CARBON MONOXIDE REDESIGNATION REQUEST

AND MAINTENANCE PLAN FOR THE

FORT COLLINS AREA

Colorado Department
of Public Health
and Environment

Adopted by the Colorado
Air Quality Control Commission
July 18, 2002

AIR POLLUTION CONTROL DIVISION
COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
4300 CHERRY CREEK DRIVE SOUTH
DENVER, COLORADO 80222-1530
(303) 692-310

PART I - BACKGROUND

CHAPTER 1: INTRODUCTION

The State of Colorado and the North Front Range Transportation & Air Quality Planning Council (the Council), which serves as the area's lead air quality planning agency, request that the U.S. Environmental Protection Agency (EPA) redesignate the Fort Collins nonattainment area to attainment/maintenance status for the National Ambient Air Quality Standards for carbon monoxide. The Fort Collins area was designated a carbon monoxide nonattainment area in 1979, but has not violated the standard since 1991. Therefore, the area is now eligible for redesignation.

Part 1 of this document is provided as background information only and is not to be construed to be part of the State's official submittal to EPA.

Part 2 of this document, which includes a listing of the requirements for redesignation and the Maintenance Plan, constitutes the State's official submittal to EPA. The Maintenance Plan, which is being submitted for inclusion in the State's federally enforceable State Implementation Plan (SIP), provides for maintenance of the national standard for carbon monoxide in the Fort Collins area through the year 2015. The Maintenance Plan has been approved by the North Front Range Transportation & Air Quality Planning Council July 11, 2002 and the Colorado Air Quality Control Commission July 18, 2002, and complies with all State and federal requirements.

■ Colorado Air Quality Control Commission

The Colorado Air Quality Control Commission (AQCC) is a regulatory body with responsibility for adopting air quality regulations consistent with State statute. This includes the responsibility and authority to adopt State Implementation Plan (SIP) elements and their implementing regulations. The Commission takes action on SIPs and regulations through a public rule-making process. The Commission is composed of nine members appointed by the Governor and confirmed by the State Senate.

■ Air Pollution Control Division

The Air Pollution Control Division of the Colorado Department of Public Health & Environment serves as staff to the Colorado Air Quality Control Commission. It is responsible for developing emission inventories, mobile modeling of transportation data, and making technical and policy recommendations regarding

State air quality plans and regulations to the Commission. The Division works in partnership with local Lead Planning Agencies and other stakeholders to develop and draft SIP elements and proposed regulatory revisions.

■ North Front Range Transportation & Air Quality Planning Council

The North Front Range Transportation & Air Quality Planning Council (the Council) was designated the lead air quality planning agency for Fort Collins and Greeley urban areas by the Governor in 1993. In this capacity, the Council's mission is to work in partnership with the Air Pollution Control Division to develop and recommend for adoption effective and cost-efficient air quality initiatives with input from state and local government, the private sector, stakeholder groups, and private citizens.

The North Front Range Council consists of 15 members representing local and state government agencies, including Larimer and Weld counties, the City of Fort Collins, the City of Loveland, the City of Greeley, Garden City, the City of Evans, the Town of Berthoud, the Town of La Salle, the Town of Windsor, the Town of Timnath, the Town of Milliken, the Town of Johnstown, the Colorado Transportation Commission and the Colorado Air Quality Control Commission,

A. National Ambient Air Quality Standards for Carbon Monoxide

There are two national standards for carbon monoxide:

- A rolling 8-hour average concentration of 9.0 parts per million (ppm), and
- A 1–hour concentration of 35 parts per million.

The national standard for carbon monoxide allows for no more than one exceedance of either standard in each calendar year. A violation occurs when two or more exceedances of the standard are recorded at the same monitoring site during a calendar year.

B. Health Effects of Carbon Monoxide

Carbon monoxide is a colorless, odorless, tasteless gas that enters the body through the lungs where it is absorbed by the bloodstream and then combined with hemoglobin in the red blood cells. Hemoglobin is the compound in the red blood cells that normally picks up oxygen from the lungs and carries it to the tissues. In the lungs, carbon monoxide competes with oxygen for available hemoglobin. when carbon monoxide binds with hemoglobin, it forms carboxyhemoglobin (COHb). Carbon monoxide attaches to hemoglobin much more readily than does oxygen. Once attached it does not disassociate from the hemoglobin as easily as

oxygen. As a result, COHb levels can continue to increase in the bloodstream and the amount of oxygen being distributed throughout the body is reduced.

Blood containing carbon monoxide can weaken heart contractions, lowering the blood volume being distributed through the body. Effects of carbon monoxide poisoning include fatigue, dizziness, headaches, loss of visual acuity, and mental confusion. Individuals with cardiovascular or chronic obstructive pulmonary disease, pregnant women, and children are at greatest risk from exposure to carbon monoxide. Carbon monoxide also affects the central nervous system by depriving it of oxygen. Therefore, even healthy individuals can experience adverse effects from carbon monoxide exposure, such as a reduced ability to concentrate. Carbon monoxide exposure in high altitude environments like the Fort Collins area can present a greater risk because of the lower levels of oxygen present in the atmosphere.

