



# Fort Collins Air Quality Plan

May 2011



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## Executive Summary

### Introduction

The 2011 Fort Collins Air Quality Plan sets forth policies and strategies that will guide the City's efforts to improve air quality over the next five years. City Council adopts air quality principles and policies when they adopt updates to City Plan, Fort Collins' comprehensive Plan. The rest of the Air Quality Plan is updated administratively, including the air quality strategies.

There are two key reasons why a city government should have an air quality plan. First, city residents have high expectations for a clean environment. Residents have identified the Air Quality Program as being the single most important program for protecting their future quality of life, according to the City of Fort Collins 2003 Citizen Survey. Second, certain air quality problems and opportunities are most effectively handled at the local government level. Examples include outreach and ordinances pertaining to wood smoke, vehicle idling and radon. The federal Clean Air Act (CAA) sets outdoor-air standards and emissions limits for equipment and fuels. Colorado state government has the responsibility for efforts to attain the federal outdoor air standards, and County government provides enforcement of state air pollution permits. However, City programs can fill gaps that are left by federal, state, and county programs. Local experimentation may develop innovations that can be used in other communities as well as by state and federal agencies. Moreover, some air quality concerns can only be addressed at the local level.

In sum, the City of Fort Collins has an Air Quality Plan in order to:

- Respond to a strong citizen mandate for the City to protect and improve air quality
- Complement and fill gaps left by federal, state and county efforts by providing local education, incentives and regulation
- Provide a long-term planning framework for air quality protection
- Recognize and coordinate the efforts of several City departments



### Local Air Quality Conditions

Most air pollution levels in Fort Collins have remained relatively flat over the past few decades. One exception is carbon monoxide, which has fallen significantly over the past 20 years. Fort Collins violated the carbon monoxide health standard in the 1980's but now, thanks largely to new car emission standards and vehicle emissions testing, carbon monoxide levels have dropped to well below the health standard.

Ground-level ozone has remained essentially flat over the past two decades. The national 8-hour ozone health standard was tightened in 1997 and again in 2008, in order to adequately protect human health. The U.S. EPA is likely to tighten ozone health standards yet again in 2011 to protect health. Fort Collins does not comply with the current 8-hour ozone health standard and is part of the Denver/North Front Range 8-hour ozone non-attainment area designated by the U.S. EPA. As of the end of 2010, data from the Fort Collins West monitoring site had the third highest 3-year average value in the state. Ground level ozone tends to be higher along the foothills throughout the front range urban area.

Visibility, a measure of how the air looks, has seen minor improvements in Fort Collins in recent years, but the city still violates the state's visibility standard one in four days each year. In City surveys, residents consistently express concerns about the "brown cloud" in Fort Collins.

### Air Quality Planning Process

To prepare the 2011 Air Quality Plan, staff assessed the current air quality situation and status of air quality indicators in Fort Collins. According to a ranking process by City staff and Air Quality Advisory Board members, the air pollutants of greatest concern in Fort Collins now are ozone, greenhouse gasses, fine particles, and indoor air pollution. Motor vehicles remain the most important source of air pollution in Fort Collins, followed by emissions from commerce and industry, with pollution from residences coming in third.

Throughout the development of the 2011 Air Quality Plan, staff invited comments from citizens, City Council advisory boards and consultants.

### **Air Quality Policies**

The 34 air quality principles and policies in the previous 2004 Air Quality Plan were condensed into 20 air quality, climate change and transportation principles and policies contained in 2011 City Plan and restated in this Air Quality Plan. The overarching goal to **“continually improve air quality”** was retained. Major policy themes continue to focus on reducing mobile source emissions and greenhouse gas emissions. New policy areas were introduced to promote alternative and efficient fuels and vehicles, increase focus on regional coordination and ozone compliance, and implement climate adaptation for the municipal government and the community. Some 2004 policies with similar themes were condensed into one. A few policy concepts were transferred into the Transportation policy section of City Plan.

### **Air Quality Implementation Strategies**

A list of potential strategies for the Air Quality Program (Environmental Services Division) was developed and ranked by City air quality staff and the Air Quality Advisory Board for importance, impact, and ease of implementation. A “Short List” of four higher priority action strategies was then fleshed out in more detail to constitute a source of ready, prioritized strategies that could be proposed for funding through Budgeting for Outcomes (BFO) and/or grant proposals. These strategies are:

1. Climate Wise - Commute Trip Reduction
2. Volunteers for Sustainable Homes
3. Promote Alternative Fuel Vehicles
4. Promote Individual Action through Information and Outreach

As actions on the Short List are funded and implemented, the Short List will be updated as needed, but at least in advance of each City budget cycle. The remaining strategies from the original list are retained in Appendix D for future consideration.

In addition to the action strategies identified in this Plan for the Environmental Services Division, it is important to recognize that a number of other City programs provide important and innovative support for local air quality improvement. These include Fort Collins’ Energy Policy programs, Climate Wise, the Solid Waste Reduction and Recycling program, building energy codes and the green building program, a whole array of transportation programs (e.g., Advanced Traffic Management System, Bike Fort Collins, public transit and Safe Routes to School), urban forestry programs and affordable housing programs. The 2011 City Plan action tables contain many strategies across the organization that support air quality improvement. These are also restated in this Air Quality Plan.

### **Monitoring and Reporting**

City staff will produce an annual report of air quality measurements from local monitoring stations including ozone, carbon monoxide, PM<sub>10</sub>, PM<sub>2.5</sub>, and visibility. Air quality indicators, including pollution levels, vehicle miles of travel (VMT), and greenhouse gas inventories are identified in the Plan and are used to assess progress achieving City air quality policies. Air quality indicators will be assessed in advance of the next Air Quality Plan update to evaluate progress and determine potential policy and strategy changes.

## I. Background

### OUTDOOR AIR QUALITY

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The Colorado Department of Public Health and Environment measures outdoor air pollution levels in Fort Collins. Most air pollution trends in Fort Collins have remained relatively flat over the past few decades. One exception is carbon monoxide, which has fallen significantly over the past 20 years. Fort Collins violated the carbon monoxide health standard in the 1980's but now, thanks largely to new car emission standards and vehicle emissions testing, carbon monoxide levels have dropped to well below the health standard.

Ground-level ozone has remained essentially flat over the past two decades. The national 8-hour ozone health standard was tightened in 1997 and again in 2008, in order to adequately protect human health. The U.S. EPA is likely to tighten ozone health standards yet again in 2011 to protect health. Fort Collins is in non-attainment for the 8-hour ozone health standard and is part of the Denver/North Front Range 8-hour ozone non-attainment area designated by the U.S. EPA. As of the end of 2010, the Fort Collins West monitoring site had the third highest 3-year average ozone value in the state. Ground level ozone tends to be higher along the foothills through the front range urban area.

Visibility, a measure of how the air looks, has seen minor improvements in Fort Collins in recent years, but Fort Collins still violates the state's guideline visibility standard one in four days each year. In City surveys, residents consistently express concerns about "brown cloud" in Fort Collins at certain times of the year.

More information about Fort Collins' ambient pollution concentrations, trends and air quality indicators is presented in Appendix A. Appendix B provides more comprehensive information about air pollutants in general.



### INDOOR AIR QUALITY

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The U.S. EPA estimates that ninety percent (90%) or more of each day is spent in our home, school, workplace, or car. While efforts to reduce air pollution typically focus on outdoor air, there are many pollutants indoors that deserve equal attention and action. The U.S. EPA estimates that indoor air can be two to five times more polluted than outdoor air. The elderly, the very young, pregnant women, and those with allergies, asthma and other respiratory ailments are often the first to notice indoor air pollution problems. In fact, indoor air pollution is among the top five environmental health risks according to the U.S. EPA.

At the federal level, the Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA). OSHA is in the U.S. Department of Labor and is responsible for developing and enforcing workplace safety and health regulations. Although OSHA does not have indoor air quality (IAQ) standards, it does have standards about ventilation and standards on some of the air contaminants that can be involved in IAQ problems.

At the state level, the Colorado Department of Public Health and Environment recognizes IAQ as a growing public concern. Currently, there are no regulations directly addressing non-occupational indoor air quality in Colorado. Most other states and the Environmental Protection Agency also do not have regulations for non-occupational indoor air quality. The CDPHE provides information on IAQ and is working to develop IAQ guidelines.

Because non-occupational indoor air quality is not regulated, there are no readily available measurements of indoor air pollution levels in Fort Collins.

## CITIZEN PERCEPTION OF AIR QUALITY IN FORT COLLINS

City residents have high expectations for a clean environment in Fort Collins. Survey data and public outreach show that residents rank air quality concerns among the high-priority issues for our community. They also believe the City has a responsibility, along with federal, state and local health agencies, to maintain and improve air quality. In addition, certain air quality problems and opportunities are best handled at the local government level. As such, it is important for the City to have a strategic Air Quality Plan.

One's perspective on air quality may well be a function of whether personal or a family member's health is negatively impacted by air pollution. According to a citizen survey in 2007, 15% of citizens rate Fort Collins air quality as "Very Good", while a majority (62%) rates it as "Good". 19% rate it as "Fair" and 3% rate it as "Poor". Twenty-nine percent (29%) of citizens indicate that they or a family member suffer from asthma, emphysema, heart disease, or other respiratory ailments.

82% of citizens indicate a concern about the impact that gasoline motor vehicle emissions have on their day-to-day health and the environment, while 80% indicate the same concern about diesel vehicle emissions.

The complete results of the Fort Collins air quality survey can be found at [fcgov.com/airquality/survey.php](http://fcgov.com/airquality/survey.php).

## FORT COLLINS ROLE IN PROTECTING AIR QUALITY

The City of Fort Collins' Air Quality Program complements federal, regional and state programs. The federal Clean Air Act (CAA) provides the structure for air quality control nationally. It defines outdoor air standards, and requires air quality monitoring and improvement in non-attainment areas (areas that do not meet the standards). The federal role assures eventual compliance with outdoor air standards, but it's inflexible and addresses only a handful of pollutants. Colorado state government is responsible for efforts to attain the federal outdoor air standards. The state adopts and enforces regulations that limit smokestack and tailpipe emissions, regional haze, the use of prescribed fire, street sanding and acid deposition. The North Front Range Metropolitan Planning Organization is the region's lead air quality planning agency regarding the development of state implementation plans and conformity determinations. Larimer County provides local enforcement of state air pollution regulations.

Gaps in federal, state, and county programs can be filled by City programs. Innovations that are developed through local experimentation can be shared with other communities and state and federal agencies. And some air quality concerns such as wood smoke, idling, and radon are best addressed at the local level.

In sum, the City of Fort Collins has an Air Quality Plan in order to:

- Respond to a strong citizen mandate for the City to protect and improve air quality
- Complement and fill gaps left by federal, state and county efforts
- Provide a long-term planning framework for air quality protection
- Recognize and coordinate the efforts of several City departments



## FORT COLLINS AIR QUALITY PLAN OVERVIEW

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The Fort Collins Air Quality Plan is a strategic plan that contains air quality principles, policies, and suggested strategies to implement the policies for the next five years. The Air Quality Plan is updated approximately every five years in conjunction with updates to City Plan and the Transportation Master Plan.

The air quality-related principles and policies contained in this Plan are identical to those contained in City Plan and are applicable to the entire City organization. The strategies contained in this Plan are targeted more towards the City's Air Quality Program that resides in the Environmental Services Division (ESD) of the Natural Resources Department. The Air Quality Plan will be used to guide the development of ESD budget requests and staff work plans.

## RELATED PLANS AND PROGRAMS

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In addition to this Air Quality Plan, numerous City policies, programs and plans provide air quality benefit to the community.

- City Plan (2011)
- Transportation Master Plan (2011)
- Pedestrian Plan (2011)
- Energy Policy (2009)
- Transfort Strategic Plan (2009)
- Climate Action Plan (2008)
- Bicycle Plan (2008)
- Municipal Action Plan for Sustainability (2004)

In addition to City policies and plans, several regional and state plans also address Fort Collins' air quality.

- North Front Range 2035 Regional Transportation Plan (2007)
- North Front Range Metropolitan Planning Organization: Long Range Transportation Demand Management Plan (2010)
- Carbon Monoxide Maintenance Plan (2003)
- Revised Carbon Monoxide Maintenance Plan (2010)
- Denver Metro Area and North Front Range Ozone Action Plan (2008)

## II. Air Quality Plan Development

### FOCUS ON SOURCES RATHER THAN POLLUTANTS

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The Air Quality Plan emphasizes emission reductions rather than ambient air quality standards, and it also emphasizes key sources rather than key pollutants. The one exception to that model is ground-level ozone. Air quality policies call out ground-level ozone because we are out of compliance with the ozone health standard. However, local approaches to address ozone still focus on key sources.

It is instructive to first consider some history about the “traditional” approach to air quality planning. The federal Clean Air Act calls for U.S. Environmental Protection Agency (EPA) to set “National Ambient Air Quality Standards” for six pollutants. The states are required to implement emission reduction strategies tailored to bring ambient air quality in line with the standard throughout the state. Standards are based on available health effects data and are designed to “protect the public health with an adequate margin of safety.” Six pollutants have ambient air quality standards: 1. carbon monoxide, 2. particulate matter, 3. ozone, 4. nitrogen dioxide, 5. sulfur dioxide and 6. lead. If air quality in the state is worse than the federal standard, the state is required to submit a “State Implementation Plan” to specify how it will attain the standards.

Communities, however, are confronted with pollutants for which the old model (ambient standard followed by implementation plan) does not fit. For example:

- **Air toxics** include many compounds that are known to contribute to cancer or respiratory disease but that do not have individual ambient air quality standards.
- The **Brown Cloud** (visibility reduction) is primarily an aesthetic issue of importance to Fort Collins citizens, although some components of the brown cloud can also affect health.
- **Carbon dioxide** and other **greenhouse gasses** are important to the global environment but do not directly cause local health effects.

We are also confronted with sources that emit several kinds of air pollution at once. For example, wood burning stoves and fireplaces produce carbon monoxide, particulates, air toxics. They also contribute to the Brown Cloud. Similarly, automobiles produce all of these and greenhouse gasses as well. If we were to follow the traditional approach and write separate control plans for each pollutant, they would overlap to a high degree.

