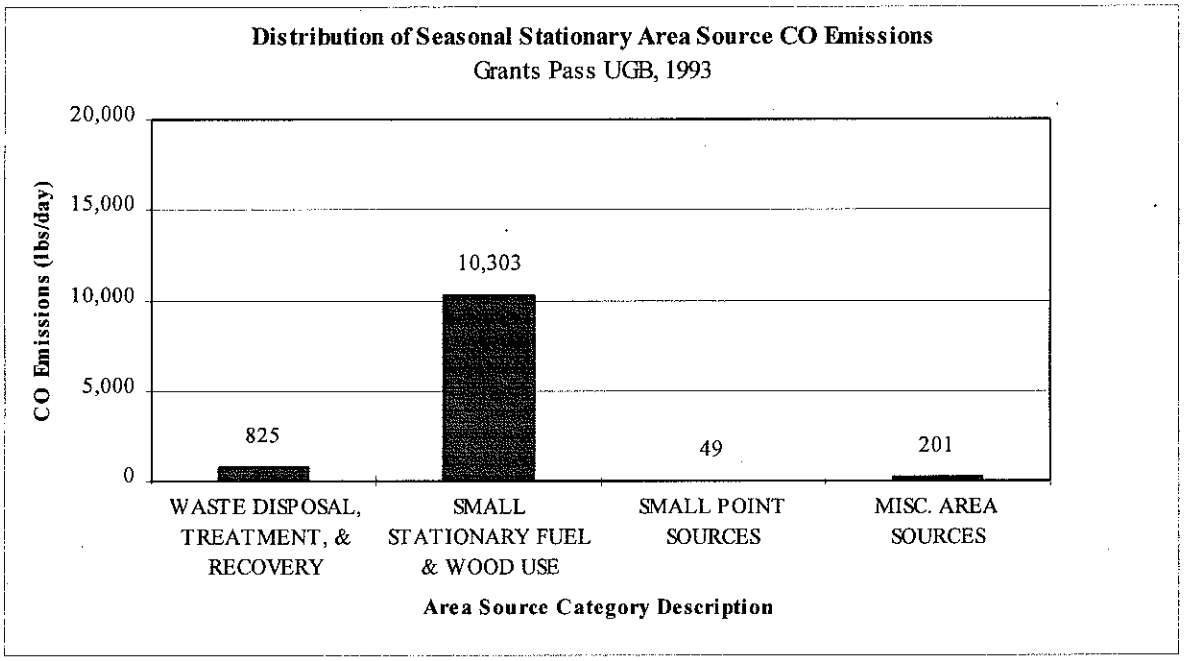


Figure 15: Percentage of Seasonal Area Source Emissions for 1993

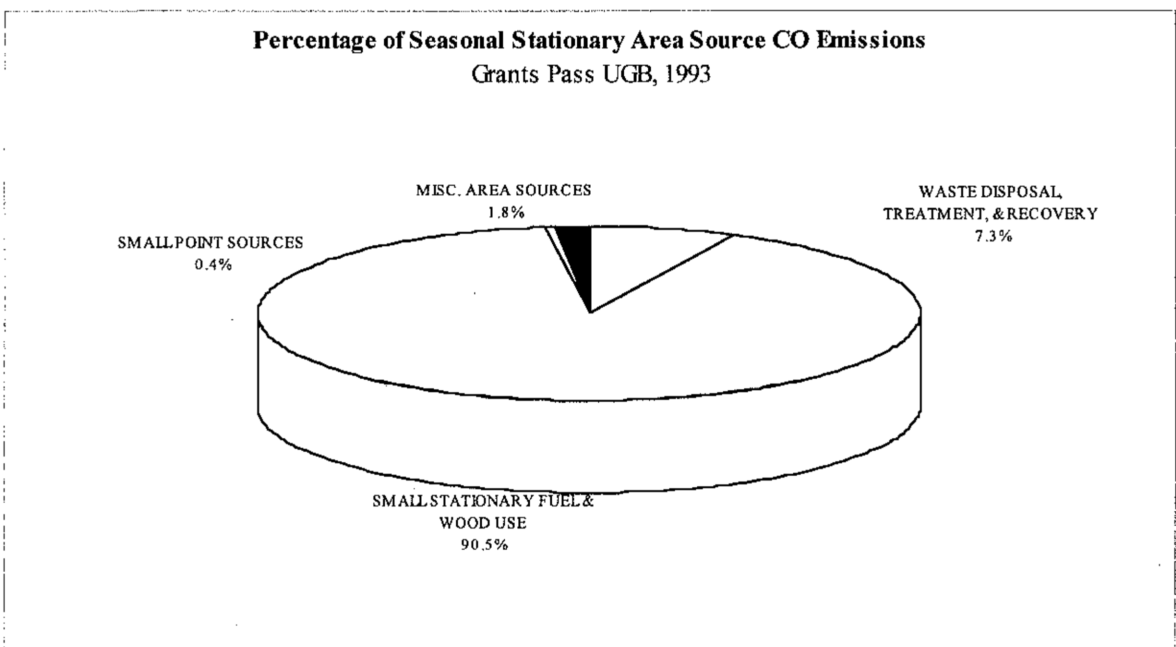


Figure 16: Annual Area Source Emissions Divided by Individual Categories for 1993

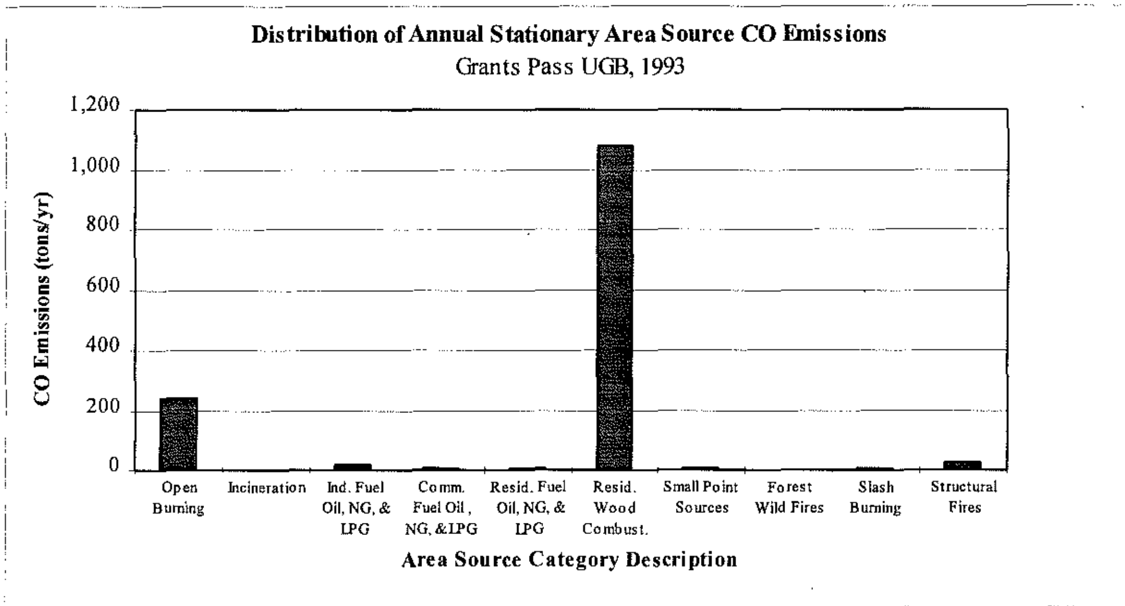
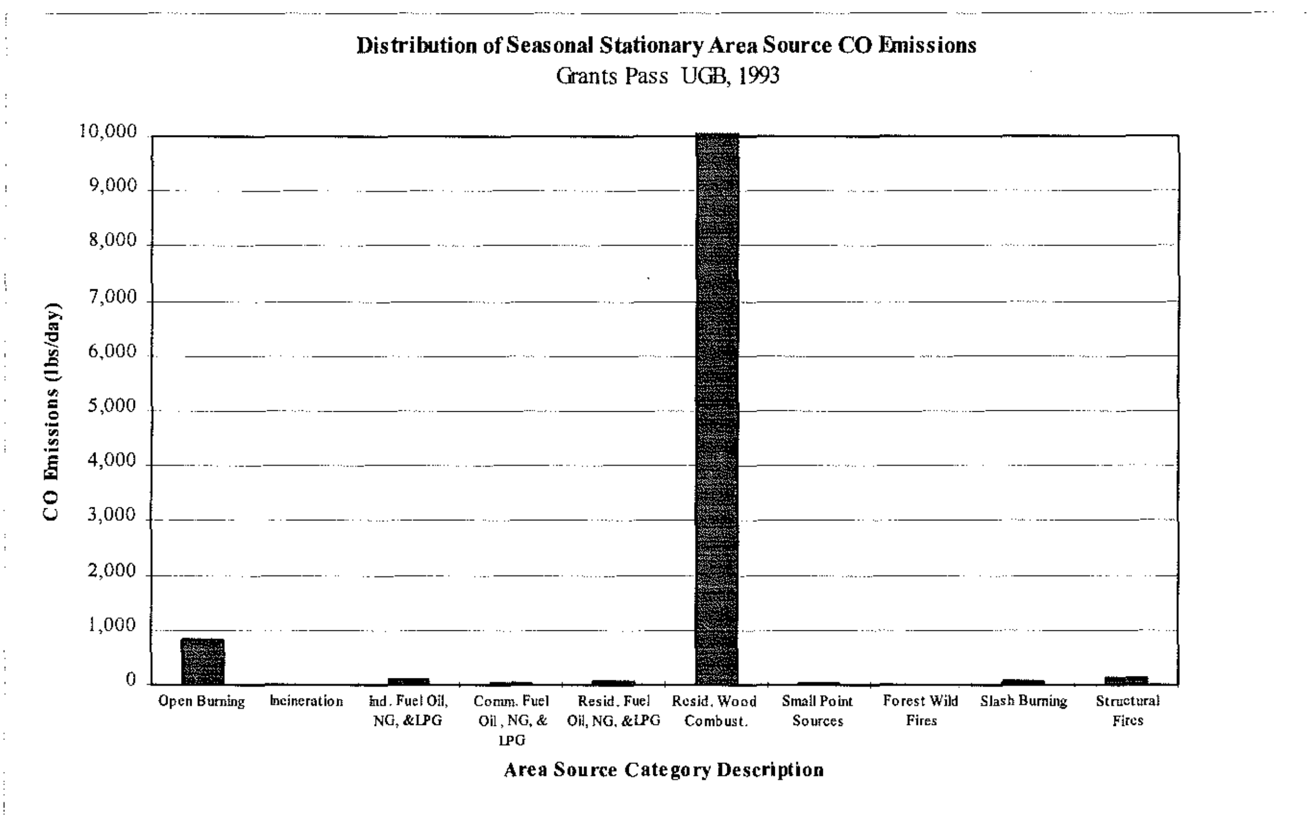


Figure 17: Seasonal Area Source Emissions Divided by Individual Categories for 1993



AREA SOURCES SUMMARIES

Table 2.4.1: Grants Pass UGB 1993 CO Season: Summary of Estimation Procedures for Area Sources

Source Description	Table Number	SCC Code	Estimation Approach
WASTE DISPOSAL, TREATMENT, & RECOVERY			
Residential Open Burning	2.4.10	26-10-030-000	Activity Level
Industrial Open Burning	2.4.11	26-10-010-000	Per Capita
Commercial / Institutional Open Burning	2.4.12	26-10-020-000	Per Capita
Commercial / Institutional On-Site Incineration	2.4.13	26-01-020-000	Activity Level
SMALL STATIONARY FUEL & WOOD USE			
Industrial			
Fuel Oil Combustion	2.4.3	21-02	
Distillate/Kerosene	2.4.3	21-02-004-000	Commodity-Consumption
Residual	2.4.3	21-02-005-000	Commodity-Consumption
Natural Gas Combustion	2.4.4	21-02-006-000	Commodity-Consumption
Liquid Petroleum Gas Combustion	2.4.5	21-02-007-000	Commodity-Consumption
Commercial / Institutional			
Fuel Oil Combustion	2.4.3	21-03	
Distillate/Kerosene	2.4.3	21-03-004-000	Commodity-Consumption
Residual	2.4.3	21-03-005-000	Commodity-Consumption
Natural Gas Combustion	2.4.4	21-03-006-000	Commodity-Consumption
Liquid Petroleum Gas Combustion	2.4.5	21-03-007-000	Commodity-Consumption
Residential			
Fuel Oil Combustion	2.4.3	21-04	
Distillate/Kerosene	2.4.3	21-04-004-000	Commodity-Consumption
Natural Gas Combustion	2.4.4	21-04-006-000	Commodity-Consumption
Liquid Petroleum Gas Combustion	2.4.5	21-04-007-000	Commodity-Consumption
Wood Combustion			
Fireplaces	2.4.6	21-04-008-001	Activity Level
Woodstoves - Certified Catalytic	2.4.6	21-04-008-030	Activity Level
Woodstoves - Certified Non-Catalytic	2.4.6	21-04-008-050	Activity Level
Woodstoves - Conventional & FP Insert	2.4.6	21-04-008-051	Activity Level
Exempt Pellet Stoves	2.4.6	21-04-008-053	Activity Level
SMALL POINT SOURCES			
Permitted Sources (>5,<100 tons/year)	2.4.14	23-07-060-000	Commodity-Consumption
MISCELLANEOUS AREA SOURCES			
Other Combustion		28-10	
Forest Wild Fires	2.4.7	28-10-001-000	Activity Level
Slash Burning	2.4.8	28-10-005-000	Activity Level
Structural Fires	2.4.9	28-10-030-000	Activity Level

Table 2.4.2: Grants Pass UGB 1993 CO Season: Summary of Emissions from Area Sources

Source Description	Table #	SCC Code	CO Annual Emissions (tons/yr)	CO Season Emissions (lbs/day)
WASTE DISPOSAL, TREATMENT, & RECOVERY				
Residential Open Burning	2.4.10	26-10-030-000	219.3	692
Industrial Open Burning	2.4.11	26-10-010-000	20.1	111
Commercial / Institutional Open Burning	2.4.12	26-10-020-000	3.6	20
Commercial / Institutional On-Site Incineration	2.4.13	26-01-020-000	0.5	3
Category Subtotal			**243.5**	**825**
SMALL STATIONARY FUEL & WOOD USE				
Industrial				
Fuel Oil Combustion		21-02		
Distillate	2.4.3	21-02-004-000	3.6	23
Residual	2.4.3	21-02-005-000	1.0	6
Kerosene	2.4.3	21-02-000-000	Combined with Distillate	
Natural Gas Combustion	2.4.4	21-02-006-000	11.0	70
Liquid Petroleum Gas Combustion	2.4.5	21-02-007-000	0.8	5
Industrial Subtotal			16.4	105
Commercial / Institutional				
Fuel Oil Combustion		21-03		
Distillate	2.4.3	21-03-004-000	0.9	8
Residual	2.4.3	21-03-005-000	0.3	3
Kerosene	2.4.3	21-03-011-000	Combined with Distillate	
Natural Gas Combustion	2.4.4	21-03-006-000	3.9	35
Liquid Petroleum Gas Combustion	2.4.5	21-03-007-000	0.1	0
Commercial Subtotal			5.2	47
Residential				
Fuel Oil Combustion		21-04		
Distillate	2.4.3	21-04-004-000	0.9	9
Residual	2.4.3	21-04-005-000	NA	NA
Kerosene	2.4.3	21-04-011-000	Combined with Distillate	
Natural Gas Combustion	2.4.4	21-04-006-000	5.0	47
Liquid Petroleum Gas Combustion	2.4.5	21-04-007-000	0.3	2
Wood Combustion				
Fireplaces	2.4.6	21-04-008-001	191.7	1,791
Woodstoves - Certified Catalytic	2.4.6	21-04-008-030	53.4	499
Woodstoves - Certified Non-Catalytic	2.4.6	21-04-008-050	216.2	2,020
Woodstoves - Conventional & FP Insert	2.4.6	21-04-008-051	610.5	5,702
Exempt Pellet Stoves	2.4.6	21-04-008-053	8.7	81
RWC Subtotal			1,080.6	10,094
Residential Subtotal			1,086.8	10,152
Category Subtotal			**1,108.4**	**10,303**
SMALL POINT SOURCES				
Permitted Sources (>5, < 100 tons/year)	2.4.14	23-07-060-000	9.0	49
Category Subtotal			**9.0**	**49**
MISCELLANEOUS AREA SOURCES				
Other Combustion		28-10		
Forest Wild Fires	2.4.7	28-10-001-000	0.0	0
Slash Burning	2.4.8	28-10-005-000	7.2	64
Structural Fires	2.4.9	28-10-030-000	25.1	138
Category Subtotal			**32.3**	**201**
Area Source Total			**1,393**	**11,379**

Note: NA indicates category or pollutant not applicable

Table 2.4.3: Grants Pass UGB 1993 CO Season: Area Source Emissions From Fuel Oil Use

Area	(1) 1993 Fuel Oil Use (10^3 gal)	(2) CO EF (lbs/ 10^3/gal)	(3) Acty (d/wk)	(4) CO Season Adjst (SAF)	(5) --- CO Emissions --- Annual (t/yr)	(6) CO Season (lbs/day)
SCC 21-04-004-000						
Residential Distillate/Kerosene Use						
Grants Pass CO UGB	370	5.0	7	1.7	0.9	9
					-----	-----
Total Residential Distillate/Kerosene Use:					0.9	9
SCC 21-03-004-000						
Commercial Distillate/Kerosene Use						
Grants Pass CO UGB	366	5.0	6	1.4	0.9	8
					-----	-----
Total Commercial Distillate/Kerosene Use:					0.92	8
SCC 21-03-005-000						
Commercial Residual Oil Use						
Grants Pass CO UGB	115	5.0	6	1.4	0.3	3
					--------	--------
Total Commercial Residual Oil Use:					0.3	3
SCC 21-02-004-000						
Industrial Distillate/Kerosene Use						
Grants Pass CO UGB	1,440	5.0	6	1.0	3.6	23
Stationary Point Sources (7)	0	5.0	6	1.0	0.0	0
					--------	--------
Total Industrial Distillate/Kerosene Use:					3.6	23
SCC 21-02-005-000						
Industrial Residual Oil Use						
Grants Pass CO UGB	399	5.0	6	1.0	1.0	6
					--------	--------
Total Industrial Residual Oil Use:					1.0	6
Total CO UGB Emissions from Fuel Oil Use:					6.7	49

Notes:

(1) Grants Pass UGB Fuel Oil Use estimates from Appendix B, Table B-5 Grants Pass UGB, 1993.
Residential Fuel Oil use based on UGB residential population, See Appendix B, Table B-1.
Commerical and Industrial LPG use based on SIC employees within Grants Pass UGB portion of Josephine County.
See Appendix B, Table B-4, Grants Pass UGB SIC population estimates.

(2) Emission factors (EF) are from the EPA document "Compilation of Air Pollutant Emission Factors" (AP-42) 5th Ed., Table 1.3-1 (Ref. 216).
EFs for the industrial and commercial/Institutional sources listed above are identical and are for uncontrolled fuel oil combustion characteristic of space heating devices.

(3) Activity is from EPA Procedures Document, Table 5.8-1 (Ref. 2).

(4) Season Adjustment Factor (SAF) is taken from the EPA Procedures Document, Table 5.8-1 (Ref 2).

(5) Annual CO Emissions [tons/yr] =
(Fuel Oil Use [10^3 gallon] * Emission Factor [lbs/gallon]) / 2000 [lbs/ton]

(6) CO Season CO Emissions [lbs/day] =
((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

(7) Only one Stationary Point source utilizes Fuel Oil.
Tim-Ply (17-0029) utilizes Diesel fuel oil as a back-up fuel for its boilers and reported no usage in 1993.
The other sources do not include fuel oil in their permits.

(8) There are no applicable State regulations which effect this category. No state control efficiency (CE), rule penetration (RP), or rule effectiveness (RE) were applied to this category.

Table 2.4.4: Grants Pass UGB 1993 CO Season: Area Source Emissions From Natural Gas Use

Area	(1) 1993 Nat Gas Use (10^6 ft^3)	(2) CO EF (lbs/ 10^6 ft^3)	(3) Acty (d/wk)	(4) CO Seasn Adjst (SAF)	(5) --- CO Emissions --- Annual (t/yr)	(6) CO Season (lbs/day)
SCC 21-04-006-000 Residential NG Use Grants Pass CO UGB						
	251	40	7	1.7	5.0	47
				Total	5.0	47
SCC 21-03-006-000 Commercial/Institutional NG Use Grants Pass CO UGB						
	374	21	6	1.4	3.9	35
				Total	3.9	35
SCC 21-02-006-000 Industrial NG Use Grants Pass CO UGB						
	855	35	6	1.0	15.0	96
Stationary Point Source adjustment(7)					4.0	26
				Total	11.0	70
Total CO UGB / NAA Emissions from Natural Gas Use:					19.9	153

Notes:

1) Natural Gas Use estimates are from Appendix B, Table B-5 for Grants Pass UGB, 1993.
Residential use based on 1993 Grants Pass UGB residential population.
Commerical and Industrial Natural Gas is use based on 1993 SIC employees within Grants Pass UGB portion of Josephine County.
See Appendix B, Table B-4, Grants Pass UGB SIC Population Estimates.

2) Emission Factors (EF) are from the EPA document "Compilation of Air Pollutant Emission Factors" (AP-42), 5th Ed. (Ref. 216), Table 1.4-1 for Uncontrolled Small Industrial Boilers, (10 - 100 10^6 btu/hr heat input), Commercial Boilers (0.3 - <10 106 btu/hr heat input), and Residential Furnaces (<0.3 106 btu/hr heat input).

3) Activity is from EPA Procedures Document, Table 5.8-1 (Ref. 2).

4) Season Adjustment Factor (SAF) is taken from the EPA Procedures Document, Table 5.8-1 (Ref 2).

5) Annual Emissions [tons/yr] = (annual Natural Gas Use [10^6 ft3] * EF [lbs/10^6 ft3]) / 2000 [lbs/ton]

6) CO Season Emissions [lbs/day] =
((Annual Emissions [t/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

7) Stationary Point source Natural Gas usage adjustment:
Stationary Point source natural gas use is subtracted to avoid double counting.
SAF= 1.0 Activity (days/wk) = 6

Source Number	Source Name	1993 Usage (10^6 ft^3)	CO EF (lb/10^6 ft^3)	CO Emissions Annual (t/yr)	CO Emissions Season (lbs/day)
17-0029	Tim-Ply Co.	211.8	35	3.7	24
17-0030	Stone Forest Indust.	26.50	21.00	0.3	2
			Total	4.0	26

8) No applicable State regulations apply to this category for carbon monoxide emissions.
Therefore, Control Efficiency (CE), Rule Penetration (RP), and Rule Effectivieness (RE). have not been applied to this category.

Table 2.4.5: Grants Pass UGB 1993 CO Season: Area Source Emissions From Liquefied Petroleum Gas Use

Area	(1) 1993 LPG Use (10^3 gal)	(2) CO EF	(3) Acty (d/wk)	(4) CO Seasn Adjst (SAF)	(5) ---- CO Emissions ---- Annual (t/yr)	(6) CO Season (lbs/day)
SCC 21-04-007-000 Residential LPG Use						
Grants Pass UGB	170	3.1	7	1.7	0.3	2.5
				Total	0.3	2.5
SCC 21-03-007-000 Commercial LPG Use						
Grants Pass UGB	56	1.9	6	1.4	0.1	0.5
				Total	0.1	0.5
SCC 21-02-007-000 Industrial LPG Use(7)						
Grants Pass UGB	501	3.2	6	1.0	0.8	5.1
				Total	0.8	5.1
Total CO NAA Emissions from Liquid Petroleum Use:					1.1	8.1

Notes:

1) LPG Use estimates from Appendix B, Table B-5 for Grants Pass UGB portion of Josephine Co., 1993 Residential use based on UGB residential population (see Appendix B, Table B-1). Commerical and Industrial LPG use based on SIC employees within Grants Pass UGB portion of Josephine County (see Appendix B, Table B-5 and Appendix B, Table B-4, Grants Pass UGB Industrial and Commercial SIC Population Estimates).

2) Emission Factors (EF) for Industrial & Commercial categories are from AP-42 (5th Edition), Table 1.5-1 for Industrial and Commercial Boilers for Propane (Ref. 216). EFs for Residential LPG use is from "Short List" of AMS SCCs and Emission Factors and is for Residential, All Combustor Types (Ref. 25). No EF existis fo this category in FIRE, Version 6.01.

3) Activity is from EPA Procedures Document, Table 5.8-1 (Ref. 2).

4) Season Adjustment Factor (SAF) is taken from the EPA Procedures Document, Table 5.8-1 (Ref 2).

5) Annual Emissions [tons/yr] = (LPG Use [10^3 gallons] * EF [lbs/10^3 gallons]) / 2000 [lbs/ton])

6) CO Season Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr]).

7) No Stationary Point sources utilizes LPG according to their permits.

8) There are no applicable State regulations which effect this category. No state control efficiency (CE), rule penetration (RP), or rule effectiveness (RE) were applied to this category.

Table 2.4.6: Grants Pass UGB 1993 CO Season: Emissions From Residential Wood Use

(1) Woodburning Device	(2) CO NAA Wd Fuel Use (tons)	(3) CO EF (lbs/ton)	(4) Control Efficiency (CE) %	(5) Rule Effectivness (RE) %	(5) Rule Penetration (RP) %	(6) Activity (d/wk)	(7) CO Season Adjustment (SAF)	(8) --- CO Emissions --- Annual (t/yr)	(9) CO Season (lbs/day)
Within UGB									
SCC 21-04-008-001									
Conventional Fireplaces without Inserts									
Grants Pass UGB	1,518	252.6	0.0	100	100	7	1.7	191.7	1,791
SCC 21-04-008-030									
DEQ Certified Catalytic Wood Stoves									
Grants Pass UGB	1,023.76	104.40	54.8%	100	100	7.00	1.70	53.44	499.17
SCC 21-04-008-050									
DEQ Certified Non-Catalytic Wood Stoves									
Grants Pass UGB	3,071	140.8	39.0%	100	100	7	1.7	216.2	2,020
SCC 21-04-008-051									
Conventional Wood Stoves and Fireplaces with Inserts									
Grants Pass UGB	5,290	230.8	0.0	100	100	7	1.7	610.5	5,702
SCC 21-04-008-053									
Exempt Pellet Stoves									
Grants Pass UGB	334	52.2	0.0	100	100	7	1.7	8.7	81
TOTAL	11,238							1,081	10,094

Notes:

1) Woodburning Device categories from EPA procedures manual (Ref 6).
2) Wood Fuel Use based on an Oregon DEQ Woodheating Survey (see Appendix B, Table B-6)
3) Emission Factors (EF) are from AP-42 (Ref. 216), Table 1.9-1 and Table 1.10-1.
4) Control Efficiency (CE) estimated based on EPA guidance (Ref 165) and according to EIIP (Ref. 321) reflected in lower emission factors of certified catalytic and non-catalytic woodstoves.
   Control Efficiency = (1 - (Controlled Emissions / Uncontrolled Emissions))
   catalytic woodstoves CE = (1-(104.4*1023.76)/(230.8*1023.76) = 54.77%
   non-catalytic wood stoves CE = (1-(140.8*3071)/(230.8*3071) = 39%
5) Rule Effectiveness (RE) and Rule Penetration (RP) are indicated through survey questionnaire results; see EPA guidance, EPA-452/R-92-010, Nov. 1992 (Ref. 165). The survey, Oregon DEQ Woodheating Survey (Ref 115), was funded by Oregon DEQ. The effect of Oregon Administrative Rules (Chapter 340-34-010 and Chapter 340-3-400) is included in the calculations. RE and RP are directly determined as a result of this survey and are both equal to 100%.
6) Activity is at the indicated number of days/week.
7) The Season Adjustment Factor (SAF) is taken from the EPA Procedures Document, Table 5.8-1 (Ref. 42).
8) Annual Emissions (t/yr) = (Wood Fuel Use [tons] * EF [lbs/ton])/2000 [lbs/ton]
9) CO Season Emissions [lbs/day] =
   (((Annual Emissions [tons/yr] * 2000 [lbs/ton])*SAF) / (Activity [days/wk] * 52 [wks/yr])) * (1 - CE/100 * RE/100 * RP/100))

Table 2.4.7: Grants Pass UGB 1993 CO Season: Emissions From Forest Wild Fires

Area	(1) Annual No. of Fires UGB	(1) No. of Fires in CO Season UGB	(1) UGB Annual Acres Burned	(2) UGB Burned in Season	(3) Fuel Amount Per Acres Burned (tons/acre)	(4) Annual Tons Burned	(5) CO EF (lbs/ton)	(6) Acty (d/wk)	(7) CO Seasonal Adjustment Factor (SAF)	(8) CO Emissions Annual (tons/yr)	(9) CO Emissions CO Season Typical Day (lbs/day)	(10) CO Emissions CO Season Worst Case Dy (lbs/day)
SCC 28-10-001-000 Forest Wildfires												
Josephine County												
Grants Pass	0.00	0.00	0.00	0.00	60	0	500	7	0.0	0.0	0.00	0
										------	------	------
TOTAL										0.0	0.00	0

Notes:

1) Acres Burned can be found in the "Oregon Forest Fire Summary, 1993" (Ref 42), pp 7, 21-23.
Although a certain number of fires occurred in Josephine county (95 fires in 1993, Ref.42,p.21), no fires are traceable to the Grants Pass UGB proper.
The number of forest fires and acres burned is assumed to be zero based on the following estimations:
a) Forests in Grants Pass UGB are estimated at equivalent to zero. DEQ estimation based on survey of fire protection boundary maps and Josephine County Maps from Josephine County GIS.
b) Carbon Monoxide is not considered pollutant that travels great distances from its origination.
2) Acres burned in season = ((No. of Fires in Co Season UGB) / (No. of fires UGB)) * (Annual Acres burned)
3) Fuel amount per acres burned (tons/acre) is estimated based on an AP-42 emission factor (Ref. 216), given in Table 13.1
4) Annual tons burned = (annual acres burned) * (fuel amount per acres burned [tons/acre])
5) The CO Emission Factor is based on studies of Pacific SE forests by Ward (Ref 43).
6) Activity is at the indicated number of days/week. Since wildfire cannot be predicted, the likelihood of occurance is set at 7 days/wk.
7) Of total forest wildfires that occurred in SW Oregon, ~ 0%
occurred during the three month CO season, December - February (Oregon Forest Fire Summary, Ref 42).
CO Season Adjustment Factor (SAF) = (0 acres * 12) / (0 acres * 3 mo).
CO Season Adjustment Factor (SAF) = 0.00

1993 Fire Report Data and Reduction to Grants Pass UG

1993	----Man-caused---- Peak (14) Season Activity # Fires	(15) Annual Activity # Fires	----Lightning---- Peak (15) Season Activity # Fires	(15) Annual Activity # Fires	----TOTAL---- Peak (15) Season Activity # Fires	(15) Annual Activity # Fires	(15) Josephine County Annual # of District # Fires	Grants Pass UGB Annual # of County # Fires	(16) Josephine County Seasonal % of Annual
Southwest Dist.	1	163	0	40	1	203	95	0.00	0.49%
Total	1	163	0	40	1	203	95	0.00	0.49%
1993	(12) CO Grants Pass UGB % of Forested County	(15) Annual Activity District Acres	(13) Annual Activity County Acres	Annual CO UGB Acres	Peak CO UGB Acres	Seasonal % of Annual	(13) Josephine . County Annual # of District Acres	Josephine County Annual # of County Acres	Seasonal % of Annual
Acres Burned Southwest Dist.	1.E-11	776	155	1.55E-09	8.E-12	0.49%	155	0.00	0.49%
Total		776		0.00	0.00	0.49%	155	0.00	0.49%

8) Annual Emissions (t/yr) = ((tons burned) * (CO EF [lbs/ton])) / (2000 [lbs/ton])
9) CO Season Typical Day Emissions [lbs/day] = ((Annual Emissions [t/yr]) * (2000 [lbs/t]) * (SAF)) / ((7 [dys/wk]) * (52 wks/yr)).
10) CO Season Worst Case Day Emissions [lbs/day] = ((Annual Emissions [t/yr]) * (SAF) * (2000 [lbs/ton])
Worst Case Day assumes that all 15+ acres will be burned on the same day, adjusted for a very small likelihood of occurrence during the winter months with a SAF of .02.
11) No applicable State regulations; No Control Efficiency, Rule Effectiveness, or Rule Penetration applied to this category.
12) For Grants Pass UGB % of County indications, Grants Pass UGB estim. at 0.8 percent of Josephine Co., but forests estim. at equiv. to zero. DEQ estim. based on survey of fire protection boundary maps and Josephine County Maps from Josephine County GIS and Ref. 328.
For more information see Table II.4.13 of 1995 PM_{10} EI.
13) SW Fire Protection District = Curry, Josephine, and Jackson Counties. Josephine County is assumed to make up approx. 20% of the SW Fire Protection District. Grants Pass UGB is assumed to make up approx. 0.8% of Josephine County land area. DEQ estim. based on survey of fire protection boundary maps and Josephine County Maps from Josephine County GIS and Ref.328.
14) CO season is defined as the months of January, February, and December.
15) Number of fires and acres burned are taken from *Oregon Department of Forestry 1993 Forest Fire summary, Ref.42, 213a*
16) Josephine County Seasonal % of Annual activity is calculated based on the Southwest District Seasonal/Annual ratio.

Table 2.4.8: Grants Pass UGB 1993 CO Season: Emissions From Slash Burning

Area	(1) Tons Burned	(2) CO UGB Factor	(3) CO UGB Tons Burned	(4) CO EF (lbs/ton)	(5) Acty (d/wk)	(6) CO Seasonal Adjustment Factor (SAF)	(7) - CO Emissions - Annual (t/yr)	(7) - CO Emissions - CO Season (lbs/day)
SCC 28-10-010-000 Managed Slash Burning Grants Pass CO UGB	7,118	0.8%	58	250	5	1.15	7	64
TOTAL UGB/NAA							7	64

Notes:

1) Data for tons Burned, by County, is taken from the "Oregon Smoke Management Annual Report", 1993 (Ref. 211) pg. 23, Table 7A (Restricted Area).

2) The CO UGB Factor represents the percentage of county-wide fires that occurred in or adjacent to the CO UGB and had an impact on the CO UGB. Grants Pass territory represents 0.8% of the Josephine County territory, Ref.328.
According to the Ref. 328, County territory is: 45793509556 sq. ft
Grants Pass UGB territory is : 370531543 sq. ft
The reason slash burning is included in the Grants Pass UGB is that the definition of slash burning includes burning from land clearing activities related to construction and commercial / industrial activity.

3) CO UGB Tons Burned = (County Tons Burned) * (CO UGB Factor)

4) The CO Emission Factor is for prescribed fires and is based on studies of Pacific SW forests by Ward (Ref. 43).

5) Slashburning does not take place on weekend days, and Activity is at the indicated days/week.

6) CO Season Adjustment Factors are calculated based on occurrence of slash burning in 1993
CO Season Adjustment Factor (SAF) = (peak season activity * 12 mo) / (annual activity * 3 mo).

Grants Pass	Year 1993	Dec 1993	Jan 1993	Feb 1993	Tons Burned CO Season	% in Season	SAF
CO UGB	7,118	1,452	0	590	2,042	28.7%	1.15

The values for Tons Burned are calculated by the Oregon Department of Forestry, and include the contribution of the duff layer to the total tonnage burned.

7) Annual Emissions [t/yr.] = (tons burned) * (EF) / 2000 [lb./ton].
CO Season Emissions [lb./day] = ((Annual Emissions [t/yr.] * 2000 [lb./ton]) * SAF) / (activity [days/wk] * 52 [wks/yr.]).

8) RE, RP, and CE not applicable to this category.

Table 2.4.9: Grants Pass UGB 1993 CO Season: Emissions From Structural Fires

Area	(1) Number of Fires	(2) Fuel Loading Factor	(2) Tons Burned	(3) CO EF (lbs/ton)	(4) Acty (d/wk)	(5) CO Seasonal Adjustment Factor (SAF)	(6) -- CO Emissions -- Annual (t/yr)	(7) CO Season (lbs/day)
SCC 28-10-030-000 Structural Fires Grants Pass CO UGB								
Grants Pass Fire & Rescue Department	123	6.8	836	60	7	1	25.1	137.9
TOTAL Grants Pass CO UGB	123		836				25.1	137.9

Notes:
(1) Data is from Oregon State Fire Marshall's Office (Ref. 212), Oregon Fire Incident Reporting System-1993

(2) Tons Burned = (Number of Fires) * (Fuel Loading Factor)
The fuel loading factor is taken from the EPA Procedures Document, Section 4.8.4 (Ref 2).
The value used in this inventory is 6.8 tons of material per fire.

(3) Emission Factors (EF) are taken from the EPA Procedures Document, Section 4.8.4 (Ref 2).

(4) Activity level is number of days/week from EPA Procedures Document (Ref. 2) Table 5.8-1.

(5) Seasonal Adjustment Factor (SAF) from EPA Procedures Document (Ref.2) Table 5.8-1.

(6) Annual Emissions [tons/yr] =
((Tons Burned) * Emission Factor [lbs/10^3 tons]) / 2000 [lbs/ton]

(7) CO Season Emissions [lbs/day] =
((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF)/(Activity [days/wk] * 52 [wks/yr]

(8) RE, RP, and CE not applicable to this category.

Table 2.4.10: Grants Pass UGB 1993 CO Season: Area Source Emissions From Residential Open Burning

SCC 26-10-030-000						
(1a) Material burned (Per Capita Open Burning Rate) (tons/1000 people/ yr.)	(2a) Residential Population (1000 people)	(3a) Emission Factor (lb./ton)	(4a) Activity (days/week)	(5a) CO SAF	(6a) CO Annual (tons/year)	(7) CO Season Typical Day (lb./day)
Res. Burning - UGB outside the City Limits						
450	7.8	122	7	0.58	213.8	681.3
(1b) Material Burned (tons/Violations)	(2b) Number of Violations	(3b) Emission Factor (lb./ton)	(4b) Activity (days/wk)	(5b) CO SAF	(6b) CO Annual (tons/yr.)	(7) CO Season Typical Day (lb./day)
Illegal Burning - UGB						
0.8	41	116	7	1	2.0	10.8
(1c) Material Burned (tons/permit)	(2c) Permits Issued	(3c) Emission Factor (lb./ton)	(4c) Activity (days/wk)	(5c) CO SAF	(6c) CO Annual (tons/yr.)	(7) CO Season Typical Day (lb./day)
Legal Burning - Permitted in City Limits						
0.4	143	122	0.1	0	3.5	0.0
Total Emissions					219.3	692.1

Notes:

1) a) Legal and illegal burning inside the UGB but outside the City Limits are accounted for by using population of the area inside the UGB outside the City Limits.
   Per capita open burning rate for the area within UGB outside the City Limits is based on the value 450 tons/1,000 people/year. EPA guidance document *Procedures for the Preparation of Emission Inventories For Carbon Monoxide and Precursors of Ozone*[2] , Table 4.6.2.
   b) For illegal burning inside the UGB the per capita open burning rate is estimated by the Grants Pass Fire District, Append.B-3.
   c) For legal burning inside the City Limits, the per capita open burning rate is estimated by the Grants Pass Fire District, Append B-3.
2) a) Estimate of the residential population inside the Grants Pass UGB but outside the Grants Pass City limits.
   b) Average of 1996 and 1997 violations reported by Grants Pass Fire District, Ref.#323; 1993 data was not available.
   c) Average of 1996 and 1997 permits issued by Grants Pass Fire District,Ref.#323; 1993 data was not available.
3) a) Average EF for brush, grass, and wood taken from the EPA AP-42, Table 2.5-5 (5th Ed.), see Appendix B-3.
   b) Average EF for brush, grass, wood, and municipal trash from EPA AP-42, Table 2.5-5(5th Ed.), see App B-3.
   c) Average EF for brush, grass, and wood taken from the EPA AP-42, Table 2.5-5 (5th Ed.), see Appendix B-3.
4) a) Activity is taken from the EPA guidance document *Procedures for the Preparation of Emission Inventories For Carbon Monoxide and Precursors of Ozone*[2], Page 5-18.
   b) Activity is taken from the EPA guidance document *Procedures for the Preparation of Emission Inventories*
   c) City of Grants Pass prohibits residential open burning in the city limits during CO season
   Open burning in the city limits was allowed during four weeks outside the CO season in 1993.
   Activity was arbitrarily estimated by dividing 4 weeks allowed burning by 52 weeks per year.
5) Seasonal Adjustment Factor (SAF)= (peak season activity * 12months)/(annual activity * 3months)
   The peak season for the CO season is from December 1 through the end of February.
   a) Burning was allowed 23 days during 1993 CO season and 157 days during the year 1993 within UGB outside city limits.
   SAF = (23 days peak season activity *12 months)/ (157 days annual activity * 3) = 0.58
   b) Illegal burning in this area likely has a similar SAF as illegal burning inside the City.
   SAF = ((10 burning Violations during peak Season) * (12 months))/((41 violations annually) * (3 months)) = 1.0
   c) City of Grants Pass prohibits residential open burning in the city limits during CO season. Hence, SAF for legal burning is zero.
6) a) Annual CO emissions [tons/year] =
   ((Per Capita Open Burning Rate [tons/1,000 people/yr.]) * (Residential Population [1,000 people] * (EF [lb./ton]))/ (2000 [lb./ton])
   b) Annual CO emissions [tons/year] = (Material burned [tons/violation] * (Number of violations) * EF [lb./ton]/(2000 lb./ton)
   c) Annual CO emissions [tons/year] = (Material burned [tons/permit] * (Number of permits) * EF [lb./ton]/(2000 lb./ton)
7) CO Typical Day Emissions [lb./day] =
   ((Annual Emissions [tons/year]) * (2000 [lb./ton]) * (SAF))/ ((Activity [days/wk]) * (52 [wk./year]))
8) The Rule Effectiveness (RE) and Rule Penetration (RP) are taken into account by the division of legal and illegal open burning. This methodology does not allow for the separation of RE & RP into distinct adjustment factors.

Table 2.4.11: Grants Pass UGB 1993 CO Season: Area Source Emissions From Industrial Open Burning

SCC 26-10-010-000	(1) Material Burned (tons/1000 mfg. employees/ yr.)	(2) Industrial Population (1000 mfg. employees)	(3) Emission Factor (lb./ton)	(4) Activity (days/wk)	(5) CO SAF	(6) CO Annual (tons/yr.)	(6) CO Season Typical Day (lb./day)
Legal Burning	0	2.96	85	7	0	0.0	0.0
Illegal Burning	160	2.96	85	7	1	20.1	110.6
Total Emissions						20.1	110.6

Notes:

1) a) For legal burning, the material loading is zero. The DEQ prohibits industrial open burning inside Josephine County including the Grants Pass UGB as defined in OAR 340 Division 23.

   b) For illegal burning, the material loading is from Ref. 2, Table 4.6-2, p. 4-38.

2) The industrial employee population for the Grants Pass UGB is estimated in Appendix B, Table B4.

3) Emission Factor (EF) was taken from the EPA AP-42, Table 2.5-1 (5th Ed.).

4) Activity is taken from the EPA guidance document *Procedures for the Preparation of Emission Inventories For Carbon Monoxide and Precursors of Ozone*[2], Page 5-18.

5) Seasonal Adjustment Factor (SAF)= (peak season activity * 12 months)/(annual activity * 3 months)

   Legal Burning

   SAF = ((0 burning peak season activity) * (12 months))/((0 annual open burns) * (3 months)) =

   undefined = 0

   The peak season for the CO season is from December 1 through the end of February.

   Although mathematically this equation is undefined, the SAF does not affect emissions and is assumed to be 0.

   Illegal burning

   SAF = ((3 months burning peak Season Activity) * (12 months))/((12 months annual open burns) * (3 months)) = 1

6) Annual CO emissions [tons/year] =

   ((Material Burned [tons/1000mfg. employees/yr.]) * (Industrial Population [1000mfg employees]) * (EF [lb./ton]))/ (2000 [lb./ton])

   CO Typical Day Emissions [lb./day] =

   ((Annual Emissions [tons/year]) * (2000 [lb./ton]) * (SAF) / ((Activity [days/wk]) * (52 [wk./year]))

7) The Rule Effectiveness (RE) and Rule Penetration (RP) are taken into account by the division of legal and illegal open burning. This methodology does not allow for the separation of RE & RP into distinct adjustment factors.

Table 2.4.12: Grants Pass UGB 1993 CO Season: Area Source Emissions From Commercial / Institutional Open Burning

SCC 26-10-020-000	Material Burned (tons/1000 employees/ yr.)	Commercial Population (1000 employees)	Emission Factor (lb./ton)	Activity (days/wk)	CO SAF	CO Emissions Annual (tons/yr.)	CO Season Typical Day (lb./day)
Legal Burning	(1a)	(2a)	(3)	(4)	(5)	(6)	(6)
	0	11.4	85	7	0	0.0	0.0
Illegal Burning	(1b)	(2b)					
	24	3.5	85	7	1	3.6	19.6
Total Emissions						3.6	19.6

Notes:

1) a) For legal burning, the material loading is zero.
The DEQ prohibits commercial and industrial open burning inside the Rogue Basin Open Burning Control Area, as defined in OAR 340 Division 23.
OAR 340-23-100 makes an exception for commercial open burning if the DEQ issues a letter permit. The DEQ issued no letter permits.
b) For illegal burning, the material loading factor of 24 tons/1000 rural employees was taken from Ref. 2, p. 4-38.
2) a) The commercial employee population number used for legal burning estimation is from Appendix B, Table B4.
b) Since the material loading factor used for illegal burning estimation is for rural population only, the number of rural commercial employees was calculated as follows:
The ratio of the commercial employee population to the total Grants Pass UGB population 11,420/25,396 (estimated in Appendix B, Table B4) was applied to the population within UGB but outside City Limits (rural population) 7,767 (see Append.B, Table B4).

3) Emission factor (EF) was taken from the EPA AP-42, Table 2.5-1 (5th Ed.).
4) Activity is taken from the EPA guidance document *Procedures for the Preparation of Emission Inventories For Carbon Monoxide and Precursors of Ozone*[2], Page 5-18.

5) Seasonal Adjustment Factor (SAF)= (peak season activity * 12 months)/(annual activity * 3 months)
Legal Burning
SAF = ((0 burning peak season activity) * (12 months)) / ((0 annual open burns) * (3 months)) =
undefined = $\boxed{0}$
The peak season for CO is from December 1 through the end of February.
SAF does not affect emissions and is assumed to be 0.
Illegal burning
SAF = ((3 months burning peak Season Activity) * (12 months))/((12 months annual open burns) * (3 months)) =
$\boxed{1}$
6) Annual CO emissions [tons/year] =
((Material Burned [tons/1000 mfg. Employees/yr.]) * (Commercial Population [1000 mfg. Employees]) * (EF [lb./ton]))/ (2000 [lb./ton])
CO Season Typical Day [lb./day] =
((Annual Emissions [tons/year]) * (2000 [lb./ton]) * (SAF))/ ((Activity [days/wk]) * (52 [wk./year]))
7) The Rule Effectiveness (RE) and Rule Penetration (RP) are taken into account by the division of legal and illegal open burning. This methodology does not allow for the separation of RE & RP into distinct adjustment factors.

Table 2.4.13: Grants Pass UGB 1993 CO Season: Area Source Emissions From Commercial / Institutional On-Site Incineration

(1) Source ACDP Number/Name	(2) Annual Tons Burned	(3) CO EF (lb./ton)	(4) Cntrl Effn (CE)	(5) Rule Effct (RE)	(6) Rule Pentrtn. (RP)	(7) Acty (d/wk)	(8) CO Season Adjust (SAF)	(9) - CO Emissions - Annual (t/yr.)	(10) Season (lb./day)
SCC 26-01-020-000 Grants Pass UGB									
17-0003 Chapel of the Valley Funeral Home	50	10.00	0.95	0.80	0.25	5.0	Uniform	0.25	1.56
17-0062 Hull & Hull Funeral Home	50	10.00	0.95	0.80	0.25	5.0	Uniform	0.25	1.56
TOTAL	100							0.50	3.12

Notes:

1) These estimates are based upon DEQ Emissions calculations for commercial on-site solid waste incineration.
   Source ACDP Number/Name is Oregon DEQ Air Contaminant Discharge Permit number. All incinerators in the State of Oregon must have design review, permits, source tests and continuous emission monitoring.
   All incinerators must be permitted in Oregon. Those sources which are above the cutoff limit for CO are included in the Point Source Inventory. Sources included here are below the cutoff levels.
   Applicable sources here are from DEQ Permit database and are minimal sources.
2) Tons burned are based on maximum throughput per DEQ ACDP permit limits.
3) Emissions Factors from FIRE version 6.0, SCC 5-03-001-01(Ref.318).
4) Control Efficiency (CE)
   Assumed to be 95% based upon BACT requirements in rules.
5) Rule Effectiveness (RE) = 80%. EPA default (Ref. 165).
6) Rule Penetration (RP) = ((uncontrolled emissions covered by regulation/ total uncontrolled emissions) * (100))
   Applicable rules for Crematory Incineration are Oregon Administrative Rules (OAR), Chapter 340, Div. 25-850, 855, 890, 895, 900, 905 & Chapter 340, Div. 21-025. Applicable rules for Solid & Infectious Waste Incineration are OAR, Chapter 340, Div. 25-850, 855, 860, 865, 870, 875, 880, 885 & Chapter 340, Div. 21-025 and 027.
   Rule Penetration - Crematory Incinerators:
   Rules effective 3/13/90; Compliance required by 3/13/93. Assumed 25% compliance in 1990, 60% in 1991 and 95% in 1992.
   Rule Penetration - Solid and Infectious Waste Incinerators:
   Rules effective 3/13/90; Compliance required by 3/13/95. Assumed 15% compliance in 1990, 30% in 1991, and 45% in 1992.
7) Activity is assumed to be 5 days/week.
8) Seasonal Adjustment Factor (SAF) is assumed to be uniform from EPA Guidance (Ref. 2, pg. 5-18).
9) Annual emissions [tons/yr.] = (Annual tons burned * Emission Factor [lb./ton]) / 2000 [lb./ton]
10) Season Emissions [lb./day] = ((Annual Emissions [t/yr.] * 2000 [lb./ton]) / (Activity [days/wk]* 52 [weeks/yr.])) * (1-(CE*RE*RP))

Table 2.4.14: Grants Pass UGB 1993 CO Season: Area Source Emissions From Small Point Sources

Source Number	Company Name	(1) CO Control Efficncy CE	(2) CO Season Adjust SAF	(3) CO Activity (d/wk)	(3) CO Yearly Activity (days/yr)	(4) -----CO Emissions----- Annual (tons/yr)	(5) Season (lbs/day)
SCC 23-99-000-000 21-02-004-000							
170013	Spalding & Son, Inc.	0.0	1	7	364	9.0	49.4
TOTAL						9.0	49.4

Notes:

1) Where controls exist, they are accounted for in the PSEL emission factor.
2) Seasonal adjustment factors were assumed to be 1 unless a resonable seasonal adjustment factor could be determined using the Emission Statements or some other method.
   Lbs per Day is Average Winter Day Emissions and is calculated:
   ((Tons per Yr) * (2000 Lbs/Ton) * (SAF)) / (Days per Year)
3) Spalding did not report its boiler operating time, so the operating hours are taken from the annual report.
4) The small point sources are selected in Appendix B, Table B-2.
   The selected source emits less than 100 tons CO/yr and is in the Grants Pass UGB.
5) The daily emissions are calculated by dividing the annual emissions by the annual days of operation.