C. Fort Collins Carbon Monoxide Area Designation History

The Fort Collins area was originally designated as nonattainment for carbon monoxide under provisions of the 1977 Clean Air Act, as amended. This designation was reaffirmed by the 1990 CAA Amendments when the area was classified as a moderate carbon monoxide nonattainment area with a design value of less than 12.7 parts per million, effective November 15, 1990 (56FR 56694, Nov. 6, 1991).

D. Provisions Concerning Transportation Conformity

Although the Maintenance Plan (in Part II of this document) does not include the Basic I/M program after January 1, 2004, the AQCC and APCD commit to implementing an I/M program in the Fort Collins maintenance area by January 1, 2026 to help assure the Conformity determination for 2030 and those thereafter. The commitment is more thoroughly discussed in the federally enforceable portion (Part II) of this document.

CHAPTER 2: ANALYSES REGARDING POTENTIAL MODIFICATIONS TO CONTROL STRATEGIES

A. Modeling Considerations

Automotive vehicles are the predominant source – roughly 65%– of carbon monoxide emissions in the Fort Collins area. Therefore the modeling of mobile source emissions is required to make projections about future year emissions. The APCD used the MOBILE 6 model, released January 23, 2002, to project future carbon monoxide emissions from on-road mobile sources.

In addition, roll-forward calculations are made to estimate future CO emissions from stationary and area sources.

For the simplest modeling demonstration total future CO emissions are compared with those of the base year – in this case, 1992, the first attainment year. If future CO emissions are predicted to be lower than those of the base year, the modeled area is thought to be able to maintain federal standards for the period of the maintenance plan.

B. Preliminary Modeling

Preliminary modeling of future emission inventories was performed using various scenarios, including:

- Oxygenated fuels and Basic I/M programs continuing through 2015
- Oxygenated fuels continued for the period without I/M
- Basic I/M was continued without oxygenated fuels
- Neither I/M nor oxygenated fuels programs in place after 2003 ("No Controls" scenario)

The preliminary modeling indicated that the fourth scenario (no Controls after 2003) demonstrated maintenance through 2015. Colorado is required, 25-7-105.1, C.R.S., to adopt programs into the SIP that are no more stringent than necessary to comply with the national standards. Therefore, the no-controls-after-2003 was selected for the Maintenance Plan.

Table 2 in Part II of this document indicates emission inventories by sector for 1992 and 1998, and projections for 2005, 2010 and 2015.

C. Analysis of Strategy Options for Maintenance Plan

Because carbon monoxide levels in the Fort Collins area decreased so dramatically in the past nine years, the State and the MPO were obliged to consider whether the oxygenated fuels program and the Basic I/M program could be modified or eliminated in the Fort Collins area without posing a threat to the National Ambient Air Quality Standards through 2015.

As delineated in Part II of this document, emission projections for the Fort Collins area indicate that the carbon monoxide standards will be maintained through 2015 without control measures, i.e., without either the Basic I/M program or the oxygenated fuels program. Therefore, the programs are no longer relied upon for compliance with the national standards for carbon monoxide in the Colorado SIP starting on January 1, 2004.

Because informal estimates for years beyond 2015 project potential Conformity issues for 2030, there is a commitment in the Maintenance Plan for resuming the Basic I/M program in 2026. The federally enforceable Maintenance Plan is contained in Part II of this document.

D. City of Fort Collins Local Air Quality Plan

The city of Fort Collins' comprehensive plan, known as City Plan, contains a goal "to continually improve Fort Collins' air quality as the city grows." Because this goal is more stringent than Federal requirements, the commission is precluded by statute from placing such a commitment in the federally enforceable SIP. (CRS 25-7-105.1) However, statute also declares that it is "the policy of this state to achieve the maximum practical degree of air purity in every portion of the state…and to prevent the significant deterioration of air quality in those portions of the state where the air quality is better than the national ambient air quality standards" (CRS 25-7-102).

Thus, the Colorado Department of Public Health & Environment commits in this narrative section (Section I, Background) to work with the City of Fort Collins to support local air quality goals via continuation of the Basic I/M program in the Fort Collins area until such time as an acceptable alternative can be found to replace it or it were no longer practical to continue to implement the program.

Furthermore, the Department commits to work in partnership with the City of Fort Collins and the MPO to identify feasible mobile source control strategies that could be managed in the future by the sate or local unit of government.