Furthermore, it is important to recognize the strengths and limitations of local government. The City of Fort Collins is not in a good position to monitor air quality for several new pollutants, nor could we credibly adopt our own local ambient air quality standards based on health effects research. What the City can do effectively is adopt policies and programs that reduce emissions from specific sources or source categories.

Because of the circumstances noted above, the Fort Collins Air Quality Plan was developed using a source reduction approach that is more suited to the City’s role in air quality protection.

### PLANNING PROCESS

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The City followed the steps outlined below to develop the 2011 Air Quality Plan. This planning approach has several advantages—it is simple, direct, action-oriented, sets priorities and takes advantage of the strengths and flexibility of local government.

1. **Assess current situation and status of air quality indicators.**  
In early 2010, data on the air quality indicators defined in the 2004 Air Quality Plan were compiled. This information is presented in Appendix A.
2. **Identify key pollutants**  
In mid 2010, staff worked with the Air Quality Advisory Board (AQAB) to select the list of pollutants to prioritize. A summary of current information was compiled for each pollutant. Air quality staff and the

AQAB conducted a forced-choice pairing exercise to identify priority pollutants. Ozone, greenhouse gases, fine particles, and indoor air pollutants topped the list of priority pollutants. Chapter 3 of this plan provides more information on this process.

**3. Identify key air pollution sources**

During 2010, staff compiled updated emissions inventory information, presented in Chapter 3 of this plan. Existing emissions inventory data are not comprehensive or consistent, making it difficult to accurately assign air pollutants to source categories. However, results continue to indicate the following ranking of local air pollution sources:

- # 1: Motor vehicles
- # 2: Commerce and Industry
- # 3: Residences

**4. Update policies to reflect pollutant and source priorities and reduce redundancies.**

The 2004 Air Quality Plan contained 34 air quality principles and policies, 11 of which were repeated in the 2004 City Plan. Starting in early 2010, staff and the Air Quality Advisory Board began to discuss air quality policies in conjunction with Plan Fort Collins efforts. Various iterations of policy proposals were shared with the Environment Subcommittee and the Transportation Subcommittee working on City Plan. Input was received from staff, consultants and relevant Council advisory boards about the proposed policy revisions.

Ultimately, the 34 air quality principles and policies from 2004 were condensed into 20 air quality, climate change and transportation principles and policies contained in 2011 City Plan and restated in this Air Quality Plan. Major policy themes remained including reducing mobile source emissions and greenhouse gas emissions. Some policies with similar themes were condensed into one. A few policy concepts were transferred into the Transportation policy section. New policy areas were introduced to promote alternative and efficient fuels and vehicles (which arose out of the key policy choices discussions for Plan Fort Collins), an increased focus on regional coordination and ozone compliance, and climate adaptation for the municipal government and the community. Appendix C identifies the direct relationship of the 2004 air quality policies to 2011 air quality policies.

**5. Develop a short list of near-term strategies and a long list of potential strategies for future consideration**

City air quality staff and the AQAB began developing a list of potential strategies from sources such as U.S. EPA, state and local air pollution agencies, the AQAB, staff knowledge, and best practices used in other cities. The potential actions were reduced to a workable number by eliminating those that are not a good fit with municipal government, and those that would duplicate or overlap with another City program. That became the Long List.

To select the Short List of action strategies for further development, staff and the AQAB used a group decision-making process, while applying two evaluation criteria:

- **Importance or Impact:** How effective might the action be? Would it address pollutants ranked as high priority? Would it improve an air quality indicator or address non-compliance with the ozone air quality standard?
- **Ease of Implementation:** What is the likelihood of City Council acceptance? Does the public expect it? How costly? What is the likelihood that City Council or a grantor would fund the action? Would the proper City departments be on board? Is the action particularly timely, or does it represent a near-term opportunity?

The Short List of higher priority action strategies was then fleshed out in more detail to constitute a source of ready, prioritized strategies that could be proposed for funding through Budgeting for Outcomes (BFO) and/or grant proposals. The strategy lists will be updated as needed, and at least every two years in advance of the BFO process.

**6. Establish air quality indicators to measure progress in achieving air quality policies**

Lastly, indicators were identified to help evaluate progress in achieving the policies. Many factors went into the consideration of indicators, including availability of data, cost of collecting new data and

relationship to City Plan indicators. Efforts were made to identify indicators that would reward results, not programs. This mirrors the concept in the principle below, developed by the Western Governors Association in the early 2000's.

**Reward Results, Not Programs – Move to a Performance-based System**

*A clean, safe environment will best be achieved when government actions are focused on outcomes, not programs, and when innovative approaches to achieving desired outcomes are rewarded. Federal, state, and local policies should encourage “outside the box” thinking in the development of strategies to achieve desired outcomes. Solving problems rather than just complying with programs should be rewarded.*

Efforts were made to select indicators that measure true air quality benefits, rather than just program metrics. For example, measures of program performance such as number of brochures distributed or number of homes mitigated for radon do not directly identify whether an air quality benefit has been achieved. At the same time, because air pollution levels are affected by actions and sources outside of Fort Collins, the list of indicators includes some program performance metrics as well.

## PUBLIC INPUT

Efforts were made throughout the development of this plan to involve affected interests. Several meetings were held with various City staff and consultants to the 2011 City Plan and Transportation Master Plan updates. Air quality staff participated in the City Plan and Transportation Master Plan update processes which had public outreach elements. Council advisory boards (Air Quality, Transportation and Natural Resources) had opportunities to provide input to the Air Quality Plan.

General comments were also sought at a number of public events including the Climate Wise Fall Fair (September 2010), the Rocky Mountain Sustainable Living Fair (September 2010), an Air Care Colorado Open House on Vehicle Emission Testing (October 2010), two Plan Fort Collins Open Houses (October 2010) and a presentation to the Eyeopeners Kiwanis (September 2010). In addition, the air quality policies received the full extent of outreach associated with the Plan Fort Collins process.

General public input was sought via the Internet starting in September 2010. Information and an online comment box was set up from Plan Fort Collins home page to the Air Quality Plan update.

Once a draft 2011 Air Quality plan was compiled, more concerted outreach was conducted in February and March 2011. Announcements about the Web-based comment opportunities were e-mailed to stakeholders. Stakeholder groups receiving a notification included interested citizens, other local governments, local environmental groups, health and air quality technical experts, and interested teachers, professors and students, and relevant City Council advisory boards.





### III. Priority Air Pollutants And Sources

#### PRIORITY AIR POLLUTANTS

In 2010 air quality staff (2) and Air Quality Advisory Board members (9) undertook an exercise to rank the priority of air pollutants to aid in updating the air quality policies and strategies for Fort Collins. Staff and the AQAB were chosen to complete the prioritization process because of the requirement to be familiar with the air pollutants being ranked.

Staff first developed the list of pollutants to be ranked, and reviewed it with the Air Quality Board. One page of information about each pollutant was compiled and considered in the exercise, provided in Appendix B. The following guidelines were used in the ranking exercise:

- 1) **Health effects** have priority over non-health effects (such as aesthetics or crop yield).
- 2) For pollutants having a standard, **non-compliance** is a higher priority than compliance.
- 3) Pollutants **widely perceived as a problem in Fort Collins** have a priority over unfamiliar pollutants.
- 4) Pollutants with an **upward or uncertain emission trend** have a higher priority than those with a downward emission trend.
- 5) **Ability to address at local level**

Fourteen air pollutant categories were ranked using a “Forced Choice” method that requires selecting the higher priority pollutant of a pair, for every possible set of pairs. The overall priority is determined by the number of times a pollutant was selected as higher priority of a given pair. Table 1 shows the final results.

Results of the 2010 prioritization exercise are not substantially different from the 2003 results. Ozone, greenhouse gases and fine particles continue to be top priorities. However in 2010, indoor air pollution rose in relative priority and as a result will factor more prominently in City air quality program offerings in the future.

**Table 1. 2010 Fort Collins Priority Air Pollutants**

2010 FORT COLLINS PRIORITY AIR POLLUTANTS		
Pollutant	Score	
Ozone	95	High Priority
Greenhouse gases	79	
PM2.5	74	
Indoor Air Quality	71	
Nitrogen Oxides	61	
Mobile Source Hazardous Air Pollutants	56	
Industrial Hazardous Air Pollutants	54	
Visibility	54	
Mercury	46	
Carbon Monoxide	46	
PM10	41	
Acid Deposition	28	
Sulfur Dioxide	12	
Lead	11	Lower Priority

## PRIORITY AIR POLLUTION SOURCES

According to the emissions inventories provided in Table 2, mobile sources remain the number one source of local air pollution. Commercial and industrial sources are the second largest source of air pollution in Fort Collins. According to these emissions inventories, commercial and industrial pollutants are nearing the magnitude of mobile source contribution of priority pollutants. The Colorado Air Pollution Control Division evaluates and develops air permits for stationary sources in Colorado. They inspect sources to determine compliance with air regulations and permit conditions, and maintain a computerized inventory of air pollution emissions throughout the state.

Collectively, residences are the third largest source of air pollution in Fort Collins. Residences can emit wood smoke into the outdoor air. Other residential activities, such as using and storing paints, cleaners, transferring fuel, using lawn and garden equipment and patio grills can allow harmful volatile organic compounds (VOC's) to escape into the atmosphere. In addition, human exposure to indoor air pollution inside residences can occur. On average, humans spend 90% of their time indoors, and receive the majority of air pollution exposure indoors.

**Table 2. Air Pollutant Emission Source Estimates**

AIR POLLUTANT EMISSION SOURCE ESTIMATES				
Pollutant	Mobile On-Road and Off-Road	Commercial & Industrial	Residential	Other
Ozone --- VOC <sup>1</sup>	52%	37%	10%	1% <sup>4</sup>
Greenhouse Gases <sup>2</sup>	23%	48%	30%	0%
Fine Particles <sup>3</sup>	66%	28%	5%	1%
Indoor Air Pollutants	0%	50%	50%	0%
NO <sub>2</sub> <sup>1</sup>	75%	25%	0%	1% <sup>4</sup>
Mobile Souce HAPS	100%	0%	0%	0%
Industrial HAPS	0%	100%	0%	0%
Visibility Reduction <sup>3</sup>	66%	28%	5%	1%
Carbon Monoxide <sup>1</sup>	90%	1%	5%	3% <sup>4</sup>
PM <sub>10</sub> <sup>1</sup>	42%	44%	3%	11% <sup>4</sup>
<b>Relative Contribution to Fort Collins Air Pollution</b>	<b>#1 Source</b>	<b>#2 Source</b>	<b>#3 Source</b>	

<sup>1</sup> CDPHE Emissions Inventory for Larimer County, Retrieved from [http://www.colorado.gov/airquality/inv\\_maps\\_2008.aspx](http://www.colorado.gov/airquality/inv_maps_2008.aspx) on 1/4/11

<sup>2</sup> City of Fort Collins 2009 Climate Protection Status Report

<sup>3</sup> North Front Range Air Quality Study; Fort Collins, Winter 1996 Data

<sup>4</sup> .e.g., forest, ag and structural fires, ag tilling

(NOTE: The inventories only address human-caused air pollution sources.)

## IV. Air Quality Vision, Principles And Policies

The air quality vision, principles and policies in this section are identical to those contained in City Plan, Fort Collins' comprehensive plan. The air quality principles and policies were updated when City Council adopted the updated version of City Plan and are reflected in the sections below. (See Appendix E for the 2011 City Council Resolution adopting City Plan.)

### AIR QUALITY VISION

The Environmental Resources vision from 2011 City Plan calls for the following air quality vision.

***A healthy and sustainable environment, including continuous improvements in air quality.***



### AIR QUALITY PRINCIPLES AND POLICIES

The primary air quality goal remains to “continually improve air quality” and is reflected in the principles and policies in this section. Full principle and policy language from the air quality and climate change sections of City Plan are restated here. Vision, principle and policy concepts from other sections of City Plan that significantly support air quality improvement are also summarized here to underscore their relationship to air quality. This includes the transportation, land use, waste management and energy sections of the 2011 City Plan.

#### **Principle ENV 8: Continually improve Fort Collins’ air quality.**

##### ***Policy ENV 8.1 – Implement Air Quality Plan***

Develop and implement a comprehensive Air Quality Plan that contains:

- Air quality policies that are reviewed and adopted by City Council in conjunction with periodic comprehensive plan updates
- Air quality strategies to meet adopted policies that are evaluated and updated prior to each biennial budget cycle
- Prioritized air pollutants
- A list of air quality indicators to track future progress

***Policy ENV 8.2 – Focus on Priority Air Pollutants***

Focus air quality policies and strategies on identified high-priority pollutants to promote program cost-effectiveness. To that end, the City will regularly prioritize air pollutants in conjunction with comprehensive plan updates, considering such criteria as health impacts, air pollution trends, compliance with current state and federal standards, aesthetics and ability to effect improvements at the local level.

***Policy ENV 8.3 – Employ a Citywide Approach***

Focus on improving air pollution by reducing total citywide emissions over the long term and assuring that localized air pollution exposures conform to adopted health standards.

***Policy ENV 8.4 – Coordinate Regionally***

Work with local and regional partners to improve air quality, recognizing that air pollution does not follow jurisdictional boundaries.

***Policy ENV 8.5 – Focus on Sources***

Rather than addressing pollutants individually, reduce air pollution by developing strategies that focus on key sources of air pollution (i.e., on-road, non-road, commercial and industrial and residential), recognizing that multiple pollutant reductions can be achieved this way.

***Policy ENV 8.6 – Prevent Pollution***

Promote prevention of air pollution at its source as the highest priority approach in reducing air pollution emissions.

***Policy ENV 8.7 – Involve and Inform the Public about Air Quality***

Raise awareness about local air quality, report available air quality information to the public on a regular basis, assist citizens in finding existing local air quality information that is of interest to them, and involve citizens and businesses in programs to improve air quality.

***Policy ENV 8.8 – Seek Ozone Compliance***

Fort Collins and other North Front Range communities do not meet the National Ambient Air Quality Standard for ozone and have therefore been designated as a non-attainment area under the Clean Air Act. Participate in planning for compliance within the non-attainment area and develop strategies to reduce ozone precursor emissions in Fort Collins.