Part 2.5 NON-ROAD MOBILE SOURCES

2.5.1 INTRODUCTION AND SCOPE

Within the Grants Pass UGB, non-road mobile emission source categories inventoried include gasoline and diesel-powered vehicles and equipment, railroads, and recreational and commercial waterborne vessels.

2.5.2 NON-ROAD VEHICLES AND EQUIPMENT

Emissions from off-road vehicles and equipment were evaluated using the *Nonroad Engine and Vehicle Emission Study – Report*[49a], and revision, *Methodology to Calculate Nonroad Emission Inventories at the County and Sub-county Level, Final Report*[49b]. The companion documents, *Nonroad Emission Inventories for CO and Ozone Nonattainment Boundaries*[51b, 51c], provided emission inventory data for Spokane. The Nonroad study (completed in 1991) was prepared by the EPA Office of Mobile Sources (OMS). These studies categorized and reported emissions for off-road vehicles and equipment for selected nonattainment areas. The Spokane Consolidated Metropolitan Statistical Area (CMSA) was one area studied.

Because of its proximity and socio-economic similarity to Grants Pass, the Spokane CMSA is considered to have per capita area source emission rates similar to Grants Pass and was chosen as a surrogate. OMS indicated that a purpose of a Nonroad Study was to provide emission data for scaling of nonattainment areas similar to the nonattainment area being inventoried[50]. At the request of DEQ, the data provided in the Nonroad Study for the Spokane CMSA was supplemented with more detailed information regarding the contribution of gasoline and diesel vehicles and equipment[51a,b,c]. The supplementary data provided by OMS was used to prepare the non-road emission estimates submitted in this SIP attainment-year inventory.

Following receipt of the revised non-road data[49b, 51b,c] from OMS in August of 1992, the non-road emission estimates for the Oregon nonattainment areas were revised and expanded. According to the *1996 Oregon Recreational Boating Survey*[346], the Rogue River is the third most used waterbody statewide. Nearly 90% of the activity days are spent fishing, with about 5% involved in cruising and the remainder spent jet skiing or water skiing.

Emissions from recreational waterborne vessels were estimated based on the *1996 Oregon Recreational Boating Survey*[346], emissions from this source are grouped with emissions data from commercial waterborne vessels for the Grants Pass UGB.

Emissions from commercial waterborne vessels were estimated based on the information provided by two local jet boats operators: "Jet Boat River Excursions Grants Pass" and "Hellgate Jet boat Excursions" and CARB document entitled *Public Meeting to Consider Approval of California's Pleasure Craft Exhaust Emissions Inventory*[347], dated November 1998.

2.5.2.1 Vehicle Categories

Vehicle categories used in the Nonroad Study[49a,51b] include Lawn and Garden Equipment, Off-Highway Recreation Equipment, Construction Equipment, Industrial Equipment, Agricultural Equipment, Light Commercial Equipment, Logging Equipment, and Air Service Equipment. These vehicle categories are grouped into three equipment types: two-cycle gasoline engines, four-cycle gasoline engines, and diesel engines. A summary of emissions from non-road mobile sources can be found in Table 2.5.1.

The OMS Nonroad Study data was generated using two approaches that are identified in the Nonroad Study as Inventory A and Inventory B. The emission estimates for the 1993 Inventory Year for Grants Pass used an average of Inventory A and B, as recommended by EPA[49b].

The approach taken with the inventory in this Report was to factor the emission estimates for the Spokane CMSA, as given in the revised Nonroad studies[51b,c], using population estimates of Grants Pass UGB. Spokane CMSA 1990 population was utilized with information on Spokane Ozone Nonattainment Area CO emissions to develop a per capita emission factor for the pollutant from each equipment type. The per capita emission factor for each equipment type was then applied to the Grants Pass UGB 1993 population to estimate emissions.

The non-road vehicle CO emission factors include tailpipe emissions from the Nonroad studies[51b,c]. The seasonal adjustment factors used are taken from the revised Nonroad studies[51b,c]. No State regulations pertaining specifically to non-road vehicles or equipment emissions were in effect for the 1993 inventory year, therefore control efficiency, rule effectiveness and rule penetration have not been applied to the non-road inventory calculations.

The details of these calculations and summary emissions are shown in Tables 2.5.2, 2.5.3, and Table 2.5.4.

2.5.3 AIRCRAFT

Emissions for the Aircraft category were not inventoried because as indicated in *Salem Grants Pass CO IPP and QA, p.33* Grants Pass does not have as airport and should not be inventoried for this category.

2.5.4 MARINE VESSELS

Marine vessels fall under two categories: commercial and recreational. In the case of the Grants Pass UGB, neither category of marine vessels has an applicable place within the CO

Season (December through February) since over 70 % of all recreational boating and 100% of commercial jet boat tours take place between May and September. However, the annual CO emissions from commercial marine vessels and annual and seasonal emissions from recreational marine vessels for the Grants Pass UGB were estimated in this inventory.
Emissions from recreational waterborne vessels were estimated based on the *1996 Oregon Recreational Boating Survey*[346]. The survey provided information on boat use days, average fuel use and percentage of boats with inboard and outboard motors. Emission factors came from *Compilation of Air Pollutant Emission Factors, Volume II: Mobile Sources*[8].
Emissions from commercial waterborne vessels were estimated based on the information provided by two local jet boats operators: "Jet Boat River Excursions Grants Pass" and "Hellgate Jet boat Excursions" and CARB document entitled *Public Meeting to Consider Approval of California's Pleasure Craft Exhaust Emissions Inventory*[347]. The information received from the jet boat operators included use days, type of engines and annual fuel consumption. Emission factors were taken from the CARB document[347]. Full calculations can be found in Table 2.5.7.

2.5.5 Railroads

Emissions from railroad operations were estimated following the recommended methodology in *Volume IV: Mobile Sources*[91]. This method required determining fuel consumption of line haul operations and yard operations, and applying the emission factors given to each type of operation. These emission factors reflect the relative contribution to emissions from different railroad engine types: line and yard.

Fuel consumption for line haul operations was estimated using data obtained by contacting the sole rail organization to operate in the Grants Pass UGB corridor in 1993, Southern Pacific (Southern Pacific 1993 Annual Report to the Interstate Commerce Comission[61]). The estimate was developed by scaling down system-wide fuel consumption by applying a ratio of fuel consumption index of Gross Ton Miles (GTM) for the system and dividing by total system fuel use. Southern Pacific also provided information on state GTM which was then reduced to Grants Pass UGB specific GTM with a ratio of Grants Pass UGB track miles to state track miles (see Appendix C, Table C-2). Total line haul fuel use for the Grants Pass UGB was then calculated by multiplying the Grants Pass UGB GTM with the previously generated fuel consumption index. Fuel use was subsequently applied to the appropriate emission factors cited above to obtain estimated line haul CO emissions within the Grants Pass UGB.

Fuel consumption for yard operations was estimated using data obtained by contacting Southern Pacific[69]. Information provided by the railroad company includes the number of yard locomotives, hours per day of operation, and days per year of operation. Daily and annual fuel use was not provided by Southern Pacific, but was instead taken from *Volume IV: Mobile Source*[91]. Daily fuel use was based on 24 hours per day of operation. These data and calculations are shown in Appendix C, Table C-3.

Activity and seasonal adjustment factors of line haul and of yard operations are considered to be uniform throughout the year. Full calculations can be found on Table 2.5.6. and Appendix C, Tables C-2 and C-3.

2.5.6 Non-Road Mobile Source Comparison

The non-road mobile source categories listed above are compared and summarized in Figures 18 through 21 and in Table 2.5.1. Each category is summarized independently in Tables 2.5.2 through 2.5.6.

Figure 18: Distribution of Annual Non-Road Mobile Source Emission Summary for 1993

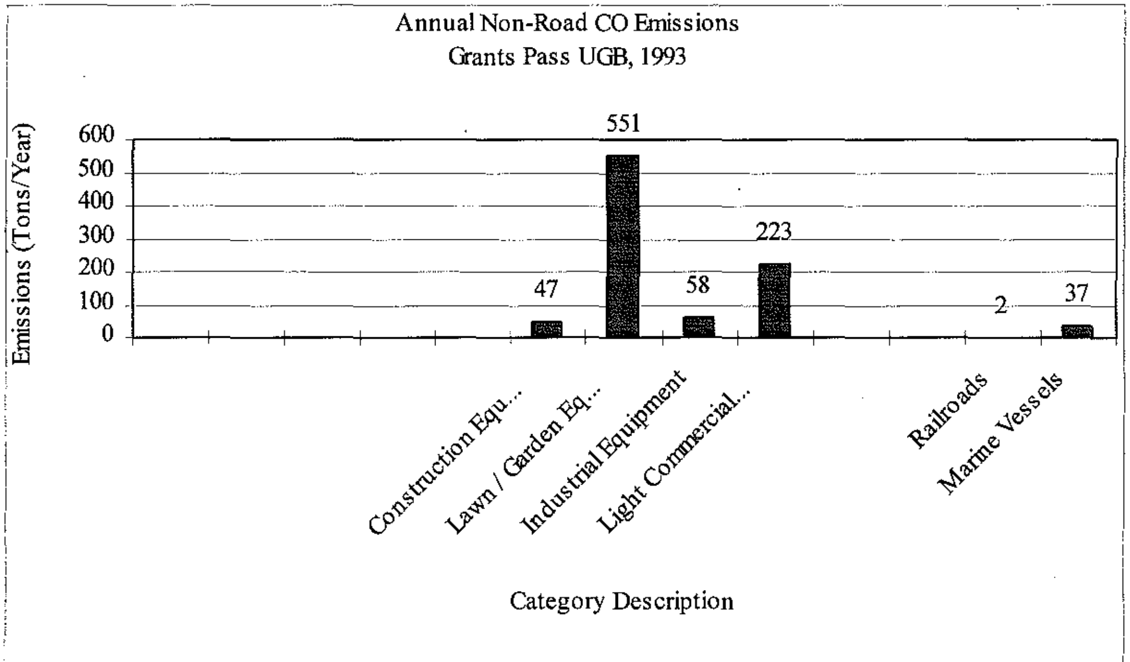


Figure 19: Percentage of Annual Non-Road Mobile Source Emission Summary for 1993

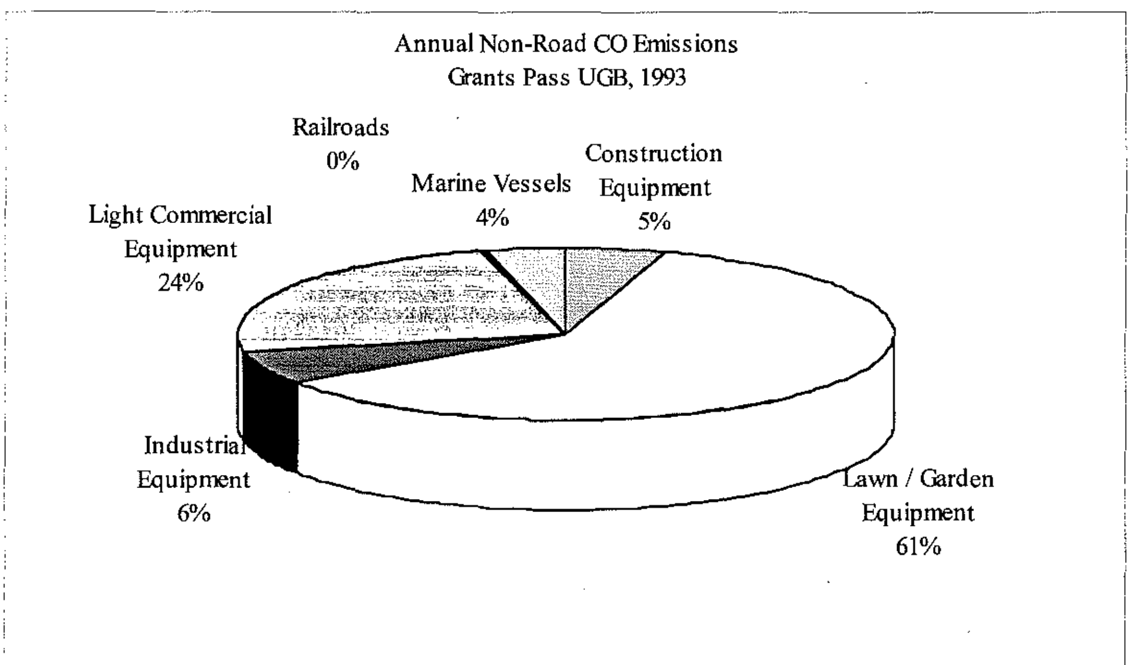


Figure 20: Distribution of Seasonal Non-Road Mobile Source Emission Summary for 1993

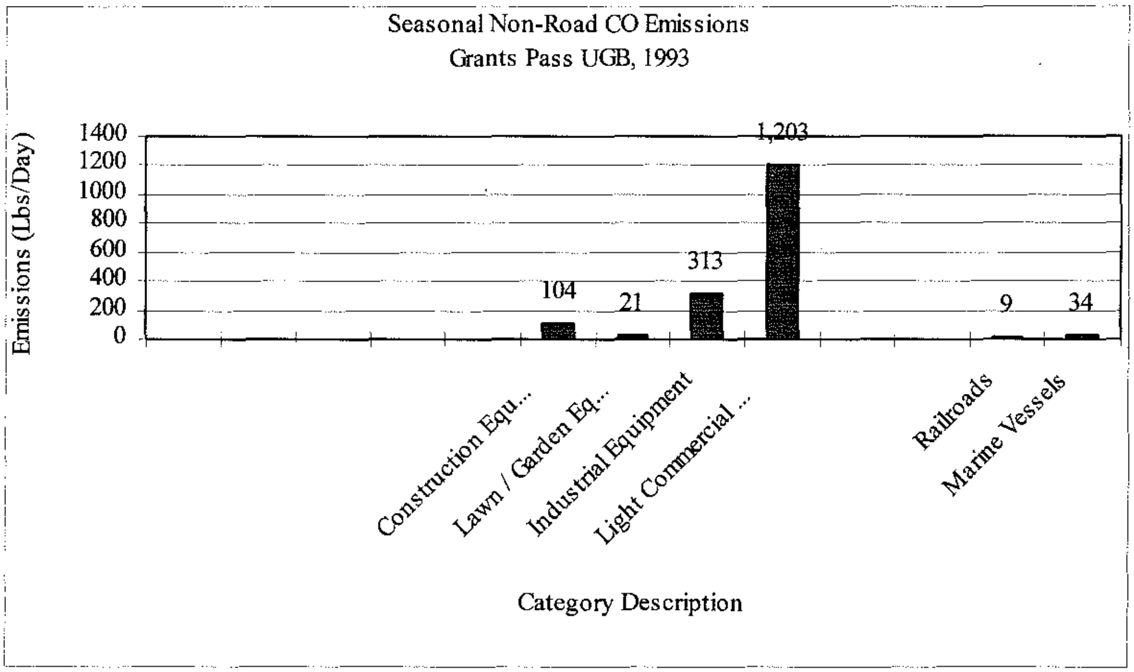
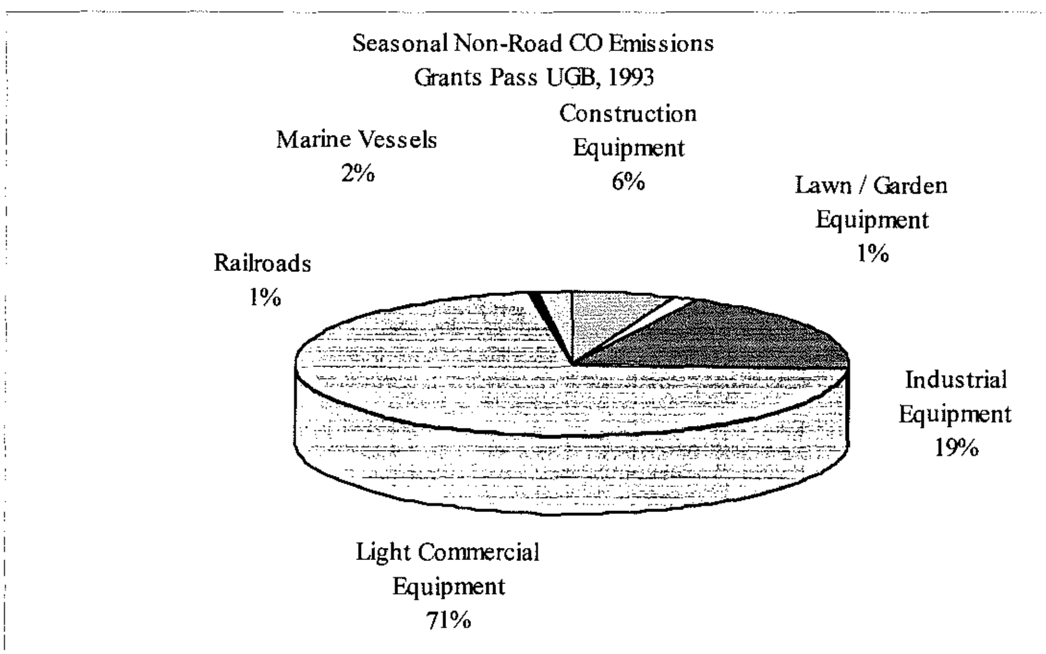


Figure 21: Distribution of Seasonal Non-Road Mobile Source Emission Summary for 1993



NON-ROAD MOBILE SOURCE SUMMARIES

Table 2.5.1: Grants Pass UGB 1993 CO Season: Summary Emissions From Non-Road Mobile Sources

Source Description	Table Number	SCC Code	CO Annual Emissions (tons/yr)	CO Season Emissions (lbs/day)
GASOLINE VEHICLES, TWO CYCLE				
Recreational Equipment	2.5.2	22-60-001-000	0.0	0.0
Construction Equipment	2.5.2	22-60-002-000	1.4	4.2
Industrial Equipment	2.5.2	22-60-003-000	13.0	70.7
Lawn / Garden Equipment	2.5.2	22-60-004-000	83.6	5.5
Agricultural Equipment	2.5.2	22-60-005-000	0.0	0.0
Light Commercial Equipment	2.5.2	22-60-006-000	10.8	58.2
Logging Equipment	2.5.2	22-60-007-000	0.0	0.0
Two Cycle Subtotal			108.8	138.6
GASOLINE VEHICLES, FOUR CYCLE				
Recreational Equipment	2.5.3	22-60-001-000	0.0	0.0
Construction Equipment	2.5.3	22-60-002-000	17.9	38.8
Industrial Equipment	2.5.3	22-60-003-000	42.9	231.5
Lawn / Garden Equipment	2.5.3	22-60-004-000	467.3	15.2
Agricultural Equipment	2.5.3	22-60-005-000	0.0	0.0
Light Commercial Equipment	2.5.3	22-60-006-000	210.9	1,139.5
Logging Equipment	2.5.3	22-60-007-000	0.0	0.0
Four Cycle Subtotal			739.0	1,425.1
GASOLINE VEHICLES, DIESEL CYCLE				
Recreational Equipment	2.5.4	22-60-001-000	0.0	0.0
Construction Equipment	2.5.4	22-60-002-000	27.5	61.0
Industrial Equipment	2.5.4	22-60-003-000	2.2	11.1
Lawn / Garden Equipment	2.5.4	22-60-004-000	0.3	0.0
Agricultural Equipment	2.5.4	22-60-005-000	0.0	0.0
Light Commercial Equipment	2.5.4	22-60-006-000	0.9	5.5
Logging Equipment	2.5.4	22-60-007-000	0.0	0.0
Diesel Subtotal			30.9	77.6
VEHICLE SUBTOTAL			878.8	1,641.4
AIRCRAFT	2.5.5	22-75-000-000	0.0	0.0
		22-75-020-000	0.0	0.0
		22-75-050-000	0.0	0.0
		22-75-060-000	0.0	0.0
AIRCRAFT SUBTOTAL			0.0	0.0
RAILROADS	2.5.6	22-85-002-000	1.6	8.9
RAILROAD SUBTOTAL			1.6	8.9
MARINE VESSELS	2.5.7	22-82-005-000	25.4	33.9
		22-80-004-000	11.2	0.0
MARINE VESSELS SUBTOTAL			36.6	33.9
			(tons/yr)	(lbs/day)
TOTAL NON-ROAD			**917.0**	**1,684.2**

Table 2.5.2: Grants Pass UGB 1993 CO Season: Summary Emissions From Non-Road Vehicles & Equipment, Two-Cycle

(1) Equipment Type	(2) Grants Pass UGB Population	(3) CO EF (lbs/person)	(4) CO Season Adjustment Factor (SAF)	(5) ----- CO Emissions ----- Annual (t/yr)	CO Season (lbs/day)
Grants Pass UGB					
SCC 22-60-001-000 Recreational Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-002-000 Construction Equip	25,396	0.11	0.54	1.4	4.2
SCC 22-60-003-000 Industrial Equip	25,396	1.02	0.99	13.0	70.7
SCC 22-60-004-000 Lawn/Garden Equip	25,396	6.59	0.01	83.6	5.5
SCC 22-60-005-000 Agricultural Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-006-000 Lt Commrcl Equip	25,396	0.85	0.99	10.8	58.2
SCC 22-60-007-000 Logging Equip	25,396	0.00	0.00	0.0	0.0
TOTAL				109	139

Notes:

1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories (Ref 51c & Append C-1).

2) 1993 Grants Pass UGB population from RVCOG, [Refs. 325]. Also see Appendix B, Table B-1. 25396

3) The per capita emission factors are derived from the Nonroad Emission inventories (Appendix C, Table C-1 which is compiled using Ref 51c, Spokane CMSA 1990 Pop).

	CO NAA (10^3 people)		CO NAA Emissions CO (tons/year)	CO NAA Emission Factor CO (lbs/person)
Rec Equip	361.36		0	0.00
Const Equip	361.36		20	0.11
Indstrl Equip	361.36		185	1.02
Lwn-Gardn Equip	361.36		1,190	6.59
Agrcltrl Equip	361.36		0	0.00
Lt Commercial	361.36		153	0.85
Logging Equip	361.36		0	0.00
		Total	1,548	

(Emission Factor lbs/person) = (CO NAA Emissions t/yr * 2000 lbs/t) / (Spokane Population)
Spokane CMSA 1990 population for the CO NAA are U.S. Census estimates (Ref 51c & Append C-1).

4) The CO Season Adjustment factors (SAF) are derived from factors given in the Nonroad Emission inventories (Refs 51c), also found in Appendix C, Table C-1.
Recreation and Lawn/Garden equipment SAFs reflect seasonal use of chainsaws, snowblowers, and snowmobiles.
Recreational, agricultural, & logging equip contained undefinable SAF because both the numerator and the denominator was equal to zero. As such, those three categories were assigned SAFs of zero.

5) (Annual Emissions t/yr = (NAA Population) * (Emission Factor) / 2000 lbs/ton)
(Season Emissions lbs/day) = (Annual Emissions t/yr) * (2000 lbs/t) * SAF / (days/yr).

6) No applicable rules for non-road vehicles, no RE, RP, or CE applied.

Table 2.5.3: Grants Pass UGB 1993 CO Season: Summary Emissions From Non-Road Vehicles & Equipment, Four-Cycle

(1) Equipment Type	(2) Grants Pass UGB Population	(3) CO EF (lbs/person)	(4) CO Seasonal Adjustment Factor (SAF)	(5) ---- CO Emissions ---- Annual (t/yr)	CO Season (lbs/day)
Grants Pass UGB					
SCC 22-60-001-000 Recreational Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-002-000 Construction Equip	25,396	1.41	0.40	17.9	38.8
SCC 22-60-003-000 Industrial Equip	25,396	3.38	0.99	42.9	231.5
SCC 22-60-004-000 Lawn/Garden Equip	25,396	36.80	0.01	467.3	15.2
SCC 22-60-005-000 Agricultural Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-006-000 Lt Commrcl Equip	25,396	16.61	0.99	210.9	1,139.5
SCC 22-60-007-000 Logging Equip	25,396	0.00	0.00	0.0	0.0
UGB TOTAL				739	1,425

Notes:

1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories (Ref 51c & Append C-1).
2) 1993 Grants Pass UGB population from RVCOG, [Refs. 325]. Also see Appendix B, Table B-1. 25396
3) The per capita emission factors are derived from the Nonroad Emission inventories (Appendix C, Table C-1 which is compiled using Ref 51c, Spokane CMSA 1990 Pop).

	CO NAA (10^3 people)	CO NAA Emissions CO (tons/year)	CO NAA Emission Factor CO (lbs/person)
Rec Equip	361.36	0	0.00
Const Equip	361.36	255	1.41
Indstrl Equip	361.36	610	3.38
Lwn-Gardn Equip	361.36	6,650	36.80
Agrcltrl Equip	361.36	0	0.00
Lt Commercial	361.36	3,001	16.61
Logging Equip	361.36	0	0.00
Total		10,516	

(Emission Factor lbs/person) = (CO NAA Emissions t/yr * 2000 lbs/t) / (Spokane Population)
Spokane CMSA 1990 population for the CO NAA are U.S. Census estimates (Ref 51c).

4) The CO Season Adjustment factors (SAF) are derived from factors given in the Nonroad Emission inventories (Refs 51c), also found in Appendix C, Table C-1.
Recreation and Lawn/Garden equipment SAFs reflect seasonal use of chainsaws, snowblowers, and snowmobiles.
Recreational, agricultural, & logging equip contained undefinable SAF because both the numerator and the denominator was equal to zero. As such, those three categories were assigned SAFs of zero.
5) (Annual Emissions t/yr = (NAA Population) * (Emission Factor) / 2000 lbs/ton)
(Season Emissions lbs/day) = (Annual Emissions t/yr) * (2000 lbs/t) * SAF / (days/yr).
6) No applicable rules for non-road vehicles, no RE, RP, or CE applied.

Table 2.5.4: Grants Pass UGB 1993 CO Season: Summary Emissions From Non-Road Vehicles & Equipment, Diesel

(1) Equipment Type	(2) Grants Pass UGB Population	(3) CO EF (lbs/person)	(4) CO Seasonal Adjustment Factor (SAF)	(5) ---- CO Emissions ---- Annual (t/yr)	CO Season (lbs/day)
Grants Pass UGB					
SCC 22-60-001-000 Recreational Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-002-000 Construction Equip	25,396	2.16	0.41	27.5	61.0
SCC 22-60-003-000 Industrial Equip	25,396	0.18	0.90	2.2	11.1
SCC 22-60-004-000 Lawn/Garden Equip	25,396	0.02	0.00	0.3	0.0
SCC 22-60-005-000 Agricultural Equip	25,396	0.00	0.00	0.0	0.0
SCC 22-60-006-000 Lt Commrcl Equip	25,396	0.07	1.11	0.9	5.5
SCC 22-60-007-000 Logging Equip	25,396	0.00	0.00	0.0	0.0
TOTAL UGB				31	78

Notes:

1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories (Ref 51c & Append C-1).

2) 1993 Grants Pass UGB population from RVCOG, [Refs. 325]. Also see Appendix B, Table B-1. 25396

3) The per capita emission factors are derived from the Nonroad Emission inventories (Appendix C, Table C-1 which is compiled using Ref 51c, Spokane CMSA 1990 Pop).

	CO NAA (10^3 people)	CO NAA Emissions CO (tons/year)	CO NAA Emission Factor CO (lbs/person)
Rec Equip	361.36	0	0.00
Const Equip	361.36	391	2.16
Indstrl Equip	361.36	32	0.18
Lwn-Gardn Equip	361.36	4	0.02
Agrcltrl Equip	361.36	0	0.00
Lt Commercial	361.36	13	0.07
Logging Equip	361.36	0	0.00
	Total	440	

(Emission Factor lbs/person) = (CO NAA Emissions t/yr * 2000 lbs/t) / (Spokane Population)
Spokane CMSA 1990 population for the CO NAA are U.S. Census estimates (Ref 51c).

4) The CO Season Adjustment factors (SAF) are derived from factors given in the Nonroad Emission inventories (Refs 51c), also found in Appendix C, Table C-1.
Recreation and Lawn/Garden equipment SAFs reflect seasonal use of chainsaws, snowblowers, and snowmobiles.
Recreational, agricultural, & logging equip contained undefinable SAF because both the numerator and the denominator was equal to zero. As such, those three categories were assigned SAFs of zero.

5) (Annual Emissions t/yr = (NAA Population) * (Emission Factor) / 2000 lbs/ton)
(Season Emissions lbs/day) = (Annual Emissions t/yr) * (2000 lbs/t) * SAF / (days/yr).

6) No applicable rules for non-road vehicles, no RE, RP, or CE applied.

Table 2.5.5: Grants Pass UGB 1993 CO Season: Non-Road Source Emissions From Aircraft

Area/Airport	Annual LTOs	CO Season LTOs	CO Emission Factor (lbs CO/LTO)	CO Emissions Annual (t/yr)	CO Emissions Season (lbs/day)
SCC 22-75-000-000					
SCC 22-75-020-000					
SCC 22-75-050-000					
SCC 22-75-060-000					
	0.00	0.00	0.00	0.00	0.00
TOTAL Grants Pass 1993 CO Emissions:				0.00	0.00

Notes: Grants Pass UGB does not have an airport and is not inventoried for the Non-Road Mobile Source Aircraft emissions category, as stated in Section 4.2, page 33, of the IPP and QA Plan for CO submitted for Grants Pass (& Salem), dated October 19, 1998.

Table 2.5.6: Grants Pass UGB 1993 CO Season: Non-Road Source Emissions From Railroads

	(1)	(2)	(3)	(4)		(5)
				CO	----- CO Emissions -----	
	Fuel	CO		Season		CO
	Burned	Emission Factor	Acty	Adjustment	Annual	Season
Area	(Gallons)	(lbs/gal)	(d/wk)	Factor	(t/yr)	(lbs/day)
SCC 22-85-002-000						
Railroads						
Grants Pass						
Line Haul	39,517	0.0626	7	1	1.2	6.8
Yard	8,569	0.0894	7	1	0.4	2.1
TOTAL Grants Pass CO EMISSIONS					1.6	8.9

Notes:
1) Fuel consumption calculation method from EPA Mobile Source, Volume IV (Ref 91, Section 6).
See Appendix, Table C-2 for Line Haul calculation worksheet.
See Appendix, Table C-3 for Yard Operation calculation worksheet.
2) Emission Factors from Procedures Document, Volume IV (Ref 91).
3) Activity is at the indicated number of days/week.
4) Seasonal consumption is assumed to be uniform with a Seasonal Adjustment Factor (SAF) = 1.0, uniform.
5) Annual Emissions [t/yr] = ((gallons fuel burned) * (EF)) / (2000 [lbs/ton])
Season Emissions [lbs/day] = (Annual Emissions [t/yr]) * (2000 [lbs/t]) * SAF / ([days/yr])

Table 2.5.7: Grants Pass UGB 1993 CO Season: Non-Road Source Emissions From Waterborne Vessels

Waterbody	Category	Launch Site	(1) Use days 1993	(2) Average fuel use gal/day	(3) Boats with outboard motors CSS 22-82-005-010	(4) Boats with inboard motors SCC 22-82-005-005	(5) Outboard motors EF, lb/gal	(6) Inboard motors EF, lb/gal (gasoline)	(6) Inboard motors EF, lb/gal (diesel)	(7) SAF	(8) CO Emissions t/year	(9) CO Seasonal Emissions, lb/day
Rogue River	Recreational marine vessels SCC 22-82-005-000	Baker Park	3,110	6.5	2177	933	3.3	1.24	0.14	0.06	25.4	33.9
			(11) Use days 1993	(12) Average fuel use gal/year	(13) Boats with inboard motors			(14) EF, lb/ gal		(15) SAF	(16) CO Emissions t/year	(9) CO Seasonal Emissions, lb/day
Rogue River	Commercial marine vessels SCC 22-80-004-000		7600	7000	7600			3.2		0	11.2	0.0
										Total:	36.6	33.9

Notes:

1) Use days fro 1993 on the portions of Rogue River within Grant Pass UGB were taken from the *1996 Oregon Recreational Boating Survey* for Baker Park Launch Site (page 162), which is the only launch site in Grants Pass UGB.
1995 use days at Baker Park Launch site were assumed representative of 1993 use days.

2) A typical boating day as reported in the *1996 Oregon Recreational Boating Survey*, on page 21 involves boating for an average of five hours and consumes an average of 6.5 gallons of fuel.

3) Oregon boaters generally operate small boats with outboard motors. 53% of the state's boats are less that 16 feet long and 70 % are powered by outboard motors. (*1996 Oregon Recreational Boating Survey*, page 20)
Based on this statements, we assume that boats with outboard motors were used on 70% of the boat use days.

4) On remaining 30 % of boat use days, boats equipped with inboard motors or combination of inboard/outboard motors are assumed to be used.

5) According to AP-42, vol. Fourth Edition, September 1985, a large portion of the pleasure craft in the US are powered by gasoline outboard motors. For this inventory, for the lack of local information, a 100% of boats with outboard motors are assumed to be powered by gasoline. EF for gasoline powered outboard motors are taken from Ap-42, vol. Fourth Edition, Table II-4.

6) Vessels falling into the inboard pleasure craft category utilize either gasoline or diesel cycle internal combustion engines (AP-42, Vol. Fourth Edition page II-3-1). Based on this statement, 50% of the boats with inboard motors are assumed to be powered by gasoline and other 50% by diesel. EF is from Table II-3.-5.

7) According to *1996 Oregon Recreational Boating Survey* (page 24, Table 3-1), approximately 6% of the annual boating in Oregon takes place during the CO Season: December, January, and February.

8) The annual CO emissions were calculated as follows:
(Average fuel use, gal/day * boats with outboard motors * outboard motors EF/2000lb/ton) +
(Average fuel use, gal/day * boats with inboard motors powered by gasoline *
inboard motors powered by gasoline EF/2000lb/ton) +
(Average fuel use, gal/day * boats with inboard motors powered by diesel *
inboard motors powered by diesel EF/2000lb/ton) .

9) Seasonal day emissions were calculated as follows: Annual emissions * SAF/ 90 days in 1993 *2000lb/day

10) For the lack of available information 2-strock/4-stroke engine differences were not analyzed for this inventory.

11) Boat use days for commercial marine vessels was calculated based on the information received from "Jet Boat River Excursions Grants Pass" and "Hellgate Jet boat Excursions". Both companies operate May 1 - September 30, 7 days a week with average 5 hours of trips a day which allows us to assume one boat use day per boat per day (with average boat use day 5 hours).

12) "Hellgate Jet boat Excursions" operates 9 boats that consume about 5000 gallons of gasoline a year on the territory of Grants Pass UGB. (Ref. 345) "Jet Boat River Excursions" operates one boat that uses approximately 2000 gallons of gasoline a year (Ref. 345).

13) All commercial jet boats in Grants Pass UGB are equipped with inboard motors powered by gasoline.

14) EF is a current emission factor for gasoline powered boats in California from a report by SAI entitled "Development of an Improved Inventory of Emissions from Pleasure Craft in California", June 1995 (ARB document *Public Meeting to Consider Approval of California's Pleasure Craft Exhaust* Emissions Inventory, Nov. 1998, Appendix G, page A11).

15) SAF is zero because commercial jet boats do not operate during the CO Season (Dec. - Feb.)

16) Annual CO emissions were calculated as follows: Fuel use gal/year * EF lb/gal / 2000 lb/ton

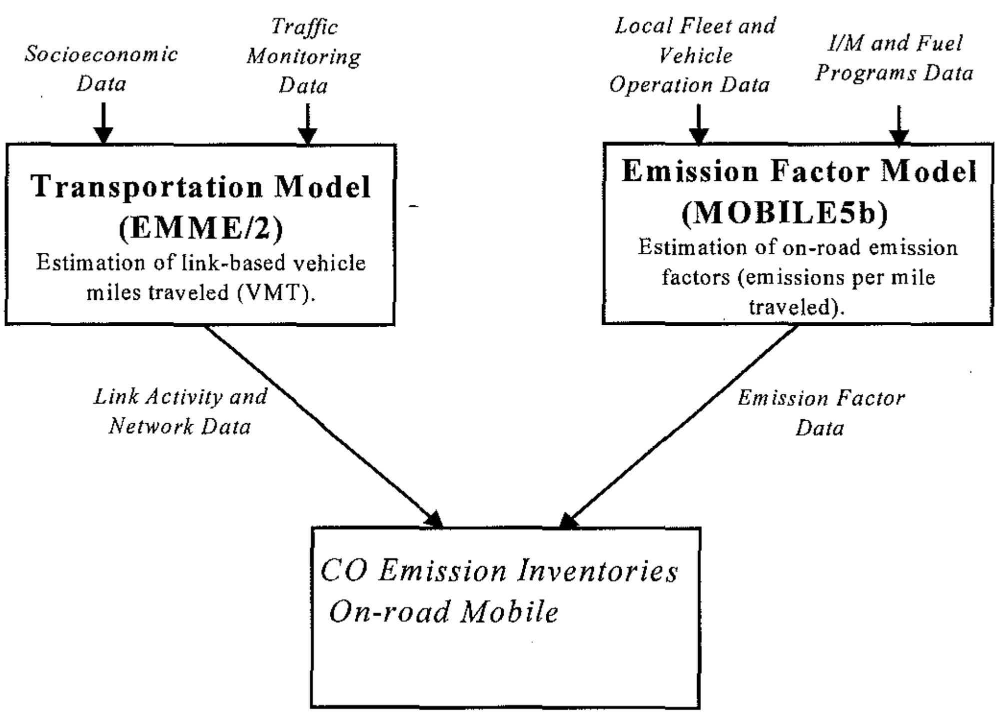
Part 2.6 ON-ROAD MOBILE SOURCES

2.6.1 INTRODUCTION AND SCOPE

The 1993 and 2015 carbon monoxide emission inventories from on-road mobile sources were completed in accordance with the current EPA emission inventory preparatory guidelines[91,133] and approved emission factor model (MOBILE5b).[332] This component of the emission inventory was completed by ODEQ, but incorporated several key elements and contributions from the RVCOG, and ODOT and other local jurisdiction participants. At various points in this section, reference is made to the material assembled into Appendix D of this report. Appendix D provides supplemental, technical detail related to the development of the on-road motor vehicle emission inventory.

Figure 22 provides an overview of the inventory process for on-road mobile sources. As shown in the boxed text of this figure, the two main steps in developing inventories were (1) link-based activity estimation using the EMME/2 transportation network travel demand model, (2) fleet CO emission factor modeling using the EPA's MOBILE5b model. The completion of each of these individual steps is discussed in section 2.6.2. These are followed by a presentation of the inventory results in Section 2.6.3.

Figure 22. Overview of main processing steps and software used for the on-road mobile source emission inventory.



2.6.2 METHODOLOGY AND APPROACH

2.6.2.1 Estimating Vehicle Activity

Vehicle activity data used to estimate on-road mobile source emissions were obtained from RVCOG's EMME/2 transportation network travel demand model. The Rogue Valley COG, in cooperation with the Oregon Department of Transportation, designed and completed the EMME/2 transportation network travel demand modeling for the Grants Pass 1994 Transportation System Planning (TSP) required by the Oregon Department of Transportation and Department of Land Conservation and Development's Transportation Planning Rule. ODEQ reaped the benefit of this Transportation System Planning effort and was supplied the relevant data. ODEQ, in turn, reviewed the socioeconomic data and other assumptions contained within the EMME/2 model set up for 1994 as they pertain to the emission inventory development process.

TRAVEL DEMAND MODEL
A 1994 travel demand model using EMME/2 software was developed by ODOT's Transportation Planning Analysis Unit and RVCOG. The model includes trip generation, trip distribution, and traffic assignment steps. It was calibrated to 1992 ground counts. Travel times were calculated per link with delays as assigned to simulate stop and intersection controls. The model generates 24-hour traffic volumes, which were used to calculate vehicle miles traveled (VMT) for the region.

Land use forecasts were prepared for the model based on current land use regulations and comprehensive plans for Grants Pass and Josephine County. The data was allocated to individual transportation analysis zones (TAZs) established within the EMME/2 model. More extensive model documentation is available from the RVCOG.

Average daily and peak hour traffic volumes and speeds were used for the ODEQ air quality analysis. This data includes traffic links within the study area for the years 1990, 1995, 2005, 2015, and 2018. Predicted future year traffic is based on a growth factor of 1.5 percent per year.

VEHICLE MILES TRAVELED (VMT) ESTIMATION
Estimates of Vehicle Miles Traveled (VMT) were produced for the base year and future years using the EMME/2 model. The 1992 base year transportation model was calibrated to an inventory of existing traffic counts using Federal Highway Administration guidelines.

Vehicle activity in the form of vehicle miles traveled (VMT) were derived from the EMME/2 travel demand model developed by ODOT and the RVCOG as part of the 1994 Transportation System Plan (TSP) and Transportation Improvement Program (TIP) for Grants Pass. As part of the Transportation System Plan an air quality conformity determination was also conducted. The 1994 TSP/TIP represented the anticipated transportation needs of the Grants Pass area to the year 2015 and included roadway types useful for reporting purposes. The validation of the EMME/2 network was considerably more extensive than the local Highway Performance Monitoring

System (HPMS) network. The data values reported in this document do not reflect HPMS-based adjustments.
The EMME/2 data acquired from RVCOG modeled typical weekday activity in 1993 and 2015. These data included link distance, travel time, speed estimates and VMT for each link in the transportation network as well as the additional, off-network activity assigned to local travel. The location of link nodes (start and end points of the link segment) were also provided in order to properly place the location of activity within the Grants Pass UGB. Overall, the domain covered by the EMME/2 modeling is larger than that of the Grants Pass UGB. For the estimation of CO emission inventories, only the links located within the Grants Pass UGB were used to estimate vehicle activity (and thus emissions). The RVCOG provided the Grants Pass UGB boundary along with the link node location data. The 1993 activity estimates were calculated by back casting the link-level activity from 1994 model output. In summary, the 1993 vehicle activity data used in the CO inventories are presented in Appendix D.

2.6.2.2.1 Temporal Adjustments

Temporal adjustments to the VMT data were evaluated by the DEQ. The VMT adjustment factors for the CO season were estimated by DEQ to account for monthly variation in on-road activity and are presented in Table 2.6.1.[313] Due to the fact that the two ODOT permanent traffic counters are located outside the Grants Pass UGB, the day-of-week activity adjustment factors for the UGB were calculated by ODEQ using City of Medford traffic count data supplied by the RVCOG. The City of Medford traffic count data most closely represents a like southern Oregon urban community and better represents a day-of-week activity adjustment factor for Grants Pass than an activity adjustment factor derived from traffic counters outside the Grants Pass UGB. The results of this calculation are shown in Appendix D Table D-7. Temporal activity adjustments were applied, as needed, to convert between VMT estimated for an annual average day and a CO-season average weekday.

2.6.2.2 <u>Emission Factor Modeling</u>

The EPA's MOBILE5b model was used to calculate CO exhaust emission factors from on-road mobile sources in accordance with EPA reference documents and guidelines.[133, 217, 315, 332] MOBILE5b predicts emission factors in the units of grams per mile and includes the effects of fleet characteristics, vehicle operating conditions, vehicle emission standards, fuel parameters, and ambient conditions. Carbon monoxide emission factors were developed for 1993 and 2015 under local modeling conditions.

Location-specific data were used in place of the model's default values when available. Input data addressing the following modeling parameters were used in the inventory process and were provided by the DEQ.[246,247,316]

- The local oxygenated fuel program
- No oxygenated fuel program
- Light-duty gasoline vehicle (LDGV) registration distribution fleet mix

- Light-duty diesel vehicle (LDDV) registration distribution fleet mix
- CO season ambient temperatures

The detailed documentation of the MOBILE5b input data and specifications are included in Appendix D in addition to the model outputs.

2.6.2.3 Emission Scenario

Emission factors for an inventory scenario were completed representing both annual and CO seasonal differences in the reporting period and the discontinuation of the oxygenated fuel program. One inventory was completed for the 1993 attainment year: annual and CO season inventories. One inventory was completed for the 2015 maintenance plan representing the removal of oxygenated fuels during the winter CO season.

2.6.3 SUMMARY OF MOBILE SOURCE EMISSIONS

On-road mobile source emissions have been summarized in the following Figures and Tables by vehicle class and by roadway type for annual and seasonal daily CO emissions.

Using the procedures, data and models described above, the on-road mobile source emission inventory was completed. The results of the on-road mobile emission estimates within the Grants Pass UGB are shown in Figures 23 through 30. Table 2.6.2 and 2.6.3 presents additional inventory results reported by vehicle class and roadway type, respectively. The data in Table 2.6.2 show that the majority of the annual on-road mobile source emissions originate from light-duty gasoline vehicles (automobiles) and light-duty gasoline trucks. These vehicle classes emit 87 percent of the fleet total on-road inventory.