The commitments made above, while not federally enforceable, are made in good faith with the City of Fort Collins and the North Front Range Transportation and Air Quality Planning Council.[1]

PART II - REDESIGNATION REQUEST AND MAINTENANCE PLAN

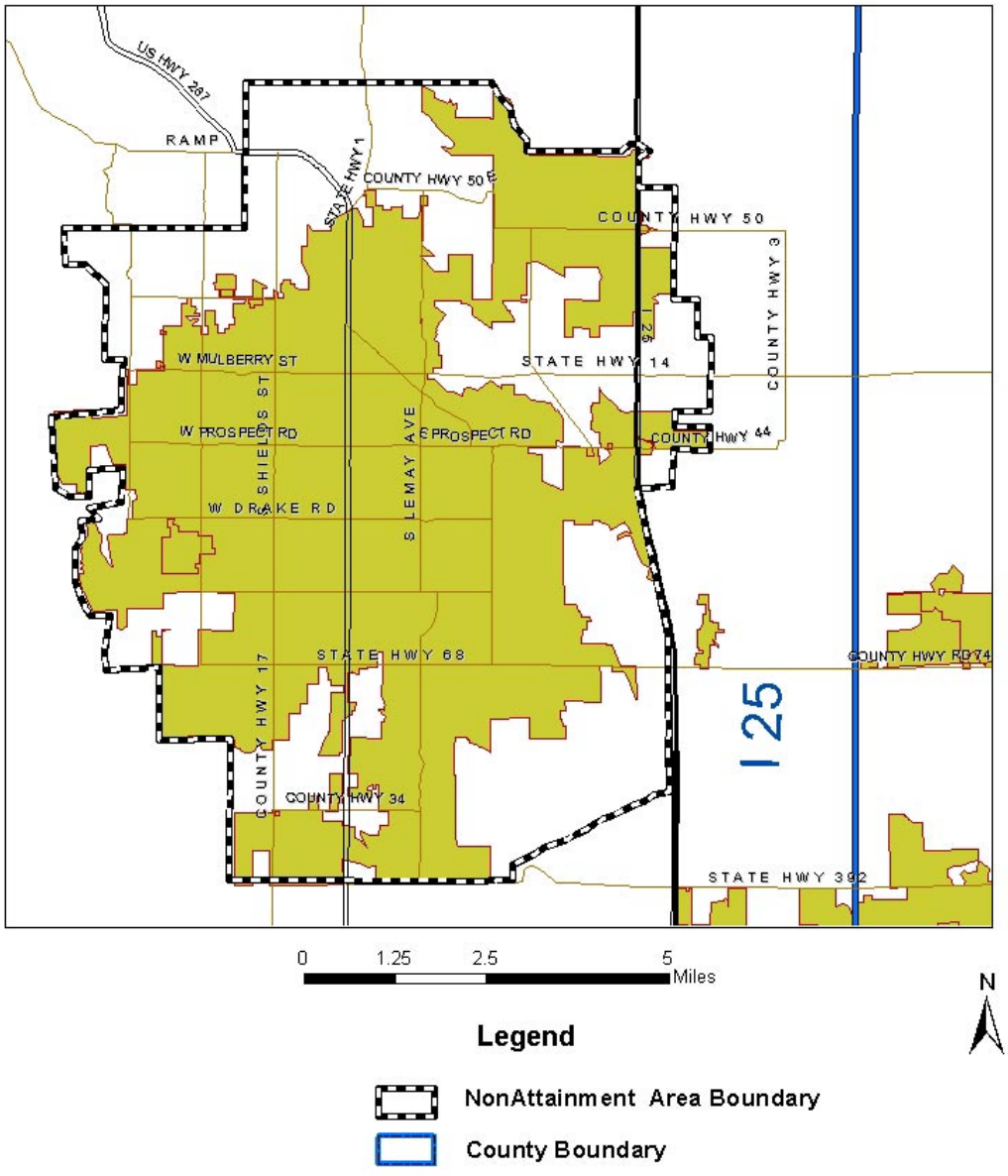
CHAPTER 1: REQUIREMENTS FOR REDESIGNATION

The State of Colorado, in coordination with the North Front Range Transportation & Air Quality Planning Council (the Council) requests that the U.S. Environmental Protection Agency (EPA) redesignate the Fort Collins nonattainment area to attainment/maintenance status for the National Ambient Air Quality Standards for carbon monoxide. The Fort Collins area has been designated as a carbon monoxide nonattainment area since the 1970's but has not violated the standard since 1991. Thus, the area is eligible for redesignation.

See Fort Collins area map on the following page.

Fort Collins Metropolitan Attainment/Maintenance Area

The Fort Collins attainment/maintenance area and the Fort Collins urban growth area are one and the same.



Map created by the APCD Technical Services Program.
Colorado Department of Public Health and Environment

A. Required Components of a Redesignation Request

Sections 107(d)(3)(D) and (E) of the CAA define the following five required components of a redesignation request.

1. Attainment of the Standard

The State must show that the area has attained the national standards for carbon monoxide. This demonstration must be based on monitoring data representative of the location of the expected maximum concentrations of carbon monoxide in the area.

Attainment of the national standard for carbon monoxide is demonstrated when two consecutive years of monitoring data for each site show no more than one exceedance per year of the 8-hour (9ppm) and 1-hour (35 ppm) standards. Table 1 demonstrates, as required by Section 107(d)(3)(E) of the Clean Air Act, that the Fort Collins area has attained the national standard for carbon monoxide. This is based on quality assured monitoring data representative of the location of expected maximum concentrations of carbon monoxide in the area (708 S. Mason St.).