***Policy ENV 8.9 – Air Quality Regulation***

Use local regulation as needed to improve air quality, in addition to public education and incentives.

***Principle ENV 9: The City will reduce total mobile source emissions by focusing on both technology (e.g., tailpipe emissions) and behavior (e.g., driving patterns).***

***Policy ENV 9.1 – Promote Alternative and Efficient Transportation Fuels and Vehicles***

Promote alternative and efficient transportation fuels and vehicles that improve air quality. Invest in infrastructure throughout the City to support alternative fuel vehicles and promote the use of such vehicles through education and incentives.

(See the “Increase Awareness” section in the Transportation chapter of City Plan. for policies on changing driving behavior.)



**Principle ENV 10: The City will, within the scope of its ability, strive to protect and improve the air so it is healthy to breathe and free of levels of pollutants that harm human health (and public welfare).**

***Policy ENV 10.1 – Forge Health Partnerships***

Because air pollution strongly affects human health, consult with a diverse range of experts from the public health and environmental health communities to assure City policies and strategies address priority health issues. (Also see the Safety and Wellness chapter.)

## CLIMATE CHANGE PRINCIPLES AND POLICIES

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The *2008 Climate Action Plan* provides a blueprint for making progress on Fort Collins' greenhouse gas reduction goals while advancing multiple other City objectives. The principle below mirrors the greenhouse gas reduction goals contained within Fort Collins *Climate Action Plan*.

**Principle ENV 11: To help engender a more economically efficient, successful, and resilient community, and to reduce the impact of the Fort Collins community on global climate change, the Fort Collins community will reduce greenhouse gas emissions 20% below 2005 levels by 2020 and 80% by 2050.**

***Policy ENV 11.1 – Implement and Update the Climate Action Plan***

Adopt, implement, report progress on and periodically update the Climate Action Plan and consider low impact carbon scenarios in all major planning efforts that impact greenhouse gas emissions.

***Policy ENV 11.2 – Update Regulations***

Regularly update codes to include effective environmental and resource conservation provisions to reduce greenhouse gas emissions by increasing energy-efficiency of buildings.

***Policy ENV 11.3 – Provide Assistance***

Offer education, programs and other assistance to citizens and local businesses interested in reducing their environmental impacts (such as the voluntary Climate Wise program).

***Policy ENV 11.4 – Lead by Example and Reduce Municipal Greenhouse Gas Emissions***

Lead by example in efforts to improve local air quality by identifying and implementing best practices in municipal operations to prevent air pollution at its source and reduce greenhouse gas emissions from municipal operations 20% below 2005 levels by 2020.

**Principle ENV 12: The City will plan and integrate strategies to adapt to a changing climate into City operations, and will promote climate adaptation actions in the community.**

***Policy ENV 12.1 – Develop a Climate Adaption Plan and Strategies***

Plan to integrate strategies for adapting to a changing climate into City operations and promote adaptation actions in the community.

## RELATED VISIONS AND PRINCIPLES

This section identifies other City Plan visions and principle concepts that, while not specifically labeled “air quality,” do support air quality improvement. These areas are transportation, growth management, waste management and energy.

### Transportation

Because the mobile source sector emits the greatest amount of air pollution emissions in Fort Collins, City policies and actions that reduce transportation emissions are critical to achieving continual air quality improvement.

The 2011 Transportation Master Plan contains five vision and policy areas that coincide with key outcomes desired from the transportation budget area for 2011/2012 budget process. The visions for the five areas also impact air quality to varying extents. The vision language is restated here and the full transportation principle and policy language can be found in the Transportation Master Plan at <http://www.fcgov.com/planfortcollins/>.

#### Integrated Land Use and Transportation

***Vision:*** Land use and transportation will be fully integrated, both locally and regionally, to create an affordable, accessible, low energy, low impact and efficient transportation system.

Land use, transportation and air quality impacts are inextricably linked. Compact urban forms that offer efficient mobility alternatives will reduce emission associated with ground transportation. Policies in this section call for:

- the city to be organized in a way that reduces the rate of vehicle miles of travel growth and dependency on the private automobile while balancing access, mobility, safety and emergency response
- development to be managed in a manner that minimizes automobile dependence and maximized choices among other modes
- support for infill and refill development
- the establishment of enhanced travel corridors
- regionally coordinated transportation solutions
- sustainable long-term funding alternatives for transportation capital, operating and maintenance costs.



#### Mobility Options

***Vision:*** Multiple modes of safe, affordable, easy and convenient travel will ensure mobility for people of all ages and abilities. Multiple travel modes will make it easy to choose transportation options that support a healthy lifestyle. Innovative travel modes will be accommodated through flexibility in the transportation system.

Before substantive behavior changes can be made that will reduce the environmental impacts of transportation, efficient, affordable and accessible alternatives must be in place. Policies in this section call for the City to accommodate new and innovative transportation modes, promote transportation

opportunities that support healthy and active lifestyles, develop enhanced travel corridors that promote walking, bicycling and pedestrians and to create transit, bicycling and walking opportunities that are safe, affordable and convenient.

### **Traffic Flow**

***Vision:** The transportation system will provide safe, reliable, convenient and effective vehicular mobility and access.*

Optimizing existing traffic flow can reduce tailpipe emissions. For example, a major signal optimization initiative in 2009 that addressed 150 traffic signals along 10 major and 5 minor corridors is estimated to reduce 1.19 million pounds of air pollution emissions, save one million gallons of fuel and save \$17.98 million in combined fuel savings and reduced motorist travel delay annually. Other strategies such as the use of roundabouts that keep traffic moving smoothly minimize emissions and increase safety. Policies in this section call for the transportation system to minimize harmful vehicular emissions through roadway design and traffic, and to develop transportation systems that are safe, predictable and adequate for the movement of people and goods.

### **Quality Travel Infrastructure**

***Vision:** Travel infrastructure will be high quality and recognized as world class by residents, visitors and peers.*

Travel infrastructure includes infrastructure for all modes of transportation including vehicles, bicycles and pedestrians. Before substantive behavior changes can be made that will reduce the environmental impacts of transportation, efficient, affordable and accessible alternatives must be in place. Policies in this section require that City capital investments support the goals of the Transportation Master Plan and Master Streets Plan, and that our transportation infrastructure will be maintained to ensure safety and long-term preservation of the asset.

### **Increase Awareness**

***Vision:** People will be aware of the impact that their travel choices have on the transportation system, the environment and the community. They will have travel options to choose that help Fort Collins achieve its overall vision of being a world class community.*

This policy category has a significant impact on air quality. Raising public awareness of opportunities and the costs and benefits of various travel choices that reflect a thorough accounting can influence travel choices that reduce environmental impact. City Plan policies in this section call for programs that raise awareness of automobile travel impacts on health, safety and the environment and the implementation of programs that promote energy efficient and environmentally sensitive transportation choices.

## **Growth Management**

The principles and policies in the Growth Management section carry forward the City Plan vision for a community with a compact land use pattern with a well-defined boundary, adequate public facilities and development paying its share of costs of necessary public facilities, and services. Principles include use of a growth management boundary, annexation only when it conforms to City Plan goals and principles, development paying its share of the cost of public facilities and services concurrent with development, and support for infill and refill development.

## **Waste Resources Management**

Management of waste has numerous direct links to air quality including the greenhouse gas emissions associated with land-filling and composting community trash, and mobile source emissions associated with transporting trash and recycled material. Local and non-local lifecycle impacts to air quality extend to emissions associated with resource extraction, product manufacture and transportation of goods. Future choices in technology to convert waste resources back into energy also have large potential consequences for air quality.

The principles and policies in the Waste Resources Management section of City Plan build on the City’s existing recycling and solid waste management efforts to reduce waste, divert waste through recycling and composting and manage hazardous materials. They reflect the City’s 1995 Pay-as-You-Throw Ordinance. They incorporate new ideas about utilizing waste materials as an economic resource, and are closely related to other topics including energy production and greenhouse gas emissions reduction. Recognizing the value of embodied energy in trash, (and its associated air quality impacts) one policy calls for the City to apply the US EPA’s integrated “hierarchy” of waste management that uses source reduction as the primary approach, followed in order by: reuse; recycling/composting; energy recovery using emerging pollution-free technology; and landfill disposal (where methane gas capture is employed), as a final resort.

## Energy

The supply and use of energy in the community has a significant impact on air quality. Air pollution emissions, including greenhouse gases, are associated with the generation of electricity to light, heat and cool buildings and power vehicles, and the combustion of natural gas primarily to heat structures. Electricity generation and natural gas exploration and development contribute to ground-level ozone formation as well as regional haze impacts.

The energy-related principles and policies in City Plan reflect the City’s commitment to maximize the benefits of efficiency and conservation, move towards clean and renewable energy sources and then adapt to the opportunities brought by innovation and emerging technologies in the electric utility industry. They build on goals and policies addressed in earlier versions of *City Plan*, including improving energy conservation, utilizing renewable energy sources and reducing energy use. They also incorporate new ideas from the City’s adopted Energy Policy, Climate Action Plan and Action Plan for Sustainability, including: providing safe, reliable, competitive and modern electric service; increasing energy-efficiency, renewable energy and carbon neutral energy; promoting green building practices in new construction and existing buildings; reducing the City’s carbon footprint; and modernizing the electric grid to provide a safe reliable grid that allows for the integration of smart technologies.



## Structure Plan Map

The City Structure Plan Map provides direction about how the city will change over time—how to grow, where to develop and how to shape growth so that it benefits overall quality of life. It focuses primarily on the physical form and development pattern of the city, serving as a blueprint for the community’s desired future. The City Structure Plan Map provides a geographic depiction of how City Plan principles and policies are applied throughout the city.

The Structure Plan Map is shaped by a number of key themes. These themes nicely sum up many of the policy areas mentioned above and have an impact on air quality.

- Focus on compact development patterns
- Provide an interconnected transit system
- Accommodate multiple means of travel
- Provide transit-oriented activity centers
- Provide an interconnected system of open lands
- Reduce carbon emissions



## V. Air Quality Implementation Strategies

This chapter summarizes strategies to improve air quality in Fort Collins, with a focus on actions to be implemented by the Air Quality Program in the City’s Environmental Services Division. It also describes additional strategies benefiting air quality that are contained in other City plans and/or are implemented by other City departments, e.g., Climate Action Plan, Energy Policy, City Plan, Transportation Master Plan, Transfort Strategic Plan, Bicycle Plan and Pedestrian Plan. Lastly, it briefly describes programs that are implemented regionally and by State government that directly impact Fort Collins citizens, such as the motor vehicle emissions testing program.

### AIR QUALITY PROGRAM (ENVIRONMENTAL SERVICES DIVISION)

This section sets forth air quality strategies that are generally to be implemented by the Environmental Services Air Quality Program. Funding for this program is provided through the City’s General Fund to the Natural Resources Department, Environmental Services Division.

Recognizing that no action strategy can be implemented unless it is granted resources in the City’s BFO (Budgeting for Outcomes) process or via other funding opportunities, this plan focuses on key, high-priority strategies (the “Short List”) that are developed to be funding-ready, i.e., ready to propose for funding in the BFO process or by outside grants. In addition, this plan identifies other strategies (the “Long List”) that could be developed into funding proposals in the future. The intent is to regularly review and maintain a small number of key, funding-ready proposals. As the Short-List strategies are implemented, staff and the Air Quality Advisory Board (AQAB) would refresh the Long List and select action strategies for development to funding-ready status. This approach is action-oriented, while maintaining flexibility to respond to emerging air quality issues and opportunities.

#### Strategy Selection Process

City air quality staff and the AQAB began the selection process by accumulating a wide variety of potential actions from sources such as US EPA, state and local air pollution agencies, AQAB and staff knowledge and best practices used in other cities. The potential actions were reduced to a workable number by eliminating those that are not a good fit with municipal government, and those that would duplicate or overlap with another city program. That became the “Long List”.

In May of 2010, to select the Short List of action strategies for further development, staff and the AQAB used a group decision-making process, while applying two evaluation criteria:

- **Importance or Impact:** How effective might the action be? Would it address pollutants ranked as high priority? Would it improve an air quality indicator or address non-compliance with the ozone air quality standard?
- **Ease of Implementation:** What is the likelihood of City Council acceptance? Does the public expect it? How costly? What is the likelihood that City Council or a grantor would fund the action? Would the proper City Departments be on board? Is the action particularly timely, or represent a near-term opportunity?



## Short List

The Short List of strategies selected in 2010 includes the following action strategies, which are further detailed below.

- Climate Wise - Commute Trip Reduction<sup>1</sup>
- Alternative Fuel Vehicles
- Volunteers for Sustainable Homes
- Promote Individual Action through Information and Outreach

One of the 2010 Short List strategies, Volunteers for Sustainable Homes, was approved for funding in the City's 2011/2010 biennial budgets, and so will be implemented. This illustrates the dynamic nature of the Short List, as it will need to be updated soon.

## Short List Strategy Descriptions

### MOBILE SOURCES

#### Climate Wise - Commute Trip Reduction<sup>1</sup>

##### **Strategy Description**

This strategy would significantly strengthen the Climate Wise (CW) program by adding 1.0 FTE to create a new focus on commute trip reduction among CW partners, in order to reduce single-occupant vehicle travel in furtherance of the Transportation Master Plan, Air Quality Plan and Climate Action Plan. CW provides limited support for transportation projects, which is the most common project choice among CW partners. The partners could boost effectiveness if provided follow-up information, training, networking, financial resources, encouragement and public recognition. This position would participate in CW assessments, recommending ways to start or strengthen employer-based commute trip reduction (CTR) and would provide continuing liaison, follow-up support and training for Employees Travel Coordinators at business sites. In addition, the position would provide assistance and training for telework programs, help to create CTR flexible benefit programs and fill any other gaps in program support for CW partners. The position would also coordinate an internal CTR program for City employees to meet the City's Sustainability Goal of increasing average vehicle ridership. Funding for the position would be sought from the federal Congestion Management and Air Quality fund, other federal sources such as the Climate Showcase Communities grant and the General Fund. This offer would dovetail with the mini-grant program for employer transportation initiatives that has been proposed by the North Front Range MPO for 2011. This offer is scalable, between 0.5 and 1.0 FTE, depending on intensity of the CTR program and whether additional TDM duties are included.