Figure 23: Distribution of Annual On-road Mobile CO Emissions by Vehicle Class, 1993

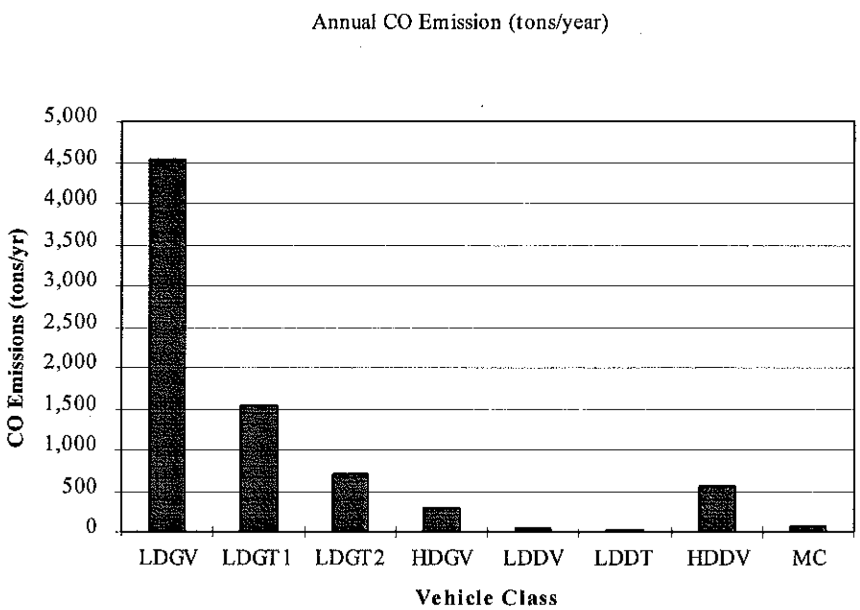


Figure 24: Percentage of Annual On-road Mobile CO Emissions by Vehicle Class, 1993

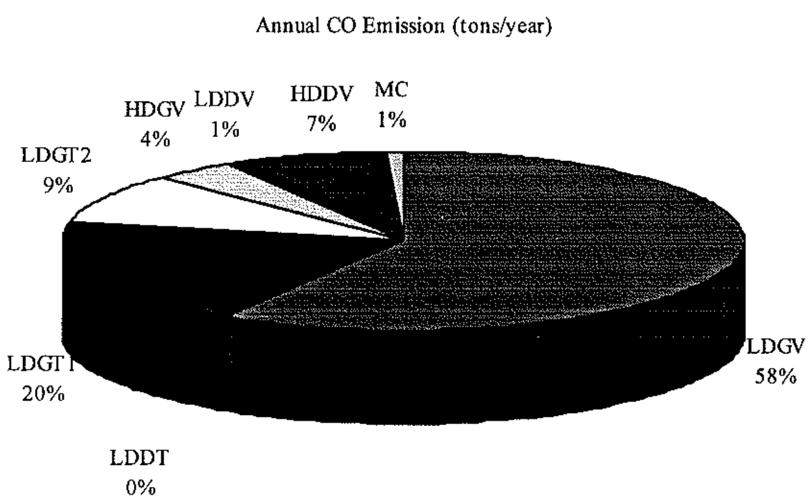


Figure 25: Distribution of Annual On-road Mobile CO Emissions by Roadway Type, 1993

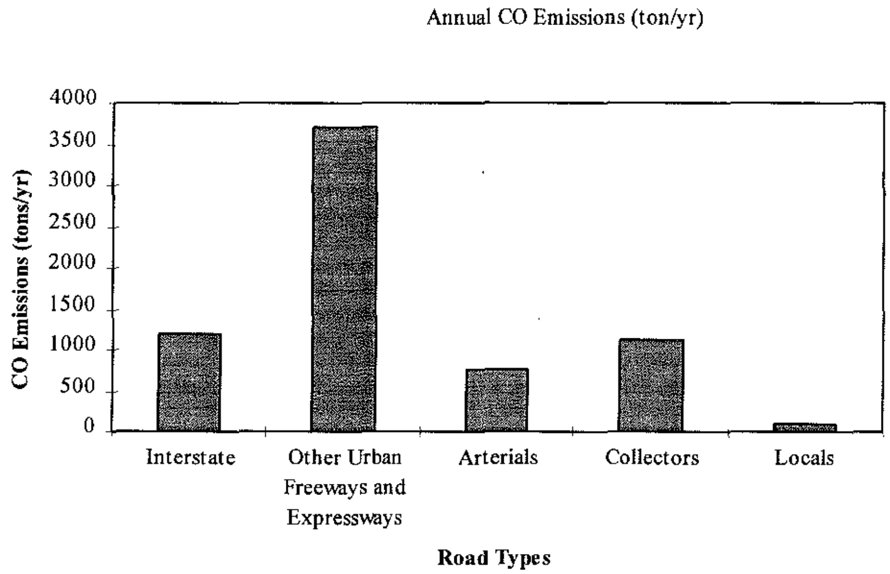


Figure 26: Percentage of Annual On-road Mobile CO Emissions by Roadway Type, 1993

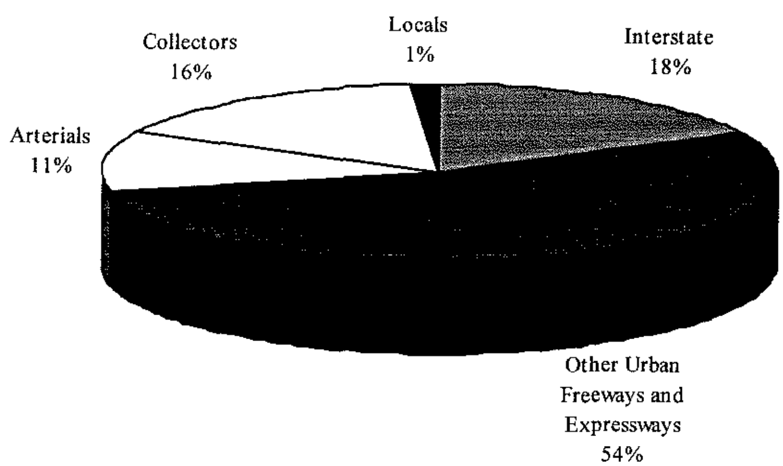


Figure 27: Distribution of Seasonal On-road Mobile CO Emissions by Vehicle Class, 1993

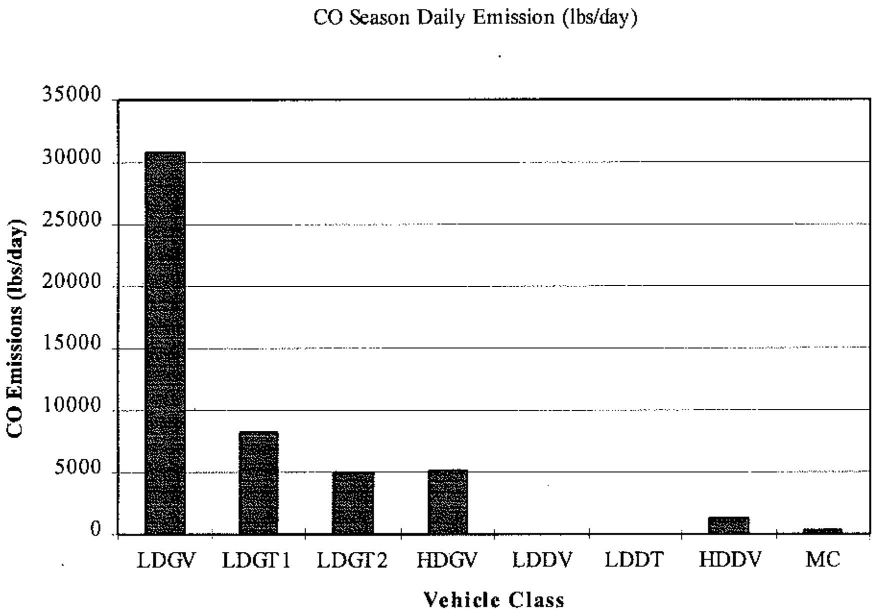


Figure 28: Percentage of Seasonal On-road Mobile CO Emissions by Vehicle Class, 1993

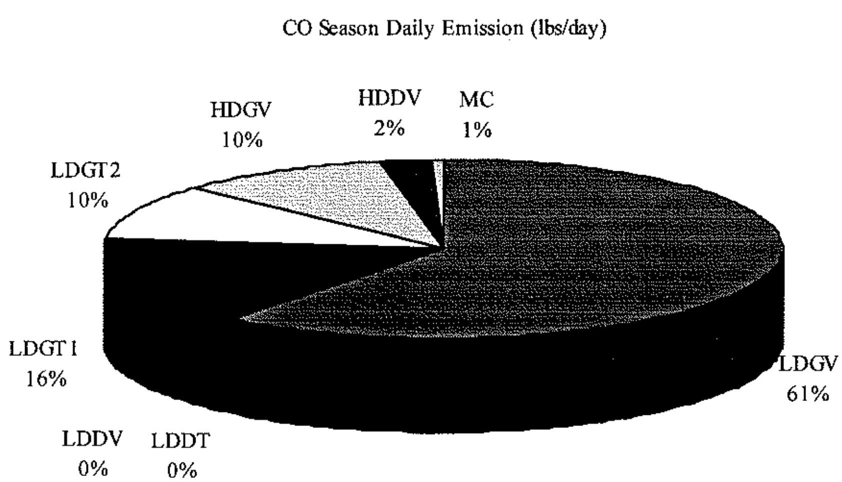


Figure 29: Distribution of Seasonal On-road Mobile CO Emissions by Roadway Type, 1993

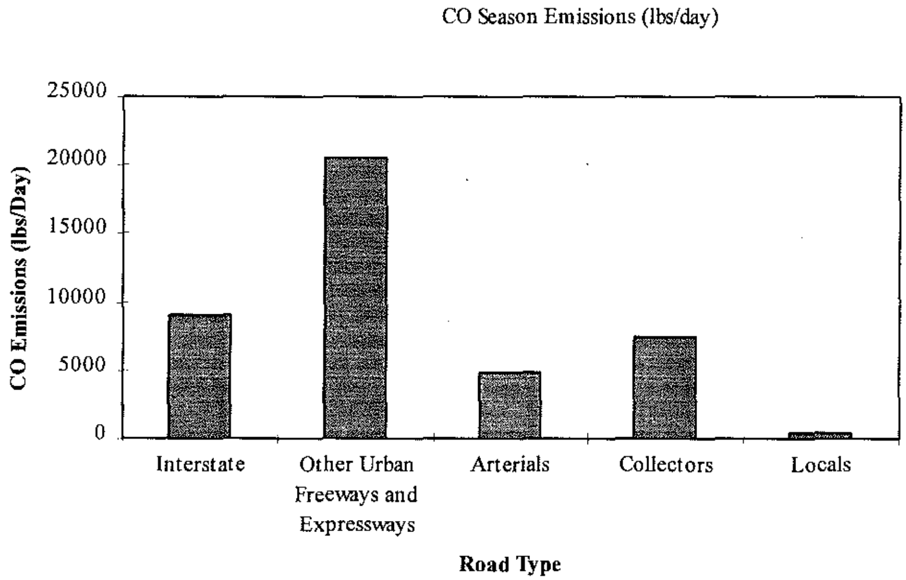


Figure 30: Percentage of Seasonal On-road Mobile CO Emissions by Roadway Type, 1993

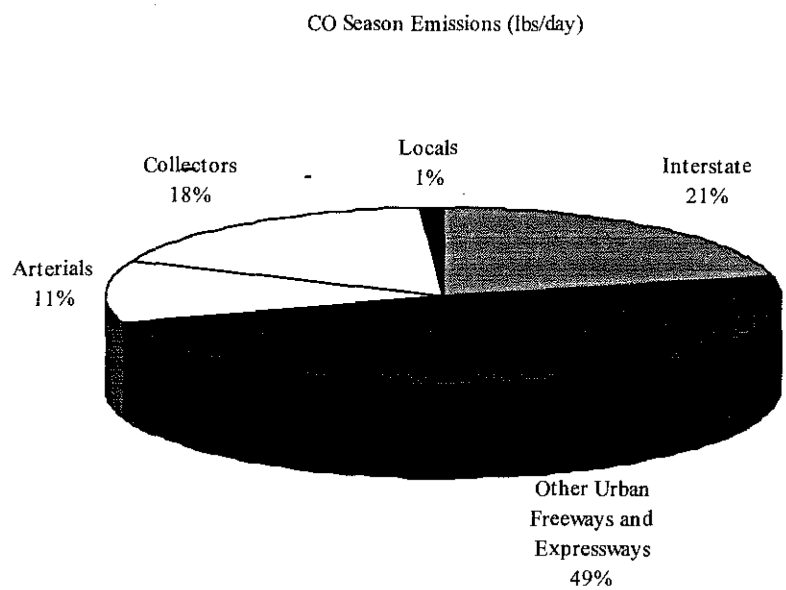


Table 2.6.1: Seasonal Activity Adjustment Factors by Roadway Classification as Reported by the DEQ.

Roadway Type	CO Season Adjustment Factor
Interstate	0.939
Other Urban Freeways and Expressways	0.907
Arterials	0.817
Collectors	0.817
Locals	0.817

Table 2.6.2: On-Road mobile emissions by vehicle class

Inventory	Description	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC	Total/Units
1993 CO	**Annual**	4,548	1,539	715	303	39	16	552	62	7,775 TONS/YR
1993 CO	**Seasonal**	30737	8289	5028	5115	13	6	1267	257	50,712 LBS/DAY

Table 2.6.3: On-Road mobile emissions by roadway type

Inventory Description		Interstate	Other Freeways And Expressways	Arterials	Collectors	Locals	Off Network VMT	Total/Units
1993 CO	**Annual**	1,202	3,696	749	1,126	88	915	7,775 tons/yr
1993 CO	**Seasonal**	9,026	20,533	4,865	7,429	486	5,765	48,104 lbs/day

Part 2.7 FUTURE YEAR EMISSION INVENTORY (2015)

2.7.1 GROWTH FACTOR DEVELOPMENT

Since levels of growth are varied depending upon the type of CO source category, a variety of applicable growth factors were developed for application to the 2015 emission inventory. Rogue Valley Council of Governments and the Grants Pass Air Quality Plan Advisory Committee assessed pertinent growth patterns within the Grants Pass UGB. Based on recommendations by the Advisory Committee, RVCOG calculated the appropriate population, household, employment, VMT, and selected employment growth rates. DEQ provided growth assumptions for wood use based on analysis of woodheating survey trends from 1985 to 1993.

2.7.2 GROWTH FACTOR IMPLEMENTATION

The selected growth rates were applied by DEQ staff for point, area, non-road mobile and on-road mobile source categories. Point, area, and non-road mobile sources were grown at a simple, linear, non-compounding rate from 1993 to 2015 using the following formula (except the area source/residential wood combustion category):

1993 Attainment Year Value + ((Growth Rate) * (Number of Years from 1993) * (1993 Attainment Year Value))

For example, for a selected sub-category for the year 2015, with a 1993 value of 10 tons per year, and a growth rate of 1%:

10 ton/yr. in 1993 + ((.01 growth) * (22 years) * (10 ton/yr. in 1993)) = 12.2 ton/yr. in 2015

The residential wood combustion category subsections were assumed a growth rate according to the estimate of new devices added to both the existing stock of housing units in 1993 and to new housing built or projected to be constructed after 1993, using the formula:

(1993 emissions) + (((emissions per device) * (No. of devices in existing RWC HUs))) + ((emissions per device) * (No. of devices in new RWC HUs)) * (No. of years from 1993)

PART 3: QUALITY ASSURANCE AND QUALITY CONTROL

3.1.0 INTRODUCTION

The Oregon DEQ is responsible for overall quality and accuracy of this inventory of Carbon Monoxide (CO) sources and emissions for the Grants Pass urban growth boundary (UGB) in the 1993 Attainment Year. Results of this inventory will be used for years to come in making decisions and planning strategies that affect the people and resources of the State of Oregon. It is critical to produce accurate and useful emission inventories that ensure consistency and confidence by each future user.

Quality assurance methods and quality control measures remain a regular and important element of the efforts of every inventory and technical service that the Oregon DEQ produces. The management of the Air Quality Division of the Oregon DEQ commit the personnel and resources necessary for conducting Quality Assurance and Control (QA/QC) activities in the planning and preparing stages as well as the inventory development and report completion stages.

A Quality Assurance (QA) plan is developed as a significant part of the Inventory Preparation Plan (IPP) and is submitted for approval by the Region 10 office of the US EPA. Essential elements of the QA plan include identifying the DEQ personnel and external resources (i.e., Rogue Valley Council of Governments for transportation issues) used in EI development and QA activities, describes the data collection and analysis measures to be used, and outlines the data handling methods and QA/ QC procedures to be followed. Upon incorporating IPP revision requests and directions provided by the Region 10 office and receiving approval to proceed, the Oregon DEQ implements the QA plan and prepares the emission inventory.

Quality Control (QC) describes the regular activities implemented by DEQ inventory development personnel to improve and control the quality of the inventory as it is being developed. Staff that contribute to each emission inventory make a continual effort to inspect, correct and verify the estimation methods, calculations and quantities in the emission inventories produced by DEQ.

QA and QC were considered separate activities in preparing this emission. Quality Assurance, (QA) is a planned system of review and audit procedures conducted by personnel not actively involved in the inventory development process. Tools were utilized by QA personnel to examine the data in the electronic spreadsheets and printed tables. Appearances of errors, inaccuracies and validity were identified and noted on an Error Report & Correction Sheet for each table, then returned to the EI preparation personnel for revision. Corrections were verified by the QA auditor before final acceptance. The QA auditing process was tracked and recorded to ensure that a complete and comprehensive QA audit was performed.

The framework of this emission inventory is established in part on earlier emission inventories produced in the Grants Pass area and on inventories for other Air Quality maintenance areas. Therefore, the QA/ QC measures taken in earlier inventories are re-checked, improved and used in subsequent inventories.

Emission inventories produced by the Oregon DEQ observe the methodologies and tools provided by the formative seven-volume QA guidance and methodology document, the Emission Inventory Improvement Program (EIIP), US EPA Document 454/R-97-004f. Originally issued in July 1997 by the Office of Air Quality Planning and Standards of the US EPA, the guidance and methodology of the EIIP has significantly influenced the data collection and reporting of each emission source category as well as the QA/ QC process of this inventory.

3.2.0 ORGANIZATION AND PERSONNEL

Brian Fields, who has experience with the emission inventory process, was appointed Quality Assurance Coordinator. Kevin McGillivray also provided QA auditing.

Steven Aalbers, Wendy Anderson, Svetlana Lazarev, and Wes Risher performed the bulk of the required source calculations and the Quality Control checking at the DEQ Headquarters Office. Ms. Lazarev made corrections to the inventory tables that were identified in the QA audit.

For transportation (highway motor vehicle) sources, DEQ's Wes Risher was the primary coordinator. Mr. Risher was the agency's liaison with outside assistance that was obtained from the Rogue Valley Council of Governments (RVCOG), and the Oregon Department of Transportation, Highway Division. Howard Harris, DEQ Transportation Control Program Coordinator, provided technical direction on On-Road Mobile Source modeling and source calculation.

The abbreviated organizational hierarchy for carrying out the Quality Assurance Program is shown below.

Oregon Department of Environmental Quality
Air Quality Division

Greg Green, Administrator - Air Quality Division
- Gerry Preston, Manager - Technical Services Section
  - Emission Inventory
    - Steven Aalbers, Emission Inventory Specialist
    - Wendy Anderson, Emission Inventory Specialist
    - Svetlana Lazarev, Emission Inventory Specialist
    - Wes Risher, Emission Inventory Specialist
  - Quality Assurance
    - Brian Fields, Emission Inventory Specialist
    - Kevin McGillivray, Emission Inventory Specialist
- Annette Liebe, Manager - Airshed Planning Section
    - Howard Harris, CO SIP Coordinator & Transportation Control Program Coordinator

Patti Seastrom, CO SIP Planning & Development Specialist

The bulk of the source data is limited to single sources of information. Therefore, data evaluation relied heavily upon checking against previously compiled information, where available.

3.3.0 DATA COLLECTION AND ANALYSIS

3.3.1 DATA COLLECTION AND ANALYSIS

To ensure the comprehensive nature of the emission inventory, the listing of sources from EPA's Quality Assurance Plan[3,10,11,298] guidance document and EPA's *Procedures for the Preparation of Emissions for Carbon Monoxide And Precursors Of Ozone*[2] were used. The inventoried sources are marked under the appropriate pollutant category. Only those sources that have been determined to operate in the inventory areas were included

As discussed in Section 1.3, the source categories were divided into Stationary Point Sources, Stationary Area Sources, Non-Road Mobile and On-Road Mobile Sources. Stationary point source information is maintained by DEQ for sources with annual emissions of at least 5 tons per year, so a questionnaire/survey was not necessary to identify stationary area and point sources. Emissions from stationary point sources were calculated on the basis of 1993 production levels and the best available emission factors (from TV source tests or from the permits). Point sources considered in this inventory are listed in Appendix A, Table A-1.

Many of the stationary area sources and non-road mobile sources were estimated based upon commodity consumption or by applying per capita emission rates. Population data was obtained from Portland State University, Population Research and Census Center[271]. Stationary area source emission estimates were based upon emission factors published in *AP-42*[216], *FIRE Version 5 SCC and Emission Factor Listings*[318], DEQ estimates based on similar processes, and other documentable sources. On-road mobile sources were based on EPA's Mobile 5b model[332] and RVCOG's transportation demand model (EMME/2) to estimate vehicle miles traveled. Customized data included the County registrations for light duty vehicles (gas and diesel) and temperatures.

Input data collection procedures relied heavily upon the EPA guidance document *Procedures for the Preparation of Emissions For Carbon Monoxide And Precursors Of Ozone*[2]. Where possible, localized data were used in place of the EPA's factors. For example, residential open burning estimates based on local information are more accurate than nationally derived values because of the high degree of regulation in the Grants Pass UGB. In this case, use of local data is more appropriate than national data.

In all cases, the source of the information and validation for its use was documented in the calculation spreadsheets and checked at the time of QC for reliability and appropriateness.

3.4.0 DATA HANDLING

Data handling included: 1) coding formats and data recording, 2) data tracking, and 3) QA/QC (which included data checking, data correcting, and handling corrected data). Specific additional procedures included checking data after conversion to the inventory format, checking for missing data, and reviewing the estimates.

3.4.1 DATA CODING AND RECORDING

No air dispersion modeling was performed for this SIP so coding the source emissions for entry into the model was not necessary.

3.4.2 DATA TRACKING

Information obtained from source files, other divisions of the DEQ, other State, Federal, and local agencies, and private companies used in compiling the emission inventories were recorded in reference files, in appendices, and documented on the calculation spreadsheets. The appendices and calculation spreadsheets were also stored electronically. All emission factors, throughputs, seasonal adjustment factors, and activities were documented on the calculation spreadsheets in both hard copy and electronic copy. All of the above mentioned information is kept at DEQ Headquarters.

3.4.3 QA/QC PROCEDURES - CHECKING AND CORRECTING

The QA personnel generated QC forms and conduct any necessary training to ensure consistency and thoroughness by the QC personnel. The QC forms followed the forms outlined in the *Quality Assurance Implementation Instructions And Examples For SIP Inventory Development*[298]. The forms are:

1. Point source spreadsheet data form
2. Point source correction form
3. Area source calculation sheet check off list
4. Area source appendices check off list
5. Area source correction form
6. Non-road mobile calculation sheet check off list
7. Non-road mobile appendices check off list
8. Non-road mobile correction form
9. Summary sheet form
10. Summary sheet correction form

The QC of all source category emissions include:

1. Checking input data for inventory completeness, missing data, incorrect calculations, incorrect information, and reasonableness, and

2. Correcting the calculation sheets, summary sheets, and Appendices.

The QA of the emission estimates include:

1. A sample calculation of selected emissions,
2. Ensuring that all QC corrections were addressed,
3. Reviewing the emission summary for reasonableness, and
4. Ensuring that the data transferred between agencies and consultants are intact.

3.4.3.1 <u>Checking Data</u>

3.4.3.1.1 Inventory Completeness

Completeness of the inventory was determined by checking against the EPA QA Plan guidance source listings. Double counting of sources was checked to ensure that source categories included in stationary point source category were not also included in area or non-road mobile categories.

3.4.3.1.2 Missing Data

In order to ensure that all the necessary data was submitted for each stationary point source, forms were created to identify all the data elements required by EPA to be reported for each stationary point source. Any parameter left blank during the initial completion of the form was considered a missing data element. Further review of the source files and, as necessary, contact with facility personnel were procedures used to obtain the missing information. If these steps did not result in supplying a missing data element, estimates were made based on similar point sources or from information contained in EPA publications. Written documentation of the source of the data were recorded in the Emission Inventory notebook on the Data Error Report and Correction form as well as in the Audit Trail notebook.

Missing data for stationary area sources and non-road mobile sources can usually be identified by the inability to calculate emissions. If the appropriate data was missing, a reasonable effort was made to acquire it. If this was unsuccessful, estimates were made based on data of recent years or on information contained in EPA documents. Missing data were recorded on the QC area and non-road mobile correction forms.

3.4.3.1.3 Incorrect Calculations

In order to ensure that all the calculations were done correctly, the calculations were first reviewed to ensure that they were used correctly, then the electronic equations were reviewed to make sure that they were entered correctly. Any improperly used or incorrect calculations were noted on the calculation sheet, in the Appendix, or on the correction form. All calculation corrections were documented on the QC Correction Forms.

3.4.3.1.4 Incorrect Information

In order to ensure that the information on the Summary Sheet, The Calculation Sheet and in Appendices are correct, all the explanations, titles, and reference were checked for accuracy and clarity. Any changes were documented either directly on the sheet or on the QC correction forms.

3.4.3.1.5 Reasonableness

A reasonableness check was performed on the estimated emissions, activity levels, and emission factors using the Portland CO SIP [319,320] and the 1993 Medford UGB CO SIP submittal as background comparisons.

Stationary point source estimated emissions associated with the Air Contaminant Discharge Permit, Title V Permit, or Title V draft for each identified point source were reviewed in relation to similar sources. In addition, the stationary point source production levels source tests, and permitted emission factors were rechecked. The source's current operational status was also reviewed using notices of construction, permit addendum's, and DEQ source inspector information. Stationary area source and non-road mobile estimated emissions were compared, when possible, to the 1992 Portland CO SIP emission inventory and the draft 1990 Grants Pass UGB CO SIP emission inventory submittal. The references from which the emission factors and activity levels were taken were confirmed for the appropriateness of their use. Any reasonableness errors were documented in the correction forms.

3.4.3.2 Correcting Data

Receipt of information that necessitated a correction to the data used in the preparation of the emission inventories was documented on the Correction form. For minor changes the corrections were noted on the actual spreadsheet with an explanation, a signature, and a date. The correction was made to the electronic copy and the corrected version was printed and placed in the final draft notebook. The correction information was placed in an audit trail notebook for QA examination.

3.4.3.3 Sample calculations

DEQ staff verified each inventory process step by duplicating a sample calculation for at least one source category. Some of these were included in the emission inventory documentation.

3.4.3.4 Corrections Review

The QA coordinator reviewed all the correction forms for accurate, appropriate and complete corrections. This involved understanding why a correction was needed, why the original mistake was made, and whether the new information was accurate. The QA coordinator(s) signed and dated the correction form after they were satisfied with the corrections.

3.4.3.5 Reasonableness Review (QA)

The emissions estimate summaries were reviewed by DEQ and its peers to determine whether they were reasonable. Peer review (QA) utilizes the resources and expertise of local/state agencies and industries to review emission estimates. DEQ worked with the RVCOG, the Grants Pass Air Quality Advisory Committee, and ODOT in this role.

Examples of the reasonableness checks performed at this stage are: estimated per capita or per activity level emission estimates were compared with similar regions. The proportion of emissions by category with those of a similar region (e.g., on-road mobile sources contribute 20% of total inventory) were also compared.

3.4.3.6 Reference Data Used to Facilitate QA

Reference data commonly used to facilitate QA are presented in the table below:

Reference	Data	Level of Resolution
County and City Data Book - 1994 (U.S. Dept. of Commerce, Bureau of the Census)	Population, housing, employment, income, climate, and others	County, City
Census of Population and Housing, Summary Population and Housing Characteristics (U.S. Dept. of Commerce, Bureau of the Census)	Population, housing	Townships, Sub-county
County Business Patterns - Oregon, 1993 (U.S. Dept. of Commerce, Bureau of the Census)	Employment, establishments by Standard Industrial Classification (SIC) code	County
State Energy Data Report Consumption Estimates (U.S. Dept. of Energy, Energy Information Administration)	Energy consumption by fuel type	State
Highway Statistics (U.S. Dept. of Transportation, Federal Highway Administration)	VMT, on-road and off-road fuel consumption	State
Regional Interim Emission Inventories (U.S. EPA)	Emissions of criteria pollutants (including PM and CO)	County
Census of Manufacturers (U.S. Dept. of Commerce, Bureau of the Census)	Employment, hours worked, value of shipments by SIC code.	County, State

3.4.3.7 <u>Computerized Checks</u>

Computerized checks have included several parts: (1) verifying that each occurrence of data formatting resulted in equivalent emissions (or other data) before and after formatting, and (2) verifying the data totals and record lengths of any data transfers between agencies and consultants in the inventory process.

3.4.4 DATA REPORTING

Hard copy of the completed emission inventory will be provided to EPA Region X.

Part 4: REFERENCES (DEQ Master Reference)

1a. *Emission Inventory Requirements for Carbon Monoxide State Implementation Plans*, EPA-450/4-91-011, U.S. EPA, Research Triangle Park, NC, March 1991.

1b. *Emission Inventory Requirements for Ozone State Implementation Plans*, EPA-450/4-91-010, U.S. EPA, Research Triangle Park, NC, March 1991.

2. *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I: General Guidance for Stationary Sources*, EPA-450/4-91-016, U.S. EPA, Research Triangle Park, NC, May 1991.

2a. *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume II: Emission Inventory Requirements For Photochemical Air Quality Simulation Models*, EPA-450/4-91-014, U.S. EPA, Research Triangle Park, NC, May 1991.

3. *Procedures for Emission Inventory Preparation, Volume I: Emission Inventory Fundamentals*, EPA-450/4-81-026a, U.S. EPA, Research Triangle Park, NC, September 1981.

4. *Procedures for Emission Inventory Preparation, Volume II: Point Sources*, EPA-450/4-81-026b, U.S. EPA, Research Triangle Park, NC. September 1981.

5. *Procedures for Emission Inventory Preparation, Volume III: Area Sources*, EPA-450/4-81-026c, U.S. EPA, Research Triangle Park, NC, September 1981.

7. *Example Emission Inventory Documentation for Post-1987 Ozone State Implementation Plans*, EPA-450/4-89-018, U.S. EPA, Research Triangle Park, NC, October, 1989.

8. *Compilation of Air Pollutant Emission Factors*, Fifth Edition and Supplements, AP-42, U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC. September 1985.

8a *Compilation of Air Pollutant Emission Factors*, Vol. II, Fourth Edition and Supplements, AP-42, U.S. EPA, Research Triangle Park, NC. September 1985.

10. *Guidance for the Preparation of Quality Assurance Plans for O_3/CO SIP Emission Inventories*, EPA-450/4-88-023, U.S. EPA, Research Triangle Park, NC, December 1988.

11. *Quality Assurance Program for Post-1987 Ozone and Carbon Monoxide State Implementation Plan Emission Inventories*, EPA-450/4-89-004, U.S. EPA, Research Triangle Park, NC, March 1989.

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APPENDIX

APPENDIX A: STATIONARY POINT SOURCES

APPENDIX B: STATIONARY AREA SOURCES

APPENDIX C: NON-ROAD MOBILE

APPENDIX D: ON-ROAD MOBILE

APPENDIX A: STATIONARY POINT SOURCES

Appendix A, Table A-1: Individual Stationary Point Source Determinations

Appendix A, Table A-2: Individual Stationary Point Source Emission Calculations

Appendix A, Table A-1: Individual Stationary Point Source Determinations

Table A-1: Grants Pass 1993 Baseline Annual and Seasonal CO: Point Source Determination

Source Permit #	Point Source Permit NAME	Address	City	Emissions, in tons per year (tpy) PSEL (tpy	Unasgn	Actual(tpy)	SIC	Comments
17-0002	Fourply Inc	124 NE BEACON DR	GRANTS PASS	1.3		0.6	2436	Actual CO <5 tpy
17-0003	Chapel of the Valley Funeral Home	2065 Upper River Rd.	GRANTS PASS	0		0		B Source emissions are negligible
17-0008	Grants Pass Moulding Inc.	123 NE Beacon Dr.	GRANTS PASS	0		0		B Source emissions are negligible
17-0009	Bentwood Furniture Inc.	310 NW Morgan Lane	GRANTS PASS	0		0		TV for VOC
17-0013	Spalding & Son, Incorporated	2345 SE N ST	GRANTS PASS	60	0	8.99	2421	Area Source for CO
17-0015	Southern Oregon Plywood	605 SE J ST	GRANTS PASS	0		0		CLOSED - YR UNKNOWN
17-0018	Rough & Ready Lumber Co.	30365 REDWOOD HWY	CAVE JUNCTION	20		40	2421	Outside Grants Pass UGB
17-0023	**Miller Redwood Co.**	**700 Merlin Road**	**Merlin**	**300**		**134.3**	**2436**	**Closed 11/19/93, permit cancelled 2/8/94**
17-0029	**Tim-Ply Co.**	**111 NE MILL ST**	**GRANTS PASS**	**3.6**	**277.2**	**3.7**	**2436**	**HF Boiler removed in 1992. Unassigned adjusted for total of 99 tpy in 1995. Baseline PSEL 280.8 tpy. Included in the point source inventory**
17-0030	**Stone Container Corp. (U.S. Forest Industries, Inc.)**	**1090 SE M ST**	**GRANTS PASS**	**281**	**0**	**170.8**	**2436**	**Major Point Source of CO, baseline PSEL CO 275tpy**
17-0035	Caveman Lumber Co.	1270 Ort Lane	Merlin	0		0		B Source emissions are negligible, closed 1996
17-0040	Riverside Ready Mix, Inc	531 SE MILL ST	GRANTS PASS	0		0		B Source emissions are negligible
17-0046	Schrock Cabinet Company	550 MILL ST	GRANTS PASS	2.1		0.09	2434	TV for VOC, Actual CO <5 tpy
17-0049	Josephine Growers Cooperative Assoc.	525 NW F ST	GRANTS PASS	0		0		B Source emissions are negligible
17-0053	Gary L Peterson	910 SE M ST	GRANTS PASS	0		0		B Source emissions are negligible
17-0055	Copeland Paving, Inc.	695 SE J ST	GRANTS PASS	25.4*		0.03	2951	Actual CO <5 tpy
17-0057	Riverside Ready Mix, Inc	689 UNION AVENUE	GRANTS PASS	0		0		B Source emissions are negligible
17-0058	Menasha Corp-Wood Fibre	130 NE BEACON DR	GRANTS PASS	0		0		B Source emissions are negligible
17-0062	Hull & Hull Funeral Home	612 NW A ST	GRANTS PASS	0		0		B Source emissions are negligible
17-0071	Copeland Paving, Inc.	696 SE J ST	GRANTS PASS			0.27	2951	Actual CO <5 tpy
17-0072	Colvin Oil Company	1044 NE 6TH ST	GRANTS PASS	0		0		B Source emissions are negligible
17-0074	Bentwood Furniture, Inc	1080 SE M ST	GRANTS PASS	0		0		TV for VOC, Closed in 1996
17-0075	Copeland Paving, Inc.	6890 WILLIAMS HWY	MURPHY	2.5		0		Outside Grants Pass UGB

1) CE, RE, location, EFs, PTE, PSELs & production levels for TV, SM, & ACDP sources were assembled using permits, annual reports, and personal knowledge of the sources by the DEQ inspector.
2) Some ACDP actual and PSEL data was retrieved from ODEQ's Air Contaminant Source Information System.
3) The permitted sources included in the CO Emission Inventory as Point Spources are highlighted in shaded gray and B16bold text.
4) RE was determined using EPA-452/R-92-010, Guidelines For Estimating and Applying Rule Effectiveness For Base Year Inventories.
5) Point source criteria: a) Located inside the Grants Pass UGB; and, b) PSEL Calculated emissions (see note 1) of greater than 100 tons/yr.
6) * - PSEL value comes from the permit issued after 1993.
7) Tim-Ply is included in the Point Source inventory due to the fact that in 1993 the plant had unassigned emissions greater than 100 tons/year (significant to projected emissions).

Appendix A, Table A-2: Individual Stationary Point Source Emission Calculations

17-0023	**Miller Redwood Company**
17-0029	**Tim-Ply Company**
17-0030	**Stone Forest Industries**

Facility Name:	Tim-Ply Company	Phone #:	(503) 773-6681
Street Address:	111 NE Mill Street	Fax #:	(503) 770-1509
	Grants Pass, OR 97526	Permit Issued: 10/27/92	SIC #1: 2436 Plywood Plant
Mailing Address:	P.O. Box 1669	Permit Expires: 6/1/97	SIC #2: 4961 Boiler
	Medford, OR 97501		

1993- CO PLANT SITE EMISSION LIMITS		Control Efficiency
	t/yr	HF Boiler permenantly replaced with a Natural Gas boiler
Boiler	3.6	CE does not apply and is 0.
Unassigned	277.2	
Total PSEL	280.8	

ANNUAL REPORTING REQUIREMENTS

	1993		1994	
Dryer Op Hours	7320 hrs	(3)	7512 hrs	(3)
Dryer Op Days	305 days		313 days	
Hog Fuel	0 (BDT)		0 (BDT)	
Natural Gas	211.8 (Cu-ft, millions)		223.2 (Cu-ft, millions)	
Diesel Oil	Not Rep. (Gals)		Not Rep. (Gals)	

ANNUAL EMISSIONS

Source/Pollutant	SCC	PSEL EF	EF Unit	1993 Thruput	1993 Annual Emission ton/yr	1993 Annual Emission lbs/day	1994 Thruput	1994 Annual Emission ton/yr	1994 Annual Emission lbs/day
Hog Fuel Boiler	1-02-009-02	(1) Shut down in '91							
Nat. Gas Boiler	1-02-006-02	(2)							
CO		35.0	Lbs/Million Cubic Feet Nat. Gas	211.8	3.7	24	223.2	3.9	25
Diesel Boiler (backup) CO	1-02-005-01	5.0	Lbs/1000 Gallons Fuel	Not Rep.	0.00	0	Not Rep.	0.00	0
				Toal:	3.7	24			

Notes:

(1) Hog fuel boiler replaced with NG boiler in Aug 1991.

(2) The EFs for the Nat. Gas Boiler were taken from the 1995 Plant Site Emission Detail Sheet attached to the Air Conatminat Discharge Permit.

(3) Operating hours are taken off of the annual report for the dryer and are assumed to be representative of boiler operating time.
915 shifts * 8hr/shift = 7320 hrs in 1993

Facility Name:	Miller Redwood Company			
Street Address:	Plywood Division	(503) 479-5396		SIC#1: 2435
	700 Merlin Road	Permit Issued:	09/17/92	SIC #2: 2436
	Merlin, Oregon	Permit Expires:	3/1/97	SIC #3: 4961
Mailing Address:	P.O. Box 840	Permit Cancelled	2/8/94	
	Merlin, Oregon 97532			

PLANT SITE EMISSION LIMITS	
CO	**ton/yr**
Plant Site	**300**

ANNUAL PRODUCTION		1992		1993	
Total Plywd Plant					
Oper. Hours		6,552	hrs/yr	2,700	hrs/yr
		24	hrs/day	24	hrs/day
		273	days/yr	112.5	days/yr
Plywd Prod. (3/8")		45,239	(Sq-ft, thou)	26,404	(Sq-ft, thou)
Hog Fuel		10,650	(BDT)	not reported	(BDT)
Steam Production	(2)	153,400	(LBs, 1000)	89,533	(LBs, 1000)

ANNUAL EMISSIONS

Source/Pollutant	SCC	PSEL EF	EF Unit	Annual Thruput	1992 Emission		Annual Thruput	1993 Emission	
Hog Fuel Boiler	1-02-009-02				ton/yr	lbs/day		ton/yr	lbs/day
CO		3.00	lbs/1000 lbs	153,400	230.1	1686	89,533	134.3	984
							Total:	134	984

Notes:

(1) The facility permanently cease operation on 11/19/93 and the permit was cancelled on 2/8/94. This information is based on conversation with Sue Rohla on 4/26/94.

(2) 1993 steam production was estimated by ratioing the 1992 steam production with the 1993 vs. 1992 plywood production.
1993 Steam Prod = (1993 Plywood Prod./1992 Plywood Prod.)*1992 Steam Prod.

Facility Name:	Tim-Ply Company	Phone #:	(503) 773-6681
Street Address:	111 NE Mill Street	Fax #:	(503) 770-1509
	Grants Pass, OR 97526	Maj Mod Issued:	7/12/95
Mailing Address:	P.O. Box 1669	Permit Expires:	6/1/97
	Medford, OR 97501	SIC #1:	2436 Plywood Plant
		SIC #2:	4961 Boiler

1995-	CO	PLANT SITE EMISSION LIMITS		Control Efficiency
	t/yr		tpy	HF Boiler permenantly replaced with a Natural Gas boiler
Boiler	3.6	Baseline PSEL	280.8	CE does not apply and is 0.
Unassigned	95.4	Baseline-1995 Total =	181.8	
Total PSEL	99			

ANNUAL REPORTING REQUIREMENTS

	1995		1996	
Dryer Op Hours	7896 hrs	(3)	6480 hrs	(3)
Dryer Op Days	329 days		270 days	
Hog Fuel	0 (BDT)		0 (BDT)	
Natural Gas	233.8 (Cu-ft, millions)		169.8 (Cu-ft, millions)	
Diesel Oil	Not Rep. (Gals)		Not Rep. (Gals)	

ANNUAL EMISSIONS

Source/Pollutant	SCC	PSEL EF	EF Unit	1995 Annual Thruput	1995 Annual Emission ton/yr	1995 Annual Emission lbs/day	1996 Annual Thruput	1996 Annual Emission ton/yr	1996 Annual Emission lbs/day
Hog Fuel Boiler	1-02-009-02	(1) Shut down in '91							
Nat. Gas Boiler	1-02-006-02	(2)							
CO		35.0	Lbs/Million Cubic Feet Nat. Gas	233.8	4.1	25	169.8	3.0	22
Diesel Boiler (backup) CO	1-02-005-01	5.0	Lbs/1000 Gallons Fuel	Not Rep.	0.00	0	Not Rep.	0.00	0

Notes:

(1) Hog fuel boiler replaced with NG boiler in Aug 1991.

(2) The EFs for the Nat. Gas Boiler were taken from the 1995 Plant Site Emission Detail Sheet attached to the Air Conatminat Discharge Permit.

(3) Operating hours are taken off of the annual report for the dryer and are assumed to be representative of boiler operating time.

Facility Name: Stone Forest Industries, Inc. (Currently U.S. Forest Industries)
Street Address: 1090 SE M Street
Grants Pass, OR 97526
Phone: (503) 476-1191
Last ACDP Permit Issued: 04/13/95
TV Permit Issued 08/05/96
TV Permit Expires: 04/01/00
SIC#1: 2436

PLANT SITE EMISSION LIMITS	
CO	tons/yr
Baseline PSEL*	275
TV PSEL	281

6 tons/yr CO added by including fugitive CO and aggregate insignificant.

ANNUAL REPORTING REQUIREMENTS

	1992	1993	1994
Veneer Dryer Hours (2)	7,357 hours/yr	5,961 hours/yr	6159 hours/yr
	24 hrs/day	24 hrs/day	24 hrs/day
	307 days/yr	248 days/yr	257 days/yr
Total Veneer Dried (3/8")	122,560 (Sq-ft, thou)	89,866 (Sq-ft, thou)	100859 (Sq-ft, thou)
NG Boilers Fuel (Cu-ft, millions)	27.2 MMCF	26.5 MMCF	28.4 MMCF

ANNUAL EMISSIONS

Source/Pollutant			(1)		1992			1993			1994		
			PSEL	EF	Annual			Annual			Annual		
BEC	ID	SCC	EF	Units	Thruput	Emission		Thruput	Emission		Thruput	Emission	
						(ton/yr)	(lbs/day)		(ton/yr)	(lbs/day)		(ton/yr)	(lbs/day)
NG Boilers		1-02-006-03											
		CO	21.0	Lbs/Million Cubic Feet Nat. Gas	27.2	0.29	1.86	26.5	0.28	2.24	28.4	0.30	2.32
Veneer Dryers		3-07-007-13											
		CO	3.80	Lbs/1000 Ft^2	122,560	232.86	1519.40	89,866	170.75	1375.02	100,859	191.63	1493.48
								Total:	171	1,377			

Notes: (1) The EFs were taken from the TV permit.
(2) The dryer hours are the average of dryers #1 &#2 operating hours reported in the annual report.

* "The Baseline Emissions Rate has been changed from 1993 permit due to an April 1993 source test. Emission factors were adjusted (20.0 lbs/Mil.cuft for NG boilers and 1.4 lbs/1000 ft^2 fro Veneer Dryers - original 1978 Base Line) as a result of data collected from the source test at the Grants Pass facility and a similar source test at the Stone Southwest, Inc. in Albany, Oregon. It is felt that the results are more reflective of actual emissions at the plant as there have been no production or operation changes since baseline which would cause a change in actual emissions." From the 1995 permit review report.

Original 1978 Baseline is 101.5 ton/yr and PSEL is102 ton/yr.

Facility Name: Stone Forest Industries, Inc. (Currently U.S. Forest Industries)
Street Address: 1090 SE M Street
Grants Pass, OR 97526
Phone: (503) 476-1191
Last ACDP Permit Issued: 04/13/95
TV Permit Issued 08/05/96
TV Permit Expires: 04/01/00
SIC #1 2436

PLANT SITE EMISSION LIMITS	
CO	tons/yr
Baseline PSEL*	275
TV PSEL	**281**

6 tons/yr CO added by including fugitive CO and aggregate insignificant.

ANNUAL REPORTING REQUIREMENTS

		1995		1996			1997	
Veneer Dryer Hours		6,333	hours/yr	6,333	hours/yr	hours	6,333	hours/yr
		24	hrs/day	24	hrs/day		24	hrs/day
		264	days/yr	264	days/yr		264	days/yr
Total Veneer Dried (3/8")		107,162	(Sq-ft, thou)	110,430	(Sq-ft, thou)		108954	(Sq-ft, thou)
NG Boilers Fuel	(Cu-ft, millions)	33	MMCF	38	MMCF		37.8	MMCF

ANNUAL EMISSIONS

Source/Pollutant			(1)		1995			1996			1997		
			PSEL	EF	Annual			Annual			Annual		
BEC	ID	SCC	EF	Units	Thruput	Emission		Thruput	Emission		Thruput	Emission	
						(t/yr)	(ppd)		(t/yr)	(ppd)		(t/yr)	(ppd)
NG Boilers		1-02-006-03											
		CO	21.0	Lbs/Million Cubic Feet Nat. Gas	33.1	0.35	2.63	37.7	0.40	3.00	37.8	0.40	3.01
Veneer Dryers		3-07-007-13											
		CO	3.8	Lbs/1000 Ft^2	107,162	203.61	1543.21	110,430	209.82	1590.27	108,954	207.01	1569.02

Notes: (1) The EFs were taken from the TV permit.

(2) The 1995 dryer hours are the average of dryers #1 &#2 operating hours reported in the annual report. 1996 & 1997 dryer hours are not reported and are ratioed with the amount of material dried.

* "The Baseline Emissions Rate has been changed from 1993 permit due to an April 1993 source test. Emission factors were adjusted as a result of data collected from the source test at the Grants Pass facility and a similar source test at the Stone Southwest, Inc. in Albany, Oregon. It is felt that the results are more reflective of actual emissions at the plant as there have been no production or operation changes since baseline which would cause a change in actual emissions." From the 1995 permit.

APPENDIX B: STATIONARY AREA SOURCES

Appendix B, Table B-1 Grants Pass Population & Housing Unit Data, 1993 and 1995

Appendix B, Table B-1. Grants Pass Population & Housing Unit Data

Grants Pass UGB 1993 Estimation						
UGB Only Year	Housing Units(4)	Population within UGB but outside City Limits(3)	Grants Pass City Limits Population (2)	Grants Pass City & UGB Area Population (1)	Grants Pass City & UGB Area Housing Units (4)	Grants Pass City Limits Housing Units(4)
1993	3236	7767	17629	25396	10582	7346
1995	3441	8259	18747	27006	11252	7811

Notes:

1) 1993 UGB population developed by RVCOG from EMME/2 Travel Model.
   1995 UGB population is from City of Grants Pass Comprehensive Plan.
2) 1993 Grants Pass city Limits population 17,629 was calculated as follows (Comprehensive Plan), Ref.#325.
   Ratio of 1995 City population to 1995 UGB population (18,747 : 27,006 = 0.6942) was applied to 1993 UGB population 25,396.
3) Population of the area between 1993 city limits and UGB is 25,396 - 17,629 = 7767.
4) Number of Housing Units is population divided by 2.4 persons per household, Ref.#325.

Appendix B, Table B-2 Grants Pass UGB 1993 Small Point Source Determination

Appendix B, Table B-2. Grants Pass UGB 1993 Baseline Annual & Seasonal CO: Area Sources - Small Point Source Determination

Permit #		Plant Site Address	City	Emissions, tons per year (tpy) PSEL	Unasgnd	Actual	SIC Code	Comments
170002	Fourply Inc	124 NE Beacon Dr.	GRANTS PASS	1.3		0.6	2436	Actual CO <5 tpy
170003	Chapel of the Valley Funeral Home	2065 Upper River Rd.	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170008	Grants Pass Moulding Inc.	123 NE Beacon Dr.	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170009	Bentwood Furniture Inc.	310 NW Morgan Lane	GRANTS PASS	0		0		TV Permit for VOC
170013	**Spalding & Son, Incorporated**	**2345 SE 'N' Street**	**GRANTS PASS**	**60**	**0**	**9.0**	**2421**	**Area Source for CO**
170015	Southern Oregon Plywood	605 SE 'J' Street	GRANTS PASS	0		0		CLOSED - Year Unknown
170018	Rough & Ready Lumber Co.	30365 Redwood Hwy.	CAVE JUNCTION	20		40	2421	Outside Grants Pass UGB
170023	Miller Redwood Co.	700 Merlin Road	Merlin	300		134.3	2436	Closed 11/19/93, permit cancelled 2/8/94.
170029	Tim-Ply Co.	111 NE Mill Street	GRANTS PASS	3.6	277.2	3.7	2436	HF Boiler removed in 1992. Unassigned adjusted for total of 99 tpy in 1995. Baseline PSEL 280.8 tpy. Due to the fact that the 1993 PSEL was greater than 100 t/yr, Timply was included in the Point Source inventory.
170030	Stone Forest Industries (Stone Container Corporation)	1090 SE 'M' Street	GRANTS PASS	281	0	171	2436	Major Source of CO, baseline PSEL CO 275tpy
170035	Caveman Lumber Co.	1270 Ort Lane	Merlin	0		0		'B' Source CO emissions are negl.; closed 1996
170040	Riverside Ready Mix, Inc	531 SE Mill Street	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170046	Schrock Cabinet Company	550 SE Mill Street	GRANTS PASS	3		0.09	2434	TV for VOC, Actual CO <5 tpy
170049	Josephine Growers Cooperative Asso	525 NW 'F' Street	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170053	Gary L Peterson	910 SE 'M' Street	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170055	Copeland Paving, Inc.	695 SE 'J' Street	GRANTS PASS	25.4*		0.03	2951	Actual CO <5 tpy.
170057	Riverside Ready Mix, Inc	689 Union Avenue	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170058	Menasha Corp-Wood Fibre	130 NE Beacon Drive	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170062	Hull & Hull Funeral Home	612 NW 'A' Street	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170071	Copeland Paving, Inc.	696 SE 'J' Street	GRANTS PASS	0		0.27	2951	Actual CO <5 tpy
170072	Colvin Oil Company	1044 NE 6TH Street	GRANTS PASS	0		0		'B' Source CO emissions are negligible
170074	Bentwood Furniture, Inc	1080 SE 'M' Street	GRANTS PASS	0		0		TV for VOC, Closed in 1996
170075	Copeland Paving, Inc.	6890 Williams Hwy.	MURPHY	2.5**		0		Outside Grants Pass UGB

1) CE, RE, location, EFs, PTE, PSELs & production levels for TV, SM, & ACDP sources were assembled using permits, annual reports, and personal knowledge of the sources by the DEQ inspector.
2) Some ACDP actual and PSEL emission data were retrieved from ODEQ's Air Contaminant Source Information System (ACSIS).
3) Small CO point sources that are included the Area Source inventory are indicated by gray shading and bold text.
4) RE was determined using EPA-452/R-92-010, "Guidelines For Estimating and Applying Rule Effectiveness (RE) for Base Year Inventories."
5) Small point sources that are included in the Area Source inventory must meet this criteria:
   a) Must be inside the Grants Pass UGB (Urban Growth Boundary); and,
   b) Must have a PSEL Calculated emissions (see note 1) of less than 100 tons/yr and actual emission of greater than 5 tons/yr.

* - PSEL value comes from the permit issued in 1996; earlier permits did not specify a PSEL for CO (baseline year 1978; soil remediation capability was added in the 1991 permit renewal).

** - PSEL value comes from the permit issued in 1998; 1993 permit did not address the CO PSEL.

Appendix B, Table B-3a Residential Open Burning, Legal

Appendix B Table B-3a. Legal Residential Open Burning

Open Burning Season [1]

Inside Grants Pass City Limits — Open Burning Allowed

	1996	1997
January	no burning	no burning
February	no burning	no burning
March	no burning	no burning
April	14	14
May	no burning	no burning
June	no burning	no burning
July	no burning	no burning
August	no burning	no burning
September	no burning	no burning
October	14	14
November	no burning	no burning
December	no burning	no burning
	28	**28**

Permits Issued

	1996	1997	Ave.
Grants Pass FD	153	133	143

Material Loading

Amount of Material/burn[2]	Density[3]			Percentage[4]			Weight[5]			
All legal types	**Wood**	**Brush**	**Leaves**	**Wood**	**Brush**	**Leaves**	**Wood**	**Brush**	**Leaves**	**Total**
3 yd^3	lbs/ft^3	lbs/ft^3	lbs/ft^3	Tons	Tons	Tons	Tons	Tons	Tons	Tons/permit
81 ft^3	9.3	9.3	11.5	30%	40%	30%	0.11	0.15	0.14	0.40

Notes

1) Information on number of permits issued reported directly by Grants Pass FD, located in Ref. 323.
2) Estimated Amount Burned/permit is based on discussions with the Grants Pass FD's Ron Shwartz. Amount burned/permit is an estimate based on observational experience.
3) The Density of the materials are estimates from a table of densities from DEQ, WMC, Solid Waste section, Ref 269.
4) The percentage of each type of material likely to be legally burned/permit is taken from the 93 Medford CO SIP, Appendix B-3 and was estimated by reviewing the violations (Medford) which were issued for burning when the ventillation index is below <400 between 1990-1997.
5) Weight/permit is estimated by multiplying the volume*the density*the percent for each material type. The three material types are summed.