2. State Implementation Plan Approval

The State must have a fully approved Carbon Monoxide nonattainment area SIP element for the Fort Collins metropolitan area under Section 110(d) of the CAA.

Under the Federal Clean Air Act of 1977, the State of Colorado submitted a Fort Collins SIP element to the EPA in June 1982. This document has served as the Fort Collins nonattainment area SIP since it was approved by EPA December 12, 1983 (48 FR 55284). Thus, the State has an approved nonattainment area Carbon Monoxide State Implementation Plan element for the Fort Collins area, as required by Section 100(k) of the CAA.

With the 1990 amendments to the CAA, the EPA designated the Fort Collins area as a “moderate” nonattainment area with a design value of less than 12.7 ppm carbon monoxide (see 56 FR 56694, November 15, 1991).

The 1982 SIP element was designed to demonstrate attainment with the carbon monoxide standard by 1987. This did not occur so soon. Fort Collins experienced violations of the 8-hour standard in 1987 and 1988; achieved the standard for the next two years (1989 and 1990); then experienced a violation in 1991. The year 1991 was the last year any exceedance of the standard was recorded for Fort Collins. The Fort Collins area has been in attainment of the carbon monoxide standard from 1992 through the present (2002).

3. Improvement in Air Quality Due to Permanent and Enforceable Emission Controls

The State must demonstrate that the improvement in air quality leading to redesignation is due to permanent and federally enforceable emissions reductions.

It is reasonable to attribute the improvement in ambient carbon monoxide concentrations in the Fort Collins area to emission reductions that are permanent and enforceable. The area has met the national standard for carbon monoxide as a result of effective local, state and federal emission reductions measures, as opposed to temporary or chance events.

A downturn in the economy is clearly not responsible for the improvement in ambient carbon monoxide levels in the Fort Collins area. Over the last nine years, the region has experienced strong growth while at the same time achieving a continuous reduction in carbon monoxide levels.

The City of Fort Collins Advance Planning staff reposts that between 1990 and 2000 the population of Fort Collins grew from 88,000 to 117,000 up 33% in the 10-year period. Employment for the area increased 30% for the same period, according to the Colorado Department of Labor and Employment. Median income rose 33% for the period.

Reductions in ambient carbon monoxide levels occurred in spite of VMT increases. For example, the MPO estimates that VMT in the Fort Collins urbanized area was 1.86 million miles per day in 1992, and had grown to 2.52 million miles per day by 1998 – an increase of 35% in VMT for the 6-year period. (Refer to Table 2 in Chapter 2 of this section.)

(Note: The following is a description of federally enforceable control measures that brought the area into attainment. This is not a description of Maintenance Plan control measures.)

a. Federal Tailpipe Standards

One of the more important carbon monoxide control measures for the Fort Collins area and the nation is the Federal Motor Vehicle Emissions Control Program (FMVECP), established in 1968. The Clean Air Act of 1977 led to the advent of catalytic converters in 1975 and computerized engine control systems in 1981. The 1990 CAA Amendments required additional control measures, including stricter emission standards for cars, light duty trucks, minivans and sport/utility vehicles; cold temperature carbon monoxide standards; and an extended warranty and recall period. Federal standards will continue to provide emission reduction benefits as older vehicles are retired and vehicles meeting the newest standards enter the fleet.

b. Vehicle Inspection & Maintenance Program

Colorado's Automobile Inspection and Readjustment (AIR) Program is described in AQCC Regulation Number 11 and has been applicable to this carbon monoxide nonattainment area since 1981. The AIR Program works to reduce carbon monoxide and other pollutants from gasoline-powered motor vehicles by requiring them to meet emission standards through periodic tailpipe tests, maintenance, and specific repairs.

The Fort Collins area has been subject to the "Basic" AIR Program which applies to motor vehicles that operate in the area 90 days or more per year, with the exception of motorcycles, farm-plated vehicles, collector series vehicles, electric vehicles, two-cycle powered vehicles, horseless carriages, and diesel vehicles. Since May 20, 1996, the program requires biennial inspections of vehicles at independent inspection stations in Fort Collins. Testing centers use EPA's preconditioned two-speed idle test procedures (EPA-AA-TSA-I/M-90-3, March 1990).

Colorado's Basic AIR Program is applicable to the Fort Collins nonattainment area, including certain areas of unincorporated Larimer County. A first inspection of a new vehicle is due four years after initial registration of a vehicle, and upon change of ownership, regardless of vehicle age. Fleet vehicles must be inspected either biennially at independent inspection stations or annually at fleet inspection stations per 42-4-309, C.R.S.

c. Oxygenated Gasoline Program

The Oxygenated gasoline program is designed to reduce wintertime carbon monoxide emissions from automobiles by requiring the use of fuel that contains added oxygen. Currently, the oxygenates typically used along Colorado's Front Range are ethanol and tertiary amyl methyl either (TAME).