#### Alternative Fuel Vehicles

##### **Strategy Description**

This strategy addresses the provision of infrastructure to support various alternative fuel vehicles, e.g., electric charging facilities. In summary, the City would establish a new staff team to explore options for addressing new vehicle fuels and vehicle types, propose regulatory revisions and new design standards to accommodate alternative vehicles and prioritize City investments in alternative fuel infrastructure. In addition, the City will continue to participate in the Clean Cities partnership and make progress on the goal to reduce traditional fuel use by the City's vehicle fleet by 20% by 2020 by purchasing alternative fuel vehicles for the City fleet, and by promoting adoption of alternative fuels/vehicles by business and the general public. Action steps include:

<sup>1</sup>The Climate Wise – Commute Trip Reduction originated out of three separate transportation-related strategies that were rated highly in the strategy evaluation process:

- **Incorporate Mobility Management Best Practices into the City's Transportation Plans and Programs**—A variety of programs and services to promote transit, cycling, walking, tele-working, etc.
- **Least-Cost Transportation Planning**—an institutional reform that would incorporate mobility management explicitly in the transportation planning process
- **Develop a Low Carbon Transportation Plan**—Fort Collins would incorporate measures into its transportation plan designed to meet specific greenhouse gas reduction goals adopted by the City Council, an idea contained in both major climate & energy bills debated by Congress in 2010.

These three strategies are closely related. Least-Cost Planning is one of the mobility management best practices. Low-Carbon Transportation Plans would involve smart growth and mobility management, which are addressed in City Plan, and lowering the carbon content of motor fuels. Thus, Commute Trip Reduction was selected as the key mobility management best practice ready for implementation

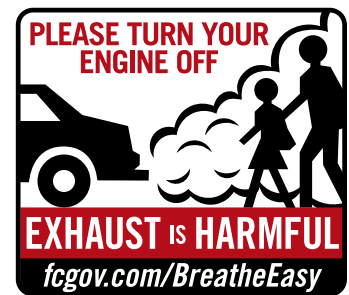
- Immediate (early 2011) – Establish an interdepartmental team on new vehicle types and fuel sources
- 2011-12 – Study then Propose Regulations to Address New/Alternative Types of Vehicles
- 2013 & Beyond – Support Alternative, Efficient Fuels/Vehicles

**INDOOR AIR POLLUTION**

**Volunteers for Sustainable Homes**

**Strategy Description**

On average, people spend 90% of their time indoors, and indoor air is often 2-5 times more polluted than outdoor air, according to the EPA. 29% of Fort Collins households have a member suffering from chronic respiratory ailments. This strategy would create a new service for residents designed to raise awareness about health hazards in their homes and help them make choices to reduce these hazards. The service would be provided by volunteers that would be trained as Home Sustainability Masters. The service can be easily expanded to include other home sustainability issues, e.g., energy awareness, recycling, landscape watering, how to ride the bus, etc. This strategy saves costs by covering volunteer training, while leveraging the skills and talents of the motivated trainees. The program would help build stronger community, as volunteers provide the service to households that volunteer to participate.



**ALL AIR POLLUTION SOURCES**

**Promote Individual Action through Information & Outreach**

**Strategy Description**

The Fort Collins air quality program is meant to complement the clean air efforts of other government agencies. Promoting individual action is an important role that is well suited to City government. This strategy includes a number of outreach activities. The City budget has already authorized some of these activities for 2011/2012. The remainder could be proposed for funding by future budgets or by grants.

**Funded and/or On-Going Outreach Activities**

The air quality outreach activities that are funded under the 2011/2012 budget are summarized below.

*Wood smoke* is a key source of fine particles in Fort Collins neighborhoods, although the amount of wood burning has been significantly reduced over a 20-year period. The City encourages individuals to replace older wood stoves with low-polluting models, and offers zero-interest loans for that purpose. The Neighborhood Resources office fields calls regarding excessive wood smoke and works in affected neighborhoods to resolve problems.

*Ground Level Ozone* is addressed by state regulation, but individuals' actions can play a significant role. Fort Collins partners with the Regional Air Quality Council and with Colorado Department of Health and Environment (CDPHE) on ozone outreach and offers programs to reduce pollution locally through an anti-idling campaign and offering rebates for purchase of zero pollution lawn mowers.

*Radon* has been identified as a significant contributor to lung cancers in the population. In addition to requiring radon mitigation in new homes, Fort Collins participates in the State Indoor Radon Grant program to offer the public low cost radon kits and to encourage testing and mitigation. Radon mitigation is eligible for zero interest loans. A behavior study has been planned to test one or more methods to increase the number of homes that are voluntarily mitigated in response to a high radon test. The study is partially funded, and will go ahead if supplemental funds are provided by local partners or grants.

A *survey* of Fort Collins residents in 2011 will help determine awareness of pollution issues, opinions regarding action strategies and receptiveness to promotion of various individual actions.

**New Outreach Activities and/or Activities that Need Additional Funding**

The section below briefly describes additional outreach activities that could be funded by future budgets or grants.

*Real-time air quality information* could be added to the time-and-temperature displays already provided by banks and others organizations. Such displays would provide information about the changing air pollution levels throughout the day, would build awareness of air pollution and increase effectiveness of programs to encourage individual actions.

*Lawn and garden equipment* is a significant source of volatile organic compounds, a precursor in the formation of ozone. In addition to the household lawn-mower rebate program already funded, an incentive/ recognition program could target lawn-care businesses to encourage best industry practices in equipment purchasing, maintenance and operation.

*Inspection/Maintenance* has returned to Fort Collins as a regulatory requirement for vehicle owners. Although inspection/maintenance is a state program, Fort Collins could help inform the public about program benefits and how to participate. In the past, Fort Collins has offered mechanic training on diagnosis and correction of high emissions test results, and could do so again if there were demand for it.

*Fleet driver training* has been demonstrated to reduce air pollution and save fuel. Many professional drivers are not aware of the particular techniques that provide these benefits. An outreach effort would target large commercial & institutional fleets to encourage voluntary training of their drivers.

*Competitions* can be used to promote behavior change. This is an outreach tool that could be employed in any of the above programs.

**Air Quality Principles Addressed by Short List Strategies**

Table 3 shows the relationship between the selected Short-List action strategies and the air quality principles that were adopted in 2011 City Plan.

**Table 3. Air Quality Policies Addressed by Short List Strategies**

<b>AIR QUALITY POLICIES ADDRESSED BY SHORT LIST STRATEGIES</b>				
	<b>Commute Trip Reduction</b>	<b>Alternative Fuel Infrastructure</b>	<b>Volunteers for Sustainable Homes</b>	<b>Promote Individual Action</b>
<b>Principle 8: Continually improve Fort Collins air quality</b>				
ENV 8.1 – Implement Air Quality Plan	X	X	X	X
ENV 8.2 – Focus on Priority air Pollutants	X	X	X	X
ENV 8.3 – Employ city-wide approach	X	X	X	X
ENV 8.4 – Coordinate regionally	X	X	X	X
ENV 8.5 – Focus on sources	X	X	X	X
ENV 8.6 – Prevent Pollution	X	X	X	X
ENV 8.7 – Involve and inform the public about air quality	X	X	X	X
ENV 8.8 – Seek Ozone Compliance	X	X		X
ENV 8.9 – Air Quality Regulation		X		
<b>Principle 9: The City will reduce total mobile source emissions by focusing on both technology (e.g., tailpipe emissions) and behavior (e.g., driving patterns)*</b>				
ENV 9.1 – Promote alternative and efficient Transportation fuels and vehicles		X		

Table continued on next page.



## AIR QUALITY POLICIES ADDRESSED BY SHORT LIST STRATEGIES

### ENV 10: ...strive to protect and improve the air so it is healthy to breathe and free of pollutants that harm human health and public welfare

<i>Transportation Master Plan*</i> • <i>Mobility Options</i> • <i>Increase Awareness</i>	X			
ENV 10.1 – Forge Health Partnerships			X	X

\* Transportation Master Plan contains policies that focus on travel behavior in two sections. The Mobility Options section deals with infrastructure for public transit, bicycling and walking. The Increase Awareness section deals with encouraging travelers to chose them.

### Relationship of Short List Strategies to Sustainability

Fort Collins has a growing commitment to evaluate programs using the lens of sustainability, i.e., how proposed actions relate to the economic, social and environmental aspects of the "triple bottom line." Although the strategy selection process outlined above did not explicitly include sustainability evaluations of each strategy, the sustainability benefits and tradeoffs of the selected Short List strategies are summarized in Table 4.

**Table 4. Relationship of Short List Strategies to Sustainability**

<b>RELATIONSHIP OF SHORT LIST STRATEGIES TO SUSTAINABILITY</b>			
<b>Air Quality Strategies</b>	<b>Economic</b>	<b>Social</b>	<b>Environmental</b>
<b>Commute Trip Reduction</b>	<ul style="list-style-type: none"> <li>+ Could reduce time lost to traffic delays.</li> <li>+ Possible cost savings for roads, parking maintenance and consumers</li> <li>+ Could increase efficiency of existing infrastructure: reduced traffic delay, tax burden</li> <li>+ Could help business attract and retain employees and increase productivity</li> <li>+ Save money from reduced fuel costs</li> </ul>	<ul style="list-style-type: none"> <li>+ Could result in increased physical activity (walking, cycling and transit use) and improve overall public health.</li> </ul>	<ul style="list-style-type: none"> <li>+ Could result in energy conservation, reduced greenhouse gas emissions and reduced air pollution.</li> </ul>
<b>Alternative Fuel Infrastructure</b>	<ul style="list-style-type: none"> <li>+ Possible fuel cost savings and increased local employment and business activity</li> <li>+ Could reduce dependence on imported fuels</li> <li>● Addresses increased consumer demand for alternative fuels &amp; vehicles</li> <li>- Could require public investment</li> </ul>	<ul style="list-style-type: none"> <li>+ Could increase resilience to fuel price/ supply shocks                             <ul style="list-style-type: none"> <li>• May not be helpful to consumers unable to switch vehicles/fuels</li> </ul> </li> <li>+ Increases consumer choice</li> </ul>	<ul style="list-style-type: none"> <li>+ Could reduce air pollution and greenhouse gas emissions</li> <li>● Electric vehicles may reduce greenhouse gas emissions</li> </ul>
<b>Volunteers for Sustainable Homes</b>	<ul style="list-style-type: none"> <li>+ Could save consumers in health care and utility costs</li> <li>+ Could increase home value by addressing chronic IAQ problems</li> <li>- Could involve homeowner investment in solutions</li> </ul>	<ul style="list-style-type: none"> <li>+ Could improve quality of life, particularly for people with asthma or other respiratory diseases</li> <li>+ Could strengthen community ties through interactions of volunteer experts with volunteer homeowners</li> </ul>	<ul style="list-style-type: none"> <li>+ Could improve home health and resource efficiency</li> </ul>
<b>Promote Individual Action</b>	<ul style="list-style-type: none"> <li>+ Could provide consumer health care savings</li> <li>● Could increase economic development potential by helping to end violations of the national ozone standard</li> </ul>	<ul style="list-style-type: none"> <li>+ Could empower citizens to help protect air quality</li> <li>+ Could help neighbors to resolve wood smoke concerns</li> </ul>	<ul style="list-style-type: none"> <li>+ Could reduce air pollution emissions</li> </ul>

**KEY:** + Potential Benefits   ● Neutral   - Potential Tradeoffs

## Environmental Services Division Action Summary

Table 5 below lists action items for Natural Resources Department, Environmental Services Division, from this 2011 Air Quality Plan and from City Plan.

Table 5. Environmental Services Division Action Table

AIR QUALITY ACTION STRATEGIES				
Action	Description	Responsibility	Near Term Timing	Long Term Timing
<b>Seek Funding for Voluntary Employer Commute Trip Reduction</b>	Seek additional funding to renew City support of local and regional employer commute trip reduction programs to increase transportation system efficiency and help achieve environmental goals from the Air Quality Plan and Climate Action Plan.	Air Quality and Advance Planning (Transportation) staff; seek additional federal funding.	2011	
<b>Implement Volunteers for Sustainable Homes</b>	Create a free, voluntary service for residents designed to raise awareness about health hazards in their homes and help them make choices to reduce these hazards, implemented by volunteers.	Natural Resources	2011 and 2012	
<b>Citizen Air Quality/Solid Waste/Climate Survey</b>	Conduct a survey of citizen views, perceptions and knowledge about air quality, waste and recycling and climate change issues and city programs.	Natural Resources	2011	
<b>New Interdepartmental Teams</b>	Participate in a new interdepartmental team to explore options for addressing new vehicle types and fuel sources. Address potential policy, regulatory and design standard changes needed to serve emerging new vehicle trends.	Advance Planning Transportation, Traffic Operations, Parks Planning, Utilities, Engineering, Police, Parking and City Attorney's Office	2011 and 2012	
<b>Northern Colorado Clean Cities Coalition</b>	Continue participation in Northern Colorado Clean Cities Coalition (education/outreach events; apply for DOE grant for public EV charge stations)	Natural Resources; Operations Services	2011 and 2012	On-going
<b>Implement Education &amp; Outreach Activities</b>	Expand idling campaign, conduct radon, ozone, wood smoke outreach	Natural Resources	2011 and 2012	On-going
<b>Air Quality Reporting</b>	Prepare annual Air Quality Trends Report Prepare 2010 Climate Status Report Prepare 2011 Climate Biennial Status Report	Natural Resources; interdepartmental Energy Management Team	Annually 2011 2012	On-going
<b>Air Quality Planning</b>	Update the Short List of funding-ready strategies, since some are already being implemented. Participate in regional and state planning for ground level ozone reduction.	Natural Resources	2011 2012	On-going

Table continued on next page.