Estimation of Material Density & Emission Factors

	Density[6] (Lbs/ft^3)		EF[7](Lbs/ton)	
Average Wood Burning	9.3	DEQ Solid Waste Recovery Survey Table	148	AP-42, Table 1.9-1 & Section 2.5
Brush/Weeds	9.3	DEQ Solid Waste Recovery Survey Table	118	AP-42 Sections 2.5
Leaves	11.5	DEQ Solid Waste Recovery Survey Table	112	AP-42 Sections 2.5

6) Densities estimated by using a table of densities from Solid Waste, WMC, DEQ and from discussions with Peter Spendelow of the DEQ Solid Waste program (Ref. 269).

7) Emission Factor (EF) calculations based upon AP-42 (Ref. 216), 5th Edition, Sections 1.9 and 2.5.
The Average Wood Burning EF was taken from the average of residential fireplace (252.6 lb/ton, Table 1.9-1), unspecified forest residue (140 lb/ton, Table 2.5-5), and unspecified orchard crops (52 lb/ton, Table 2.5-5).
The average Brush/Weeds EF is taken from Backfire Burning Wild Hay (150 lb/ton, Table 2.5-5) and Unspecified Weeds(85lb/ton, Table 2.5-5).
The EF for Uspecified Leaves is from Table 2.5-6.

Appendix B, Table B-3b: Residential Open Burning, Illegal

Appendix B, Table B-3b. Illegal Residential Open Burning

Documented Open Burning Violations

Grants Pass FD	1996	1997		
January	4	3		
February	2	4		
March	1	7		
April	9	1		
May	4	3		
June	4	2		
July	4	0		
August	1	1		
September	5	4		
October	2	4		
November	2	8		
December	2	4	Aver.	
TOTAL	40	41	41	Burning Violations/yr
Total Documented Violations =			**41**	
Peak Season Violations (Dec-Feb) =			**10**	

Notes:

1) The number of Res open burning violations in the Grants Pass City Limits were reported by the GPFD for 1996 and 1997 (1993 was not available), Ref, 323.
2) The Peak Season violations were the average of 1996 & 1997 violations issued in Dec - Feb.
3) Ron Swartz of Grants Pass FD says the GPFD responds to illegal open burns immediately and has them extinguished. Because of GPFD's vigilance coupled with the small size of the Grants Pass City boundary, the open burn violations reported likely reflect the total number of illegal open burns and no "lack of enforcement" multiplying factor will be applied.

Estimated Material being illegally burned (Medford used as a surrogate)

Approximate percentage of each type of material burned illegally, Reference 263; rounded to the nearest 5%[6].

Wood			Brush/Weeds/paper						Garbage		
Approximate Volumes of Illegal Burn Piles[5]											
Height	Diameter	Volume[5]	Height	Diameter	Volume[5]	Height	Diameter	Volume[5]	Height	Diameter	Volume[5]
ft	ft	ft^3	ft	ft	ft^3	ft	ft	ft^3	ft	ft	ft^3
8	160	*1280*	1	3	5	*12*	12	904	*5*	10	262
15	15	1766	*6*	48	*288*			7	*4*	8	134
2	2	4	1.5	2	3			7	5	300	*1500*
2	5	26	1	2	2	2	2	4	3	400	*1200*
2.5	8	84			7			7	*5*	15	7
3	6	57	2	8	67	1	4	8	2	24	*48*
10	20	2093	2	2	4	1	1	1	1.5	3	7
4	100	*400*			7	2	2	4			7
5.5	120	*660*	4	1	2	12.5	150	*1875*			7
3	6	57	1	1	1	2	20	*40*	3	7	77
		7	6	8	*48*			7	2	4	17
2	3	9	3	3	14	2	12	151			7
		76	3	2	6			7	4	6	75
2	4	17	3	3	14			7			19
1	1	1	3	6	57	2	10	105	4	8	134
2	4	17			7	5	24	*120*			7
1	4	8	2	3	9	2	20	419			7
2	4	17	2	5	26	2	4	17	3	6	57
2	4	17	2	5	26	3	25	*75*	4	8	134
2	10	105	4	4	33	4	10	209	3	10	157
6	100	*600*	3	150	*450*	2	3	9	1	3	5
8	8	268	3	8	100	2	16	*32*	2	4	17
2	3	9	2	4	17	1	3	5	2	3	9
3	3	14	3	6	57	4	15	471	1	5	13
2	6	38	4	8	134	3	10	157			7
			6	14	615	3	25	*75*	2	4	17
			2	42	*84*	6	4	50			7
			2	3	9	3	40	*120*	1.5	6	28
			2	4	17	1	3	5			7
			2	4	17	2	2	4			7
			2	4	17	2	20	*40*			7
			1	15	*15*	2	4	17			7
			2	2	4	2	4	17	2	4	17
			4	10	209	2	4	17	1	4	8
			4	15	471	1	2	2			7
			4	8	134	1	2	2	3	20	628
			5	10	262				2	12	151
			2	4	17				*3*	6	57
					6				4	8	134
			2	3	9						7
			2	4	17						7
			1	1	1						7
					7						7
			1	2	2				5	24	*120*
			1	10	52				1	4	8

			4	180	*720*					3	6	57	
			2	30	*60*					2.5	150	*375*	
			1	3	5					1	12	*12*	
			2	5	26							*7*	
			2	4	17							*7*	
			2	4	17					1	3	5	
			2	4	17							*7*	
	count	25					count	88			count	52	
Average burn volume		305	ft^3/burn			ft^3	**average**	105	ft^3		**average**	108	ft^3
Weight of Material Burned													
density[8]		9	Lbs/ft^3					9	Lbs/ft^3			11	Lbs/ft^3
Average burn weight		1.4	Tons/burn					0.5	Tons/burn			0.6	Tons/burn
													Tons/burn
											Average		0.8

4) Due to the lack of detailed violation information for Grants Pass, the illegal burning violations reported for the 1993 Medford CO SIP are used as a material loading surrogate.
5) The average volume of illegal burning violations was estimated from pile diameters and heights reported on the Jackson Co. Health and Human Services Documented Violation Summary for 1990-1997 (Ref. 263).
Pile dimensions for violations issued in Medford and Central Point were used. Central Point was included because Medford violations alone did not provide enough information to estimate average volumes for wood. The pile volumes were calculated using a 1/2 spheroid formula, the barrel is 7.43 ft^3.
6) The approximate percentage of each category of material illegally burned in Medford was estimated by counting the violations where the material burned was documented, determining the percentage, and rounding the percentage to the nearest 5%, Appendix B-3 (Material Types Burned).
7) The Italicized pile heights were not reported and are estimated assuming that the height is roughly 1/2 the pile diameter.
8) Density of the different categories of solid waste was estimated after discussion with the DEQ solid waste department and using a DEQ solid waste density conversion table (Ref. 269).

Density and Emission Factor Estimates

	Density[9] (Lbs/ft^3)		EF[10](Lbs/ton)		
Average Wood Burning	9.3	DEQ Solid Waste Recovery Survey Table	148	AP-42, Table 1.9-1 & Section 2.5	
Brush/Weeds	9.3	DEQ Solid Waste Recovery Survey Table	118	AP-42	Section 2.5, Table 2.5-5
Leaves	11.5	DEQ Solid Waste Recovery Survey Table	112	AP-42	Sections 2.5, Table 2.5-5
Municipal Waste (Garbage)	11	DEQ, WMC, Solid Waste Section, Peter Spendelow	85	AP-42	Sections 2.5, Table 2.5-5

9) Densities estimated by using a table of densities from Solid Waste, WMC, DEQ and from discussions with Peter Spendelow of the DEQ Solid Waste program (Ref. 269).
10) EFs estimated by using similar categories from the 5th edition of AP-42, Tables 1.9-1, 2.5-1, 2.5-5, 2.5-6, (Ref. 216).
The Average wood burning EF was taken from the average of residential fireplace (252.6 lb/ton, Table 1.9-1), unspecified forest residue (140 lb/ton, Table 2.5-5), and unspecified orchard crops (52 lb/ton, Table 2.5-5).
The average Brush/Weeds EF is taken from Backfire Burning Wild Hay (150 lb/ton, Table 2.5-5) and Unspecified Weeds(85lb/ton, Table 2.5-5).
The EF for uspecified leaves is from Table 2.5-6.
The EF for municipal waste is from Table 2.5-1.

Appendix B, Table B-3c: Material Residentially Open Burned

Appendix B, Table B-3c. Percent of Each Category of Material Residential Open Burned

Legal

hay	leaves	paper	wood	brush
	5	1	4	6

Category	Material	# of Burns	% of open burns	% rounded to nearest 10%
Leaves:	(Leaves & Hay)	5	31%	30%
Wood:	(Wood)	4	25%	30%
Brush:	(Brush & Paper)	7	44%	40%

Illegal

hay	leaves	paper	wood	brush	garbage	oil/diesel	pine needles	
3	19	6	13	21	20	0	1	rounded to nearest 5

Category	Material	# of Burns	% of open burns	% rounded to nearest 10%
Leaves:	(Leaves & Hay)	22	27%	30%
Wood:	(Wood)	13	16%	20%
Brush:	(Brush & Paper)	27	33%	30%
Garbage:	(Garbage)	20	24%	20%

1) Because Grants Pass violations report does not specify the type of material burned for each violation, the percentage of materials burned used in the Medford 1993 CO SIP will be used as a surrogate.
2) This Spreadsheet summarizes the rough estimate of the percentage of open burning for the various types of material being burned.
3) The estimate was made by counting the illegal burns from the violation summary (Ref. 263).
4) The legal burns were estimated by only counting burns which would have been legal except the ventilation index was below 400. Material was grouped according to similar densities and emission factors. Violations issued for Medford addresses for all years were used.

Appendix B, Table B-4: Grants Pass UGB SIC Population Estimates

Appendix B, Table B-4. 1993 Grants Pass UGB SIC Population Estimates

Commercial (SIC 50-99)[1,2]

Category	SIC	Grants Pass UGB
Retail Trade	52 - 59 & 07-14	**4,337**
Services	70 - 81 & 83 - 89	**4,832**
Educational	82	**372**
Government	91 - 98	**975**
Other	50 - 51 & 07-14	**904**
	Total	**11,420**

Industrial (SIC 20-39)[1,3]

Category	SIC	Grants Pass UGB
Manufacturing	20 - 39	**2,958**
	Total	**2,958**

Notes:

1) Data on UGB employment is from Rogue Valley Council of Governments (Ref. 326).
Data provided in Ref 326 for the category "Other " includes Agricultural employees (SIC 07 - 14) and Wholesale employees (SIC 50 - 51).
SIC codes selected are the same as Commercial and Industrial SIC codes suggested in the EPA document "The Procedure For The Preparation of EI For CO and Precursors of Ozone" (Ref. 2a).
2) Data on UGB employment in these commercial SIC categories is from Rogue Valley Council of Governments (Ref. 326).

3) Data on UGB employment in these Industrial SIC categories is from Rogue Valley Council of Governments (Ref. 326).

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Appendix B, Table B-5: Fossil Fuel Consumption Estimates

Appendix B, Table B-5. Fossil Fuel Consumption Estimates: Grants Pass UGB, 1993

Source Type		Distillate Fuel Oil (10^3 br)	(2) Distillate Fuel Oil (10^3 gal)	Residual Fuel Oil (10^3 br)	(2) Residual Fuel Oil (10^3 gal)	Kerosene (10^3 br)	(2) Kerosene (10^3 gal)	LPG (10^3 br)	(2) LPG (10^3 gal)	Natural Gas (10^9 ft^3)	(3) Natural Gas (10^6 ft^3)	Population
STATE-WIDE USE (ALL FUELS)												(1993)
Oregon (4)												3,038,000
1993	SCC											
Residential (1)	21-04-004-000	1,036	43,512	0	0	18	756	483	20,286	30	30,000	
Commercial (1)	21-03-004-000	548	23,016	175	7,350	11	462	85	3,570	24	24,000	
Industrial (1)	21-02-004-000	2,433	102,186	677	28,434	12	504	850	35,700	61	61,000	
RESIDENTIAL USE (5)												(1993)
Grants Pass UGB (1993)			364		0		6		170		251	25,396
COMMERCIAL/INSTITUTIONAL USE (6)												(SIC 50-99,1993) 732,206
Grants Pass UGB (1993)			359		115		7		56		374	11,420
INDUSTRIAL USE (7)												(SIC 20-39,1993) 210,957
Grants Pass UGB (1993)			1,433		399		7		501		855	2,958

Notes:

1) 1993 fuel consumption data from Tables 240-242, "State Energy Data Report 1993: Consumption Estimates" (Ref. 24).
2) Oil Use [10^3 Gallons] = (Oil Use [10^3 Barrels]) * (42 [gallons/barrel])
   Kerosene Use [10^3 Gallons[= (Kerosene Use [10^3 Barrels]) * (42 [gallons/barrel)
   Residual fuel oil is generally used by industry and not used for residential heating, therefore gallons used is set to zero.
   LPG Use [10^3 Gallons] = (LPG Use [10^3 Barrels]) * (42 [gallons/barrel])
3) Natural Gas usage in billion cubic feet (10^9) * 1000 = million cubic feet (10^6).
4) 1993 State population based on census data from Portland State University, Center for Population Research and Census document entitled *Population Estimates For Oregon: July1, 1996* (Ref. 272).
5) 1993 Grants Pass UGB population from Rogue Valley Council of Governments (Ref. 325) [see Appendix B, Table B-1].
6) UGB Commercial/Institutional Use = State Commercial Use * (Grants Pass UGB SIC Commercial population / State SIC Commercial population)
   Top figure is State-wide SIC 50-99 Commercial employees from County Business Patterns, 1993 Oregon (Ref. 240).
   Bottom figure is the 1993 Grants Pass UGB SIC Commercial population estimate from RVCOG data (Ref. 326) (See Appendix B, Table B-4).
7) UGB Industrial Use = State Industrial Use * (Grants Pass UBG SIC Industrial population / State SIC Industrial population)
   Top figure is State-wide SIC 20-39 Industrial employees from County Business Patterns, 1993 Oregon (Ref. 240).
   Bottom figure is the 1993 Grants Pass UGB SIC Industrial population estimate from RVCOG data (Ref. 326) (See Appendix B, Table B-4).

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Appendix B, Table B-6: 1993 Grants Pass Residential Wood Fuel Use Estimates

Appendix B, Table B-6. Grants Pass Residential Wood Fuel Use Estimates

	Grants Pass UGB Survey Year 1993		Grants Pass UGB Inventory Year 1993
SURVEY DATA (1):		SURVEY DATA APPLIED TO GRANTS PASS:	
	40.5%	Grants Pass Housing Units (HU) (6)	10,582
Woodburning HU with Fireplace (No Insert), Q9	26.5%	HDD [winter] - Inventory Year/Area = 1993/Grants Pass (7)	4748
Woodburning HU with Wood Stove (Certified), Q9	31.7%	HDD [winter] - Survey Year/Area = 1993/Grants Pass (7)	4748
Woodburning HU with Wood Stove (Non-certified), Q9 (2)	22.6%		
Woodburning HU with Fireplace Insert (Non-certified), Q9	15.2%	Tons/Cord of Wood (8)	1.72
Woodburning HU with Pellet Stove, Q9	3.9%	Tons/Ton Pellets (9)	1.0
Total	100%		
SURVEY DATA APPLIED TO Grants Pass UGB:		Grants Pass Cords Burned per HU (10)	
Woodburning HU (Fireplace)	26.5%	Cords Burned per HU (Fireplace)	0.78
Woodburning HU (Certified Catalytic Wood Stove) (3)	7.9%	Cords Burned per HU (Certified Catalytic W/S)	1.76
Woodburning HU (Certified Non-Cat Wood Stove) (3)	23.8%	Cords Burned per HU (Certified Non-Cat. W/S)	1.76
Woodburning HU (Non-Certified Wood Stove or FP Insert)	37.8%	Cords Burned per HU (Conv. Wood Stove or FP Insert)	1.90
Woodburning HU (Pellet Stove)	3.9%	Tons of Pellets Burned per HU (Pellet Stove)	2.0
Total % Woodburning Devices	100%		
Distribution to UGB Housing (4)		Grants Pass, Tons of Wood Fuel Burned (11)	
UGB HU (Fireplace)	10.7%	Tons Burned from Fireplace	1,518
UGB HU (Certified Catalytic Wood Stove)	3.2%	Tons Burned from Cert. Catalytic. W/S	1,024
UGB HU (Certified Non-Cat Wood Stove)	9.6%	Tons Burned from Cert. Non-Cat W/S	3,071
UGB HU (Conventional Wood Stove or FP Insert)	15.3%	Tons Burned Conventional W/S or FP Insert	5,290
UGB HU (Pellet Stove)	1.6%	Tons Burned from Pellet Stove (12)	334
Total % HUs w/Woodburning Devices	40.5%	Total Grants Pass Tons Wood Burned	11,238
Cords Burned per each UGB HU (5)	0.60		
Cords Burned per HU (Fireplace)	0.60		
Cords Burned per HU (Certified Catalytic W/S)	0.60		
Cords Burned per HU (Certified Non-Cat. W/S)	0.60		
Cords Burned per HU (Conv. Wood Stove or FP Insert)	0.60		
Tons of Pellets Burned per each UGB HU (Pellet Stove)(5)	1.0		

Notes:
1) Data from the "Oregon DEQ Wood Heating Survey, 1993" (Ref. 115).
2) Wood Stoves include woodburning furnaces, cookstoves, and other woodburning devices not used for home heating.
3) There were no specific survey questions to estimate the number of catalytic stoves in the inventory area. It is estimated that 25% of all certified stoves are catalytic and 75% are non-catalytic.
HU with Certified Catalytic Stoves = (HU with Certified Stoves) * (0.25) *AND* HU with Certified Catalytic Stoves = (HU with Certified Stoves) * (0.75);
4) UGB HU [for each device type] (%) = (Woodburning HU [device type] (%)) * (UGB Housing Units Burning Wood (%))
5) Cords burned per each UGB HU including non-wood burners for 1993 is a weighted average for each device.
Estimated based upon "Oregon DEQ Wood Heating Survey, 1993" (Ref. 115).
6) Grants Pass Housing Unit data from Rogue Valley COG (See Appendix B, Table B-1).
7) Data for Heating Degree Days (HDD) are from "Climatological Data Annual Summary, Oregon, 1993" (Ref. 93). See Appendix B, Table B-9.
8) Fuel loading based upon DEQ estimate for typical cord wood mixture from "Oregon DEQ Wood Heating Survey, 1993" (Ref. 115), question #15. See Appendix B, Table B-7.
9) Wood pellets for pellet stoves used for home heating are sold by the ton in plastic bags. One ton of pellets = 2000 pounds.
10) Cords burned per a single wood burning housing for 1993 is a weighted average for each device (see calculations on page 2).
11) Grants Pass Tons Burned in wood stove devices = (UGB Cords Burned per HU[for device]) * (Tons/Cord of wood) * (Number of GP Housing Units) * (UGB HU [for device] %)
12) Grants Pass Tons Burned in Pellet Stoves = (Tons Pellets Burned per HU[for pellet stoves]) * (Tons/Ton pellets) * (Number of GP Housing Units) * (UGB HU [for pellet stoves]) %

Cords of Wood or Tons of Pellets Burned Per Housing Unit :

Grants Pass UGB

ALL ZIP CODES

Fireplaces (No Insert) — Survey Cord Wood Use

	(1) Respondents	(2) Cords Burned	(3) Weight	(1) Respondents	(2a) Modified Cords Burned	(3) Weight
				38	0.5	19
	50	1	50	13	1	13
	5	2	10	5	2	10
	0	3	0	0	3	0
	1	4	4	1	4	2
	0	5	0	0	5	0
Totals	56		64	56		43
		Weighted Average =	1.1	Modified w. average =		0.8
			cords/season		modified cords/season	

Certified Wood Stove — Survey Cord Wood Use

	(1) Respondents	(2) Cords Burned	(3) Weight
	34	1	34
	24	2	48
	8	3	24
	3	4	12
	1	5	5
Totals	70		123
		Weighted Average =	1.8
		cords/season	

Fireplace Inserts & Conv. (Non-Certified) Wood Stove — Survey Cord Wood Use

	(1) Respondents	(2) Cords Burned	(3) Weight
	36	1	36
	23	2	46
	21	3	63
	2	4	8
	1	5	5
Totals	83		158
		Weighted Average =	1.9
			cords/season

Survey Tons of Pellets Used

	(4) Respondents	(5) Tons Burned	(6) Weight
	2	1	2
	1	2	2
	0	3	0
	1	4	4
	0	5	0
Totals	4		8
		Weighted Average =	2.0
			tons/season

Notes:

1) Number of "respondents" for cords of wood burned during the current heating season.
Data from Question #9 Cross-Tabulations (All zip code)) of "DEQ Grantas Pass UGB Woodheating Survey, 1993" (Ref. 115).

2) "Cords" of wood burned during the current heating season.
Data from Question #9 Cross-Tabulations (All Zip Codes) of "DEQ Grants Pass UGB Woodheating Survey, 1993" (Ref. 115).

2a) Survey questions asks for 1 cord or less. The assumption is made here is that the majority of repondents burn less than one cord in a fireplace.
Distribution assigned was 75% at one-half cord/year and 25% at one cord per year. (This assumes that most fireplace burning is recreational only.)

3) Weight = ((number of "respondents") * (number of "cords burned"))

4) Number of "respondents" for pellet stove device.
Data from Question #9 Tabulations of "DEQ Grants Pass UGB Woodheating Survey, 1993" (Ref. 115).

5) "Tons of Pellets" burned during the current heating season.
Data from Question #14 Tabulations of "DEQ Grants Pass UGB Woodheating Survey, 1993" (Ref. 115).
It is assumed that 1 ton of pellets is equivalent to 1 cord of wood and weighs 2000 pounds.

6) Weight = ((number of "respondents") * ("tons of pellets" burned))

Appendix B, Table B-7: Wood Heating Survey Cordwood Usage Evaluation

Appendix B, Table B-7 Grants Pass 1993 Wood Heating Survey Notes

CORDS BURNED PER HOUSING UNIT PER WOOD HEATING DEVICE IN GRANTS PASS UGB, 1993

Data from the "Oregon DEQ Woodstove Survey, 1992/93" (Ref 115).
Cords burned based upon weighted average using survey answer frequency (survey question 14) as follows:

Number of Cords Burned	Percent (Q14)	frequency	multiplier
1	56.3	129	129
2	25.3	58	116
3	14	32	96
4	3.5	8	32
5	0.9	2	10
Total		229	383

229 is the total frequency taken from Ref 115, Appendix C1;
frequency per cord burned = percent * 229 (tot. frequency);
multiplier = (# cords burned during heating season)*(frequency per cord burned);
Cords per HU = (total frequency)/(multiplier) = 229/383
Cords per HU = 0.60

FUEL LOADING ANALYSIS FOR GRANTS PASS UGB

Wood Type	(a) Percent of Cord Usage	(b) Typical Cord Usage Corrected	(c) Wood Density (lbs/ft3)	(d) Cord Density (lbs/cord)	(e) Typical Cord Weight (lbs/cord)	(f) Cord Weight (tons/cord)
Douglas Fir	7.7%	9.3%	32	2,560	238	0.12
Pine	0.0%	0.0%	40	3,200	0	0.00
Oak	4.9%	5.9%	45	3,600	213	0.11
Maple	0.0%	0.0%	38	3,040	0	0.00
Cedar	0.0%	0.0%	29	2,320	0	0.00
Madrone/Tamarack	35.6%	42.9%	48	3,840	1649	0.82
Lumber and Mill Scraps	14.0%	16.9%	32	2,560	432	0.22
Other (mostly hardwood)	20.7%	25.0%	45	3,600	899	0.45
Alder	0.0%	0.0%	38	3,040	0	0.00
Total	83%	100%			3,431	1.72

(a) Percent of Cord Usage are the results of the 1993 Wood Heating Survey data for Grants Pass (Question #15). Specifically, shown are the percent of respondents indicating the wood species which makes up 76% -100% of their wood usage. It is assumed that those who use less than 76% of each species of wood are using a higher % of another indicated wood species.

(b) Usage is adjusted to 100% to reflect a typical species mix cord of wood in the Grants Pass Area.
Typical Cord Usage Distribution Corrected = The percent of respondents indicating the wood species which makes up 76% -100% of their wood usage/Total percent of respondents.

For example: 7.7% of the respondents use Douglas Fir 76% - 100% of the time they use wood;
Total percent of respondents is 83%;
Typical Cord Usage Distribution Corrected (for Douglas Fir) is 7.7% / 83% = 9.3%.

(c) Air Dried Wood Density is from AP-42, Fourth Edition (Ref. 8), Pg. A-5 . Wood density for Pine is based upon Southern Pine; Oak density is the average of Red Oak & White Oak; Maple density is the average of Sugar Maple & White Maple; Cedar density is assumed to be similar to Hemlock; Madrone/Tamarack density is assumed to be the same as Hickory.

(d) A cord of wood has a volume of 128 ft^3. However, it is estimated that 80 ft^3 of the volume is occupied by wood mass (Ref. 278).
Lbs/Cord = (air dried wood density [lbs/ft^3]) * (80 [ft^3/cord])

(e) Estimated Weight a Typical Cord of Wood in Grants Pass (lbs/cord) = Cord Density (lbs/cord) * Typical Cord Percent

(f) Tons/Cord = (Lbs/Cord) / (2000 lbs/ton)

Appendix B, Table B-8: Climatological Data , Grants Pass

Appendix B, Table B-8 Monthly Heating Degree Days for Grants Pass

	Grants Pass						
Month	1990	1991	1992	1993	1994	1995	1996
	Heating Degree Days						
Jan	707	797	747	822	710	679	712
Feb	636	438	504	676	630	449	526
Mar	442	586	432	414	510	589	522
Apr	0	434	292	421	387	459	398
May	246	0	111	216	197	260	318
Jun	66	134	58	129	127	157	112
Jul	1	4	19	65	4	19	13
Aug	13	13	12	44	4	54	22
Sept	3	43	98	117	69	37	158
Oct	268	254	272	258	402	356	350
Nov	575	494	590	764	776	439	558
Dec	951	777	806	822	1,169	647	729
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Total	3,908	3,974	3,941	4,748	4,985	4,145	4,418

Notes:

1) The source of data is "Climatological Data Annual Summary, Oregon" (Ref. 93).

APPENDIX C: NON-ROAD MOBILE

Appendix C, Table C-1: Non-Road Engine Emission Inventories for CO and Ozone Nonattainment Areas (Spokane, Washington), 2-cycle, 4-cycle, and diesel

Appendix C, Table C-2: Calculations of 1993 Fuel Use by Railroad Line Haul Operations

Appendix C, Table C-3: Calculations of 1993 Fuel Use by Railroad Yard Operations

Appendix C, Table C-1: Non-Road Engine Emission Inventories for CO and Ozone Nonattainment Areas (Spokane, Washington), 2-cycle, 4-cycle, and diesel

Appendix C, Table C-1. NONROAD ENGINE EMISSION INVENTORIES FOR CO AND OZONE NONATTAINMENT BOUNDARIES,

Spokane, Washington (Average Inventory [A+B/2]):

Emissions and Seasonal Adjustment Factors

Adapted from EPA Nonroad Engine and Vehicle Emission Study - Report

EPA-21A-2001, November 1991 (Ref. 51a, and 51c)

Engine Type: 2-Stroke Gasoline	CO	CO		PM	PM	(2)	(2)	(2)	OZONE	CO	PM
	(CO Area)	(O3 Area)	NOx	(O3 Area)	(CO Area)	VOC	CO tpwd	CO tpsd	SAF	SAF	SAF
	Tons/year	Tons/year	Tons/year	Tons/year	Tons/year	tpsd	(CO Area)	(O3 Area)	(3)	(4)	(5)
Lawn and garden category											
Trimmers/Edgers/Brush Cutters	194	0	0	0	1	0.00	0.00	0.00			
Lawn Mowers	501	0	0	0	4	0.00	0.00	0.00			
Leaf Blowers/Vacuums	70	0	0	0	0	0.00	0.00	0.00			
Rear Engine Riding Mowers	0	0	0	0	0	0.00	0.00	0.00			
Front Mowers	0	0	0	0	0	0.00	0.00	0.00			
Chainsaw < 4 HP	415	0	0	0	1	0.00	0.00	0.00			
Shredder <5 HP	0	0	0	0	0	0.00	0.00	0.00			
Tillers < 5 HP	1	0	0	0	0	0.00	0.00	0.00			
Lawn & Garden Tractors	0	0	0	0	0	0.00	0.00	0.00			
Wood Splitters	0	0	0	0	0	0.00	0.00	0.00			
Snowblowers	4	0	0	0	0	0.00	0.04	0.00			
Chippers/Stump Grinders	0	0	0	0	0	0.00	0.00	0.00			
Commercial Turf Equipment	0	0	0	0	0	0.00	0.00	0.00			
Other Lawn & Garden Equipment	5	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	1,190	0	0	0	6	0.00	0.04	0.00	#DIV/0!	0.01	1.32
									"Division by 0"		
Airport Services Category											
Aircraft Support Equipment	0	0	0	0	0	0.00	0.00	0.00			
Terminal Tractors	1	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	1	0	0	0	0	0.00	0.00	0.00	#DIV/0!	0.00	#DIV/0!
									"Division by 0"		
Recreational Equipment Category											
All Terain Vehicles (ATV's)	0	0	0	0	0	0.00	0.00	0.00			
Minibikes	0	0	0	0	0	0.00	0.00	0.00			
Off-Road Motorcycles	0	0	0	0	0	0.00	0.00	0.00			

Golf Carts	0	0	0	0	0	0.00	0.00	0.00			
Snowmobiles	0	0	0	0	0	0.00	0.00	0.00			
Specialty Vehicle Carts	0	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
Recreational Marine Category											
Vessels w/Inboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Vessels w/Outboard Engines	78	0	0	0	2	0.00	0.00	0.00			
Vessels w/Sterndrive Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Inboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Outboard Engines	0	0	0	0	0	0.00	0.00	0.00			
	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------
CATEGORY TTL	78	0	0	0	2	0.00	0.00	0.00	#DIV/0!	0.00	1.32
									"Division by 0"		
Light Commercial Equipment Category											
Generator Sets	134	0	0	0	1	0.00	0.37	0.00			
Pumps	19	0	0	0	0	0.00	0.05	0.00			
Air Compressors	0	0	0	0	0	0.00	0.00	0.00			
Gas Compressors	0	0	0	0	0	0.00	0.00	0.00			
Welders	0	0	0	0	0	0.00	0.00	0.00			
Pressure Washers	0	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	153	0	0	0	1	0.00	0.42	0.00	#DIV/0!	0.99	1.32
									"Division by 0"		
Industrial Category											
Aerial Lifts	4	0	0	0	0	0.00	0.01	0.00			
Forklifts	169	0	0	0	0	0.00	0.46	0.00			
Sweepers/Scrubbers	7	0	0	0	0	0.00	0.02	0.00			
Other General Industrial Equipment	5	0	0	0	0	0.00	0.02	0.00			
Other Material Handling Equipment	0	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	185	0	0	0	0	0.00	0.51	0.00	#DIV/0!	0.99	#DIV/0!
									"Division by 0"		
Construction Equipment Category											
Asphalt Pavers	0	0	0	0	0	0.00	0.00	0.00			
Tampers/Rammers	6	0	0	0	0	0.00	0.01	0.00			
Plate Compactors	8	0	0	0	0	0.00	0.01	0.00			

Concrete Pavers	0	0	0	0	0	0.00	0.00	0.00			
Rollers	0	0	0	0	0	0.00	0.00	0.00			
Scrappers	0	0	0	0	0	0.00	0.00	0.00			
Paving Equipment	6	0	0	0	0	0.00	0.01	0.00			
Surfacing Equipment	0	0	0	0	0	0.00	0.00	0.00			
Signal Boards	0	0	0	0	0	0.00	0.00	0.00			
Trenchers	0	0	0	0	0	0.00	0.00	0.00			
Bore/Drill Rigs	0	0	0	0	0	0.00	0.00	0.00			
Excavators	0	0	0	0	0	0.00	0.00	0.00			
Concrete/Industrial Saws	0	0	0	0	0	0.00	0.00	0.00			
Cementand Mortar Mixers	0	0	0	0	0	0.00	0.00	0.00			
Cranes	0	0	0	0	0	0.00	0.00	0.00			
Graders	0	0	0	0	0	0.00	0.00	0.00			
Off-Highway Trucks	0	0	0	0	0	0.00	0.00	0.00			
Crushing/Proc. Equip.	0	0	0	0	0	0.00	0.00	0.00			
Rough Terrain Forklifts	0	0	0	0	0	0.00	0.00	0.00			
Rubber Tired Loaders	0	0	0	0	0	0.00	0.00	0.00			
Rubber Tired Dozers	0	0	0	0	0	0.00	0.00	0.00			
Tractors/Loaders/Backhoes	0	0	0	0	0	0.00	0.00	0.00			
Crawlers	0	0	0	0	0	0.00	0.00	0.00			
Skid Steer Loaders	0	0	0	0	0	0.00	0.00	0.00			
Off-Highway Tractors	0	0	0	0	0	0.00	0.00	0.00			
Dumpers/Tenders	0	0	0	0	0	0.00	0.00	0.00			
Other Construction Equipment	0	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	20	0	0	0	0	0.00	0.03	0.00	#DIV/0!	0.54	#DIV/0!
									"Division by 0"		
<u>Agricultural Equipment Category</u>											
2-Wheel Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Mowers	0	0	0	0	0	0.00	0.00	0.00			
Combines	0	0	0	0	0	0.00	0.00	0.00			
Sprayers	0	0	0	0	0	0.00	0.00	0.00			
Balers	0	0	0	0	0	0.00	0.00	0.00			
Tillers >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Swathers	0	0	0	0	0	0.00	0.00	0.00			
Hydro Power Units	0	0	0	0	0	0.00	0.00	0.00			
Other Agricultural Equipment	0	0	0	0	0	0.00	0.00	0.00			

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CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
Logging Equipment Category											
Chainsaws >4 HP	0	0	0	0	0	0.00	0.00	0.00			
Shredders >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Skidders	0	0	0	0	0	0.00	0.00	0.00			
Fellers/Bunchers	0	0	0	0	0	0.00	0.00				
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
TOTAL 2 CYCLE EQUIPMENT	1,627	0	0	0	9	0.00	1.00	0.00	#DIV/0!	0.22	1.32
									"Division by 0"		

Engine Type: 4-Stroke Gasoline	CO	CO		PM	PM				OZONE	CO	PM
	(CO Area)	(O3 Area)	NOx	(O3 Area)	(CO Area)	VOC	CO tpwd	CO tpsd	SAF	SAF	SAF
	Tons/year	Tons/year	Tons/year	Tons/year	Tons/year	tpsd	(CO Area)	(O3 Area)	(1)	(2)	(3)
Lawn and Garden Category											
Trimmers/Edgers/Brush Cutters	0	0	0	0	0	0.00	0.00	0.00			
Lawn Mowers	3,201	0	0	0	10	0.00	0.00	0.00			
Leaf Blowers/Vacuums	0	0	0	0	0	0.00	0.00	0.00			
Rear Engine Riding Mowers	234	0	0	0	0	0.00	0.00	0.00			
Front Mowers	66	0	0	0	0	0.00	0.00	0.00			
Chainsaw < 4 HP	0	0	0	0	0	0.00	0.00	0.00			
Shredder <5 HP	5	0	0	0	0	0.00	0.00	0.00			
Tillers < 5 HP	262	0	0	0	1	0.00	0.00	0.00			
Lawn & Garden Tractors	1,052	0	0	0	1	0.00	0.00	0.00			
Wood Splitters	28	0	0	0	0	0.00	0.00	0.00			
Snowblowers	10	0	0	0	0	0.00	0.11	0.00			
Chippers/Stump Grinders	123	0	0	0	0	0.00	0.00	0.00			
Commercial Turf Equipment	1,658	0	0	0	1	0.00	0.00	0.00			
Other Lawn & Garden Equipment	11	0	0	0	0	0.00	0.00	0.00			
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CATEGORY TTL	6,650	0	0	0	13	0.00	0.11	0.00	#DIV/0!	0.01	1.32
									"Division by 0"		
Airport Services Category											
Aircraft Support Equipment	22	0	0	0	0	0.00	0.06	0.00			
Terminal Tractors	163	0	0	0	0	0.00	0.45	0.00			

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CATEGORY TTL	185	0	0	0	0	0.00	0.51	0.00	#DIV/0!	0.99	#DIV/0!
									"Division by 0"		
Recreational Equipment Category											
All Terain Vehicles (ATV's)	0	0	0	0	0	0.00	0.00	0.00			
Minibikes	0	0	0	0	0	0.00	0.00	0.00			
Off-Road Motorcycles	0	0	0	0	0	0.00	0.00	0.00			
Golf Carts	0	0	0	0	0	0.00	0.00	0.00			
Snowmobiles	0	0	0	0	0	0.00	0.00	0.00			
Specialty Vehicle Carts	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
Recreational Marine Category											
Vessels w/Inboard Engines	57	0	0	0	0	0.00	0.00	0.00			
Vessels w/Outboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Vessels w/Sterndrive Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Inboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Outboard Engines	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	57	0	0	0	0	0.00	0.00	0.00	#DIV/0!	0.00	#DIV/0!
									"Division by 0"		
Light Commercial Equipment Category											
Generator Sets	1,898	0	0	0	1	0.00	5.20	0.00			
Pumps	371	0	0	0	0	0.00	1.02	0.00			
Air Compressors	250	0	0	0	0	0.00	0.68	0.00			
Gas Compressors	0	0	0	0	0	0.00	0.00	0.00			
Welders	370	0	0	0	0	0.00	1.01	0.00			
Pressure Washers	112	0	0	0	0	0.00	0.31	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	3,001	0	0	0	1	0.00	8.22	0.00	#DIV/0!	0.99	1.32
									"Division by 0"		
Industrial Category											
Aerial lifts	91	0	0	0	0	0.00	0.25	0.00			
Forklifts	448	0	0	0	0	0.00	1.23	0.00			
Sweepers/Scrubbers	42	0	0	0	0	0.00	0.11	0.00			
Other General Industrial Equipment	25	0	0	0	0	0.00	0.07	0.00			
Other Material Handling Equipment	4	0	0	0	0	0.00	0.01	0.00			

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CATEGORY TTL	610	0	0	0	0	0.00	1.67	0.00	#DIV/0!	0.99	#DIV/0!
									"Division by 0"		
Construction Equipment Category											
Asphalt Pavers	2	0	0	0	0	0.00	0.00	0.00			
Tampers/Rammers	0	0	0	0	0	0.00	0.00	0.00			
Plate Compactors	14	0	0	0	0	0.00	0.02	0.00			
Concrete Pavers	0	0	0	0	0	0.00	0.00	0.00			
Rollers	21	0	0	0	0	0.00	0.02	0.00			
Scrapers	0	0	0	0	0	0.00	0.00	0.00			
Paving Equipment	44	0	0	0	0	0.00	0.05	0.00			
Surfacing Equipment	15	0	0	0	0	0.00	0.02	0.00			
Signal Boards	0	0	0	0	0	0.00	0.00	0.00			
Trenchers	20	0	0	0	0	0.00	0.02	0.00			
Bore/Drill Rigs	7	0	0	0	0	0.00	0.01	0.00			
Excavators	0	0	0	0	0	0.00	0.00	0.00			
Concrete/Industrial Saws	66	0	0	0	0	0.00	0.07	0.00			
Cementand Mortar Mixers	22	0	0	0	0	0.00	0.02	0.00			
Cranes	6	0	0	0	0	0.00	0.01	0.00			
Graders	0	0	0	0	0	0.00	0.00	0.00			
Off-Highway Trucks	0	0	0	0	0	0.00	0.00	0.00			
Crushing/Proc. Equip.	2	0	0	0	0	0.00	0.00	0.00			
Rough Terrain Forklifts	4	0	0	0	0	0.00	0.00	0.00			
Rubber Tired Loaders	6	0	0	0	0	0.00	0.01	0.00			
Rubber Tired Dozers	0	0	0	0	0	0.00	0.00	0.00			
Tractors/Loaders/Backhoes	3	0	0	0	0	0.00	0.00	0.00			
Crawlers	0	0	0	0	0	0.00	0.00	0.00			
Skid Steer Loaders	15	0	0	0	0	0.00	0.02	0.00			
Off-Highway Tractors	0	0	0	0	0	0.00	0.00	0.00			
Dumpers/Tenders	3	0	0	0	0	0.00	0.00	0.00			
Other Construction Equipment	5	0	0	0	0	0.00	0.01	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	255	0	0	0	0	0.00	0.28	0.00	#DIV/0!	0.40	#DIV/0!
									"Division by 0"		
Agricultural Equipment Category											
2-Wheel Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Mowers	0	0	0	0	0	0.00	0.00	0.00			

Combines	0	0	0	0	0	0.00	0.00	0.00			
Sprayers	0	0	0	0	0	0.00	0.00	0.00			
Balers	0	0	0	0	0	0.00	0.00	0.00			
Tillers >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Swathers	0	0	0	0	0	0.00	0.00	0.00			
Hydro Power Units	0	0	0	0	0	0.00	0.00	0.00			
Other Agricultural Equipment	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
Logging Equipment Category									"Division by 0"		
Chainsaws >4 HP	0	0	0	0	0	0.00	0.00	0.00			
Shredders >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Skidders	0	0	0	0	0	0.00	0.00	0.00			
Fellers/Bunchers	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
TOTAL 4 CYCLE EQUIPMENT	10,758	0	0	0	14	0.00	10.79	0.00	#DIV/0!	0.36	1.32
									"Division by 0"		
Engine Type: Diesel	CO	CO		PM	PM				OZONE	CO	PM
	(CO Area)	(O3 Area)	NOx	(O3 Area)	(CO Area)	VOC	CO tpwd	CO tpsd	SAF	SAF	SAF
	Tons/year	Tons/year	Tons/year	Tons/year	Tons/year	tpsd	(CO Area)	(O3 Area)	(1)	(2)	(3)
Lawn and Garden Category											
Trimmers/Edgers/Brush Cutters	0	0	0	0	0	0.00	0.00	0.00			
Lawn Mowers	0	0	0	0	0	0.00	0.00	0.00			
Leaf Blowers/Vacuums	0	0	0	0	0	0.00	0.00	0.00			
Rear Engine Riding Mowers	0	0	0	0	0	0.00	0.00	0.00			
Front Mowers	0	0	0	0	0	0.00	0.00	0.00			
Chainsaw < 4 HP	0	0	0	0	0	0.00	0.00	0.00			
Shredder <5 HP	0	0	0	0	0	0.00	0.00	0.00			
Tillers < 5 HP	0	0	0	0	0	0.00	0.00	0.00			
Lawn & Garden Tractors	2	0	0	0	0	0.00	0.00	0.00			
Wood Splitters	0	0	0	0	0	0.00	0.00	0.00			
Snowblowers	0	0	0	0	0	0.00	0.00	0.00			
chippers and stump grinders	2	0	0	0	0	0.00	0.00	0.00			
Commercial Turf Equipment	0	0	0	0	0	0.00	0.00	0.00			
Other Lawn & Garden Equipment	0	0	0	0	0	0.00	0.00	0.00			

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CATEGORY TTL	4	0	0	0	0	0.00	0.00	0.00	#DIV/0!	0.00	#DIV/0!
									"Division by 0"		
Airport Services Category											
Aircraft Support Equipment	6	0	0	0	1	0.00	0.02	0.00			
Terminal Tractors	70	0	0	0	15	0.00	0.19	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	76	0	0	0	16	0.00	0.21	0.00	#DIV/0!	0.99	1.32
									"Division by 0"		
Recreational Equipment Category											
All Terrain Vehicles (ATV's)	0	0	0	0	0	0.00	0.00	0.00			
Minibikes	0	0	0	0	0	0.00	0.00	0.00			
Off-Road Motorcycles	0	0	0	0	0	0.00	0.00	0.00			
Golf Carts	0	0	0	0	0	0.00	0.00	0.00			
Snowmobiles	0	0	0	0	0	0.00	0.00	0.00			
Specialty Vehicle Carts	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
Recreational Marine Category											
Vessels w/Inboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Vessels w/Outboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Vessels w/Sterndrive Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Inboard Engines	0	0	0	0	0	0.00	0.00	0.00			
Sailboat Auxillary Outboard Engines	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
Light Commercial Equipment Category											
Generator Sets	6	0	0	0	1	0.00	0.02	0.00			
Pumps	2	0	0	0	0	0.00	0.01	0.00			
Air Compressors	1	0	0	0	0	0.00	0.00	0.00			
Gas Compressors	0	0	0	0	0	0.00	0.00	0.00			
Welders	4	0	0	0	1	0.00	0.01	0.00			
Pressure Washers	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	13	0	0	0	2	0.00	0.04	0.00	#DIV/0!	1.11	1.32
									"Division by 0"		

Industrial Category											
Aerial lifts	1	0	0	0	0	0.00	0.00	0.00			
Forklifts	15	0	0	0	4	0.00	0.04	0.00			
Sweepers/Scrubbers	12	0	0	0	3	0.00	0.03	0.00			
Other General Industrial Equipment	3	0	0	0	1	0.00	0.01	0.00			
Other Material Handling Equipment	1	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	32	0	0	0	8	0.00	0.08	0.00	#DIV/0!	0.90	1.32
									"Division by 0"		
Construction Equipment Category											
Asphalt Pavers	1	0	0	0	0	0.00	0.00	0.00			
Tampers/Rammers	0	0	0	0	0	0.00	0.00	0.00			
Plate Compactors	0	0	0	0	0	0.00	0.00	0.00			
Concrete Pavers	1	0	0	0	0	0.00	0.00	0.00			
Rollers	4	0	0	0	1	0.00	0.01	0.00			
Scrappers	12	0	0	0	3	0.00	0.01	0.00			
Paving Equipment	5	0	0	0	1	0.00	0.01	0.00			
Surfacing Equipment	0	0	0	0	0	0.00	0.00	0.00			
Signal Boards	0	0	0	0	0	0.00	0.00	0.00			
Trenchers	6	0	0	0	1	0.00	0.01	0.00			
Bore/Drill Rigs	4	0	0	0	1	0.00	0.01	0.00			
Excavators	22	0	0	0	5	0.00	0.02	0.00			
Concrete/Industrial Saws	0	0	0	0	0	0.00	0.00	0.00			
Cementand Mortar Mixers	0	0	0	0	0	0.00	0.00	0.00			
Cranes	22	0	0	0	6	0.00	0.02	0.00			
Graders	20	0	0	0	4	0.00	0.02	0.00			
Off-Highway Trucks	12	0	0	0	3	0.00	0.01	0.00			
Crushing/Proc. Equip.	5	0	0	0	1	0.00	0.01	0.00			
Rough Terrain Forklifts	13	0	0	0	2	0.00	0.02	0.00			
Rubber Tired Loaders	63	0	0	0	14	0.00	0.07	0.00			
Rubber Tired Dozers	3	0	0	0	1	0.00	0.00	0.00			
Tractors/Loaders/Backhoes	56	0	0	0	8	0.00	0.06	0.00			
Crawlers	59	0	0	0	13	0.00	0.06	0.00			
Skid Steer Loaders	16	0	0	0	2	0.00	0.02	0.00			
Off-Highway Tractors	62	0	0	0	7	0.00	0.07	0.00			
Dumpers/Tenders	0	0	0	0	0	0.00	0.00	0.00			
Other Construction Equipment	5	0	0	0	1	0.00	0.01	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

CATEGORY TTL	391	0	0	0	74	0.00	0.44	0.00	#DIV/0!	0.41	1.32
									"Division by 0"		
Agricultural Equipment Category											
2-Wheel Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Tractors	0	0	0	0	0	0.00	0.00	0.00			
Agricultural Mowers	0	0	0	0	0	0.00	0.00	0.00			
Combines	0	0	0	0	0	0.00	0.00	0.00			
Sprayers	0	0	0	0	0	0.00	0.00	0.00			
Balers	0	0	0	0	0	0.00	0.00	0.00			
Tillers >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Swathers	0	0	0	0	0	0.00	0.00	0.00			
Hydro Power Units	0	0	0	0	0	0.00	0.00	0.00			
Other Agricultural Equipment	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
Logging Equipment Category									"Division by 0"		
Chainsaws >4 HP	0	0	0	0	0	0.00	0.00	0.00			
Shredders >5 HP	0	0	0	0	0	0.00	0.00	0.00			
Skidders	0	0	0	0	0	0.00	0.00	0.00			
Fellers/Bunchers	0	0	0	0	0	0.00	0.00	0.00			
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
CATEGORY TTL	0	0	0	0	0	0.00	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!
									"Division by 0"		
	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
TOTAL DIESEL EQUIPMENT	516	0	0	0	100	0.00	0.77	0.00	#DIV/0!	0.54	1.32
									"Division by 0"		

Notes:

1) Data is adapted from the EPA Nonroad Engine and Vehicle Study - Report (Ref. 51a and 51c).

As suggested in the EPA Guidance (Ref. 49b) the average inventory results for Inventory A + Inventory B (A + B / 2) is used here (Ref. 91).

Column totals for each category do not correspond to EPA study hardcopy totals due to spreadsheet rounding .

2) tpsd = tons/summer day

tpwd = tons/winter day

3) Seasonal Adjustment Factor (SAF) =

(Peak Season Activity * 12 Months) / (Annual Activity * Season Months)

4) Carbon Monoxide Seasonal Adjustment Factor (SAF) =

((CO [tons/winter day in CO Area] * 90 [winter days]) * 12 [months]) / (CO [tons/year in CO Area] * 3 [months])

5) Particulate Matter Seasonal Adjustment Factor (SAF) =

((PM [tons/yr in CO Area] / 365 [days/yr] * 120 [days/PM season]) * 12 [months]) / (PM [tons/yr in CO Area] * 3 [months])

Initial QC by sda 7/26/95											
sda 05/09/97 qc comments addressed.											