The oxygenated gasoline program, as defined in Air Quality Control Commission Regulation Number 13, was first implemented in Fort Collins in 1988, running January 1 through February 28 requiring an oxygen content of 1.5% in gasoline. The program has been revised several times since then, and now requires that gasoline contain 2.7% oxygenate from November through February 7 each year.

d. Industrial Source Controls

The State's comprehensive permit rules, AQCC Regulations Number 3 and 6, control emission from industrial facilities and cap carbon monoxide emissions from new or modified major stationary sources. The State continues to enhance its permit programs, while simultaneously pursuing a strong inspection and enforcement presence, as authorized by the Commission's Common Provisions regulation.

e. Wood Stove Requirements in Colorado Air Quality Control Regulation Number 4

The regulation requires that wood stoves must be tested, certified and labeled for emission performance in accordance with federal criteria and procedures meeting emission standards set out in 40 CFR Part 60. This regulation went into effect statewide in 1991, and is likely to have inhibited increases in carbon monoxide emissions in the Fort Collins area in spite of increases in residential wood burning.

4. CAA Section 110 and Part D Requirements

For the purposes of redesignation, all of the general nonattainment area requirements of CAA Section 110 and Part D must be met. All of Section 110(a)(2) have been met by the State of Colorado, including: 1) the establishment and implementation of enforceable emission limitations; 2) monitoring, compiling, and analyzing of ambient air quality data; 3) pre-construction reviews and permitting of new and modified major stationary sources; 4) consulting with and providing for the participation of local governments that are affected by the plan; 5) assurance that the State has the adequate funds and authority to enforce the SIP Element and associated regulations; and 6) permit fees for stationary sources.

Colorado Revised Statute 25-7-111 requires the APCD to administer and enforce the air quality programs adopted by the AQCC. The APCD is committed to

implementing and enforcing the air quality plans and regulations applicable to the Fort Collins carbon monoxide attainment/maintenance area.

Part D of the CAA, pertaining to nonattainment plan provisions, requires the following items to be addressed:

- the implementation of reasonably available control measures, including reasonably available control technologies (RACT) for existing sources
- reasonable further progress (RFP) towards meeting attainment
- a current emissions inventory and periodic inventories every 3 years until attainment
- the identification and quantification of allowable emissions for new and modified stationary sources
- a stationary source permitting program
- other measures: enforceable emission limitations, other control measures, schedule for compliance
- compliance with CAA Section 110 provisions
- contingency measures

The EPA-approved Colorado SIP already includes the provisions required by Section 110(a)(2) and Part D of the CAA. In approving the Carbon Monoxide SIP for the Denver area on March 10, 1997, the EPA determined that the State met the requirements of Section 110(a)(2) and Part D of the Clean Air Act.

Other Part D requirements that are applicable in nonattainment and maintenance areas include the general and transportation conformity provisions of CAA Section 176(c). These provisions ensure that federally funded or approved projects and actions conform to the Fort Collins element of the SIP for carbon monoxide prior to the projects or actions being implemented. The EPA approved the Colorado Transportation Conformity SIP September 21, 2001, implementing the requirements of Section 176(c).

5. Maintenance Plan

In order to be redesignated to attainment/maintenance status, the State must have a fully approved carbon monoxide maintenance plan that meets the requirements of CAA Section 175A, including a demonstration that the area will maintain the standard for a period of at least 10 years following redesignation by EPA. The plan must also contain contingency measures that could be implemented if a

violation of the standard is monitored at any time during the maintenance period. Chapter 2 of this Part II constitutes the Fort Collins area Maintenance Plan.

B. Fort Collins Area Carbon Monoxide Monitoring

Ambient air monitoring conducted in Fort Collins indicates that the 8-hour carbon monoxide standard was exceeded frequently from 1981 through 1991. (The 1-hour standard was never violated in the Fort Collins area.) With the implementation of emission control programs aimed at reducing automobile emissions, carbon monoxide concentrations began to decrease substantially. The last recorded violation of the 8-hour standard occurred in 1991.

The carbon monoxide monitoring site in Fort Collins consists of one National Air Monitoring Station at 708 S. Mason Street. The Colorado Air Pollution Control Division operates the monitoring equipment and performs precision checks and accuracy audits on the equipment.

The following data verify that the Fort Collins area has been in attainment with the national standard for carbon monoxide since 1992, including the most recent 2-year period (2000-2001), in accordance with the federal requirements of 40 CFR Part 50.8.

Data recovery rates for the monitors exceed the 75% completeness requirements for all years. All state and federal quality assurance procedures have been complied with, which substantiates their validity as indicators of ambient carbon monoxide levels in the Fort Collins area. Table 1 presents the long-term record for the Fort Collins carbon monoxide monitor.