<b>AIR QUALITY ACTION STRATEGIES</b>				
Action	Description	Responsibility	Near Term Timing	Long Term Timing
<b>Coordination</b>	Increase coordination with other city staff on air quality-related activities. Increase collaboration with other partners such as CSU, Poudre School District and FortZED.	Natural Resources	2011 2012	On-going
<b>Seek Radon Funding</b>	Apply for annual state radon grant funding. Seek matching funds for radon mitigation behavior study	Natural Resources	2011	
<b>Zero Interest Loans for Air Quality</b>	Offer zero interest loans for radon mitigation and old wood stove removal/upgrade	Natural Resources	2011 2012	
<b>Update Air Quality Plan</b>	Update air quality policies in conjunction with City Plan and TMP update. Update strategies administratively.	Natural Resources		2016



## OTHER CITY PROGRAMS THAT BENEFIT AIR QUALITY

Numerous other City programs and activities support air quality improvement. Some of the major program areas are discussed below.

### **Energy Policy Programs**

Fort Collins City Council updated its Electric Energy Supply Policy in 2009. One of the primary objectives of the policy is to reduce the environmental impact of electricity generation through conservation, energy efficiency, load management and the increased use of renewable energy. Specifically, the policy supports the City's goal of reducing the community carbon footprint 20% below 2005 levels by 2020 and 80% by 2050. It further calls out the vision that the City's electricity supply would be carbon-neutral by 2050. Implementation of the policy by Fort Collins Utilities will significantly reduce greenhouse gas emission and will reduce other power plant emissions associated with electricity generation, as well.

### **Climate Wise**

Climate Wise is a free, voluntary program dedicated to helping local business and the environment. The goal of the Climate Wise program is to reduce greenhouse gas emissions by promoting waste reduction, energy savings, alternative transportation, water conservation and practicing pollution prevention. It also helps partners save money. Businesses that join the program are provided with free technical assessments and recommendations, public recognition and networking opportunities. More than 230 local companies participate in the Climate Wise program, and they have collectively reduced greenhouse gas emissions by over 105,000 metric tons CO<sub>2</sub>e per year.

### **Solid Waste Reduction and Recycling**

Fort Collins has adopted the goal of reducing solid waste delivered to the landfill by 50%, through recycling, composting and reuse. The goal is to reduce energy and natural resources consumption while extending landfill life. The Solid Waste and Recycling Program administers provision of curbside recycling to households, which is required by City Code, and manages a recycling drop-off site. In addition, information on where items can be reused, composted or recycled and beneficial programs by both the private sector and City government are promoted.

### **Building Energy Codes**

Fort Collins keeps building energy codes updated. Effective October 11, 2010, all construction within the City of Fort Collins must comply with the 2009 International Energy Conservation Code with Local Amendments. New energy conservation construction standards outlined in the code will provide increased energy conservation and performance in new homes and commercial buildings. In addition to reduced energy costs, these energy savings translate into reductions of sulfur dioxide, nitrogen dioxide and greenhouse gas emissions.

### **Green Building Program**

Fort Collins City Council views an integrated Green Building Program as a high priority, with the goal to increasingly align Fort Collins' built environment with the community's energy efficiency, water conservation and carbon emission reduction goals. At this writing, work is underway to develop Building Code Green Amendments for Council adoption in spring 2011 to set a baseline of mandatory green building practices. Future work will encourage voluntary, market-driven practices that go beyond the mandatory code, by providing education and training, recognition of green building innovation and success and incentives for projects significantly exceeding minimum codes. Green building practices reduce emissions of sulfur dioxide, nitrogen dioxide and greenhouse gases.

### **Land Use Code**

Fort Collins City Plan helps to reduce air pollution emissions in the long term by making travel by walking, bicycling and public transit more attractive, and the private automobile less necessary, as the city grows. The Land Use Code is a series of regulations that guide new developments to implement the City Plan vision.

### **Transportation Programs**

Mobile sources are collectively the largest source of air pollution in Fort Collins. The City's Transportation programs help reduce air pollution by keeping stop-and-go driving and idling to a minimum, and by providing sidewalks, bike paths and public transit and encouraging individuals to choose them for their travel needs.

*Public Transit* — Transfort and Dial-a-Ride provide fixed-route and on-demand public transit in Fort Collins. The Transfort Strategic Plan calls for increasing levels of service both within the city and interconnecting Front Range communities, as funds become available. The key component of that plan is the Mason Corridor project, a bus-rapid-transit (BRT) service that will provide the critical north-south spine for the fixed-route system. Now in its final stages of development, BRT along the Mason Corridor is expected to double Transfort daily ridership, because of travel demand on the corridor, frequent service, modern vehicles and stations and connections to other communities.

*Bike Fort Collins* — Fort Collins bicycling program encourages bicycle use and safety through educational outreach and a year-round schedule of events such as Bike to Work Day. Enabled by Fort Collins extensive system of bike lanes and paths, Bike Fort Collins has achieved a high level of bicycle commuting, and has earned Gold Level recognition as a Bicycle Friendly Community from the League of American Bicyclists.

*Safe Routes to School* — Fort Collins participates in this national program seeking to increase the number of students and parents safely walking and bicycling to school. Through bicycle and pedestrian education classes, improved sidewalks and bike lanes and enforcing school zone speed limits, Safe Routes to Schools makes walking and bicycling to school a viable choice for students and parents.

*Advanced Traffic Management System (ATMS)* — Fort Collins ATMS enhances traffic flow and reduces delays on the street network. Constructed in the early 2000's, the system includes a Traffic Management Center, a fiber optic network that connects the traffic signals along nearly 16 miles of arterial streets and video cameras that allow staff to monitor traffic flow on four arterial streets. The improved signal coordination provided by the ATMS has resulted in fewer accidents, less motorist delay and vehicle idling, fewer stops at red lights, and reduced vehicle emissions.

*Streets* — The Street Department performs street sweeping to reduce fugitive dust and improve travel safety. They also perform snow and ice control using methods that have earned the City of Fort Collins a national reputation for snow fighting methods, technology and deicing material storage. The use of advanced sand/chemical mixtures for de-icing streets does not result in fugitive dust that would be associated with traditional sanding streets practices.

### **Urban Forestry**

The Forestry Department tends Fort Collins' extensive urban forest, made up of shade trees on public and private land. Urban trees provide many ecological, economic, aesthetic and psychological benefits, including air quality benefits. Trees not only remove atmospheric carbon dioxide as part of the photosynthetic process, but also clean and purify the air by absorbing atmospheric pollutants like ozone, carbon monoxide and sulfur dioxide. In addition, trees help conserve energy required for cooling, by shading homes and paved surfaces.

**Affordable Housing**

Affordable housing allows lower income people to live in the community instead of outside the community, preventing the need for travel into the city for jobs, shopping, etc., thus reducing traffic congestion and air pollution. To promote affordable housing, the City of Fort Collins allocates federal Housing and Urban Development (HUD) and local City of Fort Collins funding to housing and human service agencies to meet the needs of low and moderate income citizens, and implements policies promoting and supporting self-sufficiency for low-income citizens.

**Regulatory and Government Affairs**

The City of Fort Collins Regulatory and Government Affairs Program provides services for environmental compliance and environmental stewardship so that internal and external customers may comply with applicable environmental regulations and sustain a healthy environment. They facilitate City compliance with air quality permitting and regulations, oversee spill response actions for City government and provide public information regarding asbestos, mold and other hazardous contaminants that affect air quality.

## Air Quality Strategies from City Plan Action Table

Table 6 below identifies the actions contained in the 2011 City Plan Action Plan that will support the goal of continually improving Fort Collins' air quality. The PRIORITY designation below the action item name indicates those actions are considered a higher priority.

**Table 6. Other City Plan Actions that Support Air Quality Improvement**  
(excerpt of 2011 City Plan Action Plan elements that impact air quality)

<b>OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT</b>	
Action item	Responsibility
<b>Immediate Actions: Council Action Required</b>	
<b>Building Code Green Amendments (PRIORITY)</b>	Consider and adopt amendments to "green" the 2009 International Building Codes (adopted September 2010). CDNS and Utilities staff.
<b>Immediate Actions: Administrative</b>	
<b>Reshaping Street Case Study (PRIORITY)</b>	Develop, implement and evaluate a "Reshaping Street" case study along LaPorte Avenue from Howes to Wood Street. Traffic Operations Advance Planning, Transportation staff
<b>New Interdepartmental Teams (PRIORITY)</b>	New Vehicle Types and Fuel Sources Explore options for addressing new vehicle types and fuel sources. Address potential policy, regulatory and design standard changes needed to serve emerging new vehicle trends. Advance Planning (Transportation), Traffic Operations, Parks Planning, Utilities, Engineering, Police, Parking and City Attorney's Office staff.
<b>Near-Term Actions for 2011 and 2012: Council Action Required</b>	
<b>Master Street Plan Street Classification Amendments (PRIORITY)</b>	Update the Master Street Plan Classifications and Larimer County Urban Area Street Standards cross-sections to address needs for urban arterials, "green streets" concepts and other context sensitive design elements. Advance Planning (Transportation) staff in coordination with Larimer County staff; funded in 2011 and 2012.

Table continued on next page.



<b>OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT</b>	
Action item	Responsibility
<b>Near-Term Actions for 2011 and 2012: Council Action Required, continued</b>	
<p><b>Land Use Code Amendments (PRIORITY)</b></p> <p><b>Infill Compatibility</b></p> <ul style="list-style-type: none"> <li>Review and revise, as needed, neighborhood transition and compatibility standards.</li> </ul> <p><b>Infill and Redevelopment</b></p> <ul style="list-style-type: none"> <li>Review and, if needed, revise the Code regarding barriers to infill/redevelopment and identify a means to capture additional green building opportunities.</li> <li>Review and revise adequate public facilities requirements and transportation levels of service for infill and redevelopment.</li> <li>Revise TOD Overlay Standards per Midtown Study recommendations.</li> <li>Review and if needed, revise utility, transportation and other requirements to reduce barriers to redevelopment.</li> <li>Review and, if needed, revise design standards for the River Downtown</li> <li>Redevelopment zoning district particularly for defining appropriate architectural and materials.</li> <li>Review and revise standards for new landscaping options citywide and residential amenities in mixed use areas.</li> </ul>	<p>Advance Planning, City Attorney's Office, CDNS and Economic Development staff/funded in 2011 and 2012.</p>
<p><b>North College/Mountain Vista Enhanced Travel Corridor</b></p> <p>Develop North College/Mountain Vista Enhanced Travel Corridor Master Plan.</p>	<p>Advance Planning (Transportation) staff.</p>
<p><b>Pedestrian Needs Assessment</b></p> <p>Conduct a citywide needs assessment to inventory pedestrian missing links and ADA ramps.</p>	<p>Advance Planning (Transportation) staff.</p>
<p><b>Bicycle Lane System Evaluation</b></p> <p>Evaluate the on-street bicycle lane system and update the Level of Service (LOS) criteria to reflect various cycling and roadway conditions throughout the community. Use this information to update the City's Bicycle Map and LOS standards.</p>	<p>Advance Planning (Transportation), Engineering and Traffic staff, Bicycle Coordinator.</p>

Table continued on next page.

<b>OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT</b>		
Action item	Description	Responsibility
<b>Near-Term Actions for 2011 and 2012: Council Action Required, continued</b>		
<b>Trail Design Standards Amendments</b>	<ul style="list-style-type: none"> <li>Update bicycle/pedestrian trail design standards to address use of trails for commuting/transportation purposes without impacting the recreational value of the trail system.</li> <li>Designate which trails these new standards would apply to and avoid impacts environmentally sensitive areas</li> </ul>	Advance Planning (Transportation) and Parks Planning staff.
<b>Transportation Funding</b>	Evaluate the feasibility of a transportation utility to finance transportation improvements, operations, and maintenance. Seek to secure a dedicated source of local revenue to continue to fund transportation capital projects when the voter approved sales and use tax initiatives sunset in 2015. Determine a dedicated source of local revenue to fund annual operations and maintenance of streets, bikeways, and pedestrian improvements.	City Manager's Office, Finance, and Planning, Development and Transportation (PDT) staff.
<b>Federal Grant Support</b>	Continue to seek out state and federal funding support for infrastructure improvements (bicycle, pedestrian, transit, and street), such as Enhanced Travel Corridors and other transportation services.	Planning, Development and Transportation (PDT) staff.
<b>Geothermal Energy Development Fees</b>	Examine the appropriate level of development fees for geothermal heating.	Light and Power Utility, City Attorney's Office, CDNS and Economic Development staff.
<b>Cardboard Waste Ban</b>	Consider an ordinance that would prohibit discarded cardboard from being placed in Fort Collins' residential or commercial trash collection system.	Natural Resources and City Attorney's Office staff; funded in 2011 or 2012.
<b>Natural Gas Franchise Fee</b>	Revisit whether the timing is right to seek a Natural Gas Franchise Fee to raise additional funding that could be used to provide incentives for natural gas/GHG efficiencies. (This strategy is in the 2008 Climate Action Plan.)	Finance and City Attorney's Office staff.
<b>Near Term Actions for 2011 and 2012: Administrative</b>		
<b>Waste Reduction and Diversion Campaign (PRIORITY)</b>	Expand education campaigns about the City's goals and objectives for reducing waste at the source and diverting material from landfill disposal.	Natural Resources staff.
<b>Waste Diversion Assistance Program (PRIORITY)</b>	Implement an assistance program to enable the building industry to achieve higher rates of waste diversion for new construction and gain LEED certification credits.	Natural Resources staff.

Table continued on next page.