Appendix C, Table C-2: Calculations of 1993 Fuel Use by Railroad Line Haul Operations

Appendix C, Table C-2. Calculations of 1993 Fuel Use by Railroad Line Haul Operations

LINE HAUL OPERATIONS:	(1) System GTM	(1) System Fuel Use Gallons	(2) Fuel Consumption Index	(3) Medford UGB GTM	(4) Medford UGB Fuel Use Gallons	(5) Oregon State Track or Locomotive Miles	(6) Medford UGB Track Miles	(7) Oregon State GTM
SCC 22-85-002-000								
Railroads								
Grants Pass UGB								
Southern Pacific Transportation Company	211,181,071	312,447,473	0.676	26,709	39,517	1,098	3.75	7,823,326
TOTAL UGB FUEL USE (gallons):					39,517			

Notes:

1) System-wide GTM (Gross Ton Mile-with locomotive) and System-wide Fuel Use for SP
   from RR's 1993 Annual Report to the Interstate Commerce Commission (Ref. 61).
   SP=Southern Pacific.
   More information on the calculation process found in "Procedures for Emission Inventory Preparation
   Volume IV: Mobile Sources," Reference 91.
2) Fuel Consumption Index = System GTM / System Fuel Use
3) Grants Pass UGB GTM for SP calculated: (State GTM) * ((Grants Pass UGB Track Miles)/(State Track Miles))
Grants Pass UGB Track Miles for Southern Pacific measured from DEQ AQMA wall map.
4) Grants Pass UGB Fuel Use calculated: (System Fuel Use [Gallons]) * ((Grants Pass UGB GTM)/ (System GTM))
   For SP: ((Grants Pass UGB GTM) / (Fuel Consumption Index [GTM/gal]))
5) State Track Miles for SP obtained from the Oregon Public Utility Commission (Ref 67).
6) Grants Pass UGB Track Miles for Southern Pacific measured from DEQ Grants Pass & Josephine County wall map.
7) State GTM supplied by Southern Pacific (Ref 68).
8) The railroad representation are Class I only.

wla 2/1/94
ymn 11/27/95
ymw 6/11/97, reformatted & modified for Medford only
ssl 1/26/98, modified for Grants Pass only.

Appendix C, Table C-3: Calculations of 1993 Fuel Use by Railroad Yard Operations

Appendix C, Table C-3. Calculations of 1993 Fuel Use by Railroad Yard Operations

YARD OPERATIONS:	---------------- OPERATIONS (1)------			(2)	(3)
	Number of Locomotives	Hours per Day	Days per Year	Daily Fuel Use Gallons	Yearly Fuel Use
SCC 22-85-002-000					
Railroad					
Medford UGB					
Southern Pacific Transportation Company	1	3	364	226	8,569
TOTAL UGB FUEL USE (gallons):					8,569

Notes:

1) Number of Locomotives and Operating Times supplied by Southern Pacific except operation info for EPT obtained from Oregon Dept of Transportation. Operating times given as days/wk were converted to days/yr by multiplying by 52 wks/yr. Documentation of this operating data available in Ref. 72.
2) Daily Fuel Use per operating locomotive, where not supplied by Southern Pacific, is assumed as per EPA Procedures Manual Vol. IV (Ref 91, section 6.2.3) to be 226 gallons/day. The Daily Fuel Use is based on 24 hour per day operation.
3) Annual Fuel Use calclated as per EPA Procedures Manual (Ref 91, section 6.2.3): (Number of Locomotives)*(10 hrs/day /24 hrs/day) * (226 Gallons/Day) * (364 Days/Yr)

wla 2/2/94
ymn 11/29/95
ymw 6/11/97, reformatted & modified for Medford only
ssl 1/26/99, modified for Grants Pass only.

APPENDIX D: ON-ROAD MOBILE

Appendix D, Table D-1: Grants Pass ambient temperature for the days with the 10 highest 8-hour Carbon Monoxide measured values from 1991-1993 CO Season.

Appendix D, Table D-2: Grants Pass 1993 Mobile 5b average speed input file

Appendix D, Table D-3: Grants Pass 1993 Mobile 5b average speed output file

Appendix D, Table D-4: Grants Pass 1993 Mobile 5b multiple speed input file

Appendix D, Table D-5: Grants Pass 1993 Mobile 5b multiple speed output file

Appendix D, Table D-6: Grants Pass 1993 Emme/2 roadway type lbs/day calculation table

Appendix D, Table D-7: Grants Pass UGB CO 1993 Annual and Seasonal: On-Road Mobile Sources CO Emissions by Vehicle Class

Appendix D, Table D-1: Grants Pass ambient temperature for the days with the 10 highest 8-hour Carbon Monoxide measured values from 1991-1993 CO Season.

Appendix D, Table D-1, Grants Pass ambient temperature for the days with the 10 highest 8-hour Carbon Monoxide measured values from 1991-1993 CO Season.

10 Highest CO values over three years	Grants Pass Monitoring		CO Conc. 8-hour avg. Maximum Crossing Midnight	8-hour period	Temperature F		
					24-hour	24-hour	8-hour
Rank	Location	Date	ppm	End Time	Maximum	Minimum	Ambient
1	Wing Bldg.	1/2/91	9.2	23:00	38.9	17.3	32.8
2	Wing Bldg.	1/3/91	9.0	22:00	38.9	24.5	32.8
3	Wing Bldg.	1/4/91	8.9	21:00	33.5	26.3	30.1
4	Wing Bldg.	12/10/90	8.5	17:00	47.9	44.3	47.7
5	Wing Bldg.	2/8/91	8.2	0:00	44.3	37.1	40.0
6	Wing Bldg.	12/31/90	8.0	21:00	38.9	15.5	32.2
7	Wing Bldg.	12/6/91	7.8	17:00	49.7	44.3	48.1
8	Wing Bldg.	2/7/92	7.5	23:00	55.1	31.7	42.3
9	Wing Bldg.	1/21/92	6.9	22:00	53.3	29.9	45.0
10	Wing Bldg.	1/14/91	6.7	14:00	56.9	46.1	52.0
					Average Maximum	Average Minimum	Average Ambient
					45.8	31.7	40.3

ssl Jan 22 1999

Appendix D, Table D-2: Grants Pass 1993 Mobile 5b average speed input file

Appendix D, Table D-2: Grants Pass 1993 Mobile 5b average speed input file

```
1
1993 Grants Pass CO without Oxy
1       TAMFLG  default
1       SPDFLG  One avg speed for all veh types
1       VMFLAG  MOBILE5 VMT mix
3       MYMRFG  input regist dist by age
1       NEWFLG  MOBILE5 basic exhaust emission rates
1       IMFLAG  No IM program
1       ALHFLG  No exhaust emission factor corrections
1       ATPFLG  No ATP is assumed
5       RLFLAG  Zero out no refueling EF's calculated
2       LOCFLG  One LAP record to apply to all scenarios
2       TEMFLG  Ambient Temperature
4       OUTFMT  80 column format
2       PRTFLG  CO output only
1       IDLFLG  No idle emission factors calculated
3       NMHFLG  VOC emission factors
1       HCFLAG  Print only sum of all HC components
.031 .037 .042 .045 .051 .053 .052 .059 .055 .054    LDGV
.039 .035 .036 .037 .046 .047 .041 .031 .021 .023
.022 .022 .021 .020 .081
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029    LDGT1
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .020
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039    LDGT2
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .027
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035    HDGV
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .043
.031 .037 .042 .045 .051 .053 .052 .059 .055 .054    LDGV
.039 .035 .036 .037 .046 .047 .041 .031 .021 .023
.022 .022 .021 .020 .081
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029    LDDT
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .020
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035    HDDV
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029    MC
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
GP   1993 CO EF   31.7 45.8 13.6 13.6  20 1 1
1 93 30.9 40.3 20.6 27.3 20.6
```

Appendix D, Table D-3: Grants Pass 1993 Mobile 5b average speed output file

Appendix D, Table D-3: Grants Pass 1993 Mobile 5b average speed output file

```
1993 Grants Pass CO without Oxy
 MOBILE5b (14-Sep-96)

M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
M170 Warning:
              Exhaust emissions for gasoline fueled vehicles
               beginning in 1995 have been reduced as a result of
               Gasoline Detergent Additive Regulations (1994).
GP   1993 CO EF
                     Minimum Temp: 32. (F)   Maximum Temp: 46. (F)
                     Period 1 RVP: 13.6      Period 2 RVP: 13.6 Period 2 Yr:
2020
VOC HC emission factors include evaporative HC emission factors.
--------------------------------------------------------------------------------
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993            Region: Low          Altitude:  500. Ft.
                       I/M Program: No        Ambient Temp:   40.3 (F)
                Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV    MC  All Veh
            ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 30.9   30.9   30.9          30.9   30.9   30.9   30.9   30.9
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 37.95  29.20  41.35  33.05  52.86   1.13   1.27   7.45  17.73  34.52
--------------------------------------------------------------------------------
```

Appendix D, Table D-4: Grants Pass 1993 Mobile 5b multiple speed input file

Appendix D, Table D-4: Grants Pass 1993 Mobile 5b multiple speed input file

```
1
1993 Grants Pass CO w/out Oxy
1       TAMFLG  default
1       SPDFLG  One avg speed for all veh types
1       VMFLAG  MOBILE5 VMT mix
3       MYMRFG  input regist dist by age
1       NEWFLG  MOBILE5 basic exhaust emission rates
1       IMFLAG  No IM program
1       ALHFLG  No exhaust emission factor corrections
1       ATPFLG  No ATP is assumed
5       RLFLAG  Zero out no refueling EF's calculated
2       LOCFLG  One LAP record to apply to all scenarios
1       TEMFLG  Ambient Temperature
4       OUTFMT  80 column format
2       PRTFLG  CO output only
1       IDLFLG  No idle emission factors calculated
3       NMHFLG  VOC emission factors
1       HCFLAG  Print only sum of all HC components
.031 .037 .042 .045 .051 .053 .052 .059 .055 .054    LDGV
.039 .035 .036 .037 .046 .047 .041 .031 .021 .023
.022 .022 .021 .020 .081
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029    LDGT1
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .020
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039    LDGT2
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .027
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035    HDGV
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .043
.031 .037 .042 .045 .051 .053 .052 .059 .055 .054    LDGV
.039 .035 .036 .037 .046 .047 .041 .031 .021 .023
.022 .022 .021 .020 .081
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029    LDDT
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .020
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035    HDDV
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029    MC
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
GP   1993 CO EF   31.7 45.8 13.6 13.6  20 1 1
1 93  6.0 40.3 20.6 27.3 20.6
1 93 10.0 40.3 20.6 27.3 20.6
1 93 11.0 40.3 20.6 27.3 20.6
1 93 12.0 40.3 20.6 27.3 20.6
1 93 13.0 40.3 20.6 27.3 20.6
1 93 14.0 40.3 20.6 27.3 20.6
1 93 15.0 40.3 20.6 27.3 20.6
1 93 16.0 40.3 20.6 27.3 20.6
1 93 17.0 40.3 20.6 27.3 20.6
1 93 18.0 40.3 20.6 27.3 20.6
1 93 19.0 40.3 20.6 27.3 20.6
1 93 20.0 40.3 20.6 27.3 20.6
1 93 21.0 40.3 20.6 27.3 20.6
1 93 22.0 40.3 20.6 27.3 20.6
```

Appendix D, Table D-5: Grants Pass 1993 Mobile 5b multiple speed output file

Appendix D, Table D-5: Grants Pass 1993 Mobile 5b multiple speed output file

```
1993 Grants Pass CO w/out Oxy
 MOBILE5b (14-Sep-96)

M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
M 49 Warning:
                 1.00     MYR sum not = 1. (will normalize)
M170 Warning:
               Exhaust emissions for gasoline fueled vehicles
                beginning in 1995 have been reduced as a result of
                Gasoline Detergent Additive Regulations (1994).
GP   1993 CO EF
                     Minimum Temp: 32. (F)   Maximum Temp: 46. (F)
                     Period 1 RVP: 13.6      Period 2 RVP: 13.6 Period 2 Yr:
2020
VOC HC emission factors include evaporative HC emission factors.
________________________________________________________________________________
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                      I/M Program: No       Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No     Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.:  6.0    6.0    6.0           6.0    6.0    6.0    6.0    6.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO:166.99 112.85 178.89 133.79 219.05   4.39   4.92  28.89  98.10 147.88

________________________________________________________________________________
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                      I/M Program: No       Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No     Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 10.0   10.0   10.0          10.0   10.0   10.0   10.0   10.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO:101.30  70.75 107.33  82.35 158.81   3.27   3.67  21.54  56.48  91.33

________________________________________________________________________________
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                      I/M Program: No       Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No     Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 11.0   11.0   11.0          11.0   11.0   11.0   11.0   11.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 92.45  65.11  97.70  75.44 147.35   3.06   3.42  20.11  50.88  83.56
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                   I/M Program: No        Ambient Temp:   42.4 (F)
             Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
              Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh

 Veh. Spd.: 12.0   12.0   12.0          12.0   12.0   12.0   12.0   12.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 85.15  60.45  89.75  69.74 137.02   2.86   3.20  18.80  46.32  77.10
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                   I/M Program: No        Ambient Temp:   42.4 (F)
             Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
              Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh

 Veh. Spd.: 13.0   13.0   13.0          13.0   13.0   13.0   13.0   13.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 79.03  56.54  83.10  64.96 127.69   2.68   3.00  17.61  42.54  71.65
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                   I/M Program: No        Ambient Temp:   42.4 (F)
             Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
              Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh

 Veh. Spd.: 14.0   14.0   14.0          14.0   14.0   14.0   14.0   14.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 73.83  53.21  77.45  60.90 119.26   2.51   2.81  16.53  39.37  67.00
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                   I/M Program: No        Ambient Temp:   42.4 (F)
             Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
              Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh

 Veh. Spd.: 15.0   15.0   15.0          15.0   15.0   15.0   15.0   15.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 69.36  50.34  72.59  57.40 111.63   2.36   2.65  15.54  36.68  62.98
```

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	16.0	16.0	16.0		16.0	16.0	16.0	16.0	16.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	65.47	47.84	68.37	54.35	104.72	2.23	2.49	14.64	34.37	59.47

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	17.0	17.0	17.0		17.0	17.0	17.0	17.0	17.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	62.06	45.63	64.67	51.67	98.45	2.10	2.35	13.82	32.36	56.38

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	18.0	18.0	18.0		18.0	18.0	18.0	18.0	18.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	59.03	43.66	61.39	49.28	92.77	1.99	2.22	13.06	30.58	53.62

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	19.0	19.0	19.0		19.0	19.0	19.0	19.0	19.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	56.32	41.88	58.46	47.14	87.60	1.88	2.11	12.37	29.00	51.15

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	20.0	20.0	20.0		20.0	20.0	20.0	20.0	20.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	53.88	40.50	56.34	45.52	82.91	1.78	2.00	11.74	27.57	49.01

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	21.0	21.0	21.0		21.0	21.0	21.0	21.0	21.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	51.66	38.95	54.24	43.80	78.63	1.70	1.90	11.16	26.27	47.00

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	22.0	22.0	22.0		22.0	22.0	22.0	22.0	22.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	49.63	37.52	52.32	42.21	74.75	1.61	1.81	10.63	25.08	45.15

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	23.0	23.0	23.0		23.0	23.0	23.0	23.0	23.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	47.77	36.20	50.55	40.75	71.21	1.54	1.73	10.14	23.98	43.46

Emission factors are as of Jan. 1st of the indicated calendar year.

User supplied veh registration distributions.

Cal. Year: 1993 Region: Low Altitude: 500. Ft.

I/M Program: No Ambient Temp: 42.4 (F)

Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6

Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	24.0	24.0	24.0		24.0	24.0	24.0	24.0	24.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	46.04	34.97	48.92	39.39	67.99	1.47	1.65	9.69	22.95	41.89

Emission factors are as of Jan. 1st of the indicated calendar year.

User supplied veh registration distributions.

Cal. Year: 1993 Region: Low Altitude: 500. Ft.

I/M Program: No Ambient Temp: 42.4 (F)

Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6

Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	25.0	25.0	25.0		25.0	25.0	25.0	25.0	25.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	44.44	33.82	47.41	38.13	65.05	1.41	1.58	9.28	21.98	40.43

Emission factors are as of Jan. 1st of the indicated calendar year.

User supplied veh registration distributions.

Cal. Year: 1993 Region: Low Altitude: 500. Ft.

I/M Program: No Ambient Temp: 42.4 (F)

Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6

Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	26.0	26.0	26.0		26.0	26.0	26.0	26.0	26.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	42.95	32.75	46.00	36.95	62.38	1.35	1.52	8.90	21.08	39.08

Emission factors are as of Jan. 1st of the indicated calendar year.

User supplied veh registration distributions.

Cal. Year: 1993 Region: Low Altitude: 500. Ft.

I/M Program: No Ambient Temp: 42.4 (F)

Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6

Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	27.0	27.0	27.0		27.0	27.0	27.0	27.0	27.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	41.56	31.74	44.69	35.85	59.96	1.30	1.46	8.55	20.23	37.82

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	28.0	28.0	28.0		28.0	28.0	28.0	28.0	28.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	40.25	30.80	43.46	34.81	57.75	1.25	1.40	8.23	19.42	36.64

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	29.0	29.0	29.0		29.0	29.0	29.0	29.0	29.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	39.03	29.91	42.31	33.84	55.75	1.21	1.35	7.94	18.66	35.54

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	30.0	30.0	30.0		30.0	30.0	30.0	30.0	30.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	37.88	29.07	41.23	32.93	53.93	1.17	1.31	7.67	17.94	34.51

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	31.0	31.0	31.0		31.0	31.0	31.0	31.0	31.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	36.81	28.29	40.21	32.07	52.29	1.13	1.26	7.43	17.27	33.54

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993            Region: Low          Altitude:  500. Ft.
                       I/M Program: No        Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 32.0   32.0   32.0          32.0   32.0   32.0   32.0   32.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 35.80  27.56  39.26  31.27  50.81   1.09   1.23   7.20  16.63  32.64
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993            Region: Low          Altitude:  500. Ft.
                       I/M Program: No        Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 33.0   33.0   33.0          33.0   33.0   33.0   33.0   33.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 34.85  26.87  38.37  30.51  49.48   1.06   1.19   7.00  16.03  31.79
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993            Region: Low          Altitude:  500. Ft.
                       I/M Program: No        Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 34.0   34.0   34.0          34.0   34.0   34.0   34.0   34.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 33.96  26.23  37.53  29.81  48.29   1.04   1.16   6.81  15.47  31.00
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993            Region: Low          Altitude:  500. Ft.
                       I/M Program: No        Ambient Temp:   42.4 (F)
                 Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                  Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 35.0   35.0   35.0          35.0   35.0   35.0   35.0   35.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 33.12  25.62  36.74  29.15  47.24   1.01   1.13   6.64  14.95  30.27
```

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	36.0	36.0	36.0		36.0	36.0	36.0	36.0	36.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	32.34	25.07	36.01	28.53	46.31	0.99	1.10	6.49	14.46	29.58

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	37.0	37.0	37.0		37.0	37.0	37.0	37.0	37.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	31.61	24.54	35.32	27.96	45.49	0.97	1.08	6.35	14.01	28.94

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	38.0	38.0	38.0		38.0	38.0	38.0	38.0	38.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	30.93	24.06	34.67	27.43	44.80	0.95	1.06	6.23	13.60	28.35

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993 Region: Low Altitude: 500. Ft.
I/M Program: No Ambient Temp: 42.4 (F)
Anti-tam. Program: No Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No

Veh. Type:	LDGV	LDGT1	LDGT2	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Veh. Spd.:	39.0	39.0	39.0		39.0	39.0	39.0	39.0	39.0	
VMT Mix:	0.585	0.198	0.092		0.039	0.005	0.002	0.071	0.008	
Composite Emission Factors (Gm/Mile)										
Exhst CO:	30.29	23.61	34.07	26.93	44.20	0.93	1.04	6.12	13.22	27.80

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993          Region: Low          Altitude:  500. Ft.
                      I/M Program: No      Ambient Temp:   42.4 (F)
                Anti-tam. Program: No    Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ----- ------ ------ ------ ------ ------ ------ ------ ------ -------
 Veh. Spd.: 40.0   40.0   40.0          40.0   40.0   40.0   40.0   40.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 29.70  23.20  33.52  26.47  43.72   0.91   1.02   6.02  12.87  27.29

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993          Region: Low          Altitude:  500. Ft.
                      I/M Program: No      Ambient Temp:   42.4 (F)
                Anti-tam. Program: No    Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ----- ------ ------ ------ ------ ------ ------ ------ ------ -------
 Veh. Spd.: 42.0   42.0   42.0          42.0   42.0   42.0   42.0   42.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 28.63  22.47  32.51  25.65  43.04   0.89   1.00   5.86  12.26  26.38

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993          Region: Low          Altitude:  500. Ft.
                      I/M Program: No      Ambient Temp:   42.4 (F)
                Anti-tam. Program: No    Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ----- ------ ------ ------ ------ ------ ------ ------ ------ -------
 Veh. Spd.: 43.0   43.0   43.0          43.0   43.0   43.0   43.0   43.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 28.16  22.14  32.06  25.29  42.85   0.88   0.99   5.80  12.00  25.99

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993          Region: Low          Altitude:  500. Ft.
                      I/M Program: No      Ambient Temp:   42.4 (F)
                Anti-tam. Program: No    Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            ----- ------ ------ ------ ------ ------ ------ ------ ------ -------
 Veh. Spd.: 44.0   44.0   44.0          44.0   44.0   44.0   44.0   44.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 27.71  21.84  31.64  24.95  42.75   0.87   0.98   5.75  11.77  25.62
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                     I/M Program: No        Ambient Temp:   42.4 (F)
               Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            _____ _____  _____  _____  _____  _____  _____  _____  _____  _____
 Veh. Spd.: 45.0   45.0   45.0          45.0   45.0   45.0   45.0   45.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 27.30  21.57  31.26  24.64  42.74   0.87   0.97   5.71  11.55  25.28
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                     I/M Program: No        Ambient Temp:   42.4 (F)
               Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            _____ _____  _____  _____  _____  _____  _____  _____  _____  _____
 Veh. Spd.: 49.0   49.0   49.0          49.0   49.0   49.0   49.0   49.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 26.20  20.84  30.23  23.82  43.68   0.86   0.96   5.65  11.02  24.43
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                     I/M Program: No        Ambient Temp:   42.4 (F)
               Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            _____ _____  _____  _____  _____  _____  _____  _____  _____  _____
 Veh. Spd.: 53.0   53.0   53.0          53.0   53.0   53.0   53.0   53.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 26.20  20.84  30.23  23.82  46.23   0.88   0.98   5.76  11.02  24.54
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low          Altitude:  500. Ft.
                     I/M Program: No        Ambient Temp:   42.4 (F)
               Anti-tam. Program: No      Operating Mode:   20.6 / 27.3 / 20.6
                Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
            _____ _____  _____  _____  _____  _____  _____  _____  _____  _____
 Veh. Spd.: 54.0   54.0   54.0          54.0   54.0   54.0   54.0   54.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 26.20  20.84  30.23  23.82  47.15   0.88   0.99   5.82  11.02  24.58
```

```
Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low         Altitude:  500. Ft.
                      I/M Program: No       Ambient Temp:   42.4 (F)
                Anti-tam. Program: No     Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 55.0   55.0   55.0          55.0   55.0   55.0   55.0   55.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 26.20  20.84  30.23  23.82  48.19   0.89   1.00   5.88  11.02  24.63

Emission factors are as of Jan. 1st of the indicated calendar year.
User supplied veh registration distributions.
Cal. Year: 1993           Region: Low         Altitude:  500. Ft.
                      I/M Program: No       Ambient Temp:   42.4 (F)
                Anti-tam. Program: No     Operating Mode:   20.6 / 27.3 / 20.6
                 Reformulated Gas: No
Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
           ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 65.0   65.0   65.0          65.0   65.0   65.0   65.0   65.0
   VMT Mix:  0.585  0.198  0.092         0.039  0.005  0.002  0.071  0.008
Composite Emission Factors (Gm/Mile)
 Exhst  CO: 75.74  59.74  92.50  70.13  67.71   1.10   1.24   7.27  37.55  68.09
```

Appendix D, Table D-6: Grants Pass 1993 EMME/2 roadway type lbs/day calculation table

Appendix D, Table D-6: Grants Pass 1993 EMME/2 roadway type lbs/day calculation table

1993 Grants Pass CO UGB without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
Rural Interstate								
420	710	1.3	1	65	13739	17861	68.09	1216155.49
710	413	1.17	1	65	13734	16069	68.09	1094138.21
		2.47	**1 Total**		**27473**	**33930**		**2310293.7**
Other Rural Principal Arterial								
193	259	0.27	2	55	7005	1891	24.63	46575.33
193	260	0.25	2	55	6893	1723	24.63	42437.49
259	193	0.27	2	55	6979	1884	24.63	46402.92
260	193	0.25	2	55	6885	1721	24.63	42388.23
		1.04	**2 Total**		**27762**	**7219**		**177803.97**
Rural Minor Arterial								
224	225	0.46	6	38	4506	2073	28.35	58769.55
225	224	0.46	6	37	4516	2077	28.94	60108.38
		0.92	**6 Total**		**9022**	**4150**		**118877.93**
Rural Major Collector								
259	262	0.77	7	45	1393	1073	25.28	27125.44
262	259	0.77	7	45	1393	1073	25.28	27125.44
		1.54	**7 Total**		**2786**	**2146**		**54250.88**
Urban Interstate								
248	520	0.01	11	45	3833	38	25.28	960.64
413	414	0.41	11	65	7676	3147	68.09	214279.23
414	415	1.83	11	55	11509	21061	24.63	518732.43
415	416	0.43	11	65	7601	3268	68.09	222518.12
417	418	0.07	11	65	7559	529	68.09	36019.61
418	419	2.32	11	55	11741	27239	24.63	670896.57
419	420	0.19	11	65	8885	1688	68.09	114935.92
520	414	0.05	11	45	3833	192	25.28	4853.76
		5.31	**11 Total**		**62637**	**57162**		**1783196.28**
Other Urban Freeways and Expressways								
191	202	0.09	12	31	11989	1079	33.54	36189.66
192	198	0.01	12	45	6058	61	25.28	1542.08
195	221	0.21	12	27	7438	1562	37.82	59074.84
195	222	0.12	12	39	5683	682	27.8	18959.6
196	200	0.07	12	35	7580	531	30.27	16073.37
197	198	0.14	12	35	3917	548	30.27	16587.96
198	199	0.12	12	34	9975	1197	31	37107
199	196	0.04	12	34	8805	352	31	10912
200	201	0.17	12	33	8998	1530	31.79	48638.7
201	191	0.02	12	31	11989	240	33.54	8049.6
202	203	0.11	12	27	14507	1596	37.82	60360.72
203	601	0.09	12	34	17200	1548	31	47988
204	205	0.07	12	29	14912	1044	35.54	37103.76
205	206	0.07	12	29	15860	1110	35.54	39449.4
206	602	0.06	12	29	15814	949	35.54	33727.46
207	527	0.03	12	23	20296	609	43.46	26467.14

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
208	209	0.05	12	23	20296	1015	43.46	44111.9
209	528	0.03	12	24	19367	581	41.89	24338.09
210	211	0.05	12	23	20429	1021	43.46	44372.66
211	534	0.03	12	24	19407	582	41.89	24379.98
212	213	0.11	12	24	19398	2134	41.89	89393.26
213	280	0.16	12	24	18472	2956	41.89	123826.84
214	437	0.01	12	22	22331	223	45.15	10068.45
215	214	0.12	12	21	23662	2839	47	133433
216	217	0.05	12	25	5886	294	40.43	11886.42
216	251	0.1	12	28	15030	1503	36.64	55069.92
217	218	0.09	12	30	5886	530	34.51	18290.3
218	220	0.12	12	39	7283	874	27.8	24297.2
218	281	0.12	12	35	9199	1104	30.27	33418.08
218	501	0.07	12	33	11824	828	31.79	26322.12
219	241	0.16	12	24	13785	2206	41.89	92409.34
220	221	0.1	12	40	7283	728	27.29	19867.12
221	195	0.21	12	28	7283	1529	36.64	56022.56
221	227	0.1	12	39	7438	744	27.8	20683.2
222	195	0.12	12	38	5897	708	28.35	20071.8
222	801	0.3	12	29	7067	2120	35.54	75344.8
223	224	0.6	12	38	4441	2665	28.35	75552.75
223	801	0.29	12	35	5355	1553	30.27	47009.31
224	223	0.6	12	38	4451	2671	28.35	75722.85
227	501	0.07	12	39	7438	521	27.8	14483.8
229	524	0.18	12	29	15814	2847	35.54	101182.38
231	438	0.29	12	16	21623	6271	59.47	372936.37
232	472	0.02	12	23	16629	333	43.46	14472.18
233	232	0.07	12	22	22954	1607	45.15	72556.05
234	235	0.11	12	22	17943	1974	45.15	89126.1
235	236	0.13	12	22	17952	2334	45.15	105380.1
236	237	0.06	12	22	17691	1061	45.15	47904.15
237	529	0.03	12	22	18071	542	45.15	24471.3
238	239	0.12	12	26	18931	2272	39.08	88789.76
239	240	0.04	12	26	18931	757	39.08	29583.56
240	525	0.17	12	29	13606	2313	35.54	82204.02
241	242	0.06	12	28	13956	837	36.64	30667.68
242	243	0.08	12	30	12470	998	34.51	34440.98
243	603	0.18	12	25	15327	2759	40.43	111546.37
244	245	0.11	12	29	13120	1443	35.54	51284.22
245	521	0.06	12	32	10602	636	32.64	20759.04
246	247	0.15	12	31	12083	1812	33.54	60774.48
247	248	0.14	12	33	9374	1312	31.79	41708.48
248	249	0.18	12	34	5914	1065	31	33015
249	250	0.02	12	35	1061	21	30.27	635.67
249	450	0	12		4854	0		0

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
250	197	0.09	12	34	3917	353	31	10943
251	217	0.08	12	25	0	0	40.43	0
251	281	0.04	12	21	15030	601	47	28247
253	254	0.24	12	31	13794	3311	33.54	111050.94
253	278	0.13	12	31	13587	1766	33.54	59231.64
254	253	0.24	12	31	13785	3308	33.54	110950.32
254	256	0.18	12	39	14246	2564	27.8	71279.2
254	290	0.06	12	25	602	36	40.43	1455.48
256	254	0.18	12	39	14266	2568	27.8	71390.4
256	257	0.28	12	45	8814	2468	25.28	62391.04
257	256	0.28	12	45	8840	2475	25.28	62568
257	258	0.82	12	54	10158	8330	24.58	204751.4
258	257	0.82	12	54	10183	8350	24.58	205243
258	276	0.25	12	54	10538	2635	24.58	64768.3
259	276	0.24	12	55	8188	1965	24.63	48397.95
276	258	0.25	12	54	10564	2641	24.58	64915.78
276	259	0.24	12	55	8163	1959	24.63	48250.17
278	253	0.13	12	30	14469	1881	34.51	64913.31
278	281	0.2	12	34	10352	2070	31	64170
278	282	0.3	12	30	3235	971	34.51	33509.21
279	231	0.06	12	16	21623	1297	59.47	77132.59
280	471	0.06	12	24	18472	1108	41.89	46414.12
281	218	0.12	12	32	13221	1587	32.64	51799.68
281	251	0.04	12	25	0	0	40.43	0
281	278	0.2	12	30	14469	2894	34.51	99871.94
281	285	0.11	12	24	11551	1271	41.89	53242.19
282	279	0.14	12	28	10293	1441	36.64	52798.24
283	234	0.17	12	23	16629	2827	43.46	122861.42
284	289	0.47	12	36	9369	4403	29.58	130240.74
284	292	0.22	12	37	8842	1945	28.94	56288.3
285	281	0.11	12	30	4660	513	34.51	17703.63
285	288	0.04	12	24	11529	461	41.89	19311.29
287	282	0.14	12	28	7058	988	36.64	36200.32
288	285	0.04	12	30	4039	162	34.51	5590.62
288	287	0.06	12	26	7557	453	39.08	17703.24
288	289	0.03	12	24	11529	346	41.89	14493.94
289	284	0.47	12	36	9307	4374	29.58	129382.92
289	288	0.03	12	23	11596	348	43.46	15124.08
289	290	0.49	12	25	268	131	40.43	5296.33
290	254	0.06	12	25	573	34	40.43	1374.62
290	289	0.49	12	25	298	146	40.43	5902.78
292	284	0.22	12	36	8904	1959	29.58	57947.22
292	294	0.4	12	35	10056	4022	30.27	121745.94
294	292	0.4	12	35	10077	4031	30.27	122018.37
294	295	0.23	12	37	8817	2028	28.94	58690.32

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
295	294	0.23	12	37	8819	2028	28.94	58690.32
295	296	0.57	12	38	5970	3403	28.35	96475.05
296	295	0.57	12	38	5970	3403	28.35	96475.05
296	297	1.02	12	53	4619	4711	24.54	115607.94
297	296	1.02	12	53	4619	4711	24.54	115607.94
383	384	0.11	12	34	11651	1282	31	39742
383	385	0.14	12	38	9804	1373	28.35	38924.55
384	383	0.11	12	34	11698	1287	31	39897
384	505	0.1	12	24	14606	1461	41.89	61201.29
385	383	0.14	12	38	9756	1366	28.35	38726.1
385	386	0.25	12	39	8261	2065	27.8	57407
386	385	0.25	12	39	8042	2011	27.8	55905.8
386	387	0.15	12	43	9733	1460	25.99	37945.4
387	386	0.15	12	43	9501	1425	25.99	37035.75
387	389	0.1	12	43	9733	973	25.99	25288.27
389	387	0.1	12	45	5593	559	25.28	14131.52
389	390	0.24	12	45	4183	1004	25.28	25381.12
389	399	0.02	12	44	5551	111	25.62	2843.82
390	389	0.24	12	45	5593	1342	25.28	33925.76
390	418	0.05	12	45	4183	209	25.28	5283.52
399	416	0.15	12	44	5551	833	25.62	21341.46
413	192	0.19	12	45	6058	1151	25.28	29097.28
417	490	0.01	12	44	5593	56	25.62	1434.72
421	216	0.14	12	27	23203	3248	37.82	122839.36
429	533	0.33	12	39	12341	4073	27.8	113229.4
429	544	0.4	12	38	12965	5186	28.35	147023.1
433	279	0.09	12	34	9822	884	31	27404
437	421	0.22	12	15	22331	4913	62.98	309420.74
438	233	0.01	12	23	21623	216	43.46	9387.36
450	420	0.08	12	44	4854	388	25.62	9940.56
471	215	0.02	12	24	18472	369	41.89	15457.41
472	283	0.07	12	23	16629	1164	43.46	50587.44
490	390	0.09	12	44	5593	503	25.62	12886.86
501	218	0.07	12	35	9199	644	30.27	19493.88
501	433	0.02	12	34	9822	196	31	6076
501	502	0.46	12	40	8024	3691	27.29	100727.39
502	501	0.46	12	40	7783	3580	27.29	97698.2
502	544	0.02	12	36	13692	274	29.58	8104.92
505	384	0.1	12	22	15164	1516	45.15	68447.4
505	533	0.5	12	38	11935	5968	28.35	169192.8
521	246	0.04	12	32	10602	424	32.64	13839.36
524	207	0.17	12	29	18517	3148	35.54	111879.92
525	219	0.26	12	29	13785	3584	35.54	127375.36
527	208	0.08	12	23	20296	1624	43.46	70579.04
528	210	0.03	12	23	21722	652	43.46	28335.92

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
529	238	0.03	12	22	18082	542	45.15	24471.3
533	429	0.33	12	40	11935	3939	27.29	107495.31
533	505	0.5	12	37	12341	6171	28.94	178588.74
534	212	0.11	12	24	19407	2135	41.89	89435.15
544	429	0.4	12	37	13692	5477	28.94	158504.38
544	502	0.02	12	38	12965	259	28.35	7342.65
601	204	0.15	12	34	17200	2580	31	79980
602	229	0.07	12	29	15814	1107	35.54	39342.78
603	244	0.06	12	25	15327	920	40.43	37195.6
801	222	0.3	12	29	6928	2078	35.54	73852.12
801	223	0.29	12	35	5473	1587	30.27	48038.49
		28.96	**12 Total**		**1824928**	**280046**		**9312147.51**
Other Urban Principal Arterials								
211	277	0.04	14	20	3845	154	49.01	7547.54
236	531	0.05	14	25	4106	205	40.43	8288.15
237	275	0.03	14	20	5075	152	49.01	7449.52
275	210	0.03	14	20	2564	77	49.01	3773.77
277	236	0.04	14	20	3845	154	49.01	7547.54
367	368	0.3	14	34	6860	2058	31	63798
368	530	0.09	14	25	5455	491	40.43	19851.13
380	800	0.15	14	35	6064	910	30.27	27545.7
381	493	0.11	14	35	4847	533	30.27	16133.91
382	425	0.15	14	34	6538	981	31	30411
382	427	0.12	14	35	6211	745	30.27	22551.15
425	382	0.15	14	34	6385	958	31	29698
425	505	0.02	14	34	6538	131	31	4061
427	367	0.09	14	35	5019	452	30.27	13682.04
493	382	0.11	14	35	6398	704	30.27	21310.08
505	425	0.02	14	34	6385	128	31	3968
530	237	0.05	14	25	5455	273	40.43	11037.39
531	380	0.08	14	25	4106	328	40.43	13261.04
800	381	0.16	14	35	6064	970	30.27	29361.9
		1.79	**14 Total**		**101760**	**10404**		**341276.86**
Urban Minor Arterials								
194	473	0.01	16	18	3197	32	53.62	1715.84
207	230	0.02	16	25	1839	37	40.43	1495.91
207	478	0.12	16	25	3576	429	40.43	17344.47
210	370	0.14	16	25	3857	540	40.43	21832.2
215	407	0.14	16	22	5496	769	45.15	34720.35
215	408	0.04	16	30	1585	63	34.51	2174.13
228	331	0.22	16	24	2623	577	41.89	24170.53
228	334	0.21	16	20	139	29	49.01	1421.29
230	207	0.02	16	19	4031	81	51.15	4143.15
230	240	0.03	16	24	2037	61	41.89	2555.29
232	408	0.05	16	27	6868	343	37.82	12972.26

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
232	422	0.13	16	29	3445	448	35.54	15921.92
240	230	0.03	16	6	7110	213	147.88	31498.44
240	350	0.01	16	23	2997	30	43.46	1303.8
320	455	0.19	16	23	3016	573	43.46	24902.58
320	478	0.02	16	25	3163	63	40.43	2547.09
326	327	0.16	16	23	2816	451	43.46	19600.46
326	328	0.23	16	22	3303	760	45.15	34314
327	326	0.16	16	22	3303	528	45.15	23839.2
327	455	0.02	16	24	2528	51	41.89	2136.39
328	326	0.23	16	23	2816	648	43.46	28162.08
328	330	0.24	16	21	3409	818	47	38446
330	328	0.24	16	23	2989	717	43.46	31160.82
330	331	0.14	16	23	2873	402	43.46	17470.92
331	228	0.22	16	23	3052	671	43.46	29161.66
331	330	0.14	16	24	2452	343	41.89	14368.27
334	228	0.21	16	20	111	23	49.01	1127.23
343	439	0.05	16	25	1043	52	40.43	2102.36
343	526	0.13	16	24	2494	324	41.89	13572.36
349	369	0.13	16	25	1962	255	40.43	10309.65
349	439	0.22	16	25	1188	261	40.43	10552.23
350	240	0.01	16	23	2747	27	43.46	1173.42
350	369	0.18	16	23	2997	539	43.46	23424.94
352	353	0.35	16	25	447	156	40.43	6307.08
352	526	0.11	16	23	2810	309	43.46	13429.14
353	352	0.35	16	25	504	176	40.43	7115.68
353	354	0.13	16	25	905	118	40.43	4770.74
354	353	0.13	16	25	1168	152	40.43	6145.36
354	355	0.15	16	30	905	136	34.51	4693.36
355	354	0.15	16	30	1168	175	34.51	6039.25
355	386	0.11	16	30	905	100	34.51	3451
369	349	0.13	16	24	2213	288	41.89	12064.32
369	350	0.18	16	23	2747	494	43.46	21469.24
370	540	0.08	16	24	4762	381	41.89	15960.09
373	374	0.49	16	38	3448	1690	28.35	47911.5
374	373	0.49	16	38	3406	1669	28.35	47316.15
374	375	0.29	16	33	3646	1057	31.79	33602.03
375	374	0.29	16	33	3604	1045	31.79	33220.55
375	376	0.13	16	28	3646	474	36.64	17367.36
376	375	0.13	16	28	3604	469	36.64	17184.16
376	377	0.23	16	24	4981	1146	41.89	48005.94
377	376	0.23	16	25	4762	1095	40.43	44270.85
377	378	0.06	16	24	4981	299	41.89	12525.11
378	211	0.14	16	25	2823	395	40.43	15969.85
386	355	0.11	16	30	1168	128	34.51	4417.28
386	539	0.01	16	22	2624	26	45.15	1173.9

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
402	404	0.52	16	34	2478	1289	31	39959
404	402	0.52	16	34	2542	1322	31	40982
404	405	0.27	16	32	4051	1094	32.64	35708.16
405	404	0.27	16	31	4115	1111	33.54	37262.94
405	406	0.13	16	31	4290	558	33.54	18715.32
406	405	0.13	16	31	4354	566	33.54	18983.64
406	407	0.1	16	27	5157	516	37.82	19515.12
407	215	0.14	16	22	5403	756	45.15	34133.4
407	406	0.1	16	27	5220	522	37.82	19742.04
408	215	0.04	16	27	6868	275	37.82	10400.5
408	232	0.05	16	30	1585	79	34.51	2726.29
409	410	0.29	16	30	1709	496	34.51	17116.96
409	422	0.15	16	30	1861	279	34.51	9628.29
410	409	0.29	16	30	1677	486	34.51	16771.86
410	515	0.04	16	27	4192	168	37.82	6353.76
411	412	0.51	16	25	2260	1153	40.43	46615.79
411	429	0.22	16	22	4135	910	45.15	41086.5
412	411	0.51	16	25	2260	1153	40.43	46615.79
422	232	0.13	16	30	2402	312	34.51	10767.12
422	409	0.15	16	30	1862	279	34.51	9628.29
429	411	0.22	16	22	4135	910	45.15	41086.5
429	515	0.05	16	22	4513	226	45.15	10203.9
439	343	0.05	16	25	1071	54	40.43	2183.22
439	349	0.22	16	25	1151	253	40.43	10228.79
455	320	0.19	16	24	2528	480	41.89	20107.2
455	327	0.02	16	23	3016	60	43.46	2607.6
473	194	0.01	16	19	3090	31	51.15	1585.65
478	207	0.12	16	25	3163	380	40.43	15363.4
478	320	0.02	16	25	3576	72	40.43	2910.96
515	410	0.04	16	26	4513	181	39.08	7073.48
515	429	0.05	16	22	4192	210	45.15	9481.5
526	343	0.13	16	23	2810	365	43.46	15862.9
526	352	0.11	16	24	2494	274	41.89	11477.86
539	386	0.01	16	21	2900	29	47	1363
540	377	0.04	16	24	4762	190	41.89	7959.1
		14.4	**16 Total**		**274624**	**40175**		**1568259.01**
Urban Collector								
190	201	0.01	17	13	4389	44	71.65	3152.6
190	604	0.04	17	24	2085	83	41.89	3476.87
194	308	0.08	17	35	1427	114	30.27	3450.78
194	551	0.48	17	29	2926	1404	35.54	49898.16
199	312	0.06	17	25	1694	102	40.43	4123.86
199	313	0.07	17	24	2385	167	41.89	6995.63
200	313	0.13	17	45	342	44	25.28	1112.32
201	190	0.01	17	24	2085	21	41.89	879.69

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
201	351	0.06	17	30	1247	75	34.51	2588.25
203	333	0.09	17	25	317	29	40.43	1172.47
203	522	0.02	17	26	3433	69	39.08	2696.52
204	318	0.14	17	30	1879	263	34.51	9076.13
204	346	0.04	17	24	2470	99	41.89	4147.11
206	319	0.14	17	30	202	28	34.51	966.28
206	347	0.06	17	30	570	34	34.51	1173.34
209	291	0.02	17	21	2975	60	47	2820
209	322	0.14	17	23	2269	318	43.46	13820.28
213	397	0.03	17	25	1746	52	40.43	2102.36
213	480	0.12	17	25	1161	139	40.43	5619.77
216	432	0.02	17	28	2288	46	36.64	1685.44
220	227	0.03	17	25	0	0	40.43	0
222	473	0.08	17	19	3090	247	51.15	12634.05
222	546	0.01	17	28	3630	36	36.64	1319.04
223	310	0.23	17	35	1219	280	30.27	8475.6
225	311	0.84	17	35	298	250	30.27	7567.5
234	397	0.03	17	25	325	10	40.43	404.3
234	484	0.02	17	25	486	10	40.43	404.3
238	291	0.05	17	24	2051	103	41.89	4314.67
238	366	0.15	17	24	1856	278	41.89	11645.42
241	347	0.04	17	30	48	2	34.51	69.02
243	346	0.04	17	25	1333	53	40.43	2142.79
243	475	0.01	17	24	2372	24	41.89	1005.36
244	333	0.01	17	24	2524	25	41.89	1047.25
246	255	0.01	17	25	1501	15	40.43	606.45
246	604	0.04	17	25	388	16	40.43	646.88
248	312	0.06	17	25	1321	79	40.43	3193.97
255	246	0.01	17	25	1352	14	40.43	566.02
255	337	0.16	17	25	1501	240	40.43	9703.2
256	704	0.04	17	42	5433	217	26.38	5724.46
257	269	0.07	17	25	393	28	40.43	1132.04
257	458	0.02	17	24	1736	35	41.89	1466.15
258	267	0.27	17	35	381	103	30.27	3117.81
259	274	0.18	17	35	81	15	30.27	454.05
264	265	0.29	17	55	1406	408	24.63	10049.04
265	264	0.29	17	55	1379	400	24.63	9852
265	266	0.21	17	55	2211	464	24.63	11428.32
266	265	0.21	17	55	2217	466	24.63	11477.58
266	267	0.49	17	55	3272	1603	24.63	39481.89
266	274	0.18	17	35	81	15	30.27	454.05
266	435	0.04	17	45	1150	46	25.28	1162.88
267	258	0.27	17	35	381	103	30.27	3117.81
267	266	0.49	17	55	3278	1606	24.63	39555.78
267	268	0.18	17	55	3653	658	24.63	16206.54

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
267	436	0.61	17	40	0	0	27.29	0
268	267	0.18	17	55	3659	659	24.63	16231.17
268	269	0.62	17	49	5820	3608	24.43	88143.44
269	257	0.07	17	25	393	28	40.43	1132.04
269	268	0.62	17	49	5826	3612	24.43	88241.16
269	704	0.22	17	42	5426	1194	26.38	31497.72
271	492	0.29	17	45	3	1	25.28	25.28
272	435	0.49	17	45	1150	564	25.28	14257.92
272	492	0.08	17	40	1150	92	27.29	2510.68
272	549	0.2	17	45	0	0	25.28	0
274	259	0.18	17	35	81	15	30.27	454.05
274	266	0.18	17	35	81	15	30.27	454.05
279	432	0.07	17	30	0	0	34.51	0
279	502	0.5	17	45	839	420	25.28	10617.6
285	287	0.05	17	30	865	43	34.51	1483.93
287	285	0.05	17	30	1464	73	34.51	2519.23
287	440	0.01	17	34	1582	16	31	496
289	302	0.2	17	23	2555	511	43.46	22208.06
291	209	0.02	17	23	2269	45	43.46	1955.7
291	238	0.05	17	21	2903	145	47	6815
292	293	0.34	17	24	1737	591	41.89	24756.99
292	300	0.34	17	25	131	45	40.43	1819.35
293	292	0.34	17	24	1736	590	41.89	24715.1
293	458	0.51	17	24	1737	886	41.89	37114.54
295	298	1.03	17	44	3147	3241	25.62	83034.42
298	295	1.03	17	44	3149	3243	25.62	83085.66
300	292	0.34	17	25	174	59	40.43	2385.37
300	547	0.28	17	25	252	71	40.43	2870.53
301	302	0.18	17	25	511	92	40.43	3719.56
301	303	0.53	17	35	787	417	30.27	12622.59
301	547	0.13	17	25	313	41	40.43	1657.63
302	289	0.2	17	23	2531	506	43.46	21990.76
302	301	0.18	17	25	535	96	40.43	3881.28
303	301	0.53	17	35	824	437	30.27	13227.99
303	304	0.33	17	35	775	256	30.27	7749.12
304	303	0.33	17	35	808	267	30.27	8082.09
304	305	0.19	17	35	722	137	30.27	4146.99
305	304	0.19	17	35	714	136	30.27	4116.72
305	306	1.02	17	27	3322	3388	37.82	128134.16
305	310	0.2	17	34	3105	621	31	19251
306	305	1.02	17	27	3322	3388	37.82	128134.16
307	308	0.35	17	34	1582	554	31	17174
307	440	0.18	17	34	1683	303	31	9393
308	194	0.08	17	35	1432	115	30.27	3481.05
308	307	0.35	17	34	1683	589	31	18259

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
310	223	0.23	17	35	1091	251	30.27	7597.77
310	305	0.2	17	34	3098	620	31	19220
310	548	0.13	17	34	1651	215	31	6665
310	551	0.11	17	29	3042	335	35.54	11905.9
311	225	0.84	17	35	310	260	30.27	7870.2
311	548	0.24	17	34	1639	393	31	12183
312	199	0.06	17	25	1321	79	40.43	3193.97
312	248	0.06	17	25	1694	102	40.43	4123.86
313	199	0.07	17	25	1588	111	40.43	4487.73
313	200	0.13	17	45	1760	229	25.28	5789.12
313	323	0.01	17	25	1073	11	40.43	444.73
314	323	0.07	17	25	1666	117	40.43	4730.31
314	325	0.01	17	35	208	2	30.27	60.54
315	324	0.09	17	25	210	19	40.43	768.17
315	325	0.26	17	25	400	104	40.43	4204.72
315	351	0.08	17	30	326	26	34.51	897.26
316	317	0.13	17	25	538	70	40.43	2830.1
316	324	0.12	17	25	1696	204	40.43	8247.72
316	331	0.36	17	25	1148	413	40.43	16697.59
316	332	0.06	17	30	969	58	34.51	2001.58
317	316	0.13	17	25	1912	249	40.43	10067.07
317	318	0.13	17	25	538	70	40.43	2830.1
318	204	0.14	17	30	841	118	34.51	4072.18
318	317	0.13	17	25	1912	249	40.43	10067.07
318	523	0.01	17	29	1941	19	35.54	675.26
319	206	0.14	17	30	690	97	34.51	3347.47
319	320	0.38	17	25	2013	765	40.43	30928.95
319	470	0.16	17	25	106	17	40.43	687.31
319	523	0.12	17	29	2278	273	35.54	9702.42
320	319	0.38	17	23	2770	1053	43.46	45763.38
320	321	0.08	17	23	3066	245	43.46	10647.7
321	320	0.08	17	19	3897	312	51.15	15958.8
321	322	0.08	17	14	4953	396	67	26532
322	209	0.14	17	24	2046	286	41.89	11980.54
322	321	0.08	17	10	5784	463	91.33	42285.79
322	370	0.06	17	19	3272	196	51.15	10025.4
323	313	0.01	17	25	1666	17	40.43	687.31
323	314	0.07	17	25	1073	75	40.43	3032.25
324	315	0.09	17	25	725	65	40.43	2627.95
324	316	0.12	17	25	605	73	40.43	2951.39
325	314	0.01	17	35	400	4	30.27	121.08
325	315	0.26	17	25	208	54	40.43	2183.22
328	329	0.18	17	25	173	31	40.43	1253.33
329	328	0.18	17	25	106	19	40.43	768.17
329	470	0.02	17	25	173	3	40.43	121.29