TABLE 1
1992 - 2001 CARBON MONOXIDE DATA SUMMARY FOR FORT COLLINS MONITOR
(708 S. MASON ST)
(ppm = parts per million)

	1-hour standard 35 ppm		8-hour standard 9 ppm		Data Capture	
YEAR	1st Max	2nd Max	1st Max.	2nd Max.	%	Q/A Audits*
1992	14.2 ppm	13.8 ppm	7.9 ppm	6.9 ppm	99	Y
1993	17.3 ppm	13.8 ppm	7.4 ppm	6.6 ppm	99	Y
1994	13.6 ppm	12.1 ppm	7.3 ppm	6.0 ppm	99	Y
1995	10.6 ppm	9.8 ppm	5.6 ppm	5.2 ppm	99	Y
1996	12.7 ppm	10.9 ppm	5.5 ppm	5.1 ppm	98	Y
1997	10.3 ppm	9.2 ppm	5.3 ppm	5.2 ppm	99	Y
1998	12.7 ppm	10.9 ppm	5.3 ppm	4.1 ppm	99	Y
1999	8.7 ppm	8.4 ppm	5.8 ppm	5.1 ppm	99	Y
2000	9.6 ppm	7.5 ppm	4.0 ppm	3.8 ppm	99	Y
2001	7.2 ppm	6.8 ppm	3.3 ppm	3.0 ppm	98	Y

NOTE: The 1-hour carbon monoxide standard is 35 parts per million.
The 8-hour carbon monoxide standard – the standard of concern for Fort Collins – is 9 parts per million.

*Accuracy audits were conducted at this station during each year from 1992 – 2001. All audits passed required quality assurance measures.

C. Quality Assurance Program

Carbon monoxide data for the Fort Collins area has been collected and quality-assured in accordance with 40 CFR Part 58, Appendix A, EPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. 11; Ambient Air Specific Methods, the Division's Standard Operating Procedures Manual, and Colorado's Monitoring SIP which EPA approved in 1993. The data are recorded in EPA's Aerometric Information Retrieval System (AIRS) and are available for public review at the APCD and through EPA's AIRS database.

In addition, the APCD has verified the integrity of the air quality monitoring network. Precision and accuracy results for the Fort Collins monitoring network for the years 1999 and 2000 are contained in the Division's Quality Assurance report1.[2] Results for 2001 are summarized in the Division's Accuracy Audits from March and September 2001, attached to the Technical Support Document. The calculated 95% probability limits for the precision checks and accuracy audits demonstrate that the sites were meeting acceptable quality assurance limits for repeatability and accuracy.

CHAPTER 2: MAINTENANCE PLAN

Section 107(d)(3)(E) of the CAA stipulates that for a nonattainment area to be redesignated to attainment, EPA must fully approve a maintenance plan that meets the requirements of CAA Section 175A. The maintenance plan is a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least ten years after redesignation by EPA.

Because EPA is allowed up to two years to approve redesignation requests after receiving a complete submittal, and given the time needed to complete the State processes for legislative approval and AQCC rule-making, the milestone year for this maintenance plan is 2015.

The EPA has established the core elements listed below as necessary for approval of maintenance plans.

1. Emission inventories for current and future years
2. Maintenance demonstration
3. Description of the control measures for the maintenance period
4. Mobile source emissions budget
5. Approved monitoring network
6. Verification of continued attainment
7. Contingency plan
8. Subsequent maintenance plan revisions

A. Emission Inventories and Maintenance Demonstration

This section presents the emission inventories portion of the maintenance plan. Regional emission inventories are provided for the 1992 attainment year, 1998, 2004, 2005 and 2010 interim years, and the 2015 maintenance year. (Please see Tables 2 and 3 below.)

Table 2 - 1992-2015 Fort Collins Urban Growth Area Emission Inventories

Year	Urban Growth Area VMT	Fleet Avg. CO rate G/mi	Mobile Inventory Tons/day	Stationary & Area/Non-road Tons/day	Inventory Totals Tons/day	Strategies
1992	1,861,417	46.11	94.6	23.8	**118.4**	Idle I/M 1992 oxy level
1998	2,516,439	29.17	80.9	24.8	**105.7**	Idle I/M 1998 oxy level
2004	3,122,413	27.67	95.2	18.7	**113.9**	No controls
2005	3,236,739	25.58	91.3	17.5	**108.8**	No controls
2010	3,709,693	18.34	75.0	19.5	**94.5**	No controls
2015	4,182,646	15.49	71.4	22.4	**93.9**	No controls

Modeled emission inventories for the years 2004, 2005, 2010 and 2015 (interim years and out year) incorporate no control strategies.

The inventories provide emissions estimates for a weekday during the winter carbon monoxide season (November through February). The modeling domain consists of the Fort Collins urban growth area, which encompasses the Fort Collins attainment area. The carbon monoxide attainment/maintenance area is used to establish the mobile source emissions budget.

The inventories were developed using EPA-approved emissions modeling methods and the latest transportation and demographic data from the North Front Range Transportation & Air Quality Planning Council. The technical support document for this maintenance plan contains detailed information on model assumptions and parameters for each source category. It also describes in detail the assumptions and methodologies used for all modeling work.