<b>OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT</b>		
Action item	Description	Responsibility
<b>Near Term Actions for 2011 and 2012: Administrative, continued</b>		
<b>Energy Efficiency Improvement Financing and Incentives (PRIORITY)</b>	Develop an on-bill financing option for energy efficiency improvements and income-qualified incentives for energy efficiency upgrades.	Light and Power Utility and Economic Development staff.
<b>Improvements to Process for Infill and Redevelopment</b>	Review and make improvements to the development review process to add flexibility for infill and redevelopment projects.	CDNS and Economic Development staff.
<b>Regulations to Address New/Alternative Types of Vehicles</b>	Continue inter-department staff team to review current and potential future regulations and/or design standards to address new/alternate types of vehicles. Propose recommendations for implementation of new regulations and/or design standards over time as appropriate depending upon market demand and public use of new vehicle types.	Advance Planning (Transportation Planning), Traffic Operations, Utilities, Parks and Recreation, Engineering, Police, Parking, and City Attorney's Office staff.
<b>Pedestrian and Bicycle Safety Education</b>	Implement additional bicycle and pedestrian safety education programs for people of all ages. Include educational efforts to increase safe use of on-street facilities and off-street, multipurpose trails.	Advance Planning (Transportation), Parks, Traffic Operations, and Police Services staff.
<b>C&amp;D Drop-off at Larimer County Landfill</b>	Work with Larimer County to establish a designated area at the landfill for accepting certain types of construction and demolition (C&D) debris, thereby increasing opportunities for materials recovery.	Natural Resources staff.
<b>Private Partnerships for Recycling Dropoffs</b>	Encourage private partnerships for constructing community drop-offs to collect more recyclables (paper, glass, textiles, etc.)	Natural Resources staff; funded in 2011-2012.
<b>Voluntary Employer Commute Trip Reduction</b>	Seek additional grant funding to renew City support of local and regional employer commute trip reduction programs to increase transportation system efficiency and help achieve environmental goals from the Air Quality Plan and Climate Action Plan (2011-2012 grant writing).	Air Quality and Advance Planning (Transportation) staff; seek additional federal funding.
<b>Master Home Environmentalist (Same as "Volunteers for Sustainable Homes)</b>	Seek funding to implement a —Master Home Environmentalist program to enlist and train volunteers to perform voluntary home assessments of indoor air quality and other environmental factors.	Natural Resources staff; limited funding in 2011 and 2012, possible grant funding opportunity.
<b>Waste Reduction Education</b>	Seek funding to implement an education "push" to publicize new recycling and waste reduction opportunities.	Natural Resources staff; seek possible funding source.
<b>Multi-Family and Business Recycling Outreach</b>	Develop outreach programs to encourage multi-family property managers to provide single-stream recycling systems to tenants and to encourage businesses that dispose of high levels of trash per week to sign up for recycling from their service provider.	Natural Resources staff; limited funding in 2011 and 2012, possible grant funding opportunity.

Table continued on next page.

OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT		
Action item	Description	Responsibility
<b>Long Term Actions: Council Action Required</b>		
<b>Climate Action Plan Update (PRIORITY)</b>	Complete a comprehensive update of the 2008 Climate Action Plan in 2015/2016.	Natural Resources staff; needs dedicated funding.
<b>2009 Energy Policy Update (PRIORITY)</b>	Update the 2009 Energy Policy in 2014/2015.	Utilities staff.
<b>Short-Term Transportation Capital Improvement Plan (PRIORITY)</b>	Implementation of five-year Transportation Capital Improvement Plan to the extent possible given available resources for capital as well as on-going operations and maintenance costs.	Advance Planning (Transportation), and Engineering staff.
<b>Transfort Strategic Plan Update (PRIORITY)</b>	Update the 2009 Transfort Strategic Plan.	Transfort and Advance Planning (Transportation) staff
<b>PAYT for Commercial Customers (PRIORITY)</b>	Consider an ordinance that would amend the City's Pay-as-you-throw (PAYT) system to include all commercial customers, i.e., require recycling fee to be embedded in rates and charge volume-based pricing.	Natural Resources staff.
<b>Plan Fort Collins Update (PRIORITY)</b>	Update Plan Fort Collins (including City Plan and the Transportation Master Plan) every 5 years.	Advance Planning staff.
<b>Timberline Enhanced Travel Corridor and Access Management Plans</b>	Develop an Enhanced Travel Corridor Master Plan and access management plan for Timberline Road from Harmony Road to Mountain Vista to support the reduced Master Street Plan classification of Timberline Road north of Prospect Road from a 6 lane arterial to a 4 lane arterial along this segment.	Engineering and Advance Planning (Transportation) staff.
<b>Prospect Enhanced Travel Corridor Plan</b>	Develop Prospect Enhanced Travel Corridor Master Plan.	Advance Planning staff.
<b>West Elizabeth Enhanced Travel Corridor Plan</b>	Develop West Elizabeth Enhanced Travel Corridor Master Plan.	Advance Planning staff.
<b>Bicycle Plan Update</b>	Update the 2008 Bicycle Plan.	Advance Planning (Transportation Planning) staff.
<b>Transportation User Cost</b>	Explore a cost per user or cost per person mile travel measure as part of the triple bottom line analysis to help identify total transaction cost for transportation from both the City and the customer/user perspective.	Advance Planning (Transportation), PDT, and Finance staff.

Table continued on next page.



<b>OTHER CITY PLAN ACTIONS THAT SUPPORT AIR QUALITY IMPROVEMENT</b>	
Action item	Description
<b>Long Term Actions: Council Action Required, continued</b>	
<b>Building Code Updates</b>	Regularly update City codes (building, energy, green aspects) in alignment with national model code cycles.
<b>Energy Performance for Public Financing</b>	Require enhanced energy performance for publicly financed projects.
<b>Long Term Actions: Administrative (No Council Action Required)</b>	
<b>Green Street Demonstration Project Construction (PRIORITY)</b>	Pursue funding opportunities (local, state, federal and public/private partnerships) to construct and implement "Green Street" demonstration project.
<b>Support Alternative, Efficient Fuels/ Vehicles (PRIORITY)</b>	As sustainable alternative fuels emerge (cellulosic ethanol, CNG, other biofuels, electric) and/or highly efficient vehicles emerge, the City should invest in infrastructure and promote and support the use of such alternative fuels and vehicles to reduce carbon emissions an air pollution.
<b>Public Building Energy Updates (PRIORITY)</b>	Develop real-time energy use displays in public buildings and provide for Light and Power vehicle charging capability in new City buildings
<b>Streetlight Efficiency (PRIORITY)</b>	Improve street lighting efficiency.
<b>Light and Power Vehicle Charging Stations</b>	Develop public electric vehicle charging stations
<b>Solar Garden</b>	Develop a community "solar garden that provides an opportunity for electric utility customers to individually benefit from collectively sharing a larger-scale remote solar energy resource.
<b>Drake Treatment Plant Upgrades</b>	Seek outside funding for upgrades to the Drake Treatment Plant that would enable the City to add source-separated food waste as a feedstock that increases alternative energy generation.
<b>Renewable Energy Purchase Options</b>	Explore long-term local renewable energy purchase options.

Responsibility

Utilities and CDNS staff.

Utilities, Natural Resources, Facilities and City Attorney's Office staff.

Utilities, Advance Planning (Transportation), Engineering and Streets staff.

Natural Resources staff, Utilities staff.

Utilities staff.

Utilities staff.

Utilities staff.

Utilities staff. Not Funded.

Water Utility staff.

Utilities and Finance staff; not funded.

## REGIONAL AND STATE AIR QUALITY PROGRAMS

### Colorado Department of Health and Environment

Motor vehicles—Colorado administers requirements aimed at improving vehicle emissions. The AIR program (Automobile Inspection and Readjustment) in the Denver and North Front Range areas requires that vehicles be tested and those with high-emissions must be corrected. Remote sensing technology is used to “screen out” the cleanest vehicles from the requirement to visit a testing station. Diesel vehicles are inspected to control the density of smoke emissions (opacity).

Industry and commerce—Stationary sources such as gas stations, breweries, electric power plants, and oil & gas development sites must register with the state and many are required to obtain permits to emit air pollution. Staff members inspect sources to determine compliance with regulation and permit conditions.

Indoor Air Pollution—Colorado provides technical assistance on indoor air pollutants, and enforces regulations on ozone-depleting compounds (chlorofluorocarbons), asbestos remediation, and lead paint removal.

Radon—Colorado’s Radon Program provides radon information and support for local efforts to increase home testing and mitigation.

Air Quality Monitoring—A network of monitoring stations throughout the state provides information on air pollutant concentrations and compliance with health standards. Pollutants monitored on Fort Collins include ozone, particulate matter (PM10 and PM2.5) carbon monoxide, and visual air quality.

### North Front Range Transportation and Air Quality Planning Council

As the Metropolitan Planning Organization (MPO) for 15 member municipalities and Larimer and Weld counties, the Planning Council is responsible for regional transportation planning. It also acts as a gateway for state and federal funds that support local roadway, transit, and demand-management projects. The MPO has a special role in planning to achieve national air quality standards. It provides input to the state Air Quality Control Commission and Air Pollution Control Division on State Implementation Plans (SIP) for Fort Collins and Greeley. Also, the MPO is responsible for assuring that transportation projects will not cause or contribute to a violation of national air quality standards.

The MPO provides direct services to help reduce travel demand on area roadways. Offerings such as the VanGo vanpooling program, information/assistance, and technical tools for carpool matching help businesses provide transportation alternatives for employees.

### Larimer County Health Department

The County enforces Colorado’s air pollution control regulations by performing compliance inspections of businesses that have air quality permits. In addition, the County issues permits that regulate open burning, investigates air quality complaints, and operates air quality monitoring stations in partnership with the state.

# VI. Continuous Improvement - Measurement and Reporting

## AIR QUALITY INDICATORS

Progress on goals is typically measured using indicators. The 2011 City Plan defines indicators as qualitative or quantitative factors or variables that provide a simple and reliable means to measure achievement over time. Indicators are intended to show whether the actions taken by the public and private sectors in Fort Collins are achieving the desired results. However, since local air quality is significantly affected by actions outside of Fort Collins and by natural conditions such as weather, it is difficult to find indicators that solely indicate the effects of Fort Collins' activities on air quality.

This section identifies air quality indicators that will be used to assess air quality status, evaluate progress and guide the identification of priority pollutants and sources when the Air Quality Plan is next updated. A few of the indicators just measure program activity, but the majority evaluate air quality conditions, despite the fact that Fort Collins alone cannot control our air quality conditions.

**Table 7. Air Quality Indicators**

AIR QUALITY INDICATORS		
Indicator	Unit	Desired Direction
<b>Compliance with National Ambient Air Quality Standards</b>	Ozone – PPB Carbon Monoxide – PPM PM <sub>10</sub> and PM <sub>2.5</sub> – ug/m <sup>3</sup>	No violations
<b>Number of Days Per Year that Exceed a NAAQS<sup>1</sup></b>	Number of Days	Declining trend
<b>Number of Ozone Action Alerts</b>	Number of Days	Declining trend
<b>Max and Average AQI for Fort Collins</b>	By Pollutant, by Year	Declining trend
<b>Ambient Air Pollution Levels</b>	Trend over Time	Declining trend
<b>Visibility Standard</b>	# of Days out of Compliance	Improving compliance
<b>VMT Growth Rate</b>	Annual Growth Rate (%)	Decreasing
<b>Fleet average tailpipe emissions</b>	Grams Per Mile as Estimated by EPA's Mobile Model	Reductions over previous years
<b>Citywide Total Motor Vehicle Emissions</b>	Tons per Day of VOC, NOx, PM <sub>2.5</sub>	Reductions over previous years
<b>Annual Transit Ridership</b>	# of Riders	Increasing
<b>Commercial and Industrial Emissions</b>	Tons Per Year	Reductions over previous years
<b>Greenhouse Gas Emissions<sup>1,2</sup></b>	Citywide Emissions of CO <sub>2</sub> e (tons per year)	Reductions over previous years
<b>Wood Smoke Emissions<sup>3</sup></b>	Citywide Emissions (tons per year)	Reductions over previous years
<b>Non-Certified Wood Stoves<sup>3</sup></b>	Number of Non-Certified Units in the City, Based on Local Survey Data	Decrease in number of non-certified wood stoves
<b>Number Complaints to Wood Smoke Response Line</b>	Number of Complaints/yr	Declining trend

AIR QUALITY INDICATORS		
Indicator	Unit	Desired Direction
Number Radon Test Kits Sold by City	Number of Kits/yr	Increasing trend
Percent of Available Air Quality Zero Interest Loans Funding Used Yearly	%/year	100% of available funding
Percent of Citizens Who Report a Member in Household with Chronic Respiratory Problem <sup>3</sup>	%	Declining trend

<sup>1</sup> Community Scorecard Indicator

<sup>2</sup> City Plan indicator

<sup>3</sup> Periodic Air Quality Survey

## AIR QUALITY REPORTING

### Annual Ambient Air Quality Report

On an annual basis, City staff will produce a brief report showing the status of ambient air quality measurements from Fort Collins monitors, including ozone, carbon monoxide, PM<sub>10</sub>, PM<sub>2.5</sub> and visibility. This report will be sent to City Council and posted on the City's web site. The City will also prepare a brief annual summary of activities undertaken to protect air quality and submit this to City Council.

### Air Quality Indicators Report

The Air Quality Plan will be updated every five years, in conjunction with updates of City Plan and the Transportation Master Plan. The status of air quality indicators will be evaluated and reported prior to the next update of the Air Quality Plan. The indicator report will be used to determine whether modifications to policies and implementation strategies are warranted in the next update of the Air Quality Plan.

## Glossary

**APCD** – Air Pollution Control Division, a branch of the Colorado Department of Public Health and Environment

**AQAB** – Fort Collins Air Quality Advisory Board

**ATMS** – Automated Traffic Management System

**BFO** – Budgeting for Outcomes; the biennial budgeting process used by the City of Fort Collins

**BRT** – Bus Rapid Transit

**CAA** – Clean Air Act. The original Clean Air Act was passed in 1963, but our national air pollution control program is actually based on the 1970 version of the law. The 1990 Clean Air Act Amendments are the most far-reaching revisions of the 1970 law.

**CDOT** – Colorado Department of Transportation

**CDPHE** – Colorado Department of Public Health and Environment

**city** – The term city (lower case c) refers to the whole area of the city and its inhabitants.

**City** – When the term City (capital C) is used, it refers to the City of Fort Collins as a municipal government.

**City Plan** – Fort Collins Comprehensive Land Use Plan. First adopted under the “City Plan” title in 1997, updated in 2004 and 2011.

**CO** – Carbon monoxide, one of the six criteria pollutants for which National Ambient Air Quality Standards have been set by EPA.

**Criteria pollutants** – Six pollutants that EPA has defined health and welfare standards for; carbon monoxide, ozone, particulates, sulfur dioxide, nitrogen dioxide, and lead.