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
331	316	0.36	17	25	1139	410	40.43	16576.3
332	316	0.06	17	30	693	42	34.51	1449.42
332	522	0.06	17	23	3919	235	43.46	10213.1
333	203	0.09	17	24	2524	227	41.89	9509.03
333	244	0.01	17	25	317	3	40.43	121.29
337	255	0.16	17	25	1352	216	40.43	8732.88
337	338	0.13	17	30	1239	161	34.51	5556.11
338	337	0.13	17	30	1047	136	34.51	4693.36
338	339	0.37	17	30	461	171	34.51	5901.21
338	340	0.31	17	30	976	303	34.51	10456.53
339	338	0.37	17	30	461	171	34.51	5901.21
340	338	0.31	17	30	784	243	34.51	8385.93
340	341	0.18	17	30	1182	213	34.51	7350.63
341	340	0.18	17	30	1027	185	34.51	6384.35
341	342	0.31	17	30	1317	408	34.51	14080.08
341	344	0.14	17	30	319	45	34.51	1552.95
342	341	0.31	17	30	1323	410	34.51	14149.1
342	343	0.31	17	22	3087	957	45.15	43208.55
343	342	0.31	17	21	3431	1064	47	50008
344	341	0.14	17	30	157	22	34.51	759.22
344	481	0.13	17	30	791	103	34.51	3554.53
346	204	0.04	17	25	1220	49	40.43	1981.07
346	243	0.04	17	21	3485	139	47	6533
347	206	0.06	17	30	37	2	34.51	69.02
347	241	0.04	17	30	218	9	34.51	310.59
348	349	0.34	17	24	2059	700	41.89	29323
348	481	0.27	17	28	2361	637	36.64	23339.68
349	348	0.34	17	23	2273	773	43.46	33594.58
351	201	0.06	17	29	1935	116	35.54	4122.64
351	315	0.08	17	30	3	0	34.51	0
352	362	0.07	17	24	2047	143	41.89	5990.27
354	511	0.17	17	30	0	0	34.51	0
357	430	0.39	17	28	3163	1234	36.64	45213.76
357	510	0.29	17	30	0	0	34.51	0
360	379	0.18	17	25	0	0	40.43	0
360	511	0.05	17	30	78	4	34.51	138.04
361	362	0.1	17	20	3216	322	49.01	15781.22
361	363	0.15	17	23	2407	361	43.46	15689.06
361	364	0.27	17	30	756	204	34.51	7040.04
361	379	0.01	17	25	0	0	40.43	0
362	352	0.07	17	23	2306	161	43.46	6997.06
362	361	0.1	17	20	3163	316	49.01	15487.16
363	361	0.15	17	23	2478	372	43.46	16167.12
363	384	0.07	17	23	2407	168	43.46	7301.28
364	361	0.27	17	30	739	200	34.51	6902

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
364	365	0.21	17	30	765	161	34.51	5556.11
365	364	0.21	17	30	1098	231	34.51	7971.81
365	367	0.06	17	25	1622	97	40.43	3921.71
365	491	0.15	17	30	1402	210	34.51	7247.1
366	238	0.15	17	24	1853	278	41.89	11645.42
366	368	0.05	17	24	2090	105	41.89	4398.45
366	491	0.12	17	29	1651	198	35.54	7036.92
367	365	0.06	17	25	1262	76	40.43	3072.68
367	381	0.06	17	25	1452	87	40.43	3517.41
368	366	0.05	17	22	2780	139	45.15	6275.85
368	380	0.06	17	23	2326	140	43.46	6084.4
370	322	0.06	17	16	3881	233	59.47	13856.51
370	378	0.05	17	23	2366	118	43.46	5128.28
375	400	0.15	17	20	0	0	49.01	0
376	541	0.07	17	25	1508	106	40.43	4285.58
378	370	0.05	17	16	3881	194	59.47	11537.18
378	398	0.24	17	23	2311	555	43.46	24120.3
379	360	0.18	17	25	0	0	40.43	0
379	361	0.01	17	25	0	0	40.43	0
380	368	0.06	17	25	1610	97	40.43	3921.71
380	424	0.08	17	25	905	72	40.43	2910.96
381	367	0.06	17	23	2934	176	43.46	7648.96
381	426	0.07	17	24	2119	148	41.89	6199.72
384	363	0.07	17	23	2478	173	43.46	7518.58
384	428	0.07	17	25	1379	97	40.43	3921.71
385	535	0.01	17	25	78	1	40.43	40.43
385	536	0.01	17	25	1473	15	40.43	606.45
392	428	0.08	17	25	939	75	40.43	3032.25
392	537	0.13	17	35	1379	179	30.27	5418.33
393	394	0.07	17	24	2216	155	41.89	6492.95
393	426	0.2	17	24	2445	489	41.89	20484.21
394	393	0.07	17	24	2445	171	41.89	7163.19
394	395	0.11	17	24	2151	237	41.89	9927.93
394	396	0.28	17	25	78	22	40.43	889.46
395	394	0.11	17	24	2456	270	41.89	11310.3
395	410	0.15	17	24	2482	372	41.89	15583.08
396	394	0.28	17	25	2	1	40.43	40.43
396	423	0.06	17	25	697	42	40.43	1698.06
397	213	0.03	17	25	325	10	40.43	404.3
397	234	0.03	17	25	1746	52	40.43	2102.36
398	378	0.24	17	25	1667	400	40.43	16172
398	407	0.21	17	22	2587	543	45.15	24516.45
398	480	0.02	17	25	1656	33	40.43	1334.19
398	542	0.19	17	25	367	70	40.43	2830.1
400	375	0.15	17	20	0	0	49.01	0

1993 Grants Pass CO UGB without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
400	542	0.13	17	25	13	2	40.43	80.86
400	705	0.12	17	20	14	2	49.01	98.02
405	705	0.11	17	20	239	26	49.01	1274.26
406	543	0.11	17	25	1032	114	40.43	4609.02
407	398	0.21	17	22	2616	549	45.15	24787.35
410	395	0.15	17	23	2836	425	43.46	18470.5
422	479	0.01	17	24	1743	17	41.89	712.13
423	396	0.06	17	25	603	36	40.43	1455.48
423	479	0.23	17	25	701	161	40.43	6509.23
423	483	0.15	17	24	2147	322	41.89	13488.58
423	484	0.13	17	25	379	49	40.43	1981.07
424	380	0.08	17	24	2147	172	41.89	7205.08
424	483	0.02	17	25	905	18	40.43	727.74
426	381	0.07	17	24	2382	167	41.89	6995.63
426	393	0.2	17	24	2216	443	41.89	18557.27
427	493	0.04	17	25	2492	100	40.43	4043
428	384	0.07	17	25	939	66	40.43	2668.38
428	392	0.08	17	25	1379	110	40.43	4447.3
430	357	0.39	17	28	3155	1230	36.64	45067.2
430	508	0.2	17	28	3163	633	36.64	23193.12
431	545	0.11	17	12	4511	496	77.1	38241.6
431	546	0.18	17	16	3874	697	59.47	41450.59
432	216	0.02	17	30	0	0	34.51	0
432	279	0.07	17	28	2288	160	36.64	5862.4
435	266	0.04	17	45	1150	46	25.28	1162.88
435	272	0.49	17	45	1150	564	25.28	14257.92
436	267	0.61	17	40	0	0	27.29	0
436	549	0.1	17	45	0	0	25.28	0
440	287	0.01	17	34	1683	17	31	527
440	307	0.18	17	34	1582	285	31	8835
458	257	0.02	17	24	1737	35	41.89	1466.15
458	293	0.51	17	24	1736	885	41.89	37072.65
470	319	0.16	17	25	173	28	40.43	1132.04
470	329	0.02	17	25	106	2		0
473	222	0.08	17	18	3197	256	53.62	13726.72
475	243	0.01	17	22	3078	31	45.15	1399.65
475	481	0.16	17	24	2372	380	41.89	15918.2
479	422	0.01	17	25	701	7	40.43	283.01
479	423	0.23	17	24	1743	401	41.89	16797.89
480	213	0.12	17	25	1656	199	40.43	8045.57
480	398	0.02	17	25	1161	23	40.43	929.89
481	344	0.13	17	30	635	83	34.51	2864.33
481	348	0.27	17	29	1810	489	35.54	17379.06
481	475	0.16	17	22	3078	492	45.15	22213.8
483	423	0.15	17	25	905	136	40.43	5498.48

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
483	424	0.02	17	24	2147	43	41.89	1801.27
484	234	0.02	17	25	379	8	40.43	323.44
484	423	0.13	17	25	486	63	40.43	2547.09
491	365	0.15	17	29	2095	314	35.54	11159.56
491	366	0.12	17	30	958	115	34.51	3968.65
492	271	0.29	17	45	3	1	25.28	25.28
492	272	0.08	17	40	1150	92	27.29	2510.68
493	427	0.04	17	25	941	38	40.43	1536.34
502	279	0.5	17	45	60	30	25.28	758.4
502	545	0.01	17	17	4805	48	56.38	2706.24
507	536	0.15	17	25	1645	247	40.43	9986.21
507	537	0.13	17	35	1107	144	30.27	4358.88
507	538	0.12	17	29	3020	362	35.54	12865.48
508	430	0.2	17	28	3155	631	36.64	23119.84
508	538	0.14	17	31	2752	385	33.54	12912.9
508	539	0.19	17	21	2900	551	47	25897
510	357	0.29	17	30	0	0	34.51	0
511	354	0.17	17	30	0	0	34.51	0
511	360	0.05	17	30	78	4	34.51	138.04
511	535	0.22	17	25	78	17	40.43	687.31
522	203	0.02	17	23	3919	78	43.46	3389.88
522	332	0.06	17	26	3433	206	39.08	8050.48
523	318	0.01	17	29	2278	23	35.54	817.42
523	319	0.12	17	29	1941	233	35.54	8280.82
535	385	0.01	17	25	78	1	40.43	40.43
535	511	0.22	17	25	78	17	40.43	687.31
536	385	0.01	17	25	1645	16	40.43	646.88
536	507	0.15	17	25	1473	221	40.43	8935.03
537	392	0.13	17	35	939	122	30.27	3692.94
537	507	0.13	17	34	1547	201	31	6231
538	507	0.12	17	31	2752	330	33.54	11068.2
538	508	0.14	17	29	3020	423	35.54	15033.42
539	508	0.19	17	22	2624	499	45.15	22529.85
541	376	0.07	17	24	1685	118	41.89	4943.02
541	542	0.1	17	25	22	2	40.43	80.86
542	398	0.19	17	25	189	36	40.43	1455.48
542	400	0.13	17	25	14	2	40.43	80.86
542	541	0.1	17	25	200	20	40.43	808.6
542	543	0.11	17	25	156	17	40.43	687.31
543	406	0.11	17	25	1032	114	40.43	4609.02
543	542	0.11	17	25	156	17	40.43	687.31
545	431	0.11	17	11	4805	529	83.56	44203.24
545	502	0.01	17	19	4511	45	51.15	2301.75
546	222	0.01	17	25	3874	39	40.43	1576.77
546	431	0.18	17	17	3630	653	56.38	36816.14

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
547	300	0.28	17	25	313	88	40.43	3557.84
547	301	0.13	17	25	252	33	40.43	1334.19
548	310	0.13	17	34	1639	213	31	6603
548	311	0.24	17	34	1651	396	31	12276
549	272	0.2	17	45	0	0	25.28	0
549	436	0.1	17	45	0	0	25.28	0
551	194	0.48	17	29	3029	1454	35.54	51675.16
551	310	0.11	17	29	2918	321	35.54	11408.34
604	190	0.04	17	13	4389	176	71.65	12610.4
604	246	0.04	17	24	2018	81	41.89	3393.09
704	256	0.04	17	42	5426	217	26.38	5724.46
704	269	0.22	17	42	5433	1195	26.38	31524.1
705	400	0.12	17	20	13	2	49.01	98.02
705	405	0.11	17	20	239	26	49.01	1274.26
		55.17	**17 Total**		**538857**	**90992**		**3314686.6**
Urban Local								
309	313	0.34	19	29	1872	636	35.54	22603.44
309	335	0.76	19	34	1844	1401	31	43431
313	309	0.34	19	29	1844	627	35.54	22283.58
334	336	0.85	19	35	139	118	30.27	3571.86
335	309	0.76	19	34	1872	1423	31	44113
335	336	0.01	19	34	1844	18	31	558
336	334	0.85	19	35	111	94	30.27	2845.38
336	335	0.01	19	34	1872	19	31	589
336	711	0.3	19	34	1983	595	31	18445
391	387	0.01	19	35	3908	39	30.27	1180.53
415	391	0.35	19	45	3908	1368	25.28	34583.04
419	250	0.11	19	45	2856	314	25.28	7937.92
711	336	0.3	19	34	1983	595	31	18445
		4.99	**19 Total**		**26036**	**7247**		**220586.75**
		116.59	**Grand Total**		**2895885**	**533471**	**19201379.5**	42,339.04
			speed	miles	EF by speed		Co Gm	
	Off network VMT		20	53347.1	49.01		2614541.371	5,765.06
							Total	**48,104.11**

Summary of VMT by Roadway Classification

Interstate (rural and urban)	91092	**9,026.15**
Other Urban Freeways and Expressways	280046	**20,533.29**
Arterials (other rural principal, rural minor, other urban principal, urban minor)	61948	**4,864.71**
Collectors (rural major, urban)	93138	**7,428.51**
Locals (urban)	7247	**486.39**
	533471	

1993 Grants Pass CO UGB
without Oxy, Mobile 5b

Fnode	Tnode	Length	Type	Speed	Volume	Vmt	without Oxy Gm/mile CO EF by speed	Total CO Gm
Off network VMT			20	53347.1	49.01		2614541.371	**5,765.06**
							Total	**48,104.11**

Appendix D, Table D-7: Grants Pass UGB CO 1993 Annual and Seasonal: On-Road Mobile Sources CO Emissions by Vehicle Class

Appendix D, Table D-7. Grants Pass UGB CO 1993 Annual: On-Road Mobile Sources CO Emissions by Vehicle Class

Area Facility Type	(1) Avg. Wkdy Vehicle Miles Traveled by Facility Type (Miles/day)	(2) All Vehicle Emission Factor (Gm/Mile)	Avg. Wkdy CO Emissions by Facility Type (Gm/day)	(3) AADT to AWD Adj.	(4) Unadj Emissions All Veh (lbs/dy)	(5) Annual CO Emissions All Veh (tons/yr)	(6) CO Emissions LDGV SCC 21-01-001 000 (tons/yr)	LDGT1 SCC 22-01-020 000 (tons/yr)	LDGT2 SCC 22-01-040 000 (tons/yr)	HDGV SCC 22-01-070 000 (tons/yr)	LDDV SCC 22-30-001 000 (tons/yr)	LDDT SCC 22-30-060 000 (tons/yr)	HDDV SCC 22-30-070 000 (tons/yr)	MC SCC 22-01-080 000 (tons/yr)
Grants Pass UGB VMT Mix (7)							0.585	0.198	0.092	0.039	0.005	0.002	0.071	0.008
Grants Pass UGB Trip														
Interstate (urban, rural)	91,092	34.52	3,144,496	0.95	6,934	1,202	703	238	111	47	6	2	85	10
Other Urban Freeways	280,046	34.52	9,667,188	0.95	21,316	3,696	2,162	732	340	144	18	7	262	30
Arterials	61,948	34.52	2,138,445	0.87	4,715	749	438	148	69	29	4	1	53	6
Collectors	93,138	34.52	3,215,124	0.87	7,089	1,126	658	223	104	44	6	2	80	9
Locals	7,247	34.52	250,166	0.87	552	88	51	17	8	3	0	0	6	1
Off network VMT	53,347	49.01	2,614,541	0.87	5,765	915	535	181	84	36	5	2	65	7
Total Grants Pass UGB	586818.10		21,029,960		46,371	7,775	4,548	1,539	715	303	39	16	552	62
Notes:							LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC

1) From RVCOG EMME/2 output Miles/day: Appendix D, Table .
2) All Vehicle Emission Factors (Gm/Mile) from EPA Mobile 5b run using 30.9 average speed (Ref: 332).
   Off Network VMT using emission factor for vehicle speed at 20 miles per hour.
3) AADT to AAWD Annual Adjustment Factors are from calculations prepared by Howard Harris used in the Medford CO on-road mobile EI (Ref. 313).
4) Unadjusted Emissions, All vehicles [lbs/day] =
   averages weekday emissions by facility type [g/dy] * 0.002205 [g/lb]
5) Annual CO emissions, all vehicles [tons/yr] =
   unadjusted emissions, all vehicles [lbs/day] * Annual adjustment factor*365 days per year. Divide total by 2000 to convert lbs to tons
6) CO emissions by vehicle class = weighted fleet VMT mix (%) * CO emissions
7) VMT mix by vehicle class (a weighted percentage established using the EPA Mobile 5b) (Ref 332).
   TRIPS

Vehicle Class	VMT Mix
LDGV	0.585
LDGT1	0.198
LDGT2	0.092
HDGV	0.039
LDDV	0.005
LDDT	0.002
HDDV	0.071
MC	0.008

wcr 05/26/99 updated spreadsheet for 1993 EMME/2 Grants Pass runs

Appendix D, Table D-7. Grants Pass UGB CO 1993 Season: On-Road Mobile Sources CO Emissions by Vehicle Class

Area Facility Type	(1) Avg. Wkdy Vehicle Miles Traveled by Facility Type (Miles/day)	(2) All Vehicle Emission Factor (Gm/Mile)	Avg. Wkdy CO Emissions by Facility Type (Gm/day)	(3) Seasonal Adj Factor	(4) Unadj Emissions All Veh (lbs/dy)	(5) CO Season Emissions All Veh (lbs/dy)	(6) CO Emissions LDGV SCC 21-01-001 000 (lbs/day)	LDGT1 SCC 22-01-020 000 (lbs/day)	LDGT2 SCC 22-01-040 000 (lbs/day)	HDGV SCC 22-01-070 000 (lbs/day)	LDDV SCC 22-30-001 000 (lbs/day)	LDDT SCC 22-30-060 000 (lbs/day)	HDDV SCC 22-30-070 000 (lbs/day)	MC SCC 22-01-080 000 (lbs/day)
Grants Pass UGB VMT Mix (7)							0.585	0.198	0.092	0.039	0.005	0.002	0.071	0.008
Grants Pass UGB Trip														
Interstate (urban, rural)	91,092	34.52	3,144,496	0.939	6,934	6,511	3,809	1,289	599	254	33	13	462	52
Other Urban Freeways	280,046	34.52	9,667,188	0.907	21,316	19,334	11,310	3,828	1,779	754	97	39	1,373	155
Arterials	61,948	34.52	2,138,445	0.817	4,715	3,852	2,254	763	354	150	19	8	274	31
Collectors	93,138	34.52	3,215,124	0.817	7,089	5,792	3,388	1,147	533	226	29	12	411	46
Locals	7,247	34.52	250,166	0.817	552	451	264	89	41	18	2	1	32	4
Off network VMT	53,347	49.01	2,614,541	0.817	5,765	4,710	2,755	933	433	184	24	9	334	38
Total Grants Pass UGB	586818.10		21,029,960		46,371	40,650	23,780	8,049	3,740	1,585	203	81	2,886	325
Notes:							LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC

1) From RVCOG EMME/2 output Miles/day: Appendix D, Table .
2) All Vehicle Emission Factors (Gm/Mile) from EPA Mobile 5b run using 30.9 average speed (Ref: 332).
Off Network VMT using emission factor for vehicle speed at 20 miles per hour.
3) Seasonal Adjustment Factors are from calculations prepared by Howard Harris used in the Medford CO on-road mobile EI (Ref. 313).
4) Unadjusted Emissions, All vehicles [lbs/day] =
averages weekday emissions by facility type [g/dy] * 0.002205 [g/lb]
5) CO emissions, all vehicles [lbs/day] =
unadjusted emissions, all vehicles [lbs/day] * Seasonal adjustment factor
6) CO emissions by vehicle class = weighted fleet VMT mix (%) * CO emissions
7) VMT mix by vehicle class (a weighted percentage established using the EPA Mobile 5b) (Ref 332).
TRIPS

Vehicle Class	VMT Mix
LDGV	0.585
LDGT1	0.198
LDGT2	0.092
HDGV	0.039
LDDV	0.005
LDDT	0.002
HDDV	0.071
MC	0.008

wcr 05/26/99 updated spreadsheet for 1993 EMME/2 Grants Pass runs

Table 2. Grants Pass UGB 1993 CO Season: Summary of Seasonal Emission Growth from 1993 to 2015

Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Lbs per Day																							
Actuals																							
POINT SOURCES actuals	**2386**	1521	1571	1615	1,594	1,604	1,613	1,623	1,632	1,642	1,652	1,661	1,671	1,680	1,690	1,699	1,709	1,718	1,757	1,766	1,776	1,785	**1,795**
Percent of Category	*4%*	*2%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*
PSELs																							
POINT SOURCES psels	5789	3,225	3,225	3,225	3,225	3,245	3,264	3,283	3,303	3,322	3,342	3,361	3,380	3,400	3,419	3,438	3,458	3,477	3,496	3,516	3,535	3,554	3,574
AREA SOURCES	11,379	11,317	11,255	11,192	11,130	11,067	11,005	10,943	10,880	10,818	10,756	10,693	10,631	10,569	10,506	10,444	10,381	10,319	10,257	10,194	10,132	10,070	**10,007**
Percent of Category	*17%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*18%*	*17%*
NON-ROAD SOURCES	**1,684**	**1,711**	**1,738**	**1,765**	**1,792**	**1,819**	**1,845**	**1,872**	**1,899**	**1,926**	**1,953**	**1,980**	**2,007**	**2,033**	**2,060**	**2,087**	**2,114**	**2,141**	**2,168**	**2,195**	**2,221**	**2,248**	**2,275**
Percent of Category	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*
MOBILE SOURCES	**48,104**	47,843	47,583	47,322	47,061	46,800	46,540	46,279	46,018	45,757	45,497	45,236	44,975	44,715	44,454	44,193	43,932	43,672	43,411	43,150	42,889	42,629	**42,368**
Percent of Category	*72%*	*77%*	*77%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*76%*	*75%*	*75%*	*75%*	*75%*	*75%*	*73%*
TOTAL ALL SOURCES	**66,957**	62,392	62,146	61,894	61,577	61,290	61,003	60,717	60,430	60,143	59,857	59,570	59,283	58,997	58,710	58,423	58,137	57,850	57,592	57,305	57,019	56,732	**58,224**
Total Percent	*95%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*97%*

Change ButtoN for On-Road Mobile Source Emissions
No Oxygenate = 1

1

Annual Mobile Source Growth as Generated from Season Day Emissions Above																							
Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mobile Source Growth		0.994578	0.98916	0.98374	0.978318	0.972897	0.967477	0.962057	0.956637	0.951217	0.945797	0.940377	0.934957	0.929537	0.924117	0.918697	0.9132768	0.907857	0.902437	0.897017	0.891597	0.886176	0.88075643

Notes:
1) Point Source emissions drop from 2386 lb./day in 1993 down to 1521 lb./day.
due to the 11/19/93 Miller Redwood Company closure. Miller Redwood Company is not included in the future projections.

Grants Pass UGB 1993 CO Season: Summary of Annual Emission Growth from 1993 to 2015

Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Tons per Year											
	Actuals	Actuals	Actuals	Actuals								
POINT SOURCES (1)	**309**	196	208	213	210	212	213	214	215	217	218	219
Percent of Category	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*
AREA SOURCES	**1,393**	1,389	1,385	1,381	1,377	1,373	1,369	1,365	1,361	1,357	1,353	361
Percent of Category	*13%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*4%*
NON-ROAD SOURCES	**917**	932	946	961	976	990	1,005	1,020	1,034	1,049	1,064	1,078
Percent of Category	*9%*	*9%*	*9%*	*9%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*11%*	*12%*
MOBILE SOURCES	**7,775**	7,733	7,691	7,649	7,606	7,564	7,522	7,480	7,438	7,396	7,354	7,311
Percent of Category	*75%*	*75%*	*75%*	*75%*	*75%*	*75%*	*74%*	*74%*	*74%*	*74%*	*74%*	*82%*
TOTAL ALL SOURCES	**10,394**	10,249	10,230	10,204	10,169	10,139	10,109	10,079	10,048	10,018	9,988	8,970
Total Percent	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Category	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
POINT SOURCES (1)	220	222	223	224	226	227	232	233	234	236	**237**
Percent of Category	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*
AREA SOURCES	1,344	1,340	1,336	1,332	1,328	1,324	1,320	1,316	1,312	1,308	**1,304**
Percent of Category	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*
NON-ROAD SOURCES	1,093	1,108	1,122	1,137	1,152	1,166	1,181	1,195	1,210	1,225	**1,239**
Percent of Category	*11%*	*11%*	*11%*	*12%*	*12%*	*12%*	*12%*	*12%*	*12%*	*13%*	*13%*
MOBILE SOURCES	7,269	7,227	7,185	7,143	7,101	7,059	7,016	6,974	6,932	6,890	**6,848**
Percent of Category	*73%*	*73%*	*73%*	*73%*	*72%*	*72%*	*72%*	*72%*	*72%*	*71%*	*71%*
TOTAL ALL SOURCES	9,927	9,897	9,867	9,836	9,806	9,776	9,749	9,719	9,689	9,658	**9,628**
Total Percent	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Notes:

1) Point Source emissions drop from 309 ton/yr. in 1993 down to 196 ton/yr.
due to the 11/19/93 Miller Redwood Company closure. Miller Redwood Company is not included in the future projections.

Table 3. Grants Pass UGB CO SIP - 2015 Growth: Industrial Sources Emission Projections Using Actual Emissions

Company Name		(1) 1993 Annual (tons/yr)	(1) 1993 Daily (lbs/day)	(1) 2009 Annual (tons/yr)	(1) 2009 Daily (lbs/day)	(1,2) 2015 Annual (tons/yr)	(1,2) 2015 Daily (lbs/day)	Plant Site Emission Limits Annual (tons/yr)
Growth Years from 1993								
17-0023	Miller Redwood CO	134	984	0	0	0	0	0*
17-0029	Tim-Ply Co.	4	25	3	24	3	25	4
17-0030	Stone Forest Industries	171	1,377	222	1,685	234	1,770	281
Total CO		(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)
(Grants Pass UGB + 25 mile radius)		309	2,386	226	1,709	237	1,795	285

Notes:
1) Summary of the point source projection table and the PSEL table.
2) The 2015 projected actual emissions and the latest PSELs were compared for each source to determine if any excedences had occurred. In all cases the actual emissions were below the PSEL.
* - Miller Redwood Co, was closed in 1993, their 1993 PSEL were 300ton/yr.

ajb 7/29/97
ssl modified for Grants Pass 2/1/99

Table 4. Grants Pass UGB CO SIP - 2015 Growth: Indus. .. Sources Using Actual Emissions

Company Name	1993 Annual (tons/yr)	1993 Daily (lbs/day)	1994 Annual (tons/yr)	1994 Daily (lbs/day)	1995 Annual (tons/yr)	1995 Daily (lbs/day)	1996 Annual (tons/yr)	1996 Daily (lbs/day)	1997 Annual (tons/yr)	1997 Daily (lbs/day)	1998 Annual (tons/yr)	1998 Daily (lbs/day)
Growth Years from 1993									1		2	
SCC 21-02-004-000 & 21-02-006-001												
17-0023 Miller Redwood CO	134	984	0	0	0	0	0	0	0	0	0	0
17-0029 Tim-Ply	4	25	4	25	4	25	3	22	3	22	3	22
17-0030 Stone Forest Industries, Inc.Stone Forest Industries, Inc.	171	1377	192	1496	204	1546	210	1593	207	1572	209	1581
Total CO	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)	309	2,386	196	1,521	208	1,571	213	1,615	210	1,594	212	1,604

Company Name	1999 Annual (tons/yr)	1999 Daily (lbs/day)	2000 Annual (tons/yr)	2000 Daily (lbs/day)	2001 Annual (tons/yr)	2001 Daily (lbs/day)	2002 Annual (tons/yr)	2002 Daily (lbs/day)	2003 Annual (tons/yr)	2003 Daily (lbs/day)	2004 Annual (tons/yr)	2004 Daily (lbs/day)
Growth Years from 1993	3		4		5		6		7		8	
SCC 21-02-004-000 & 21-02-006-001												
17-0023 Miller Redwood Co.	0	0	0	0	0	0	0	0	0	0	0	0
17-0029 Tim-Ply	3	22	3	23	3	23	3	23	3	23	3	23
17-0030 Stone Forest Industries, Inc.Stone Forest Industries, Inc.	210	1591	211	1600	212	1610	214	1619	215	1629	216	1638
Total CO	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)	213	1,613	214	1,623	215	1,632	217	1,642	218	1,652	219	1,661

Company Name	2005 Annual (tons/yr)	2005 Daily (lbs/day)	2006 Annual (tons/yr)	2006 Daily (lbs/day)	2007 Annual (tons/yr)	2007 Daily (lbs/day)	2008 Annual (tons/yr)	2008 Daily (lbs/day)	2009 Annual (tons/yr)	2009 Daily (lbs/day)	2010 Annual (tons/yr)	2010 Daily (lbs/day)
Growth Years from 1993	9		10		11		12		13		14	
SCC 21-02-004-000 & 21-02-006-001												
17-0023 Miller Redwood Co.	0	0	0	0	0	0	0	0	0	0	0	0
17-0029 Tim-Ply	3	23	3	23	3	23	3	24	3	24	3	24
17-0030 Stone Forest Industries, Inc.Stone Forest Industries, Inc.	217	1647	219	1657	220	1666	221	1676	222	1685	224	1695
Total CO	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)	220	1,671	222	1,680	223	1,690	224	1,699	226	1,709	227	1,718

Company Name	2011 Annual (tons/yr)	2011 Daily (lbs/day)	2012 Annual (tons/yr)	2012 Daily (lbs/day)	2013 Annual (tons/yr)	2013 Daily (lbs/day)	2014 Annual (tons/yr)	2014 Daily (lbs/day)	2015 Annual (tons/yr)	2015 Daily (lbs/day)
Growth Years from 1993	18		19		20		21		22	
SCC 21-02-004-000 & 21-02-006-001										
17-0023 Miller Redwood Co.	0	0	0	0	0	0	0	0	0	0
17-0029 Tim-Ply	3	24	3	25	3	25	3	25	3	25
17-0030 Stone Forest Industries, Inc.Stone Forest Industries, Inc.	229	1732	230	1742	231	1751	232	1761	234	1770
2015 Gratns Pass CO/pt source growth to 2015										
Total CO	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)	232	1,757	233	1,766	234	1,776	236	1,785	237	1,795

Notes:

1) Actual emissions were calculated for 1993-1996 for Tim-Ply and 1993-1997 for Stone Forest.

2) Growth Factor is a Grants Pass Industrial Employees Growth Factor Ref.326 0.6%

3) A linear growth rate was used to project emissions out to 2015 using the 1996 actual emissions as a starting year for Tim-Ply and 1997 actual emissions for Stone Forest Industries.
The equation used was: Emissions for a particular year = Starting Year Emissions + [(Ind. pop. growth * # of years after Starting Year) * Starting Year Emissions]

4) Miller Redwood Co. ceased operation on 11/19/1993 and its permit was cancelled on 2/8/94,

ajb 7/29/97, ymw 9/2/97 added growth factor switch availability
ssl 2/1/99 modified for Grants Pass.

Table 4a. Grants Pass UGB CO SIP - 2015 Growth: Industrial Sources Using PSEL Emissions

		1993		1994		1995		1996		1997		1998	
		Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily
	Company Name	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
Growth Years from 1997												1	
SCC 21-02-004-000													
& 21-02-006-001													
17-0023	Miller Redwood Co. (4)	300.0	2,564										
17-0029	Tim-Ply	280.8	1,681	280.8	1,681	281	1,681	281	1,681	281	1681	282	1692
17-0030	U.S. Forest Industries, Inc. (5)	281.0	1,544	281.0	1,544	281.0	1,544	281.0	1,544	281	1544	283	1553
Total CO		(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)		862	5,789	562	3,225	562	3,225	562	3,225	562	3,225	565	3,245

		1999		2000		2001		2002		2003		2004	
		Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily
	Company Name	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
Growth Years from 1997		2		3		4		5		6		7	
SCC 21-02-004-000													
& 21-02-006-001													
17-0029	Tim-Ply	284	1702	286	1712	288	1722	289	1732	291	1742	293	1752
17-0030	U.S. Forest Industries, Inc. (5)	284	1562	286	1572	288	1581	289	1590	291	1600	293	1609
Total CO		(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)		569	3,264	572	3,283	575	3,303	579	3,322	582	3,342	585	3,361

		2005		2006		2007		2008		2009		2010	
		Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily
	Company Name	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
Growth Years from 1997		8		9		10		11		12		13	
SCC 21-02-004-000													
& 21-02-006-001													
17-0029	Tim-Ply	294	1762	296	1772	298	1782	299	1792	301	1803	303	1813
17-0030	U.S. Forest Industries, Inc. (5)	294	1618	296	1627	298	1637	300	1646	301	1655	303	1664
Total CO		(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)		589	3,380	592	3,400	596	3,419	599	3,438	602	3,458	606	3,477

	Company Name	2011 Annual (tons/yr)	2011 Daily (lbs/day)	2012 Annual (tons/yr)	2012 Daily (lbs/day)	2013 Annual (tons/yr)	2013 Daily (lbs/day)	2014 Annual (tons/yr)	2014 Daily (lbs/day)	2015 Annual (tons/yr)	2015 Daily (lbs/day)
Growth Years from 1997		14		15		16		17		18	
SCC 21-02-004-000											
& 21-02-006-001											
17-0029	Tim-Ply	304	1823	306	1833	308	1843	309	1853	311	1863
17-0030	U.S. Forest Industries, Inc. (5)	305	1674	306	1683	308	1692	310	1701	311	1711
Total CO		(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)
(Grants Pass UGB + 25 mile radius)		609	3,496	612	3,516	616	3,535	619	3,554	622	3,574

Notes:

1) PSEL emissions were taken from the latest ACDP permit for Tim-Ply and TV permit for Stone Forest.

2) Growth Factor is a Grants Pass Industrial Employees Growth Facto 0.6%

3) A linear growth rate was used to project emissions out to 2015 using the 1997 PSELs as a starting year.
The equation used was: Emissions for a particular year = Starting Year Emissions + [(Ind. empl growth factor * # of years after Start. Year) * Start. Year Emiss.]
Daily Emissions were calculated as Annual Emissions *2000 lb/ton / days of the plant's normal operating schedule from the permit

4) Miller Redwood Co. ceased operation on 11/19/1993 and its permit was canceled on 2/8/94.
Hours of operation for 1990-92 were averaged to establish days operated (234 days/year) for daily PSEL. Actual number of days operated in 1993 were 112.5.

5) U.S. Forest Industries, Inc. was called Stone Forest Industries, Inc. in 1993.
The name was changed to the current name (U.S. Forest Industries, Inc.) in September, 1996.

Table 5. Grants Pass UGB 1993 CO Season: Area Source Summary -
Annual & Seasonal CO Emission Growth for 1993, 2009, & 2015

Type of Growth	AREA SOURCE Category	1993 Annual Ton/Yr	1993 Seasonal Lbs/Day	2009 Annual Ton/Yr	2009 Seasonal Lbs/Day	2015 Annual Ton/Yr	2015 Seasonal Lbs/Day
	WASTE DISPOSAL, TREATMENT, & RECOVERY						
3	Commercial / Institutional On-Site Incineration	0.5	3.1	0.6	3.9	0.7	4.1
3	Commercial / Institutional Open Burning	3.6	19.6	4.4	24.3	4.7	26.0
4	Industrial Open Burning	20.1	110.6	22.1	121.2	22.8	125.2
2	Residential Open Burning	219.3	692.1	275.4	869.3	296.5	935.8
	Subtotal	243.5	825.4	302.5	1,018.7	324.7	1,091.1
	SMALL STATIONARY FUEL & WOOD USE						
	Industrial						
	Fuel Oil Combustion						
4	Distillate	3.6	23.1	3.9	25.3	4.1	26.1
4	Residual	1.0	6.4	1.1	7.0	1.1	7.2
4	Kerosene	Combined with Distillate					
4	Natural Gas Combustion	11.0	70.4	12.0	77.2	12.4	79.7
4	Liquid Petroleum Gas Combustion	0.8	5.1	0.9	5.6	0.9	5.8
	Industrial Subtotal	16.4	105.0	18.0	115.1	18.5	118.9
	Commercial / Institutional						
	Fuel Oil Combustion						
3	Distillate	0.9	8.2	1.1	10.2	1.2	10.9
3	Residual	0.3	2.6	0.4	3.2	0.4	3.4
3	Kerosene	Combined with Distillate					
3	Natural Gas Combustion	3.9	35.3	4.9	43.7	5.2	46.9
3	Liquid Petroleum Gas Combustion	0.1	0.5	0.1	0.6	0.1	0.6
	Commercial / Institutional Subtotal	5.2	46.5	6.4	57.7	6.9	61.9
	Residential						
	Fuel Oil Combustion						
2	Distillate	0.9	8.6	1.2	10.9	1.3	11.7
2	Residual	NA	NA	NA	NA	NA	NA
2	Kerosene	Combined with Distillate					
2	Natural Gas Combustion	5.0	46.8	6.3	58.8	6.8	63.3
2	Liquid Petroleum Gas Combustion	0.3	2.5	0.3	3.1	0.4	3.3
	Wood Combustion						
6,10	Fireplaces	191.7	1,791.1	242.4	2,264.5	261.4	2,442.0
7,11	Woodstoves - Certified Catalytic	53.4	499.2	86.2	805.6	98.6	920.6
7,11	Woodstoves - Certified Non-Catalytic	216.2	2,019.6	349.0	3,259.6	398.7	3,724.5
8,12	Woodstoves - Conventional & FP Insert	610.5	5,702.3	242.3	2,262.8	104.2	973.0
9,13	Exempt Pellet Stoves	8.7	81.5	25.0	233.9	31.2	291.1
	RWC Subtotal	1,080.6	10,093.6	944.9	8,899.2	894.1	8,351.2
							0.0
	Residential Subtotal	1,086.8	10,151.6	952.7	10,381.5	902.5	8,429.5
							0.0
	SMALL POINT SOURCES						0.0
4	Permitted Sources (>5, <100 tons/year)	9.0	49.4	9.9	54.1	10.2	55.9
	SPS Subtotal	9.0	49.4	9.9	54.1	10.2	55.9
	MISCELLANEOUS AREA SOURCES						
	Other Combustion						
5	Forest Wild Fires	0.0	0.0	0.0	0.0	0.0	
5	Slash Burning	7.2	63.5	7.2	63.5	7.2	63.5
2	Structural Fires	20.0	137.9	31.5	173.2	33.9	186.4
	Misc. Subtotal	32.3	201.4	38.7	236.7	41.1	249.9
	TOTAL EMISSIONS FROM AREA SOURCES	1,393.1	11,379.3	1,328.2	10,381.5	1,303.9	10,007.3

Notes: This table is a summary of data provided in detail in Table 6. "Area Source Summary - Annual Emission Growth from 1993 to 2015", and provided in detail in Table 7, "Area Sources - Seasonal Emission Growth from 1993 to 2015."

Table 6. Grants Pass UGB 1993 CO Season: Area Sources - Summary of Annual Emission Growth from 1993 to 2015

Type of Growth	Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	Years of Growth	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		Tons per Year																						
	WASTE DISPOSAL, TREATMENT, & RECOVERY																							
3	Commercial / Institutional On-Site Incineration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7
3	Commercial / Institutional Open Burning	3.6	3.6	3.7	3.7	3.8	3.8	3.9	3.9	4.0	4.0	4.1	4.2	4.2	4.3	4.3	4.4	4.4	4.5	4.5	4.6	4.6	4.7	4.7
4	Industrial Open Burning	20.1	20.2	20.4	20.5-	20.6	20.7	20.9	21.0	21.1	21.2	21.3	21.5	21.6	21.7	21.8	21.9	22.1	22.2	22.3	22.4	22.5	22.7	22.8
2	Residential Open Burning	219.3	222.8	226.3	229.8	233.3	236.8	240.3	243.8	247.4	250.9	254.4	257.9	261.4	264.9	268.4	271.9	275.4	278.9	282.4	286.0	289.5	293.0	296.5
	Subtotal	243.5	247.2	250.9	254.5	258.2	261.9	265.6	269.3	273.0	276.7	280.4	284.1	287.8	291.5	295.1	298.8	302.5	306.2	309.9	313.6	317.3	321.0	324.7
	SMALL STATIONARY FUEL & WOOD USE																							
	Industrial																							
	Fuel Oil Combustion																							
4	Distillate	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.0	4.0	4.0	4.1	4.1
4	Residual	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
4	Kerosene	Combined with Distillate																						
4	Natural Gas Combustion	11.0	11.0	11.1	11.2	11.2	11.3	11.4	11.4	11.5	11.6	11.6	11.7	11.8	11.8	11.9	12.0	12.0	12.1	12.2	12.2	12.3	12.4	12.4
4	Liquid Petroleum Gas Combustion	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	Industrial Subtotal	16.4	16.5	16.6	16.7	16.8	16.9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	18.0	18.1	18.2	18.2	18.3	18.4	18.5
	Commercial / Institutional																							
	Fuel Oil Combustion																							
3	Distillate	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
3	Residual	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
3	Kerosene	Combined with Distillate																						
3	Natural Gas Combustion	3.9	4.0	4.0	4.1	4.2	4.2	4.3	4.3	4.4	4.5	4.5	4.6	4.6	4.7	4.8	4.8	4.9	4.9	5.0	5.1	5.1	5.2	5.2
3	Liquid Petroleum Gas Combustion	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Commercial / Institutional Subtotal	5.2	5.3	5.3	5.4	5.5	5.6	5.7	5.7	5.8	5.9	6.0	6.0	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.7	6.7	6.8	6.9
	Residential																							
	Fuel Oil Combustion																							
2	Distillate	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.3
2	Residual	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Kerosene	Combined with Distillate																						
2	Natural Gas Combustion	5.0	5.1	5.2	5.3	5.3	5.4	5.5	5.6	5.7	5.7	5.8	5.9	6.0	6.1	6.1	6.2	6.3	6.4	6.5	6.5	6.6	6.7	6.8
2	Liquid Petroleum Gas Combustion	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
	Wood Combustion																							
6.10	Fireplaces	191.7	194.9	198.1	201.3	204.4	207.6	210.8	213.9	217.1	220.3	223.4	0.0	229.8	232.9	236.1	239.3	242.4	245.6	248.8	251.9	255.1	258.3	261.4
7.11	Woodstoves - Certified Catalytic	53.4	55.5	57.5	59.6	61.6	63.7	65.7	67.8	69.8	71.9	73.9	0.0	78.0	80.1	82.1	84.2	86.2	88.3	90.4	92.4	94.5	96.5	98.6
7.11	Woodstoves - Certified Non-Catalytic	216.2	224.5	232.8	241.1	249.4	257.7	266.0	274.3	282.6	290.9	299.2	0.0	315.8	324.1	332.4	340.7	349.0	357.3	365.6	373.9	382.2	390.4	398.7
8.12	Woodstoves - Conventional & FP Insert	610.5	587.5	564.4	541.4	518.4	495.4	472.4	449.4	426.4	403.4	380.3	0.0	334.3	311.3	288.3	265.3	242.3	219.2	196.2	173.2	150.2	127.2	104.2
9.13	Exempt Pellet Stoves	8.7	9.7	10.8	11.8	12.8	13.8	14.8	15.9	16.9	17.9	18.9	0.0	21.0	22.0	23.0	24.0	25.0	26.1	27.1	28.1	29.1	30.1	31.2
	RWC Subtotal	1,080.6	1,072.1	1,063.7	1,055.2	1,046.7	1,038.2	1,029.7	1,021.3	1,012.8	1,004.3	995.8	0.0	978.9	970.4	961.9	953.4	944.9	936.5	928.0	919.5	911.0	902.5	894.1
	Residential Subtotal	1,086.8	1,078.4	1,070.1	1,061.7	1,053.3	1,044.9	1,036.5	1,028.2	1,019.8	1,011.4	1,003.0	7.3	986.3	977.9	969.5	961.1	952.7	944.4	936.0	927.6	919.2	910.8	902.5
	SMALL POINT SOURCES																							
4	Permitted Sources (>5, <100 tons/year)	9.0	9.0	9.1	9.2	9.2	9.3	9.3	9.4	9.4	9.5	9.5	9.6	9.6	9.7	9.7	9.8	9.9	9.9	10.0	10.0	10.1	10.1	10.2
	SPS Subtotal	9.0	9.0	9.1	9.2	9.2	9.3	9.3	9.4	9.4	9.5	9.5	9.6	9.6	9.7	9.7	9.8	9.9	9.9	10.0	10.0	10.1	10.1	10.2
	MISCELLANEOUS AREA SOURCES																							
	Other Combustion																							
5	Forest Wild Fires	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Slash Burning	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
2	Structural Fires	25.1	25.5	25.9	26.3	26.7	27.1	27.5	27.9	28.3	28.7	29.1	29.5	29.9	30.3	30.7	31.1	31.5	31.9	32.3	32.7	33.1	33.5	33.9
	Misc. Subtotal	32.3	32.7	33.1	33.5	33.9	34.3	34.7	35.1	35.5	35.9	36.3	36.7	37.1	37.5	37.9	38.3	38.7	39.1	39.5	39.9	40.3	40.7	41.1
	TOTAL EMISSIONS FROM AREA SOURCES	1,393.1	1,389.1	1,385.0	1,381.0	1,376.9	1,372.8	1,368.8	1,364.7	1,360.7	1,356.6	1,352.6	361.2	1,344.4	1,340.4	1,336.3	1,332.3	1,328.2	1,324.1	1,320.1	1,316.0	1,312.0	1,307.9	1,303.9

Table 6. Grants Pass UGB 1993 CO Season: Area Sources - Summary of Annual Emission Growth from 1993 to 2015

Type	Grants Pass UGB Growth Factors	%	Growth Parameter Data
1	Population (Zoning & Land Use Based)	1.60%	Linear, Non-Compounding
2	Housing Zoning & Land Use Projections	1.60%	Linear, Non-Compounding
3	Commerical Zoning & Land Use Projections	1.50%	Linear, Non-Compounding
4	Industrial Zoning & Land Use Projections	0.60%	Linear, Non-Compounding
See Below	Residential wood combustion	-	Housing, Wood Usage, Fraction of Existing &
"	"	see shaded	New Housing Equipped with Wood Burning Units
"	"	area below	(Linear, Non-Compounding)
5	Wildfires, Slashburning	0.00%	No Growth

See DEQ reference 300
Growth formula applied to years 1994 to 2015 =
(1993 lbs/day) + ((applicable growth rate) * (years of growth) * (1993 lbs/day))

Special Growth Rate Break Down for Residential Wood Combustion Subcategories

Existing UGB RWC Housing Profile		Est. UGB Devices/yr	
6	Fireplace (No Insert)	1	Fireplaces, Linear, Non-compounding, Table 11
7	Total Certified WS	16	Woodstoves, Linear, Non-Compounding, Table 11.
8	Woodstove (Non-Cert.)	-61	Compound Rate, Table 11.
9	Woodburning Pellet Stove	8	Pelletstoves, Linear, Non-Compounding, Table 11.

NEW UGB RWC Housing Profile		Est. UGB Devices/yr	
	New RWC Homes	69	=2015-1993 new RWC housing units divided by 22yearsTable 11
10	Fireplace (No Insert)	17	=2015-1993 new RWC housing units divided by 22 years. Table 11.
11	Total Certified WS	36	=2015-1993 new RWC housing units divided by 22 years. Table 11.
12	Woodstove (Non-Cert.)	0	=2015-1993 new RWC housing units divided by 22 years. Table 11.
13	Woodburning Pellet Stove	12	=2015-1993 new RWC housing units divided by 22 years.Table 11.

1) UGB Device annual growth factors are calculated in the Table RWC Turnover based on the number devices in Housing Units in Grants Pass UGB in 1985 and 1993. Ref 115 .
UGB Device annual growth factors for new RWC housing were adopted from Medford, Oregon 1993 Heating Survey. Ref 299.

2) RWC (Residential Wood Combustion) growth data is explained in the 2015_Grants Pass RWC Growth Table (Table11. "Summary of Emission Growth from Residential Wood Combustion").