Table 3 - Fort Collins Carbon Monoxide Maintenance Plan Stationary and Area Source Emission Inventories

Source Cat.	1992	1998	2005	2010	2015
Residential Heating	0.19	0.20	0.25	0.30	0.33
Commercial Heating	0.06	0.07	0.09	0.11	0.13
Commercial Non-road	3.9	4.8	6.5	7.9	10.0
Construction Non-road	1.9	1.9	1.6	1.7	1.9
Industrial Non-road	1.8	1.9	2.0	2.1	2.2
Commercial Lawn and Garden	1.4	1.5	1.8	2.0	2.4
Residential Lawn and Garden	0.2	0.2	0.3	0.3	0.3
Agriculture Non-road	0.003	0.003	0.003	0.003	0.004
Recreation Non-road	0.128	0.131	0.138	0.144	0.151
Wood Burning	13.5	13.6	4.2	4.3	4.3
Railroad*	0.036	0.041	0.042	0.045	0.052
Point Sources	0.7	0.4	0.5	0.6	0.6
Total Stationary & Area Sources (tons/day)	**23.8**	**24.8**	**17.5**	**19.5**	**22.4**

* Locomotives and service

Note: Results are reported with one-to-three decimal places place to provide representation of smaller source categories. This level of precision is not intended to suggest a level of accuracy.

B. Control Measures to be Removed for the Maintenance Period

As of January 1, 2004, the oxygenated fuels program and the Basic I/M program will not be part of the federally enforceable SIP for the Fort Collins area. No emission reduction credit has been taken in the maintenance demonstration for these or any other current State or local control programs.

Specific programs and requirements that will cease to be part of the Fort Collins Element of the SIP as of January 1, 2004 are:

1) Oxygenated fuels program
2) Basic I/M program
3) Contingency measures included in the 1982 attainment SIP element.

The federally enforceable Basic I/M program included in the SIP for this area through December 31, 2003 does not include on-board diagnostics (OBD) testing because modeling demonstrates that maintenance of the NAAQS can be achieved without it. For the period prior to January 1, 2004, maintenance is achieved with Basic I/M without OBD testing. For the period beginning January 1, 2004,

maintenance is achieved for the remainder of the maintenance period without an I/M program.

C. Enforceable Control Measures for the Maintenance Period

1. Federal Motor Vehicle Emissions Control tailpipe standards and regulations, including those for small engines and non-road mobile sources. Credit is taken for these federal requirements, but they are part of a federally administered program and not a state commitment of the Colorado SIP.

2. Air Quality Control Commission Regulation Number 3

3. Wood stove standards contained in AQCC Regulation Number 4

4. AQCC Regulation Number 6

5. AQCC Common Provisions Rule

The Common Provisions and Regulation Number 6 delineate industrial source control programs. The Common Provisions, and Parts A and B of Regulation Number 3 are already included in the approved Colorado SIP. Regulation Number 6 and Part C of Regulation Number 3 implement the Federal standards of performance for new stationary sources and the federal operating permit program. The Fort Collins area Maintenance Plan makes no changes to these regulations.

In accordance with State and federal regulations and policies, the State and federal nonattainment area New Source Review requirements currently in effect for Fort Collins will revert to the State and federal attainment area Prevention of Significant Deterioration permitting requirements once EPA approves this redesignation request and maintenance plan.

D. Transportation Conformity and Mobile Source Carbon Monoxide Emissions Budgets

The transportation conformity provisions of Section 176(c)(2)(A) of the CAA require regional transportation plans and programs to show that emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable state implementation plan.

For the Fort Collins area, total carbon monoxide emissions in future years must be lower than those of 1992 (the base year). The Fort Collins area mobile source emissions budgets are:

99 tons per day for 2005 through 2009
98 tons per day for 2010 through 2014
94 tons per day for 2015 and beyond.

The emissions budgets are derived by taking the difference between the base year (1992) total emissions and future year total emissions. This difference is the "safety margin, " most of which can be added to projected mobile source CO emissions for a mobile source emissions budget. The safety margin, less one ton, is added to the projected mobile source emissions for each year to arrive at the emissions budget, as shown below in Table 4.

Table 4: Mobile Source Emissions, Margins of Safety, Emissions Budget (Tons Per Day)

Year	Mobile Emissions (tpd)	Total Emissions (tpd)	Math	Margin of Safety (tpd)	Emissions Budget
1992 Base	94.6	118	N/A	N/A	N/A
2005	91.3	109	118 - 109 = 9. 9 - 1 = 8 91 + 8 = 99	8	99 tpd
2010	75	94	118 - 94 = 24 24 - 1=23 75 + 23 = 98	23	98 tpd
2015	71.4	94	118 – 94= 24 24 – 1 = 23 71 + 23 = 94	23	94 tpd

Three emissions budgets are calculated for the Fort Collins area. The first applies to the years 2005 through 2009; the second applies to 2010 through 2014; and the third applies to 2015 and beyond.

Post Maintenance Period Commitment: Because informal roll forward analyses indicate that the emissions budget may be exceeded by mobile source emissions in the 2030, the Colorado Department of Public Health & Environment commits to re-implementing the Basic Inspection & Maintenance Program in 2026. The I/M program shall include any federally required on-board diagnostic tests.