**CTR** – Commute Trip Reduction

**EPA** – Environmental Protection Agency

**Exceedance (of a standard)** – when the air quality measurement goes above the level of a standard. Because compliance with many standards is calculated statistically, one exceedance does not necessarily result in a violation of a standard.

**Fine particles** – Particulate matter refers to tiny particles of solid or semi-solid material suspended in the atmosphere. “Fine” particles are  $PM_{2.5}$  (particulate matter of 2.5 microns or less) which is approximately 1/20 the diameter of a human hair.

**FTE** – Full time equivalent. One FTE equals one full time staff person.

**Growth Management Area Boundary** – An area identified through public policy, within which urban development will be allowed.

**Greenhouse gases** – Atmospheric greenhouse gases (water vapor, carbon dioxide, and other gases) are those gases that trap some outgoing infrared energy emitted from the Earth and cause heat to be retained in the atmosphere, somewhat like the glass panels of a greenhouse. Without this natural “greenhouse effect,” temperatures would be much lower than they are now, and life as known today would not be possible. However, the recent increase in the concentration of atmospheric greenhouse gases is linked to the phenomenon known as global warming. Efforts to



reduce greenhouse gases focus on human-caused greenhouse gases.

**HAPS (Hazardous Air Pollutants)** – The US Congress amended the federal Clean Air Act in 1990 to address a large number of pollutants that are known to cause or may reasonably be anticipated to cause adverse effect to human health or adverse environmental effects. 188 specific pollutants and chemical groups were initially identified as HAPS, and the list has been modified over time.

**Industrial HAPS** – The 1990 CAAA address a large number of air pollutants that are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects. 188 specific pollutants and chemical groups were initially identified as hazardous air pollutants (HAPs), and the list has been modified over time. This category of pollutants in the Air Quality Plan refers to only industrial source HAPS; those emitted from small and large commercial and industrial sources.

**Lead** – Lead is a metal that can harm the nervous system. The current sources of atmospheric lead emissions are lead gasoline additives, nonferrous smelters, and battery plants. Between 1970 and 1997, air emissions of lead in the United States were reduced by 98%, largely as a result of the phase-out of leaded gasoline.

**Mobile Source HAPS** – The 1990 CAAA address a large number of air pollutants that are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects. 188 specific pollutants and chemical groups were initially identified as hazardous air pollutants (HAPs), and the list has been modified over time. According to a Denver study, the most important mobile source air toxics are formaldehyde, acetaldehyde, 1,3 butadiene, benzene, acrolein, and diesel exhaust particulate matter plus diesel exhaust organic gases.

**MPO (Metropolitan Planning Organization)** – The regional organization responsible for comprehensive transportation planning and programming in urbanized areas. Work products include the Transportation Plan, the Transportation Improvement Program, and the Unified Planning Work Plan. There are six MPO's in Colorado. Fort Collins' MPO is called the North Front Range Transportation and Air Quality Planning Council, also known as the "NFRMPO". It consists of 15 local governments including Larimer and Weld Counties, Fort Collins, Greeley, and Loveland. The NFRMPO is also the lead air quality planning agency for the region for developing State Implementation Plans.

**NAAQS (National Ambient Air Quality Standards)** –The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

**NOx (Nitrogen Oxides)** – NOx is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. NOx includes NO<sub>2</sub> (nitrogen dioxide), NO (nitric oxide), N<sub>2</sub>O (nitrous oxide), and NO<sub>3</sub>- (nitrates). Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NOx are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NOx is a ground level ozone precursor.

**NFRAQS** – The Northern Front Range Air Quality Study was instituted by the Colorado State Legislature through House Bill 95-1345. The legislation delineated an independent, objective, scientifically peer-reviewed study of air pollution along the Northern Front Range of Colorado to determine a) sources of carbon particles found in Denver's "Brown Cloud", b) whether the Denver area is ammonia-rich with regard to formation of ammonium nitrate and ammonium sulfate particles, and c) what are the sources of visibility-reducing PM<sub>2.5</sub> particles. PM<sub>2.5</sub> sampling was conducted in Fort Collins during winter '96/'97 high pollution episodes. The majority of sampled particles originated from motor vehicles.

**NRD (Natural Resources Department)** – The City of Fort Collins Natural Resources Department.

**Ozone** – Ozone is a secondary pollutant formed when nitrogen oxides and hydrocarbons react in the presence of sunlight and heat. Elevated ground level ozone levels can cause breathing problems and respiratory infections for the elderly, young and those with pre-existing ailments. Even healthy people who exercise or work outdoors can experience breathing problems when exposed to elevated ozone levels. While ground level ozone in high concentrations is considered an air pollutant, stratospheric ozone in the upper atmosphere (12 - 30 miles above the ground) is good because it absorbs cancer-causing ultraviolet radiation.

**PM<sub>10</sub>** – Particulate matter refers to tiny particles of solid or semi-solid material suspended in the atmosphere. PM<sub>10</sub> are particles that are 10 microns or less in diameter (~ 1/6 of a human hair). PM<sub>10</sub> is generally created during the combustion of fossil fuels in industrial processes or heating and consists of fly ash from power plants, carbon black from diesel and gasoline engines, and soot from woodburning.

**PPM** – parts per million.

**Policy** – As defined by *City Plan*, a definite course or method of action selected to guide and determine present and future decisions.

**Principle** – As defined by *City Plan*, a general or fundamental rule, doctrine, or assumption.

**State Implementation Plan** – A document that contains procedures detailing how a state will attain or maintain compliance with National Ambient Air Quality Standards. It is prepared by the state, with input from the lead air quality planning agencies, and submitted to the Environmental Protection Agency for approval.

**Sulfur Dioxide** – Sulfur dioxide (SO<sub>2</sub>) is a colorless gas with a pungent odor belonging to the family of gases called sulfur oxides (SO<sub>x</sub>). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes. SO<sub>2</sub> is highly soluble in water and is readily oxidized in the air to sulfates, contributing to acid rain associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and adverse health effects.

**Sustainability** – refers to the long-term social, economic and environmental health of a community. A sustainable community thrives without compromising the ability of future generations to meet their needs. Sustainable cities use resources efficiently and effectively. They conserve, reuse, and recycle. They use local resources when they can. They minimize exportation of environmental risk.

**TDM (Transportation Demand Management)** – TDM is a general term for actions that encourage a decrease in the demand for our existing transportation systems. Example strategies include ridesharing and transit use, zoning and ordinances that promote transit use and mixed-use development, public education about transportation issues, park-and-ride facilities, various driving disincentives and ridesharing incentives, and commute trip reduction programs.

**Visibility** – “Visibility” is a measure of how the air looks. It can be described as the maximum distance that an object can be perceived against a background sky. Visibility also can refer to the clarity of objects in the distance, middle or foreground. Visibility is unique among air pollution effects because it involves human perception and judgment.

**VMT (Vehicle Miles Traveled)** – A measure of the extent of motor vehicle operation; the total number of vehicle miles traveled within a specific geographic area over a given period of time.

**VOC (Volatile Organic Compound)** – Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity. VOC’s are ground level ozone precursors.

**Violation (of a standard)** – occurs when the conditions defining compliance with a standard are exceeded. This often involves averaging measurements over time. For example, a violation of the 8-hour ozone standard occurs when the three year average of the 4<sup>th</sup> highest daily value each year exceeds 0.075 PPM.

**APPENDIX A**  
**Air Quality Indicators Report**  
**February 2010**

## INTRODUCTION

Fort Collins Air Quality Plan uses specific indicators to measure progress in protecting air quality. A single indicator can reflect trends in multiple pollutants, and can focus on aspects of the problem that are within our control.

The Air Quality Plan is to be updated in 2010, concurrent with updates of City Plan and Transportation Master Plan. This indicators report provides a basis to determine whether modification of air quality policies and programs are warranted in the Air Quality Plan update.

## SUMMARY OF INDICATOR STATUS

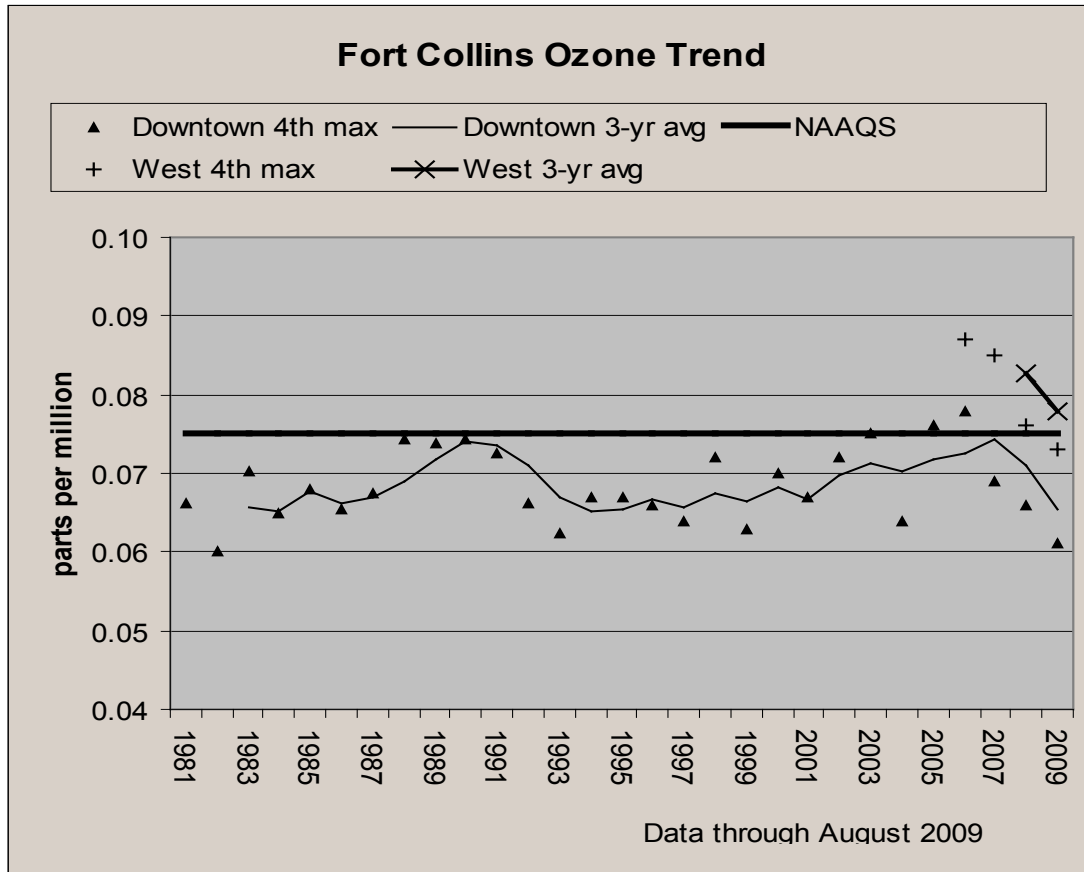
The following table provides an overview of the air quality indicators and their status as of February 2010. Satisfactory trends are shown in blue text, while the red text indicates trends that need improvement. Further information on each indicator follows the table.

### Summary Of Air Quality Indicator Status

SUMMARY OF AIR QUALITY INDICATOR STATUS			
Indicator	Unit	Desired Direction	Status
<b>Ambient Air Pollution Levels</b>	Pollutant concentration, specific to each NAAQS	Declining trend	<ul style="list-style-type: none"> <li>CO – declining trend</li> <li>Particulates – flat trend</li> <li>Ozone – flat trend</li> </ul>
<b>Visibility Standard</b>	# of days out of compliance	Improving compliance	Trend is flat, averaging 24% non-compliance
<b>Compliance with National Ambient Air Quality Standards</b>	Percentage of NAAQS in 2008	Less than 100%	<ul style="list-style-type: none"> <li>CO – 33%</li> <li>Ozone – 104%</li> <li>PM<sub>2.5</sub> – 71%</li> <li>PM<sub>10</sub> – 45%</li> </ul>
<b>VMT reduction program performance [Mobility Management]</b>	NA	Meet or exceed performance of similar programs in comparable cities ["best practices"]	Fort Collins is not implementing all of the mobility management programs that are economically justified.
<b>VMT growth rate</b>	Annual growth rate (%)	Decreasing	Declined 7% from 1998 to 2005.
<b>Fleet average tailpipe emissions</b>	Grams per mile as estimated by EPA's Mobile Model	Reductions over previous years	Emission rates are declining for CO, NO <sub>x</sub> , VOC
<b>City-wide Total Motor Vehicle Emissions</b>	Tons per Day of VOC, NO <sub>x</sub> , PM <sub>2.5</sub>	Reductions over previous years	Total emissions declining
<b>Commercial and Industrial Emissions</b>	Tons Per Year	Reductions over previous years	Rising
<b>Greenhouse Gas Emissions</b>	Citywide emissions of CO <sub>2</sub> e (tons per year)	Reductions over previous years	Declined 0.8% from 2005 through 2008
<b>Wood smoke emissions</b>	City-wide emissions (tons per year)	Reductions over previous years	Declining
<b>Non-certified fireplaces and stoves</b>	Number of non-certified units in the City, based on local survey data	Decrease in number of non-certified wood stoves	Declining