Table 7. Grants Pass UGB 1993 CO Season: Area Sources - Summary of Seasonal Emission Growth from 1993 to 2015

Type of Growth	Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	Years of Growth:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		Lbs per Day																						
	WASTE DISPOSAL, TREATMENT, & RECOVERY																							
3	Commercial / Institutional On-Site Incineration	3.1	3.2	3.2	3.3	3.3	3.35	3.4	3.4	3.5	3.5	3.6	3.6	3.68	3.7	3.8	3.8	3.9	3.9	4.0	4.0	4.1	4.1	4.1
3	Commercial / Institutional Open Burning	19.6	19.9	20.2	20.5	20.7	21.04	21.3	21.6	21.9	22.2	22.5	22.8	23.10	23.4	23.7	24.0	24.3	24.6	24.9	25.2	25.4	25.7	26.0
4	Industrial Open Burning	110.6	111.3	111.9	112.6	113.2	113.91	114.6	115.2	115.9	116.6	117.2	117.9	118.56	119.2	119.9	120.5	121.2	121.9	122.5	123.2	123.9	124.5	125.2
2	Residential Open Burning	692.1	703.2	714.3	725.4	736.4	747.51	758.6	769.7	780.7	791.8	802.9	814.0	825.03	836.1	847.2	858.2	869.3	880.4	891.5	902.5	913.6	924.7	935.8
	ste Disposal, Treatment & Recovery" Area Sources - Subtotal	825.4	837.5	849.6	861.7	873.7	885.81	897.9	910.0	922.0	934.1	946.2	958.3	970.36	982.4	994.5	1,006.6	1,018.7	1,030.7	1,042.8	1,054.9	1,067.0	1,079.1	1,091.1
	SMALL STATIONARY FUEL & WOOD USE																							
	Industrial																							
	Fuel Oil Combustion																							
4	Distillate	23.1	23.2	23.4	23.5	23.6	23.77	23.9	24.0	24.2	24.3	24.5	24.6	24.74	24.9	25.0	25.2	25.3	25.4	25.6	25.7	25.8	26.0	26.1
4	Residual	6.4	6.4	6.5	6.5	6.5	6.58	6.6	6.7	6.7	6.7	6.8	6.8	6.85	6.9	6.9	7.0	7.0	7.0	7.1	7.1	7.2	7.2	7.2
4	Kerosene	Combined with Distillate																						
4	Natural Gas Combustion	70.4	70.8	71.3	71.7	72.1	72.52	72.9	73.4	73.8	74.2	74.6	75.1	75.48	75.9	76.3	76.7	77.2	77.6	78.0	78.4	78.9	79.3	79.7
4	Liquid Petroleum Gas Combustion	5.1	5.2	5.2	5.2	5.3	5.29	5.3	5.3	5.4	5.4	5.4	5.5	5.50	5.5	5.6	5.6	5.6	5.7	5.7	5.7	5.8	5.8	5.8
	Industrial Subcategory - Subtotal	105.0	105.6	106.3	106.9	107.5	108.16	108.8	109.4	110.0	110.7	111.3	111.9	112.57	113.2	113.8	114.5	115.1	115.7	116.3	117.0	117.6	118.2	118.9
	Commercial / Institutional																							
	Fuel Oil Combustion																							
3	Distillate	8.2	8.3	8.5	8.6	8.7	8.83	9.0	9.1	9.2	9.3	9.4	9.6	9.69	9.8	9.9	10.1	10.2	10.3	10.4	10.6	10.7	10.8	10.9
3	Residual	2.6	2.6	2.6	2.7	2.7	2.76	2.8	2.8	2.9	2.9	3.0	3.0	3.03	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4
3	Kerosene	Combined with Distillate																						
3	Natural Gas Combustion	35.3	35.8	36.3	36.9	37.4	37.92	38.4	39.0	39.5	40.0	40.6	41.1	41.62	42.2	42.7	43.2	43.7	44.3	44.8	45.3	45.9	46.4	46.9
3	Liquid Petroleum Gas Combustion	0.5	0.5	0.5	0.5	0.5	0.51	0.5	0.5	0.5	0.5	0.5	0.6	0.56	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Commercial / Institutional Subcategory - Subtotal	46.5	47.2	47.9	48.6	49.3	50.02	50.7	51.4	52.1	52.8	53.5	54.2	54.91	55.6	56.3	57.0	57.7	58.4	59.1	59.8	60.5	61.2	61.9
	Residential																							
	Fuel Oil Combustion																							
2	Distillate	8.6	8.8	8.9	9.1	9.2	9.33	9.5	9.6	9.7	9.9	10.0	10.2	10.30	10.4	10.6	10.7	10.9	11.0	11.1	11.3	11.4	11.5	11.7
2	Residual	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Kerosene	Combined with Distillate																						
2	Natural Gas Combustion	46.8	47.6	48.3	49.1	49.8	50.60	51.3	52.1	52.8	53.6	54.3	55.1	55.84	56.6	57.3	58.1	58.8	59.6	60.3	61.1	61.8	62.6	63.3
2	Liquid Petroleum Gas Combustion	2.5	2.5	2.5	2.6	2.6	2.65	2.7	2.7	2.8	2.8	2.8	2.9	2.93	3.0	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.3	3.3
	Wood Combustion																							
6,10	Fireplaces	1,791.1	1,820.7	1,850.2	1,879.8	1,909.4	1939.01	1,968.6	1,998.2	2,027.8	2,057.4	2,086.9	2,116.5	2146.13	2,175.7	2,205.3	2,234.9	2,264.5	2,294.1	2,323.7	2,353.2	2,382.8	2,412.4	2,442.0
7,11	Woodstoves - Certified Catalytic	499.2	518.3	537.5	556.6	575.8	594.94	614.1	633.2	652.4	671.6	690.7	709.9	729.01	748.2	767.3	786.5	805.6	824.8	843.9	863.1	882.2	901.4	920.6
7,11	Woodstoves - Certified Non-Catalytic	2,019.6	2,097.1	2,174.6	2,252.1	2,329.6	2407.10	2,484.6	2,562.1	2,639.6	2,717.1	2,794.6	2,872.1	2949.57	3,027.1	3,104.6	3,182.1	3,259.6	3,337.1	3,414.5	3,492.0	3,569.5	3,647.0	3,724.5
8,12	Woodstoves - Conventional & FP Insert	5,702.3	5,487.3	5,272.3	5,057.4	4,842.4	4627.42	4,412.5	4,197.5	3,982.5	3,767.6	3,552.6	3,337.6	3122.66	2,907.7	2,692.7	2,477.8	2,262.8	2,047.8	1,832.9	1,617.9	1,402.9	1,188.0	973.0
9,13	Exempt Pellet Stoves	81.5	91.0	100.5	110.1	119.6	129.13	138.7	148.2	157.7	167.2	176.8	186.3	195.82	205.3	214.9	224.4	233.9	243.4	253.0	262.5	272.0	281.6	291.1
	Residential Woodstove Combustion Grouping - Subtotal	10,093.6	10,014.4	9,935.2	9,856.0	9,776.8	9697.60	9,618.4	9,539.2	9,460.0	9,380.8	9,301.6	9,222.4	9143.18	9,064.0	8,984.8	8,905.6	8,826.4	8,747.2	8,668.0	8,588.8	8,509.6	8,430.4	8,351.2
	Residential Subcategory - Subtotal	10,151.6	10,073.3	9,995.0	9,916.7	9,838.5	9760.18	9,681.9	9,603.6	9,525.4	9,447.1	9,368.8	9,290.5	9212.26	9,134.0	9,055.7	8,977.4	8,899.2	8,820.9	8,742.6	8,664.3	8,586.1	8,507.8	8,429.5
	SMALL POINT SOURCES																							
4	Permitted Sources (>5, <100 tons/year)	49.4	49.7	50.0	50.3	50.6	50.88	51.2	51.5	51.8	52.1	52.4	52.7	52.95	53.2	53.5	53.8	54.1	54.4	54.7	55.0	55.3	55.6	55.9
	Small Point Sources - Subtotal	49.4	49.7	50.0	50.3	50.6	50.88	51.2	51.5	51.8	52.1	52.4	52.7	52.95	53.2	53.5	53.8	54.1	54.4	54.7	55.0	55.3	55.6	55.9
	MISCELLANEOUS AREA SOURCES																							
	Other Combustion																							
5	Forest Wild Fires	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Slash Burning	63.5	63.5	63.5	63.5	63.5	63.55	63.5	63.5	63.5	63.5	63.5	63.5	63.55	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
2	Structural Fires	137.9	140.1	142.3	144.5	146.7	148.90	151.1	153.3	155.5	157.7	159.9	162.1	164.34	166.5	168.8	171.0	173.2	175.4	177.6	179.8	182.0	184.2	186.4
	Miscellaneous Area Sources - Subtotal	201.4	203.6	205.8	208.0	210.2	212.45	214.7	216.9	219.1	221.3	223.5	225.7	227.89	230.1	232.3	234.5	236.7	238.9	241.1	243.3	245.5	247.7	249.9
	TOTAL EMISSIONS FROM AREA SOURCES	11,379.3	11,317.0	11,254.6	11,192.2	11,129.9	11067.49	11,005.1	10,942.8	10,880.4	10,818.0	10,755.7	10,693.3	10630.93	10,568.6	10,506.2	10,443.8	10,381.5	10,319.1	10,256.7	10,194.4	10,132.0	10,069.6	10,007.3

Table 7. Grants Pass UGB 1993 CO Season: Area Sources - Summary of Seasonal Emission Growth from 199

Growth Rate Factors and Types

Type	Grants Pass UGB Growth Factors	Annual Growth	Growth Parameter Data
1	Population (Zoning & Land Use Based)	1.60%	Linear, Non-Compounding
2	Housing Zoning & Land Use Projections	1.60%	Linear, Non-Compounding
3	Commerical Zoning & Land Use Projections	1.50%	Linear, Non-Compounding
4	Industrial Zoning & Land Use Projections	0.60%	Linear, Non-Compounding
see next	Residential wood combustion	*see shaded*	Housing, Wood Usage, Fraction of Existing &
table	" " " "	*area below*	New Housing Equipped with Wood Burning Units
below	" " " "	" " " "	(Linear, Non-Compounding)
5	Wildfires, Slashburning	0.00%	No Growth

See DEQ Reference # 300
Growth formula applied, years 1994 to 2015 = (1993 lbs/day) + [(applicable growth rate) * (years of growth) * (1993 lbs/day)]

Special Growth Rate Break Down for Residential Wood Combustion (RWC) Subcategories

Type	Existing UGB RWC Housing Profile	Est. UGB Devices/yr	
6	Fireplace (No Insert)	1	Fireplaces, Linear, Non-compounding, Table 11
7	Total Certified Woodstoves	16	Woodstoves, Linear, Non-Compounding, Table 11.
8	Woodstove (Non-Cert.)	-61	Compound Rate, Table 11
9	Woodburning Pellet Stove	8	Pellet Stoves, Linear, Non-Compounding, Table 11.

Type	New UGB RWC Housing Profile	Est. UGB Devices/yr	
	New RWC Homes :	69	=2015-1993 new RWC housing units divided by 22yearsTable 11
10	Fireplace (No Insert)	17	=2015-1993 new RWC housing units divided by 22 years, Table 11.
11	Total Certified Woodstoves	36	=2015-1993 new RWC housing units divided by 22 years, Table 11.
12	Woodstove (Non-Cert.)	0	=2015-1993 new RWC housing units divided by 22 years, Table 11.
13	Woodburning Pellet Stove	12	=2015-1993 new RWC housing units divided by 22 years,Table 11.

1) UGB Device annual growth factors are calculated in the Table RWC Turnover based on the number devices in Housing Units in Grants Pass UGB in 1985 and 1993, Ref 115.
UGB Device annual growth factors for new RWC housing were adopted from Medford, Oregon 1993 Heating Survey, Ref 299.
2) RWC (Residential Wood Combustion) growth data is explained in the 2015_Grants Pass RWC Growth Table (Table11. "Summary of Emission Growth from Residential Wood Combustion").
3) All of the RWC (Residential Wood Combustion) growth data explained in 2015_Grants Pass RWC Growth Table 11.

Table 8 Grants Pass UGB 1993 CO Season: Non-Road Summary Annual & Seasonal Emission Growth from 1993 to 2015

Type of Growth	Category	1993 Tons/Yr	1993 Lbs/Day	2009 Tons/Yr	2009 Lbs/Day	2015 Tons/Yr	2015 Lbs/Day
	GASOLINE VEHICLES, TWO CYCLE						
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	1.4	4.2	1.8	5.2	1.9	5.6
1	Industrial Equipment	13.0	70.7	16.3	88.8	17.6	95.6
1	Lawn / Garden Equipment	83.6	5.5	105.0	7.0	113.1	7.5
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	10.8	58.2	13.5	73.1	14.5	78.7
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0
	Two Cycle Subtotal	108.8	138.6	136.6	174.1	147.1	187.4
	GASOLINE VEHICLES, FOUR CYCLE						
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	17.9	38.8	22.5	48.8	24.2	52.5
1	Industrial Equipment	42.9	231.5	53.8	290.8	58.0	313.0
1	Lawn / Garden Equipment	467.3	15.2	587.0	19.2	631.9	20.6
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	210.9	1,139.5	264.9	1,431.3	285.1	1,540.7
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0
	Four Cycle Subtotal	739.0	1,425.1	928.2	1,790.0	999.2	1,926.8
	GASOLINE VEHICLES, DIESEL CYCLE						
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	27.5	61.0	34.5	76.6	37.2	82.5
1	Industrial Equipment	2.2	11.1	2.8	13.9	3.0	15.0
1	Lawn / Garden Equipment	0.3	0.0	0.4	0.0	0.4	0.0
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	0.9	5.5	1.1	7.0	1.2	7.5
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0
	Diesel Subtotal	30.9	77.6	38.8	97.5	41.8	105.0
	VEHICLE SUBTOTAL	878.8	1,641.4	1,103.7	2,061.6	1,188.1	2,219.2
3	*AIRCRAFT*	0.0	0.0	0.0	0.0	0.0	0.0
	AIRCRAFT SUBTOTAL	0.0	0.0	0.0	0.0	0.0	0.0
2	*RAILROADS*	1.6	8.9	1.8	9.8	1.8	10.1
	RAILROAD SUBTOTAL	1.6	8.9	1.8	9.8	1.8	10.1
1	MARINE VESSELS	36.6	33.9	46.0	42.6	49.5	45.9
	MARINE VESSELS SUBTOTAL	36.6	33.9	46.0	42.6	49.5	45.9
	TOTAL NON-ROAD	**917.0**	**1,684.2**	**1,151.5**	**2,113.9**	**1,239.5**	**2,275.1**

Table 9. Grants Pass UGB 1993 CO Season: Non-Road Summary Annual Emission Growth from 1993 to 2015

Type of Growth	Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
(1)	Years of Growth	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		Tons per Year																						
	GASOLINE VEHICLES, TWO CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9
1	Industrial Equipment	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.5	14.7	14.9	15.1	15.3	15.5	15.7	15.9	16.1	16.3	16.5	16.7	17.0	17.2	17.4	17.6
1	Lawn / Garden Equipment	83.6	85.0	86.3	87.6	89.0	90.3	91.7	93.0	94.3	95.7	97.0	98.4	99.7	101.0	102.4	103.7	105.0	106.4	107.7	109.1	110.4	111.7	113.1
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	10.8	10.9	11.1	11.3	11.4	11.6	11.8	12.0	12.1	12.3	12.5	12.6	12.8	13.0	13.2	13.3	13.5	13.7	13.8	14.0	14.2	14.4	14.5
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Two Cycle Subtotal	108.8	110.5	112.3	114.0	115.8	117.5	119.2	121.0	122.7	124.5	126.2	127.9	129.7	131.4	133.2	134.9	136.6	138.4	140.1	141.9	143.6	145.3	147.1
	GASOLINE VEHICLES, FOUR CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	17.9	18.2	18.5	18.8	19.1	19.4	19.6	19.9	20.2	20.5	20.8	21.1	21.4	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7	23.9	24.2
1	Industrial Equipment	42.9	43.6	44.2	44.9	45.6	46.3	47.0	47.7	48.4	49.0	49.7	50.4	51.1	51.8	52.5	53.2	53.8	54.5	55.2	55.9	56.6	57.3	58.0
1	Lawn / Garden Equipment	467.3	474.8	482.3	489.8	497.3	504.7	512.2	519.7	527.2	534.6	542.1	549.6	557.1	564.6	572.0	579.5	587.0	594.5	601.9	609.4	616.9	624.4	631.9
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	210.9	214.3	217.7	221.0	224.4	227.8	231.2	234.5	237.9	241.3	244.6	248.0	251.4	254.8	258.1	261.5	264.9	268.3	271.6	275.0	278.4	281.8	285.1
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Four Cycle Subtotal	739.0	750.9	762.7	774.5	786.3	798.2	810.0	821.8	833.6	845.5	857.3	869.1	880.9	892.8	904.6	916.4	928.2	940.1	951.9	963.7	975.5	987.4	999.2
	GASOLINE VEHICLES, DIESEL CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	27.5	27.9	28.4	28.8	29.2	29.7	30.1	30.6	31.0	31.4	31.9	32.3	32.8	33.2	33.6	34.1	34.5	35.0	35.4	35.8	36.3	36.7	37.2
1	Industrial Equipment	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.7	2.8	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0
1	Lawn / Garden Equipment	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Diesel Subtotal	30.9	31.4	31.9	32.4	32.9	33.4	33.9	34.4	34.9	35.4	35.9	36.4	36.9	37.4	37.8	38.3	38.8	39.3	39.8	40.3	40.8	41.3	41.8
	VEHICLE SUBTOTAL	878.8	892.8	906.9	920.9	935.0	949.1	963.1	977.2	991.2	1,005.3	1,019.4	1,033.4	1,047.5	1,061.5	1,075.6	1,089.7	1,103.7	1,117.8	1,131.8	1,145.9	1,160.0	1,174.0	1,188.1
3	AIRCRAFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AIRCRAFT SUBTOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	RAILROADS	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	RAILROAD SUBTOTAL	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1	MARINE VESSELS	36.6	37.2	37.8	38.4	39.0	39.6	40.2	40.7	41.3	41.9	42.5	43.1	43.7	44.3	44.8	45.4	46.0	46.6	47.2	47.8	48.4	49.0	49.5
	MARINE VESSELS SUBTOTAL	36.6	37.2	37.8	38.4	39.0	39.6	40.2	40.7	41.3	41.9	42.5	43.1	43.7	44.3	44.8	45.4	46.0	46.6	47.2	47.8	48.4	49.0	49.5
	TOTAL NON-ROAD	917.0	931.7	946.3	961.0	975.6	990.3	1,005.0	1,019.6	1,034.3	1,048.9	1,063.6	1,078.2	1,092.9	1,107.5	1,122.2	1,136.9	1,151.5	1,166.2	1,180.8	1,195.5	1,210.1	1,224.8	1,239.5

	Growth Factors - Grants Pass UGB:	%	Growth Parameter Data
1	Population	1.60%	Linear, Non-Compounding
2	Railroads	0.60%	Industrial Employment (Linear, Non-Compounding)

Growth formula applied to years 1994 to 2015 =
(1993 tons/year) + ((applicable growth rate) * (years of growth) * (1993 tons/year))

1) Nonroad vehicles, excluding Railroads, were grown at the rate of linear population growth for the Grants Pass UGB. The population growth rate was applied to these nonroad categories because the base conversion from EPA's Spokane Nonroad Emission Study was proportioned on a per capita basis. In keeping with the reallocation to Grants Pass on a per capita basis, the growth should also be applied using estimated population growth rates for the UGB.

Table 10. Grants Pass UGB 1993 CO Season: Non-Road Summary Seasonal Emission Growth from 1993 to 2015

Type of Growth	Category	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
(1)	Years of Growth	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	Lbs per Day																							
	GASOLINE VEHICLES, TWO CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	4.2	4.2	4.3	4.4	4.4	4.5	4.6	4.6	4.7	4.8	4.8	4.9	5.0	5.0	5.1	5.2	5.2	5.3	5.4	5.4	5.5	5.6	5.6
1	Industrial Equipment	70.7	71.8	73.0	74.1	75.2	76.4	77.5	78.6	79.8	80.9	82.0	83.1	84.3	85.4	86.5	87.7	88.8	89.9	91.1	92.2	93.3	94.5	95.6
1	Lawn / Garden Equipment	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.1	7.2	7.3	7.4	7.5
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	58.2	59.2	60.1	61.0	62.0	62.9	63.8	64.7	65.7	66.6	67.5	68.5	69.4	70.3	71.3	72.2	73.1	74.1	75.0	75.9	76.9	77.8	78.7
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Two Cycle Subtotal	138.6	140.8	143.1	145.3	147.5	149.7	151.9	154.2	156.4	158.6	160.8	163.0	165.2	167.5	169.7	171.9	174.1	176.3	178.6	180.8	183.0	185.2	187.4
	GASOLINE VEHICLES, FOUR CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	38.8	39.4	40.1	40.7	41.3	41.9	42.5	43.2	43.8	44.4	45.0	45.6	46.3	46.9	47.5	48.1	48.8	49.4	50.0	50.6	51.2	51.9	52.5
1	Industrial Equipment	231.5	235.2	238.9	242.6	246.3	250.0	253.7	257.4	261.1	264.9	268.6	272.3	276.0	279.7	283.4	287.1	290.8	294.5	298.2	301.9	305.6	309.3	313.0
1	Lawn / Garden Equipment	15.2	15.5	15.7	16.0	16.2	16.5	16.7	17.0	17.2	17.4	17.7	17.9	18.2	18.4	18.7	18.9	19.2	19.4	19.6	19.9	20.1	20.4	20.6
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	1,139.5	1,157.8	1,176.0	1,194.2	1,212.5	1,230.7	1,248.9	1,267.2	1,285.4	1,303.6	1,321.9	1,340.1	1,358.3	1,376.6	1,394.8	1,413.0	1,431.3	1,449.5	1,467.7	1,486.0	1,504.2	1,522.4	1,540.7
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Four Cycle Subtotal	1,425.1	1,447.9	1,470.7	1,493.5	1,516.3	1,539.1	1,561.9	1,584.7	1,607.5	1,630.3	1,653.1	1,675.9	1,698.7	1,721.6	1,744.4	1,767.2	1,790.0	1,812.8	1,835.6	1,858.4	1,881.2	1,904.0	1,926.8
	GASOLINE VEHICLES, DIESEL CYCLE																							
1	Recreational Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Construction Equipment	61.0	62.0	62.9	63.9	64.9	65.9	66.9	67.8	68.8	69.8	70.8	71.7	72.7	73.7	74.7	75.6	76.6	77.6	78.6	79.5	80.5	81.5	82.5
1	Industrial Equipment	11.1	11.3	11.4	11.6	11.8	12.0	12.2	12.3	12.5	12.7	12.9	13.0	13.2	13.4	13.6	13.8	13.9	14.1	14.3	14.5	14.6	14.8	15.0
1	Lawn / Garden Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Agricultural Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Light Commercial Equipment	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.1	7.2	7.3	7.4	7.5
1	Logging Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Air Service Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Diesel Subtotal	77.6	78.9	80.1	81.4	82.6	83.8	85.1	86.3	87.6	88.8	90.1	91.3	92.5	93.8	95.0	96.3	97.5	98.7	100.0	101.2	102.5	103.7	105.0
	VEHICLE SUBTOTAL	1,641.4	1,667.7	1,693.9	1,720.2	1,746.4	1,772.7	1,799.0	1,825.2	1,851.5	1,877.8	1,904.0	1,930.3	1,956.5	1,982.8	2,009.1	2,035.3	2,061.6	2,087.8	2,114.1	2,140.4	2,166.6	2,192.9	2,219.2
3	AIRCRAFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AIRCRAFT SUBTOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	RAILROADS	8.9	9.0	9.0	9.1	9.1	9.2	9.2	9.3	9.3	9.4	9.4	9.5	9.5	9.6	9.6	9.7	9.8	9.8	9.9	9.9	10.0	10.0	10.1
	RAILROAD SUBTOTAL	8.9	9.0	9.0	9.1	9.1	9.2	9.2	9.3	9.3	9.4	9.4	9.5	9.5	9.6	9.6	9.7	9.8	9.8	9.9	9.9	10.0	10.0	10.1
1	MARINE VESSELS	33.9	34.5	35.0	35.5	36.1	36.6	37.2	37.7	38.3	38.8	39.3	39.9	40.4	41.0	41.5	42.1	42.6	43.1	43.7	44.2	44.8	45.3	45.9
	MARINE VESSELS SUBTOTAL	33.9	34.5	35.0	35.5	36.1	36.6	37.2	37.7	38.3	38.8	39.3	39.9	40.4	41.0	41.5	42.1	42.6	43.1	43.7	44.2	44.8	45.3	45.9
	TOTAL NON-ROAD	1,684	1,711	1,738	1,765	1,792	1,819	1,845	1,872	1,899	1,926	1,953	1,980	2,007	2,033	2,060	2,087	2,114	2,141	2,168	2,195	2,221	2,248	2,275

	Grants Pass UGB Growth Factors	%	Growth Parameter Data
1	Population (Zoning & Land Use Projection data)	1.60%	Linear, Non-Compounding. (Ref. 326)
2	Railroads	0.60%	Industrial Employment (Linear, Non-Compounding)
	Growth formula applied to years 1994 to 2015 =		
	(1993 lbs/day) + ((applicable growth rate) * (years of growth) * (1993 lbs/day))		

(1) Nonroad vehicles, excluding Railroads, were grown at the rate of linear population growth for the Grants Pass UGB.
The Grants Pass population growth factor was estimated by RVCOG. Ref. 326.
The population growth rate was applied to these nonroad categories because the base conversion from EPA's Spokane Nonroad Emission Study was proportioned on a per capita basis. In keeping with the reallocation to Grants Pass on a per capita basis, the growth should also be applied using estimated population growth rates for the UGB.

ymw 6/25/97, 8/28/97 modified growth factors.
SSL 8/24/99 MARINE VESSELS

Table 11 Grants Pass UGB 1993 to 2015 CO Season: Summary Emission Growth From Residential Wood Combustion; RWC Device Data

ANNUAL Emissions Growth from Residential Wood Combustion, Grants Pass CO EI 1993 to 2015

Year:	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Years from 1993 >>>		1	2	3	4	5	6	7	8	9	10	11
TONS/YEAR		(12)										
SCC 21-04-008-001 Fireplaces w/o insert	**191.7**	194.9	198.1	201.3	204.4	207.6	210.8	213.9	217.1	220.3	223.4	226.6
SCC 21-04-008-030 Certified Catalytic Wood-Stove	**53.4**	55.5	57.5	59.6	61.6	63.7	65.7	67.8	69.8	71.9	73.9	76.0
SCC 21-04-008-050 Cert. Non-Catalytic Wood-Stove	**216.2**	224.5	232.8	241.1	249.4	257.7	266.0	274.3	282.6	290.9	299.2	307.5
SCC 21-04-008-051 Conventional Wood-Stove or Fireplace Insert	**610.5**	587.5	564.4	541.4	518.4	495.4	472.4	449.4	426.4	403.4	380.3	357.3
SCC 21-04-008-053 Exempt Pellet Stoves	**8.7**	9.7	10.8	11.8	12.8	13.8	14.8	15.9	16.9	17.9	18.9	19.9
TOTAL	**1,080.6**	1,072.1	1,063.7	1,055.2	1,046.7	1,038.2	1,029.7	1,021.3	1,012.8	1,004.3	995.8	987.3

Year:	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Years from 1993 >>>	12	13	14	15	16	17	18	19	20	21	22
TONS/YEAR											
SCC 21-04-008-001 Fireplaces w/o insert	229.8	232.9	236.1	239.3	242.4	245.6	248.8	251.9	255.1	258.3	261.4
SCC 21-04-008-030 Certified Catalytic Wood-Stove	78.0	80.1	82.1	84.2	86.2	88.3	90.4	92.4	94.5	96.5	98.6
SCC 21-04-008-050 Cert. Non-Catalytic Wood-Stove	315.8	324.1	332.4	340.7	349.0	357.3	365.6	373.9	382.2	390.4	398.7
SCC 21-04-008-051 Conventional Wood-Stove or Fireplace Insert	334.3	311.3	288.3	265.3	242.3	219.2	196.2	173.2	150.2	127.2	104.2
SCC 21-04-008-053 Exempt Pellet Stoves	21.0	22.0	23.0	24.0	25.0	26.1	27.1	28.1	29.1	30.1	31.2
TOTAL	978.9	970.4	961.9	953.4	944.9	936.5	928.0	919.5	911.0	902.5	894.1

SEASONAL Emissions Growth from Residential Wood Combustions, Grants Pass CO EI 1993 to 2015

Year:	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Years from 1993 >>>		1	2	3	4	5	6	7	8	9	10	11
LBS/DAY		(12)										
SCC 21-04-008-001 Fireplaces w/o insert	**1,791.1**	1,820.7	1,850.2	1,879.8	1,909.4	1,939.0	1,968.6	1,998.2	2,027.8	2,057.4	2,086.9	2,116.5
SCC 21-04-008-030 Certified Catalytic Wood-Stove	**499.17**	518.3	537.5	556.6	575.8	594.9	614.1	633.2	652.4	671.6	690.7	709.9
SCC 21-04-008-050 Cert. Non-Catalytic Wood-Stove	**2,019.62**	2,097.1	2,174.6	2,252.1	2,329.6	2,407.1	2,484.6	2,562.1	2,639.6	2,717.1	2,794.6	2,872.1
SCC 21-04-008-051 Conventional Wood-Stove or Fireplace Insert	**5,702.3**	5,487.3	5,272.3	5,057.4	4,842.4	4,627.4	4,412.5	4,197.5	3,982.5	3,767.6	3,552.6	3,337.6
SCC 21-04-008-053 Exempt Pellet Stoves	**81.5**	91.0	100.5	110.1	119.6	129.1	138.7	148.2	157.7	167.2	176.8	186.3
TOTAL	**10,093.6**	10,014.4	9,935.2	9,856.0	9,776.8	9,697.6	9,618.4	9,539.2	9,460.0	9,380.8	9,301.6	9,222.4

Year:		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Years from 1993 >>>		12	13	14	15	16	17	18	19	20	21	22
LBS/DAY												
SCC 21-04-008-001 Fireplaces w/o insert		2,146.1	2,175.7	2,205.3	2,234.9	2,264.5	2,294.1	2,323.7	2,353.2	2,382.8	2,412.4	**2,442.0**
SCC 21-04-008-030 Certified Catalytic Wood-Stove		729.0	748.2	767.3	786.5	805.6	824.8	843.9	863.1	882.2	901.4	**920.6**
SCC 21-04-008-050 Cert. Non-Catalytic Wood-Stove		2,949.6	3,027.1	3,104.6	3,182.1	3,259.6	3,337.1	3,414.5	3,492.0	3,569.5	3,647.0	**3,724.5**
SCC 21-04-008-051 Conventional Wood-Stove or Fireplace Insert		3,122.7	2,907.7	2,692.7	2,477.8	2,262.8	2,047.8	1,832.9	1,617.9	1,402.9	1,188.0	**973.0**
SCC 21-04-008-053 Exempt Pellet Stoves		195.8	205.3	214.9	224.4	233.9	243.4	253.0	262.5	272.0	281.6	**291.1**
TOTAL		9,143.2	9,064.0	8,984.8	8,905.6	8,826.4	8,747.2	8,668.0	8,588.8	8,509.6	8,430.4	**8,351.2**

1993 Emission Calculations for Grants Pass UGB CO

(1) Woodburning Device by Type & SCC No.	(2) CO NAA Wood Fuel Use (tons)	(3) CO EF (lbs/ton)	(4) Control Efficiency (CE) %	(5) Rule Effectivness (RE)	(6) Rule Penetration (RP)	(7) Activity (d/wk)	(8) CO Season Adjustment (SAF)	(9) --- CO Emissions --- Annual (t/yr)	(10) CO Season (lbs/day)	(11) No. of Residential Wood Combustion (RWC) Devices in UGB for 1993
Grants Pass UGB/CO NAA Josephine County										
SCC 21-04-008-001 Fireplace w/out Insert	1,518	252.6	0.0	100	100	7	1.7	191.7	1,791	1136
	UGB Device Population:		1136				Emissions per Device:	0.169	1.5770	
SCC 21-04-008-030 Certified Catalytic Wood-Stove	1,024	104.4	54.8%	100	100	7	1.7	53.4	499.17	340
	UGB Device Population:		340				Emissions per Device:	0.157	1.4697	
SCC 21-04-008-050 Certified Non-Catalytic Wood-Stove	3,071	140.8	39.0%	100	100	7	1.7	216.2	2,020	1019
	UGB Device Population:		1019				Emissions per Device:	0.212	1.982	
SCC 21-04-008-051 Conv. Wood-Stove or Fireplace Insert	5,290	230.8	0.0	100	100	7	1.7	610.5	5,702	1620
	UGB Device Population:		1620				Emissions per Device:	0.377	3.520	
SCC 21-04-008-053 Exempt Pellet Stoves	334	52.2	0.0	100	100	7	1.7	8.7	81	167
	UGB Device Population:		167				Emissions per Device:	0.052	0.488	
TOTAL	11,238							1,081	10,094	4281
	UGB Device Population:		4281				Emissions per Device:	0.252	2.358	

Notes:

1) Woodburning Device categories include:
   - Conventional Fireplaces without Inserts
   - DEQ Certified Catalytic Wood Stoves
   - DEQ Certified Non-Catalytic Wood Stoves
   - Total Conventional Wood Stoves and Fireplaces with Inserts
   - Exempt Pellet Stoves

2) Grants Pass Tons Burned in wood stove devices =
   (UGB Cords Burned per HU[for device]) * (Tons/Cord of wood) * (Number of GP Housing Units) * (UGB HU [for device] %)

3) Emission Factors (EF) are from AP-42 (Ref. 216), Table 1.9-2 and Table 1.10-2.

4) Control Efficiency (CE) estimated based on EPA guidance (Ref 165) and according to EIIP (Ref. 321) reflected in lower emission factors of certified catalytic and non-catalytic woodstoves.

Control Efficiency = (1 - (Controlled Emissions / Uncontrolled Emissions))

catalytic woodstoves CE = (1-(104.4*1023.76)/(230.8*1023.76) = 54.77%

non-catalytic wood stoves CE = (1-(140.8*3071)/(230.8*3071) = 39%

5) Rule Effectiveness:

Rule Effectiveness is indicated through survey questionaire results;

(see EPA guidance; EPA-452/R-92-010, Nov. 1992 (Ref. 165).

The survey was funded by Oregon DEQ.

The effect of Oregon Administrative Rules (Chapter 340-34-010 and Chapter 340-3-400) is included in the calculations in Appendix B, Table B-6.

The percent rule effectiveness is directly determined as a result of this survey.

Rule Effectiveness applied to this category = 100 %

6) Rule Penetration:

Rule Peneration is indicated through survey questionaire results; (see EPA guidance; EPA-452/R-92-010, Nov. 1992 (Ref. 165).

The survey was funded by Oregon DEQ.

The effect of Oregon Administrative Rules (Chapter 340-34-010 and Chapter 340-3-400) is included in the calculations in Appendix B, Table B-6.

The percent rule penetration is directly determined as a result of this survey.

Rule Penetration applied to this category = 100 %

7) Activity is at the indicated number of days/week.

8) The Season Adjustment Factor (SAF) is taken from the EPA Procedures Document, Table 5.8-1 (Ref. 42).

9) Annual Emissions (t/yr) = (Wood Fuel Use [tons] * Uncontrolled EF [lbs/ton])/2000 [lbs/ton]

10) CO Season Emissions [lbs/day] = (((Annual Emissions [tons/yr] * 2000 [lbs/ton])*SAF)
/ (Activity [days/week] * 52 [weeks/year])) * (1 - CE/100 * RE/100 * RP/100))

11) The number of devices in the UGB in 1993 was calculated by multiplying the number of Housing Units (HU) in the UGB of the woodburning HU with each category of woodburning devices. The percentage came from the 1992-1993 Oregon Woodheating Survey (Ref.115). Since the survey does not break down the Cert. Woodstoves (WS) category, the ration based on the cert. Catalytic and cert. Non-cat. emissions difference, where cert.cat. Emissions are assumed to be 25% of the cert. WS emissions and cert. Non-cat. Are assumed to be 75% of cert. WS emissions was applied.

GROWTH FACTORS

Residential Wood Combustion Growth Calculations / Assumptions

UGB Estimated increase in new housing in 1993-2015period=	3728	Ref. 326

Grants Pass UGB 1993 Housing Units=	10582	See 1993 CO EI, Append B, Table B-1.
Grants Pass UGB 1995 Housing Units=	11252	See 1993 CO EI, Append B, Table B-1.
Grants Pass UGB Estim. 2015 Housing Units=	14310	at 1.6% growth rate, see Ref.326
UGB Estim. increase in RWC housing in the 1993- 2015 period=	1507	=UGB new housing 3728 * 0.4
UGB Estim. new RWC homes each year=	69	=1507 UGB new RWC housing /22years between1993 and 2015

For the purpose of these calculations we assumed that

40.5% of UGB New Housing Units will have Woodburning Devices, 0.4050

The assumption is based on the 1993 Oregon Wood Heating Survey, Ref. 115

NEW UGB RWC Housing Profile	Estimated UGB Annual Growth Devices/yr	
New RWC Homes	69	=1993-2015 RWC Housing Units(HU) / 22 years
Fireplace (No Insert)	17	=2015-1993 RWC HU with fierplaces / 22 years
Total Certified WS	36	=2015-1993 RWC HU with Certified WS / 22years
Woodstove (Non-Cert.)	0	=2015-1993 RWC HU with Non.-Certified WS / 22 yr. (not allowed for installation in new houses since 1993).
Woodburning Pellet Stove	12	=2015-1993 RWC HU with Pellet Stoves / 22 years.

For the existing UGB Housing Units the percentage of the RWC Housing Units declines at the rate of 2.59% a year.

The assumption is based on the evaluation of the 1985 and 1993 surveys data
(the number of the RWC Housing Units has droped by 2.59% a year over the course of 8 years). See Table 12.

Existing RWC Housing Profile UGB Housing Units Burning Wood	Estumated UGB Annual Growth Devices/yr	
Fireplace (No Insert)	1	Fireplaces, Linear, Non-Compounding, see Table 12.
Total Certified WS	16	Woodstoves, Linear, Non-Compounding, see Table 12.
Woodstove (Non-Cert.)	-61	Compound Rate, calculated in the Table 12.
Woodburning Pellet Stove	8	Pellet stoves, Linear, Non-Compounding, see Table 12.

12) 1994 - 2015 emissions were projected as follows:

1993 emission + (((emissions/device * estimated # of new devices/year, existing housing profile) + (emissions/device * estimated # of new devices/year, new housing profile))* # of years since 1993)

2015 (, PASS UGB WOODSTOVE POPULATION FORECAST

New Construction Population Distribution

	2015 Grants Pass UGB	
Total UGB Housing (4)	3,728	
Housing Units Burning Wood (5)	40.5%	1,508
Woodburning HU with Fireplace (No Insert)	10.7%	400
Woodburning HU with Woodstove (certified)	22.3%	831
Woodburning HU with Woodstove or FP Insert (non-certified conventional)	0.0%	-
Woodburning HU with Pellet Stove	7.4%	277
	40.5%	1,508

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Years Till 2015		1	2	3	4	5	6	7	8	9	10	11	12
Number new UGB housing units		169	339	508	677	847	1,016	1,185	1,354	1,524	1,693	1,862	2,032
Percentage Housing Units Burning Wood (5)	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%
Housing Units Burning Wood (5)		69	137	206	274	343	411	480	548	617	685	754	822
# of Devices													
Woodburning HU with Fireplace (No Insert)		18	36	55	73	91	109	127	145	164	182	200	218
Woodburning HU with Woodstove (certified)		38	75	113	151	189	226	264	302	340	377	415	453
Woodburning HU with Woodstove or FP Insert (non-certified conventional)		-	-	-	-	-	-	-	-	-	-	-	-
Woodburning HU with Pellet Stove		13	25	38	50	63	75	88	101	113	126	138	151
Total	-	69	137	206	274	343	411	480	548	617	685	754	822

Device/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		2015 # of Devices New Homes	2015 Distribution of devices New Homes
Years Till 2015	13	14	15	16	17	18	19	20	21	22			
Number new UGB housing units	2,201	2,370	2,540	2,709	2,878	3,048	3,217	3,386	3,556	3,725			
Percentage Housing Units Burning Wood (5)	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%	40.5%			
Housing Units Burning Wood (5)	891	959	1,028	1,096	1,165	1,233	1,302	1,370	1,439	1,507			
# of Devices													
Woodburning HU with Fireplace (No Insert)	236	254	273	291	309	327	345	363	382	400		400	27%
Woodburning HU with Woodstove (certified)	491	528	566	604	642	679	717	755	793	830		830	55%
Woodburning HU with Woodstove or FP Insert (non-cert. conv.)	-	-	-	-	-	-	-	-	-	-		-	0%
Woodburning HU with Pellet Stove	164	176	189	201	214	226	239	252	264	277		277	18%
Total	891	959	1,028	1,096	1,165	1,233	1,302	1,370	1,439	1,507		1,507	100%

2015 Existing & New HU Burning wood

	2015 Total # of dev.	2015 distribution
Woodburning HU with Fireplace (No Insert)	1,567	31%
Woodburning HU with Woodstove (certified)	2,543	51%
Woodburning HU with Woodstove or FP Insert (non-certified conventional)	276	6%
Woodburning HU with Pellet Stove	610	12%
	4,996	100%

4) Total UGB Housing units (new construction) was calculated as follows: 2015 projected HU (14310) - 1993 HU (10582) = 3728

5) Due to unavailability of the Grants Pass new housing information, Medford new housing calculation patterns were adopted here.

The percentage of HU burning wood was assumed to be the same as in 1993 and was held steady until the year 2015.

The percentage of the HU with fireplaces was carried over from the 1993.

The percentage of the HU with cert. woodstoves was assumed to be equal to 75% of a difference between the total woodburning HU percentage and HU with fireplaces percentage.

The percentage of the non-cert. Woodstoves was assumed to be zero because non-cert. Woodstoves are not allowed for installation in new houses since 1993.

The percentage of the HU with pellet stoves was assumed to be equal to 25% of a difference between the total woodburning HU percentage and HU with fireplaces percentage.

Table 1? 2015 GRANTS PASS WOODSTOVE POPULATION FORECAST

	Existing Houses Distribution (1)					
	1985 Grants Pass UGB Percentage	1985 Grants Pass # of Devices	1993 Grants Pass UGB Percentage	1993 Grants Pass # of Devices	Compound/Linear Changeover Rates	
						Annual Change
Total UGB Population Estimated	24,000		25,397			
Total UGB Housing	10,000		10,582			
Housing Units Burning Wood	54%	5,400	40.5%	4,281	Eight Year Trend	-2.59%
Woodburning HU with Fireplace (No Insert)	8.6%	864	10.7%	1,136	Eight Year Trend	3.93%
Woodburning HU with Woodstove (certified)	3.0%	297	12.8%	1,359	Eight Year Trend	44.68%
Woodburning HU with Woodstove or FP Insert (non-certified conventional)	42.4%	4,239	15.3%	1,620	Eight Year Trend	-7.72%
Woodburning HU with Pellet Stove	0.0%	-	1.58%	167	Eight Year Trend	20.89%
	54.0%	5,400	40.5%	4,281		

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Years Since 1993		1	2	3	4	5	6	7	8	9	10	11	12
Number existing UGB housing units	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582
Percentage Housing Units Burning Wood	40.5%	39.76%	39.12%	38.52%	37.98%	37.47%	37.00%	36.57%	36.18%	35.81%	35.47%	35.16%	34.87%
Housing Units Burning Wood	4,281	4,208	4,140	4,077	4,019	3,965	3,916	3,870	3,828	3,789	3,754	3,720	3,690
# of Devices (2)													
Woodburning HU with Fireplace (No Insert)	1,136	1,139	1,141	1,144	1,146	1,148	1,150	1,152	1,154	1,155	1,156	1,158	1,159
Woodburning HU with Woodstove (certified)	1,359	1,392	1,422	1,450	1,476	1,500	1,522	1,542	1,561	1,578	1,594	1,609	1,623
Woodburning HU with Woodstove or FP Insert (non-certified conventional)	1,620	1,495	1,379	1,273	1,175	1,084	1,000	923	852	786	725	669	618
Woodburning HU with Pellet Stove	167	183	197	210	222	233	244	253	262	270	277	284	291
Total	4,281	4,208	4,140	4,077	4,019	3,965	3,916	3,870	3,828	3,789	3,754	3,720	3,690

Device/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		2015 # of Devices Existing	2015 Distribution of devices Existing houses
Years Since 1993	13	14	15	16	17	18	19	20	21	22			
Number UGB housing units	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582			
Percentage Housing Units Burning Wood	34.6%	34.4%	34.1%	33.9%	33.7%	33.6%	33.4%	33.2%	33.1%	33.0%			
Housing Units Burning Wood	3,662	3,636	3,612	3,590	3,569	3,551	3,533	3,517	3,502	3,489			
# of Devices													
Woodburning HU with Fireplace (No Insert)	1,160	1,161	1,162	1,163	1,164	1,164	1,165	1,166	1,166	1,167		1,167	33%
Woodburning HU with Woodstove (certified)	1,635	1,647	1,658	1,668	1,677	1,685	1,693	1,700	1,707	1,713		1,713	49%
Woodburning HU with Woodstove or FP Insert (non-certified)	570	526	485	448	413	381	352	325	300	276		276	8%
Woodburning HU with Pellet Stove	297	302	307	312	316	320	323	327	330	333		333	10%
Total	3,662	3,636	3,612	3,590	3,569	3,551	3,533	3,517	3,502	3,489		3,489	100%

Notes:

1)The percentage of the HU burning wood on 1993 is from 1992 - 1993 Oregon Woodheating Survey, Ref. 115.

The percentage of the HU burning wood on 1985 is from "Medford Area Wood Heating Survey, 1985", Ref.28.

A survey of wood heating in Grants Pass in 1985 has not been conducted. Data from Medford has been used due to proximity and economic and social similarities.

2) The number of devices in the existing HU was calculated in two ways.

Fireplaces, Cert. woodstoves, and pellet stoves growth was assumed a growth rate based on the 1985 - 1993 growth trend using the formula:

1993 number of sub-category devices - (total number of devices in the given year - total number of devices in 1993) * (Growth Rate)

3) Non-certified woodstoves are not allowed for installation since 1993.

Because of the decline in the population of the non-cert. Woodstove subcategory, a compounded negative growth rate was selected in order to prevent the premature elimination of all devices .

Grants Pass 2015 Road & Street Network

ID#	Section Description	Approx. Length/Miles	EMME/2 FNode No's	Comments
*1	Connect Bridge #4 and Lincoln Road to Hwy 199. Beginning at Flower Lane proceed south from Rogue River Bridge #4 across Hwy 199 to Allen Creek Rd at Jct with Hwy 99 then south along entire length of Allen Cr. Rd. Upgrade and widen 1.25 miles. Construct .25 mile of new road from Denton Trail to Allen Lee Rd.	1.5	257, 293	Upgrade & widen 1.25 miles. New construction .25 miles. (SEE NOTE BELOW TABLE)
2	Connect Lincoln Rd to Bridge #4 and upgrade Lincoln Rd. Upgrade Lincoln Rd starting with its intersecting with Lower River Rd then south to intersection with Webster Rd (Approx. 0.3 miles. Construct new section from intersection with Webster Rd to Bridge #4 (approx. 0.23 miles).	0.53	513	Upgrade and widen .3 miles. New construction .23 miles.
3	Upgrade New Hope Rd from its intersection with Hwy 238 to a point approx .20 miles southwest of its intersection with Allen Creek Rd.	0.5	295	Upgrade & Widen existing road.
4	Construct new E-W section of road between Hwy 238 and New Hope Rd. Begins near intersection of Allen Creek Rd & New Hope Rd.	0.2	296	New Construction
5	Harbeck Rd: Upgrade & widen from intersection with Allen Cr. Rd. to intersection with Hwy 238.	0.5	292	Upgrade & Widen existing road.
6	West Grants Pass Bypass. Beginning at or near intersection of Upper Rogue River Rd. and Lincoln Rd. then northerly across Tokay Canal then northeasterly to a point near the corner of Sections 7, 12, 13, and 18 then northeasterly crossing Blue Gulch Cr. at a point approx. 700 feet directly north of the terminus of Brush St then northerly to a small saddle approx 300 feet west of elevation point 1418T (Grants Pass USGS Quad 1986) then northeasterly to a point at the intersection of Cook Ave. and Candler Ave. then easterly along Cook Ave. to the intersection of Highland Ave and Highland Ave then easterly and ending at the intersection of Morgan Lane and Hawthorne Ave.	2.5	334, 1003, 1004 & 1006	Preliminary route location using USGS quad and other map information.
7	Upgrade Agness Ave and 'N' Street beginning at Agness Ave jct with Spaulding Ave south to intersections with 'N' Street and Gladiola St then westerly along 'N' Street to the intersection of 'N' St and Harvey Dr.	0.5	412, 1014	Upgrade & Widen existing roads.
8	Extend and connect Spaulding Ave to Redwood Hwy 199. Starting at the intersection of Spaulding Ave and Beacon Dr construct new section to Hwy 199 at or intersection of Hwy 199 and 'F' St.	0.2	392, 505	New Construction
9	Upgrade 9th St from its intersection with Savage Street north to its intersection with Hillcrest Dr	0.45	337, 481	Upgrade & Widen existing road.

10	Extend and connect Midland Avenue from its intersection with Hwy 99 to new intersection with 9th St.	0.7	244	New Construction
11	Upgrade Dimmick St beginning at its intersection with West 'G' St and to its intersection with West 'A' St.	0.45	326, 375	Upgrade & Widen existing road.
12	Upgrade 'E' Street beginning at its intersection with 4th Street and ending with its intersection with Dimmick St.	0.36	540	Upgrade & Widen existing road.
13	Upgrade 'F' Street beginning at its intersection with 4th Street and ending with its intersection with Dimmick St.	0.36	1002	Upgrade & Widen existing road.
14	Construct new route beginning at or near intersection of Dimmick St and Highland Ave and proceeding in a northwesterly direction to a point approx. .05 miles north of Blue Gulch and joining with the proposed West Grants Pass bypass.	0.6	382	New Construction.
15	Upgrade Hawthorne Ave beginning at its intersection with Hillcrest and ending at its intersection with Morgan Ln.	0.3	315	Upgrade & Widen existing road.
16	Upgrade Hillcrest Drive beginning at the intersection of 10th St and Hillcrest Drive and ending at the intersection of Hillcrest Drive and Beacon Drive.	0.25	338, 339	Upgrade & Widen existing road.
17	Connect Hillcrest Drive to Greenfield Road beginning near the intersection of Hillcrest Drive and the Demaray Canal then northwesterly paralleling Demaray Canal and at some point crossing the canal then proceeding to a connection with Greenfield Road approx. 240' southwest of its intersection with Spring Mtn Road .	0.43		New Construction.
18	Upgrade and re-route existing Greenfield Road, Granite Hill Road and West Scenic Drive beginning at a point on Greenfield Road approx. 240' southeast of it to its intersection with Spring Mtn Road then proceeding on Greenfield road to its intersection with Scoville Road (near State Police Office) then north on Scoville Road to its intersection with East Scenic Drive and Granite Hill Road then on Granite Hill Road to its intersection with West Scenic Drive thence to the end of West Scenic Drive the approx. terminus.	1.5	197, 1008, 1019	Upgrade, widen and realign.
19	Upgrade and extend 'F' Street beginning at its intersection with 4th Street to its connection with the proposed West Grants Pass Bypass.	1.3	1002	Upgrade, widen and realign. Involves approx. 0.11 miles of new construction.