This commitment to implement an I/M program in 2026 is included in the Maintenance Plan for purposes of 40 CFR Part 93.122(a)(3)(iii), which provides that emissions reduction credit from such programs may be included in the emissions analysis required by the Federal Transportation Conformity Rule, if the Maintenance Plan contains such a written commitment. This commitment is included in the Maintenance Plan solely for the purpose of authorizing such emission reduction credits for transportation conformity determinations and shall not be construed to extend the maintenance period beyond the year 2015.

E. Monitoring Network / Verification of Continued Attainment

Once the Fort Collins area has been redesignated to attainment status by EPA, the APCD will continue to operate an appropriate air quality monitoring network in accordance with 40 CFR Part 58 to verify the continued attainment of the carbon monoxide standard. The APCD has committed to siting a second carbon monoxide monitor in the Fort Collins area in 2002.

If measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) change significantly over time, the APCD will perform the appropriate studies to determine whether additional and/or re-sited monitors are necessary. Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether additional and/or re-sited monitors are necessary. Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

F. Contingency Plan

Section 175A(d) of the CAA requires that the maintenance plan contain contingency provisions to assure that the State will promptly correct any violation of the carbon monoxide standard which occurs after redesignation to attainment. Attainment areas are not required to have pre-selected contingency measures, and this plan removes any commitment to contingency measures contained in the 1982 Fort Collins nonattainment SIP Element.

The contingency plan must ensure that the contingency measures are adopted expeditiously once the need is triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and

3) a description of the process for recommending and implementing the contingency measures.

Triggering of the contingency plan does not automatically require a revision of the SIP, nor is the area necessarily redesignated once again to nonattainment. Instead, the State will have an appropriate time-frame to correct a violation by implementing one or more of the contingency measures. In the event that violations continue to occur after contingency measures have been implemented, additional contingency measures will be implemented until the violations are corrected.

1. List of Potential Contingency Measures

Section 175A(d) of the CAA requires the Maintenance Plan to include as potential contingency measures all of the carbon monoxide control measures contained in the SIP before redesignation which were relaxed or modified through the Maintenance Plan. For the Fort Collins area, this includes the following measures:

a. A Basic vehicle inspection and maintenance program as described in AQCC Regulation Number 11 prior to modifications made as of July 18, 2002, with the addition of any on-board diagnostics components required by federal law.

b. An oxygenated fuels program as described in Chapter 1, Part 1 of this document and set forth in Colorado Air Quality Regulation Number 13, prior to modifications made as of July 18, 2002.

In addition to this list of potential contingency measures, the State may evaluate other potential strategies, including but not limited to, enhanced I/M, transportation control measures and mandatory wood burning restrictions, in order to address any future violations in the most appropriate and effective manner possible.

2. Tracking and Triggering Mechanisms

- **Tracking**

The primary tracking plan for the Fort Collins area consists of continuous carbon monoxide monitoring by APCD as described above. The APCD will notify the EPA, the AQCC, the Council and local governments of any exceedance of the carbon monoxide standard within 30 days of occurrence.

The ongoing regional transportation planning process carried out by the Council in coordination with CDOT, APCD, AQCC, and EPA, will serve as another means of tracking mobile source carbon monoxide emissions into the future. In this process actual VMT and emissions trends are compared with modeled projections.

- **Triggering**

An exceedance of the carbon monoxide standard (any value over 9.5 ppm) may trigger a voluntary, local process by the Council and APCD to identify and evaluate potential contingency measures. However, the only federally enforceable trigger for mandatory implementation of contingency measures shall be a violation of the carbon monoxide standard. Specifically, this would be a second value of 9.5 ppm or higher at the same monitor during any calendar year.

3. Process for Recommending and Implementing Contingency Measures

The State will move forward with mandatory implementation of contingency measures under the SIP if a violation (a second exceedance in a calendar year) of the carbon monoxide standard occurs.

No more than 60 days after being notified by the APCD that a violation of the carbon monoxide standard has occurred the APCD, in conjunction with the North Front Range Council and the AQCC, will initiate a subcommittee process to begin evaluating potential contingency measures. The subcommittee will present recommendations to the North Front Range MPO and the Division within 120 days of notification. The North Front Range MPO and the Division will then present recommended contingency measures to implement to the AQCC within 180 days of notification.

The AQCC will then hold a public hearing to consider the contingency measures recommended by the APCD and Council, along with any other contingency measures the Commission believes may be appropriate to effectively address the violation. The necessary contingency measures will be adopted and implemented within one year after a violation occurs.

G. Subsequent Maintenance Plan Revisions

It is required that a maintenance plan revision be submitted to EPA eight years after the original redesignation request/maintenance plan is approved. The purpose of this revision is to provide for maintenance of the NAAQS for an additional ten years following the first ten-year period. The State of Colorado commits to submit a revised maintenance plan eight years after redesignation to attainment, as required by the CAA and EPA.

ENDNOTES

[1] Letter from Doug Benevento to John Fischbach, March 5, 2002.

[2] Colorado Department of Public Health & Environment, APCD, Technical Services Program, April 9, 2002.