*Project #1 is listed as a long-range project in the Grants Pass Urban Area Master Transportation Plan. Due to uncertainty about funding availability, Project #1 was not included in the 2015 transportation network for development of the CO SIP.

State of Oregon

Department of Environmental Quality — Memorandum

Date: September 13, 1999

To: Environmental Quality Commission

From: Langdon Marsh, Director

Subject: Agenda Item H, October 1, 1999, EQC Meeting, Air Toxics Program Development: Recommendations of the HAP Consensus Group

Statement of Purpose

The Department convened a group of stakeholders known as the "HAP Consensus Group" to help decide what, if any changes should be made to the existing air toxics program. The HAP Consensus Group, or HCG, arrived at a unique set of consensus recommendations as the basis for air toxics program development. The purpose of this informational item is to introduce the Commission to the HCG recommendations and background information prior to planned rulemaking during the next year.

Background

The Department currently administers the federal air toxics program, which consists of technology-based controls on 188 Hazardous Air Pollutants (HAPs) from industrial sources. While this program achieves substantial reductions in air toxics emissions, the smaller area and mobile sources, which are responsible for a greater percentage of emissions of air toxics than large industrial sources, have yet to be controlled. In addition, the public is concerned about other air toxics that are not on the list of 188 HAPs.

During the past ten years, the Department has been concerned about its lack of information about air toxics and lack of ability to address potential health problems and risks related to air toxics. The Department has had difficulty communicating with the public about air toxics. The only available forum for public concerns about air toxics has been the permitting process, which does not adequately meet communication needs, and results in disproportionate attention on large industrial point sources. Because there has been no state-wide policy or rulemaking relating to this issue, the Department has had no systematic way to respond to cases in which air toxics emissions from permitted sources may be causing public health impacts.

As part of its strategic plan, the Department is committed to finding ways to address the significant emissions from area and mobile sources of air toxics. The goal of the HCG was to understand the air toxics concerns and needs of Oregonians, and develop consensus recommendations to address the concerns. The eighteen member HCG, composed of public interest, business and government representatives worked through a process that resulted in innovative recommendations targeting specific air toxics needs. Instead of building a new overarching program, the HCG focused on filling in areas of specific need, and enhancing the existing program.

The HCG recommendation that represents the largest step forward in addressing air toxics problems is the Geographic Program. Under the place-based Geographic Program, areas of concern would be identified, studied, and placed on an air toxics reduction plan, all with the involvement of a local committee. The Geographic Program would require evaluation of the impacts of multiple sources of air toxics in an identified area. The resulting local air toxics reduction plan is expected to be an effective tool to address cumulative emissions. This approach will allow the Department to better target point, area and mobile sources for emission reductions in proportion to their contributions. It will complement federal technology-based controls for major industrial sources and is expected to fit well within upcoming federal efforts at reducing air toxics in urban areas.

Good science and increased information were stressed as the necessary foundation for air toxics program development. As a result, the HCG recommended enhancements to the air toxics emission inventory, monitoring and modeling activities. A Scientific Advisory Panel is recommended to help the Department develop health benchmarks and evaluate program progress. The HCG also recommended that the Department consider adoption of state categorical air toxics emission limits when there is a need to reduce emissions from a particular category of sources state-wide. As a backup to other program elements, the HCG recommended establishing a Safety Net Program to address risk from the very rare case of an industrial source of air toxics that is not subject to the federal regulation, and does not fall within a designated Geographic Area.

Adequate resources are key to implementing the HCG recommendations. Only a small portion of HCG recommendations can be supported with existing resources. New program elements could be implemented incrementally over two biennia, commensurate with available funding. Stable, long-term funding will be an important element of the overall Air Quality Budget, beginning with an air toxics program policy package request for the 2001-2003 budget.

Authority of the Commission with Respect to the Issue

The Commission has statutory authority to address this issue under ORS 468A.025.

Intended Future Actions

A more detailed background on air toxics issues and summary of the HCG recommendations is attached. Over the next year, the Department plans to develop draft rules to begin implementation of the HCG recommendations. Rules may be proposed for adoption as early as October 2000. The Department will continue to work with HCG members and their broader interest groups to continue and increase support for funding air toxics program development.

Department Recommendation

It is recommended that the Commission accept this report, discuss the matter, provide advice and guidance to the Department as appropriate, and consider this information when evaluating proposed rules.

Approved:

Section: Gregg E Fande

Division: Henry T. Preston for Andy Ginsburg

Report prepared by: Sarah Armitage
Phone: (503) 229-5186
Date Prepared: September 13, 1999

Air Toxics Program Development
The Work and Recommendations of the HAP Consensus Group

September 1999
Oregon Department of Environmental Quality

Background
Addressing hazardous air pollutants (HAPs), especially from the predominant area and mobile sources, is a high priority in the Department's strategic plan for air quality. To make progress in this area, and in response to long-standing air toxics concerns, the Department convened a broad-based group of stakeholders known as the "HAP Consensus Group" in November 1998. Composed of representatives from the public, business and government, the HAP Consensus Group (HCG) worked through a process to understand the air toxics concerns and needs of Oregonians, and develop consensus recommendations to address them. In July, 1999, the HCG arrived at a unique set of recommendations as the basis for air toxics program development. The HCG recommended a three-part strategy that would tackle the difficult problem of reducing air toxics emissions while greatly improving information and complementing existing and future federal and state regulatory efforts.

Adequate resources are key to implementing the HCG recommendations. Only a small portion of HCG recommendations can be supported with existing resources. New program elements should be implemented incrementally, commensurate with available funding. Stable, long-term funding will be sought beginning with an air toxics program policy package request for the 2001-2003 budget.

How have air toxics been regulated in Oregon ?

➢ **What are air toxics ?**
Air toxics are generally defined as pollutants known or suspected to cause serious health problems. Air toxics can also be damaging to the environment. Air toxics may exist as particulate matter, as gases, or as gases adsorbed onto particles. They include metal fumes, smoke, other particles, and vapors from fuels, coatings and other sources. Thousands of substances are considered air toxics. They are distinguished from six pollutants with ambient standards, known as criteria pollutants. Criteria pollutants are carbon monoxide, ozone, particulate matter, lead, sulfur dioxide, and nitrogen dioxide. Exposure to criteria pollutants can also result in serious health problems. Many criteria pollutant controls also reduce air toxics.

"Hazardous air pollutants", or HAPs, are the 188 air toxics that are specifically listed under the Clean Air Act and addressed by means of a federal regulatory framework that is administered in Oregon by DEQ and Lane Regional Air Pollution Authority (LRAPA). The federal HAP list includes pollutants like benzene found in gasoline, perchloroethylene emitted from dry cleaners, methylene chloride used as an industrial solvent, heavy metals like mercury and lead, polychlorinated biphenyls (PCBs), dioxins and some pesticides. Initial emission inventories conducted by EPA and DEQ on the list of 188 federal HAPs indicate that at this time there may be ten to twenty air toxics of most concern in Oregon.

➢ **What are the sources of air toxics ?**

Some air toxics come from natural sources such as forest fires and volcanoes; some come from human sources, both stationary and mobile. Two types of stationary sources generate routine (as opposed to accidental) air toxics emissions: point sources such as aluminum plants or wood cabinet makers; and area sources, such as wood stoves or auto body shops. Mobile sources are major contributors to air toxics emissions. They can be classified as on or off-road: cars and trucks or lawnmowers and watercraft.

➢ **What health and environmental effects do they cause ?**

Air toxics can cause many health effects. More than half of the federally listed HAPs are known or suspected carcinogens. Many are known to have respiratory, neurological, immune or reproductive effects, particularly for more sensitive populations, such as children. Many of the HAPs are also known to cause adverse effects in many fish and animal species, including endangered species.

➢ **How has EPA regulated air toxics ?**

In the past, air toxics regulation was risk-based. Due to the technical and political complexity of establishing risk-based rules, there was little progress in reducing air toxics emission prior to 1990. In 1990, Congress amended the Clean Air Act. Among the many changes was a new approach to reducing the release of air toxics. This approach has two components. In the first phase, Congress directed EPA to develop requirements for sources to meet specific emissions limits based on what had already been achieved by similar sources around the country. The EPA developed these requirements under a program called the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Under the NESHAPs, EPA makes a determination of "maximum achievable control technology" (MACT) or "generally available control technology" (GACT) for the categories of industry that emit 188 listed air toxics. In the second phase, EPA must assess the effectiveness of these limits in reducing health and environmental effects, adding requirements where needed to address any significant remaining risks. Congress also gave EPA specific deadlines to accomplish these things.

Under the Clean Air Act Amendments of 1990, EPA regulates 188 listed chemicals, and groups of chemicals as air toxics. The EPA prioritized source categories for development of standards and has assigned them to 2, 4, 7, and 10-year groups as required by Congress. Currently, standards have been promulgated for about 78 out of 169 source categories. In addition, EPA has placed requirements on certain sources to prevent catastrophic accidental releases. There are also rules in place to allow state and local air agencies to administer the MACT in lieu of the federal government within their jurisdictions. This is known as NESHAPs delegation. EPA is also working on proposals that will reduce air toxics emissions from area and mobile sources.

➢ **How has DEQ regulated air toxics ?**

Since 1986, the Department responded to air toxics issues that have arisen during the permitting process. An initial air toxics emission inventory was conducted in 1986. The Department has employed several methods to address emissions from permitted sources, but none worked, and the Department never developed its own state-specific air toxics program. Two methods that were discontinued were the "Interim HAP Policy" and the "HAP Public

Information Tool". Under the Interim HAP Policy, HAP emissions were compared to previously set "significant levels", and permit conditions were drafted to quantify and reduce emissions. Under the HAP Public Information Tool, HAP emissions were compared to "significant levels" for the purpose of communicating relative hazards to the public.

The Department has relied upon the federal program to achieve air toxics reductions. The Department began implementing the new federal technology-based NESHAP standards in 1992, and in 1995 adopted OAR, Division 32 as a framework for further implementation of the federal program. These rules also included procedures required by EPA to control new major air toxics sources on a case-by-case basis prior to federal rule promulgation. At this time, DEQ also began assisting EPA with development of various MACT standards, identifying sources of air toxics, and providing assistance to small sources of air toxics. Currently, DEQ continues to implement federal technology-based standards through major source permits, adopt NESHAPs, and provide assistance to sources to reduce their air toxics emissions.

So far, DEQ has identified about 400 sources that are subject to NESHAPs. Three hundred and fifty of these are dry cleaners. Of the remaining sources, some are major, and have NESHAP requirements included in their air permits. Major sources receive Oregon's Federal Operating Permits (Title V), smaller sources are covered with State Air Contaminant Discharge Permits (ACDPs). DEQ is also working on general permit and non-permit approaches for small businesses subject to these standards.

Examples of Oregon sources affected by NESHAPs standards are:

- Dry Cleaning using Perchloroethylene
- Hard and Decorative Chromium Electroplating and Anodizing
- Ethylene Oxide Sterilization
- Pulp and Paper Industry
- Halogenated Solvent Cleaning
- Ship Building and Repair
- Wood Furniture Manufacturing
- Primary Aluminum Production

➢ **What are the next steps for the federal program ?**

Over the next several years, EPA will continue to develop standards for the remaining source categories to further reduce HAPs emissions. Once all MACT standards are implemented, EPA projects a 75 percent reduction in the emission of HAPs. After setting a MACT standard for a source category, EPA has 8 years to examine residual emissions and to issue requirements for additional controls if necessary to reduce an unacceptable risk.

EPA is also working to develop an urban strategy that will reduce emissions of at least 30 of the most toxic pollutants from area sources and address the health problems associated with the cumulative effects of exposure. Part of this strategy involves controlling emissions of toxic pollutants from motor vehicles and fuels. Under section 202 (l) of the Clean Air Act, EPA is currently updating a study of air toxics emissions from motor vehicles and fuels, and considering rulemaking. Recently EPA has realized it will be beneficial to have a nationwide network of air monitors to measure HAP concentrations and has begun to support and expand upon existing local efforts. In August 1999, DEQ began studies to site a permanent air toxics monitor in the Portland area.

Why explore a state-specific approach to regulating air toxics ?

While the federal air toxics program has and is projected to result in substantial reductions in regulated air toxics emissions nationally, the emissions of air toxics not on the federal HAP list and emissions from area and mobile sources have not been addressed in Oregon. Smaller area and mobile sources are responsible for a greater percentage of emissions of air toxics than large industrial sources. Concerns about air toxics not regulated by the federal program routinely arise during the public participation phase of air permitting. There has been longstanding concern about health risks associated with potential air toxics "hot spots" where concentrations may be greater due to multiple sources, land use patterns and physical characteristics, such as topography. Examples of other problems identified are: uncertainty for the public and regulated community, potential failure to address health problems, lack of communications about risk and health effects, and misdirected resources. Because of Oregon's unique characteristics, the Department set out to evaluate whether and how to supplement the federal air toxics program.

One way to evaluate the need for a state-specific air toxics program is to determine where air toxics emissions are not addressed by the federal program. These areas are known as the "HAP Gap". The HAP Gap can be broken into seven components:

- **Substances**: The federal program only addresses 188 HAPs. This list does not necessarily include substances of interest in Oregon and certainly does not consider the thousands of chemicals that are present in our environment.

- **Source Category Choices**: The federal program only includes categories for some processes. Decisions about processes to include or sub-categorization are made from a national perspective that may overlook regional differences. A gap in regulation exists where there is no single source in the country over ten tons.

- **Size**: Except for the few source categories specifically listed as area sources all of the issued NESHAP have applicability thresholds at 10/25 tons. Requirements are triggered when a source emits 10 tons per year or more of any one HAP or more than 25 tons per year or more of combined HAPs. Although the Act allows for Lower Quantity cut-offs, the EPA has taken this approach infrequently.

- **Level of Control**: EPA's initial technology approach does not require the most stringent technology available and does not account for risk. In developing each NESHAP, EPA establishes a "MACT floor" based on the average level of control achieved by the top 12% of the sources in the country. On occasion EPA has set the level of control higher than the floor, generally based on technical feasibility. A more stringent standard based on other considerations could be required in Oregon.

- **Timing**: Under the federal timetable, many source categories important in Oregon have yet to be regulated. Examples are the categories of reinforced plastics (bathtubs, boats) and metal finishing/coating. A few of the standards scheduled for promulgation in 1997 are still not completed. Many of the standards for 2000 will be up to a year late. The proposed Urban Area Source Strategy includes a timetable for source control that stretches to 2009. Oregon could accelerate implementation by attempting to adopt controls equal to the anticipated federal standard.

- **Cumulative Effects Based on Location**: Cumulative emissions resulting from a number of controlled or uncontrolled sources located in one geographic area have not yet been addressed by the federal program. Aside from the additive impact of multiple sources of the same pollutant, the science has not yet evolved to the point where synergistic or antagonistic effects can be accounted for in developing standards. Other effects such as atmospheric fate, persistence, and bioaccumulation are also not well-understood.

- **Communications**: The federal program does not adequately deliver information about exposure, effects and sources of HAP. The lack of a monitoring network and of regularly updated emissions inventories is only now being recognized as a significant deficiency. The federal program also fails to engage the interested public in any discussion that would allow exposure reduction strategies to be based on local factors.

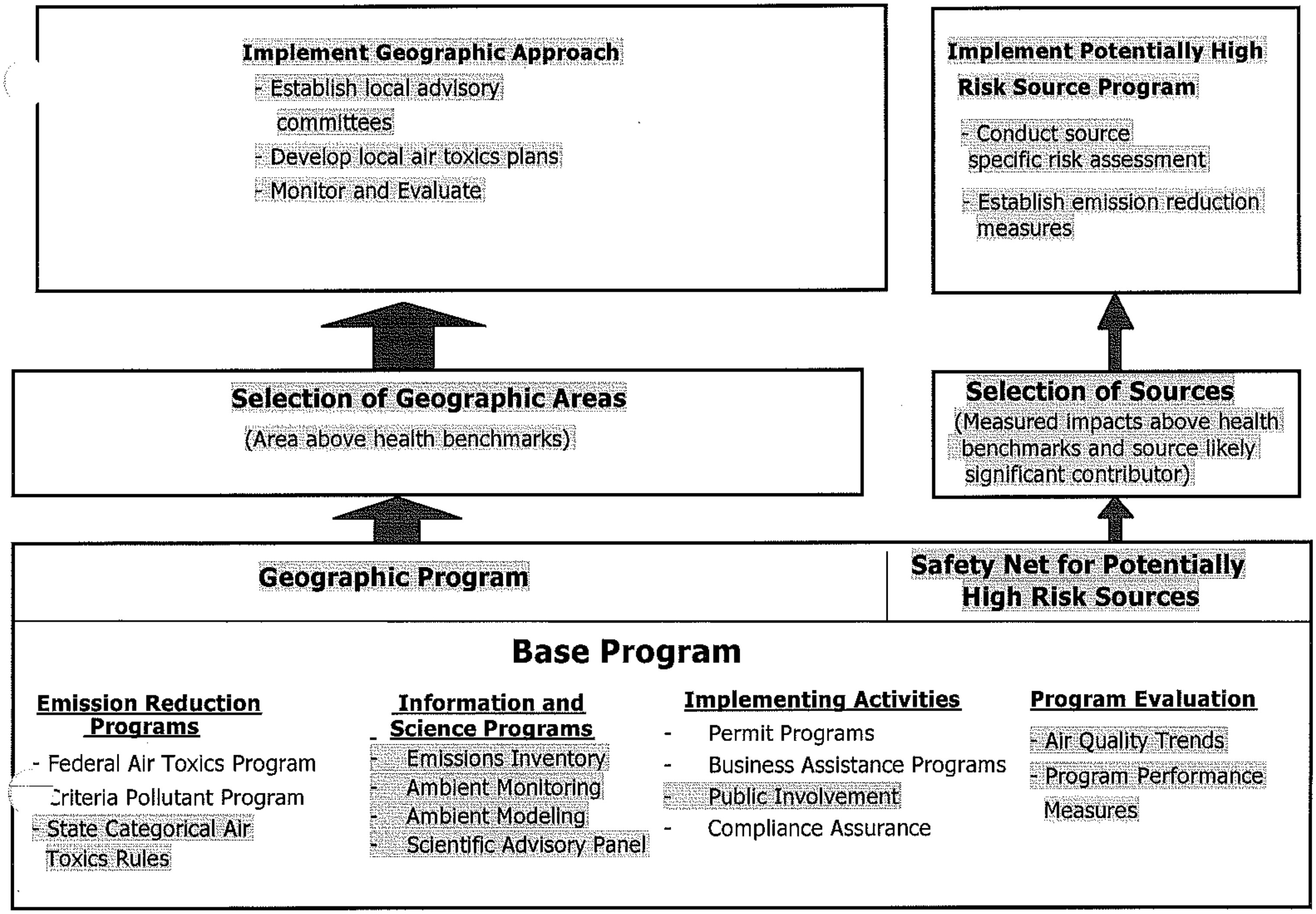
What are the Recommendations of the HCG ?

Discussing the concept of the HAP Gap, and considering how other states and EPA have regulated air toxics helped the HCG focus on areas appropriate for state-specific action. The recommendations of the HCG are unique because they target specific air toxics concerns rather than seek to build an overarching regulatory program. The recommendations balance the need for collecting more information to better understand air toxics against the need to expediently reduce air toxics where there are known hazards.

The HCG made recommendations in three areas: improving the scientific basis of the air toxics program, establishing a geographic approach to emission reductions, and creating a safety net for potentially high risk sources not otherwise addressed. The HCG also expressed its concern about resources necessary to the program. The following chart shows the structure of the HCG recommendations. New and enhanced program elements are highlighted and explained below.

Recommended Air Toxics Program Structure

(New and enhanced program elements are highlighted)



- **Improving the Base Program**

  In addition to conducting the ongoing federal program and supporting elements, such as compliance assurance, technical assistance and public involvement, the HCG recommended enhancements in five areas to improve the scientific basis for the air toxics program.

  1) Emission Inventory

  The HCG recommended that the Department should conduct a statewide base air toxics emission inventory as soon as possible and seek funding to update the inventory regularly. The air toxics emission inventory should include all types of sources, including point, area and mobile, contain a broad list of substances, and be progressively rendered more accurate and complete. An improved air toxics emission inventory is necessary to identify air toxics concerns as well as to design emission reduction strategies.

  2) Ambient Monitoring

  The HCG recommended that the Department enhance its air toxics monitoring capability by setting up a permanent air toxics monitoring base network to track trends statewide. State of the art technology, including mobile and real-time monitors were recommended to respond to complaints and verify emission inventory data. Improved ambient monitoring would allow the Department to identify geographic areas to target for emission reductions and to track progress in reducing air toxics exposures.

3) Ambient Modeling
The HCG recommended that the Department conduct periodic statewide screening modeling using emission inventory information. This would help to site monitors, verify emission inventory data against monitored data, and identify geographic areas of concern for emission reductions.

4) Scientific Advisory Panel
The HCG recommended the establishment of a Scientific Advisory Panel to assist the Department in implementing the air toxics program, where science is not as well developed as in the criteria pollutant program. The Scientific Advisory Panel would help the Department adopt ambient screening benchmarks and acceptable source impact levels for air toxics. The benchmarks and impact levels would be used as selection tools in the Geographic and Safety Net Programs. The Panel would also assist the Department in evaluating air toxics program effectiveness, and sources of concern for the Safety Net Program.

5) State Categorical Air Toxics Rules
The HCG recommendations allow the use of existing authority to adopt categorical air toxics rules for identified source categories that are of concern state-wide, and not addressed by the NESHAPs. It is expected that these categories could be identified through emission inventory development or through implementation of the Geographic and Safety Net Programs. This process would be secondary to the operation of other program elements, but important to fill regulatory gaps as they are identified.

➢ **Establishing a Geographic Program**
To complement the base program, the HCG recommended that the Commission adopt a Geographic Program to address cumulative emissions of air toxics. This program is needed because the federal NESHAP program applies control requirements uniformly to source categories, without considering the number of sources of the same substance that may be located in a given community. The Geographic Program, modeled after the criteria pollutant program, would include four components: selection of areas, establishment of local advisory committees, development of specific local plans to reduce emissions, and monitoring and evaluation.

1) Selection of Geographic Areas
The HCG recommended use of clear criteria on how geographic areas are selected for plan development. All areas that exceed ambient screening benchmarks should be selected for the program. The areas could be established at the scale of a neighborhood or urban area, including both areas of impact and areas of influence. Areas would be prioritized for work using prioritization criteria that could include the level of exceedance of benchmarks, population demographics and public interest.

2) Establishment of Local Advisory Committees

The HCG recommended that local advisory committees assist the Department in developing air toxics plans. Clear criteria would be needed regarding the role and make-up of the advisory committees.

3) Development of Local Air Toxics Plans

The HCG recommended that the Department develop local air toxics plans based on the recommendations of the local advisory committee. The process used by the Department to develop a local air toxics plan would be tailored to the needs of the individual community, but the Commission should provide general guidelines on plan development, including milestones for completion of tasks. The Department should establish specific and expeditious timelines to develop local air toxics plans. The Department should recommend a plan to the Commission within a timeline even if a local committee is unable to do so.

Geographic plans should be designed to reduce air toxics emissions in a timely manner. Geographic plans should evaluate emissions from all types of sources, and impose requirements equitably between and within source categories, considering relative emissions, toxicity and cost effectiveness. The Department should evaluate a variety of regulatory and non-regulatory approaches to reducing air toxics emissions.

4) Monitoring and Evaluation

The HCG recommended that geographic plans should include evaluation measures to assess the plan's effectiveness and allow for progressive improvements in the plan. Geographic plans could be evaluated using more detailed local emission inventories, ambient monitoring and tracking of performance measures.

➢ **Creating an Air Toxics Safety-Net Program**

The HCG recommended that the Commission also adopt an Air Toxics Safety Net Program to address emissions from potentially high-risk sources. This program would be used in the rare cases where a source of air toxics is causing a health concern but is not addressed by the Base Program or the Geographic Program. An example would be a large source that falls just below the NESHAP threshold and is outside of an area for which a geographic program strategy is being developed. If the Department determined through monitoring that health benchmarks are being exceeded in the vicinity of a source, and demonstrated to the satisfaction of a Scientific Advisory Panel that a source is a likely significant contributor, the source would be required to conduct a risk assessment. The risk assessment would be used as the basis for establishing source-specific emission limits. The elements of the Safety Net Program are: source selection, source-specific risk assessment, and establishing emission limitations.

1) Source Selection

The HCG recommended formulation of clear criteria for source selection, including:

- ambient monitoring information on concentrations of toxic air pollutants above screening benchmarks in the vicinity of the source,
- evidence that the source is significantly contributing to ambient concentrations of air toxics,
- proximity to people or sensitive environmental areas,

- emission of more than some threshold quantity of an air toxic that exceeds the screening benchmark,
- inapplicability of a NESHAP.

The Scientific Advisory Panel would have an opportunity to review sources of concern and provide input to the Department.

2) Source-specific Risk Assessment
Upon notification by the Department, a source would conduct a risk assessment. This would be used as the basis for emission reductions, or demonstrating that the source is not contributing significantly to the exceedance of the ambient benchmark.

3) Establishing Emission Reductions
The HCG recommended that emission reductions should be established if needed to achieve the acceptable source impact levels.

➢ **Resources**

Because adequate resources are key for the Department to implement a number of recommended program elements, the HCG made four recommendations related to resources:

1) Incremental Approach
The Department should use an incremental approach to ramping up the air toxics program, commensurate with available funding. In the initial stages of the program, the highest priority for funding should be to develop the scientific underpinnings of the program, including the emission inventory, monitoring and work of the scientific advisory panel.

2) Stable Long-Term Funding
The Department should seek stable, long-term funding for the air toxics program as an important element of the overall Air Quality budget, beginning with an air toxics program policy package request for the 2001-2003 budget.

3) All Categories of Sources
The Department should consider funding options that charge all categories of air toxics sources in proportion to their relative air toxics emissions.

4) Collaboration with Stakeholders
The Department should collaborate with citizen, business and public organizations to develop support for funding the air toxics program. In particular, the Department should collaborate with constituencies represented by members of the HCG to support program funding.

Additional Information

If you have any questions about the HCG Recommendations (including the HCG process), please contact Sarah Armitage at (503) 229-5186 or email at armitage.sarah@deq.state.or.us.

Approved_____
Approved with Corrections__X__

Minutes are not final until approved by the EQC

Environmental Quality Commission
Minutes of the Two Hundred and Seventy-Ninth Meeting

September 30 – October 1, 1999
Regular Meeting

On September 30, 1999, the Environmental Quality Commission traveled to Coos Bay, Oregon. They toured several sites in the Coos Bay area before meeting with local officials that evening. On October 1, 1999, they held their regular meeting at the Red Lion Inn, 1313 N Bayshore Drive, Coos Bay, Oregon. The following Environmental Quality Commission members were present:

Carol Whipple, Chair
Melinda Eden, Vice Chair
Tony Van Vliet, Member
Mark Reeve, Member

Also present were Larry Knudsen, Assistant Attorney General, Oregon Department of Justice (DOJ); Langdon Marsh, Director, Department of Environmental Quality (DEQ); and other staff from DEQ.

Note: The Staff reports presented at this meeting, which contain the Department's recommendations, are on file in the Office of the Director, 811 SW Sixth Avenue, Portland, Oregon 97204. Written material submitted at this meeting is made a part of the record and is on file at the above address. These written materials are incorporated in the minutes of the meeting by reference.

A. Approval of Minutes

The following corrections were made to the August 12-13, 1999, minutes: on page 4, section H, all references to the Department that are designated as "we" need to be changed to "the Department," and on page 4, the last line should read "interviews, site assessment work, and developing a programmatic work*plan*. A motion was made by Commissioner Van Vliet to adopt the minutes of the August 12-13, 1999, meeting as corrected. Vice-Chair Eden seconded the motion and it carried with four "yes" votes.

A motion was made by Commissioner Van Vliet to adopt the minutes of the August 18, 1999 meeting. It was seconded by Commissioner Reeve and carried with four "yes" votes.

B. Approval of Tax Credits

Tax credits were presented by Maggie Vandehey, tax credit coordinator.

Maggie Vandehey requested the removal of applications numbered 4928, 5004, 5156 and 5213 from consideration for certification as pollution control facilities at this time. A motion was made by Commissioner Reeve to remove applications numbered 4928, 5004, 5156 and 5213 from the approval of the applications presented in Attachment B of Agenda Item B. Commissioner Van Vliet seconded the motion and it carried with four "yes" votes.

When questioned about the difference between the Eligible Facility Cost on the work sheet and the amount brought forward as the Director's Recommendation on application number 5170, staff indicated the amount should have been $110,163 rather than $94,250.

Commissioner Van Vliet asked if it was possible for any grower to claim an alternative to open field burning even though they had no intention of open field burning. Staff stated that it is possible. The Department of Agriculture determines if a grass seed grower has had a history of open field burning when they review an application claiming an alternative to field burning for tax credit purposes.

Commissioner Reeve compared the return on investment in an application for approval (5250) and an application for denial (5860), and asked how return on investments within such a close range could result in such opposite results. Ms. Vandehey explained that one was a return on investment factor contrasting with the facility return on investment. The variables used in the tables to determine return on investment are the useful life of the facility and the year the facility was completed. The difference between 0 and 100% of the facility cost allocable to pollution control occurs in a narrow band. A motion was made by Commissioner Reeve to approve the tax credit applications presented in Attachment B including approval of application number 5170 in the amount of $110,163. Commissioner Eden seconded the motion and it carried with four "yes" votes.

Maggie Vandehey requested the removal of applications numbered 5197, 5199 and 5200 from consideration for denial of certification as pollution control facilities. A motion was made by Commissioner Van Vliet to deny applications numbered 4860 and 5140. Commissioner Reeve seconded the motion and it carried with four "yes" votes.

A motion was made by Commissioner Van Vliet to transfer certificates numbered 2602 and 3084. Commissioner Eden seconded the motion and it carried with four "yes" votes.

Maggie Vandehey indicated the law was unclear about who had the authority to reject applications that were submitted to the Department beyond two years after the claimed facility was substantially complete; therefore staff presented them to the Commission for rejection. She stated that PGE confirmed that the submittal date was beyond two years of substantial completion. A motion was made by Commissioner Eden to reject applications numbered 5066 and 5067 as presented in Attachment E. Commissioner Reeve seconded the motion and it carried with four "yes" votes.

Commission action on tax credits:

App.No.		Cost	% Allocable	Value	Commission Action
Attachment A – Approvals					
4816	IDT	$ 2,252,909	100%	$ 1,126,455	Approved
4928	Willamette Industries, Inc.	$ 730,586	100%	$ 365,293	Removed from Agenda
4959	Tidewater Barge Lines, Inc.	$ 775,000	56%	$ 217,000	Approved
4965	Tidewater Barge Lines, Inc.	$ 775,000	55%	$ 213,125	Approved
5004	Widmere Brothers Brewing Co.	$ 102,442	100%	$ 51,221	Removed from Agenda
5047	Mitsubishi Silicon America	$ 157,664	100%	$ 78,832	Approved
5048	Mitsubishi Silicon America	$ 517,957	100%	$ 258,979	Approved
5065	PGE	$ 70,855	100%	$ 35,428	Approved
5090	PGE	$ 23,090	100%	$ 11,545	Approved
5091	Praegitzer Industries, Inc.	$ 48,740	100%	$ 24,370	Approved
5111	Denton Plastics, Inc.	$ 32,000	100%	$ 16,000	Approved

5125	PGE	$ 242,117	100%	$ 121,059	Approved
5126	PGE	$ 44,045	100%	$ 22,023	Approved
5127	Merix Corporation	$ 444,044	100%	$ 222,022	Approved
5147	Coburg Mini Storage	$ 2,980	100%	$ 1,490	Approved
5148	Don G. Averill Trucking, Inc.	$ 6,000	100%	$ 3,000	Approved
5156	JR Simplot Company	$ 757,749	100%	$ 378,875	Removed from Agenda
5165	United Disposal Service, Inc.	$ 15,672	100%	$ 7,836	Approved
5168	Jackson Oil, Inc.	$ 31,550	100%	$ 15,775	Approved
5169	Jackson Oil, Inc.	$ 77,735	100%	$ 38,868	Approved
5170	Miles Investment, L.L.C.	$ 110,163	86%	$ 40,528	Approved Corrected
5173	Roger Neuschwander	$ 5,500	100%	$ 2,750	Approved
5175	Tydan Farms	$ 34,042	37%	$ 6,298	Approved
5177	B K & S Corporation	$ 1,980	100%	$ 990	Approved
5184	Capitol Recycling & Disposal, Inc.	$ 10,064	100%	$ 5,032	Approved
5186	Robert L. Secolo/Land Development	$ 372,786	96%	$ 178,937	Approved
5187	United Disposal Service, Inc.	$ 46,603	100%	$ 23,301	Approved
5188	Capitol Recycling & Disposal, Inc.	$ 173,298	100%	$ 86,649	Approved
5189	Capitol Recycling & Disposal, Inc.	$ 6,734	100%	$ 3,367	Approved
5190	Wilco Farmers	$ 286,975	94%	$ 134,878	Approved
5193	Sherlock Oil Company	$ 153,679	100%	$ 76,840	Approved
5194	Safeway, Inc.	$ 20,951	100%	$ 10,476	Approved
5203	Morse Bros., Inc.	$ 282,897	100%	$ 141,448	Approved
5205	Capitol Recycling & Disposal, Inc.	$ 195,205	100%	$ 97,603	Approved
5209	Powell Butte Country Store, Inc.	$ 32,133	100%	$ 16,067	Approved
5211	Capitol Recycling & Disposal, Inc.	$ 22,815	100%	$ 11,408	Approved
5213	Magnum Properties, Inc.	$ 10,243	100%	$ 5,122	Removed from Approval
5214	United Disposal Service, Inc.	$ 136,669	100%	$ 68,334	Approved
5215	William C. Smith Farms, Inc.	$	100%	$ 21,754	Approved

		43,508			
5216	Capitol Recycling & Disposal, Inc.	$ 4,790	100%	$ 2,395	Approved
5217	Neuschwander, L.W.	$ 125,870	86%	$ 54,124	Approved
5218	WWDD	$ 7,405	100%	$ 3,703	Approved
5219	United Disposal Service, Inc.	$ 4,275	100%	$ 2,138	Approved
5220	United Disposal Service, Inc.	$ 4,260	100%	$ 2,130	Approved
5222	Freres Lumber Company, Inc.	$ 120,000	100%	$ 60,000	Approved
5224	Bimor Stations, Inc.	$ 93,262	86%	$ 40,103	Approved
5225	4 B Farms, Inc.	$ 105,452	63%	$ 33,217	Approved
5226	Magnum Properties, Inc	$ 16,595	100%	$ 8,298	Approved
5234	Bob Weber, Inc.	$ 2,895	100%	$ 1,448	Approved
5235	Curtis Johnston	$ 92,000	100%	$ 46,000	Approved
5237	Capitol Recycling & Disposal, Inc.	$ 15,724	100%	$ 7,862	Approved
5238	Capitol Recycling & Disposal, Inc.	$ 44,352	100%	$ 22,176	Approved
5239	Capitol Recycling & Disposal, Inc.	$ 39,897	100%	$ 19,949	Approved
5241	Carson Oil Company	$ 268,362	83%	$ 111,370	Approved
5244	TOC, Inc.	$ 1,712	100%	$ 856	Approved
5245	Courtesy Automotive, Inc	$ 2,495	100%	$ 1,248	Approved
5247	Jubitz Corporation	$ 449,953	90%	$ 202,479	Approved
5250	United Disposal Service, Inc.	$ 165,744	100%	$ 82,872	Approved
5251	BEST BUY IN TOWN, INC.	$ 46,093	100%	$ 23,047	Approved
5252	Capitol Recycling & Disposal, Inc.	$ 4,530	100%	$ 2,265	Approved
5253	Capitol Recycling & Disposal, Inc.	$ 187,416	100%	$ 93,708	Approved
Attachment C - Denials					
4860		$ 3,091,970	0%		Denied
5154		$ 5,695	0%		Denied
5197		$ 32,062	0%		Removed from Agenda
5199		$ 9,914	0%		Removed from Agenda

5200		$ 24,643	0%		Removed from Agenda
Attachment D - Transfers					
	Certificate #2602 and 3084				Transferred
Attachment E - Rejections					
5066		$ 66,785	0%		Rejected
5067		$ 132,217	0%		Rejected

C. Informational Item: Carbureted 2-stroke Marine Engines

Mindy Correll, intern in the Pollution Prevention Program, presented an informational report on the impacts of marine engines on the environment and possible voluntary policies to encourage the retirement of carbureted 2-stroke marine engines. The conclusions of the report were:

- Carbureted 2-stroke marine engines have a significant impact on air quality and a negative, but unquantified, impact on water quality.
- Current policies on marine engines (EPA and CARB) regulate new engines entering the market and will rely on the turnover rate of technology being used. Therefore, the policies will effectively reduce marine engines in the long-term (25 years).
- Marine engines already in use have not been targeted.
- A voluntary policy aimed at encouraging retirement of carbureted 2-stroke marine engines already in use would reduce marine engine emission in the short-term (5 years).
- Any policy option encouraging the retirement of carbureted 2-stroke marine engines is complicated by the cost of purchasing a new marine engine.

Marine engine owners have not been asked about incentives to encourage retirement of their current motors. Information is currently not being collected regarding the number of carbureted 2-stroke vs. direct fuel injection 2-stroke vs. 4-stroke marine engines registered in Oregon. The Commission suggested DEQ work with the Oregon State Marine Board to begin collecting this data. Recommendations were made by Director Marsh on ways to proceed.

1. DEQ should begin to work with stakeholders, including the State Marine Board, to identify ways to collect more data and possible develop voluntary policy options for encouraging the retirement of carbureted 2-stroke marine engines.
2. Whenever possible, DEQ should collect and refine information regarding the impacts of marine engines on Oregon's environment by monitoring the research work being conducted around the nation.
3. DEQ should watch California for results of CARB regulations on marine engines and monitor if there is any ancillary effect for Oregon.
4. DEQ should continue to look at options for encouraging the retirement of carbureted 2-stroke marine engines but keep in mind that any policy will be complicated by the cost of new marine engines and weight that cost with the benefits of the policy.

D. Informational Item: Final Legislative Report

Lauri Aunan, Assistant to the Director, presented information on the final status of 1999 legislation as contained in a memorandum dated September 7, 1999.

E. Rule Adoption: Reorganization and Non-substantive Changes to OAR Divisions 20 through 34

Andy Ginsburg, Acting Air Quality Administrator, provided the Commission with introductory remarks. Scott Manzano, lead rule writer, informed the Commission that the rule was proposed for reorganization and clarification purposes; it would provide a basis for further rule streamlining in the future and contained no regulatory change.

The Department received only one public comment, which was from ~~Stole Rive~~ *Stoel Rives* Attorneys regarding potential misplacement of definitions during the reorganization process, and potentially adding more rules to the State Implementation Plan (SIP). Air Quality staff had carefully reviewed the definition applicability, and the proposed rule was non-substantive; no regulatory changes were proposed. The rules for the Title V fee increase, adopted by the Commission in June, 1999, were inadvertently omitted from the proposed rule text, and should be part of the proposed rule for adoption. The omitted rule numbers were specifically stated for the record.

After discussion with Larry Knudsen, Department of Justice, it was recommended that the Commission adopt the proposed rules, including the Title V fee adoption of June, 1999. A motion was made by Commissioner Reeve to reflect that recommendation. It was seconded by Commissioner Van Vliet and carried with four "yes" votes. A motion was then made by Commissioner Reeve to adopt the proposed renumbered and revised SIP rules as an amendment to the State Implementation Plan. It was seconded by Commissioner Van Vliet and carried with four "yes" votes.

F. Rule Adoption: Grants Pass Carbon Monoxide Maintenance Plan

Andy Ginsburg, Acting Air Quality Administrator, and Patti Seastrom, Air Quality Planner, presented the proposed carbon monoxide maintenance plan and redesignation request. The plan demonstrates that Grants Pass will continue to met the public health standards for carbon monoxide through 2015, without the need to continue the wintertime oxygenated fuel requirement for the Grants Pass control area. The plan was developed with the assistance of the Grants Pass Air Quality Advisory Committee and allows the Department to request that the Environmental Protection Agency redesignate Grants Pass as an area that meets the carbon monoxide public health standards. The significant reduction in carbon monoxide emissions is a result of continuing improvements in motor vehicle emissions control technology. A third bridge constructed across the Rogue River has also helped to reduce carbon monoxide emissions in the nonattainment area by diverting traffic around the congested central business district. The redesignation and elimination of oxygenated fuel will be effective upon approval by EPA. The Department will continue to monitor for carbon monoxide once the area is redesignated. If an exceedance occurs, the plan includes contingency measures to address a future possible exceedance. Commissioner Reeve asked if the area that potentially affects carbon monoxide levels in the central business district is larger than the central business district. The emission inventory presented for adoption is an inventory of the urban growth boundary. Although carbon monoxide is a localized pollutant, growth in the area could result in carbon monoxide "hot spots" outside of the existing nonattainment area, and the Department periodically studies those occurrences. When asked if woodstove use was a factor in the nonattainment area, staff responded that residential woodstove use occurs on the perimeter of the central business district and is a factor, although insignificant when compared to motor vehicle emissions. Counsel was asked if the delayed implementation language proposed in the rule amendments is necessary, given the significant rule cleanup just adopted. He replied that it is fairly common practice, but could be handled in a separate rule to avoid an anachronism in the rule. The Secretary of State could also be asked to not codify the rule until it is effective, or the rule can be amended after EPA takes action on the SIP. Staff agreed to continue looking for a better solution.

Commissioner Reeve asked if Medford and Portland had been able to demonstrate compliance with the standard in future years without oxygenated fuel. Staff responded that Medford was unable to demonstrate compliance without oxygenated fuel because of significant growth projections. DEQ will reanalyze Medford when the revised MOBILE model is available. This version of the model will apply a lower emissions credit to oxygenated fuel. Portland was able to demonstrate compliance with oxygenated fuel; however, local interests requested oxygenated fuel continue to provide an additional safety margin.

A motion was made by Commissioner Eden to adopt the maintenance plan and redesignation, including the attached reports. Commissioner Van Vliet seconded the motion and it carried with four "yes" votes. A second motion was made by Commissioner Eden to ensure that all proposed revisions to the State Implementation Plan are adopted. Commissioner Reeve seconded the motion and it carried with four "yes" votes. Chair Whipple also asked the Department to express the Commission's appreciation of the efforts made by the Grants Pass Air Quality Advisory Committee to the committee members.

Andy Ginsburg and Patti Seastrom then briefly explained to the Commission the $PM_{2.5}$ pollution prevention efforts also taking place in the Grants Pass area. The Grants Pass Air Quality Advisory Committee developed a five-point plan to reduce $PM_{2.5}$ emissions from woodstoves and open burning over the next three years. The measures are a combination of voluntary and regulatory, and will be implemented by local government. Commissioner Reeve asked for an update on the legal status of the $PM_{2.5}$ standard. Staff replied that the circuit court decided that EPA does not have the authority to enforce the new standard, but did not set aside the standard. The Department is moving ahead with pollution prevention work on the basis of protecting public health according to the standard.

G. Expansion of the Rogue Basin Open Burning Control Area

This item was postponed.

H. Informational Item: Hazardous Air Toxics Program (HAP) Development

The recommendations of the HAP Consensus Group were presented by Sarah Armitage, HAP Coordinator; committee member Sarah Doll of Oregon Environmental Council; and committee member Lowell Miles of Miles Fiberglass. The presentation described air toxics concerns that caused the Department to convene the HAP Consensus Group, the committee process, and committee recommendations for developing the Department's existing air toxics program. The recommendations were composed of scientific enhancements to the Base Air Toxics Program, a Geographic Approach to address local air toxics concentrations, and a Safety Net Program to catch potentially high risk emissions not addressed by other program elements. Discussion centered on how different program elements would work, the operation of a recommended Science Advisory Panel, and program funding issues.

Public Comment:

The following citizens presented public testimony.

Bob Hagbom, Mayor of Brookings, thanked DEQ for helping them with the expansion of the city's wastewater treatment plant.

Richard Knablin, Coalition for Community Vision, spoke regarding building regulations in a tsunami zone.

Susan Callahan testified regarding the proposed Nucor plant.

Dan Pence and Shane Jackson, SCOW, thanked the Commission and DEQ for their research regarding 2-stroke marine engines and urged continued follow-up.

Chris Hagerbaumer, Oregon Environmental Council, spoke regarding 2-stroke marine engines.

Robert Stewart addressed the Commission on several Coos County issues.

Peter Ryan testified regarding the proposed Nucor plant.

I. Commissioners' Reports

No reports were given.

J. Director's Report

On Sept. 24, Gov. Kitzhaber announced an Executive Order directing DEQ to lead a statewide effort to eliminate releases of Persistent, Bioaccumulative, and Toxic pollutants (PBTs) into Oregon's environment by the year 2020. PBTs are highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to human and ecosystem health. They come in both natural and synthetic form. Only in the past few years have scientists discovered that PBTs can have an adverse effect on the hormonal and nervous system, can cause reproductive and developmental problems, have genetic impacts, and can cause cancer. In upcoming months, DEQ will work with a broad range of industries, governmental agencies, and interested citizens to learn more about the origins, amounts, and types of PBTs released in Oregon. Data will be used to develop plans to eliminate their release. DEQ will identify ways to provide technical assistance, economic incentives, and pollution prevention education to help eliminate PBT releases in the future.

Dan's Ukiah Service in Ukiah, Oregon, has been fined $63,000 for not upgrading or recertifying underground fuel tanks by the March, 1999, deadline and for refusing DEQ access to their records. Every other station in Oregon is either in compliance or working toward compliance. Dan Vincent, the station owner, has filed a written appeal. DEQ is moving forward with setting a date for a contested case hearing.

DEQ is installing a new system of collecting methane gas at the Killingsworth Fast Disposal (KFD) site, at NE Killingsworth Street and NE 75th Avenue, near the Portland Airport. The 24-acre former landfill site once was operated by Riedel Waste Disposal Systems (RWS) in the 1980s. It closed in 1990, and became an "orphan" site in 1994 after RWS was dissolved and its parent company filed for bankruptcy. Installation of the new methane collection system will continue through this winter. Currently, DEQ is drilling new gas extraction wells. The drilling should be completed this fall. The methane collection system and a 35-foot-high flare tower will be constructed later this winter. The tower will be an enclosed stack where the gas will be burned. Overall cost of this construction project is about $1 million, with funding coming from DEQ's Solid Waste Orphan Site Fund.

Recent events surrounding the Ashland Irrigation Project will mean that full improvements to Bear Creek water quality during the summer months will be delayed one or two years. While different options are possible, there will be no way for Ashland to meet the summer Bear Creek TMDL by April, 2000, as currently set forth in the MAO with the city. To meet the Bear Creek nutrient TMDL, Ashland is combining the improvement of the treatment works and the reuse of effluent offsite.

A new program called Eco-Logical Business for automotive services has been implemented. This is a product of the Portland Area Pollution Prevention Outreach Team which includes DEQ; the cities of Gresham, Portland and Troutdale; Unified Sewerage Agency; Washington County; Clackamas County; and Metro. To date, six automotive service operations have volunteered in Portland for this new program and subsequently met certification criteria which recognize shops that use management practices designed to prevent pollution and minimize releases to the environment through spills or improper disposal. In most cases, these practices go beyond the minimum to comply with environmental regulations. The Outreach Team has also partnered with local automotive trade associations to more effectively promote the program within the business community.

The Department is making progress on agreements with both the Port of Portland and Ross Island Sand & Gravel for site assessment work at Ross Island. The Port of Portland workplan for their portion of the investigation has gone through extensive review, including review and comment by a panel of outside experts. The potential operation changes at Ross Island are a business decision for Ross Island Sand & Gravel, and do not affect the Department's objectives or expectations for a thorough assessment and potential cleanup at the site.

There were no exceedances of the federal standard for ground-level ozone anywhere in the state this summer. There were two Clean Air Action Days in the Portland-Vancouver area (Aug. 23 and Aug. 27) as a precaution due to forecasted high temperatures.

DEQ played a pivotal role in negotiating an agreement on a small refinery compliance extension that will allow western states to support a nationwide cap on sulfur in gasoline. This clears the path for EPA to adopt this measure to significantly reduce motor vehicle emissions.

The Department began its dialogue September 2, 1999, with the Army concerning the Dunnage incinerator at the Umatilla Chemical Disposal Program (UMCD) and plans to postpone its construction for further study. Department staff are currently researching and reviewing the Army's proposal to draft a recommendation to the Commission. Also on that date Department staff discussed issues dealing with the storage of munitions and wastes. The application for a UMCD storage permit is currently under review by staff, and two Notices of Deficiency have been issued.

GASP et al has filed a new Petition for Review in Multnomah County Circuit Court challenging the EQC's March, 1999, Order Clarifying Permit Decision. The petition for review was filed on August 9, 1999. The attorney general's office is preparing a response to the petition that is due within 30 days of the receipt of petition.

The Commission asked that a representative from the Army be at the next EQC meeting to update them on the September 15 incident at the UMCD.

Staff Notes:
Tom Fisher was honored for his 25 years of service. He started with DEQ May 7, 1974 as a sanitarian with the Department's on-site program in Salem. He has worked in the Salem office except for two rotational assignments. He has spent most of his time as a regional generalist, working in the air quality, water quality and solid waste programs. Since 1993, he has worked in the Water Quality program, or jointly with the Solid Waste program. Tom is recognized as one of the Department's most experienced and knowledgeable staff on beneficial use of biosolids and beneficial use of food processing wastewater.

Bonnie Lamb and Bud Roman were the subject of a glowing "hats off" letter sent to the Director from Farmers Irrigation District this month. In the matter of working on water quality issues, District Coordinator Jerry Bryan wrote, "Bonnie is an asset to your department and to the State of Oregon." And Bud's assistance in the removal of an underground storage tank was "solution-oriented." Both Bonnie and Bud were commended by Mr. Brian as having "impressed us greatly."

Sherm Olson, Dennis Illingworth, and Greg Farrell were the subject of praise by David Schuman, Deputy Attorney General of Oregon in a letter to the Director this month. "I would like to take this opportunity to tell you what a terrific job your staff did in helping me prepare for and try the EZ Drain case. I was impressed with the assistance (and the education) I received from these fine employees," Mr. Schuman wrote.

There being no further business, the meeting was adjourned at 1:25 p.m. The Commission toured the New Carissa site after the meeting.