## AMBIENT AIR POLLUTION LEVELS

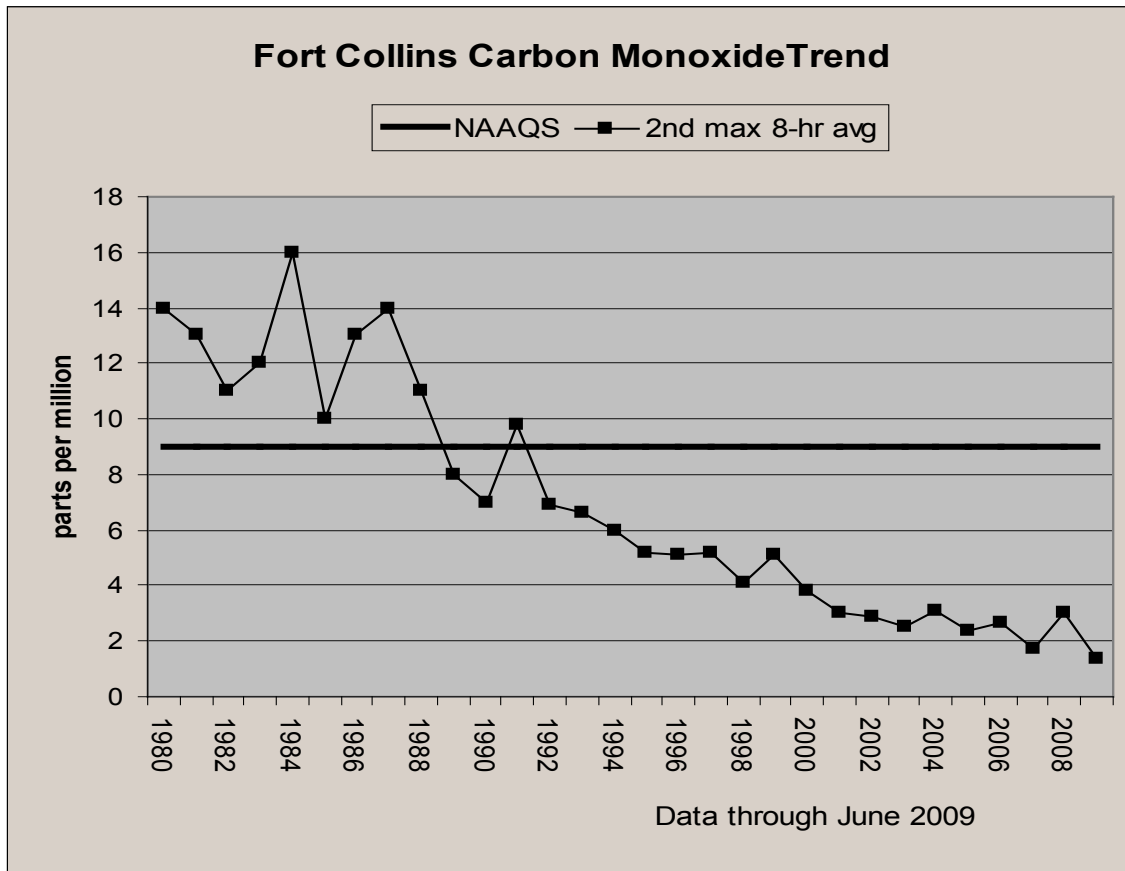
**Ozone** is formed when nitrogen oxides and hydrocarbons emitted mainly by motor vehicles and industry react in sunlight. Because ozone concentrations at the FTC-West site have exceeded the federal standard in 2008 and 2009, Fort Collins has been included in Colorado's ozone non-attainment area defined by EPA. The NAAQS is based on the 3-year running average of the 4th-highest 8-hour average recorded each year. NAAQS = 0.075 ppm; FTC West ozone = 0.078 ppm in 2009.



**Ozone at the Fort Collins West site violated the National Ambient Air Quality Standard in 2008 and 2009.**

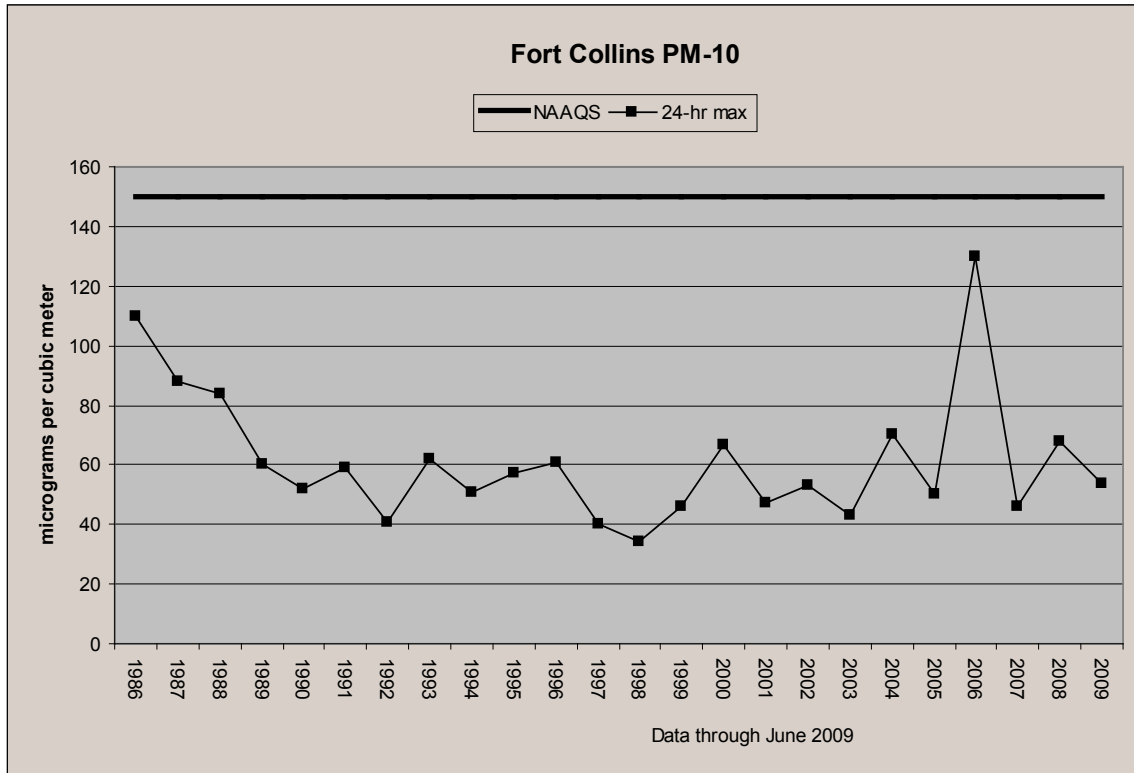
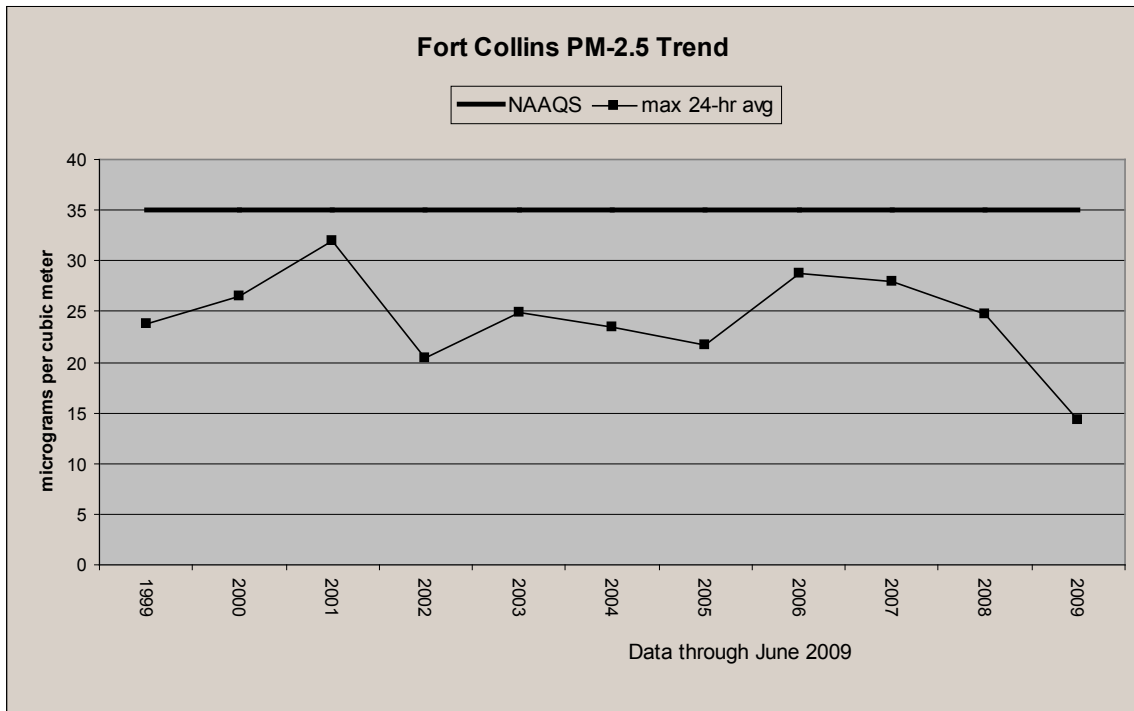


**Carbon Monoxide** is emitted mainly by motor vehicles. Emissions continue to decrease nation-wide, largely due to new car standards. Carbon monoxide concentrations in Fort Collins are now well below the federal standard.



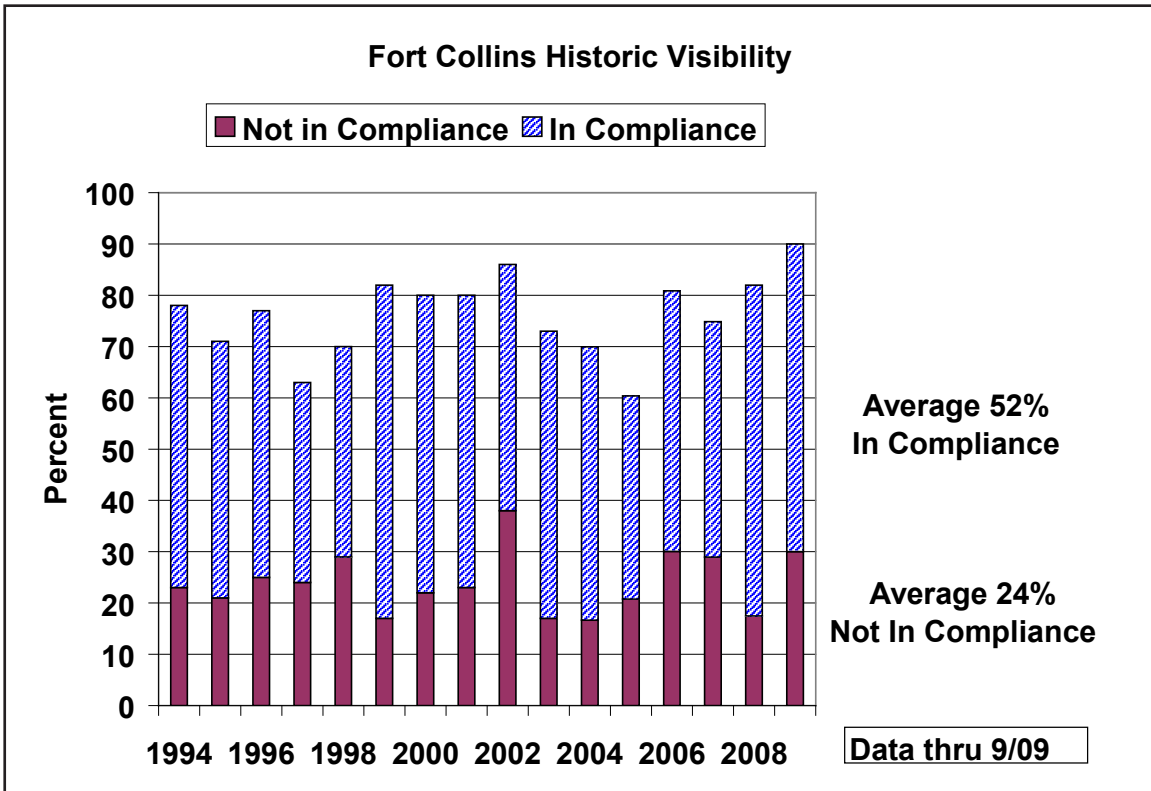
**Carbon monoxide levels in Fort Collins have improved significantly since the 1980's.**

**Particulate Matter** (PM<sub>10</sub>) are mainly dust from roads, fields, and construction sites. Fine particles (PM<sub>2.5</sub>) typically form when reactions occur between certain pollutants in the atmosphere. Fine particles are a major factor in poor visibility.

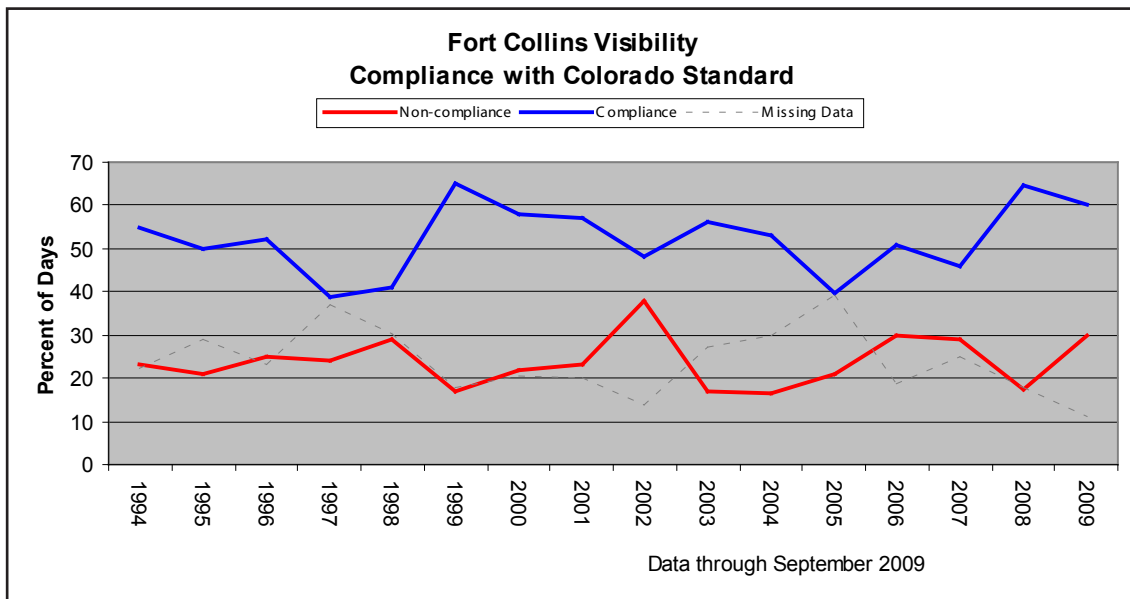


**Fort Collins particulate concentrations are below federal standards.**

**Visibility** is a measure of how the air looks. On average, Fort Collins violates Colorado's guideline visibility standard 24% of the time, nearly one in four days each year. Data not shown are "missing", which occurs when humidity is >70 percent and during instrument maintenance.



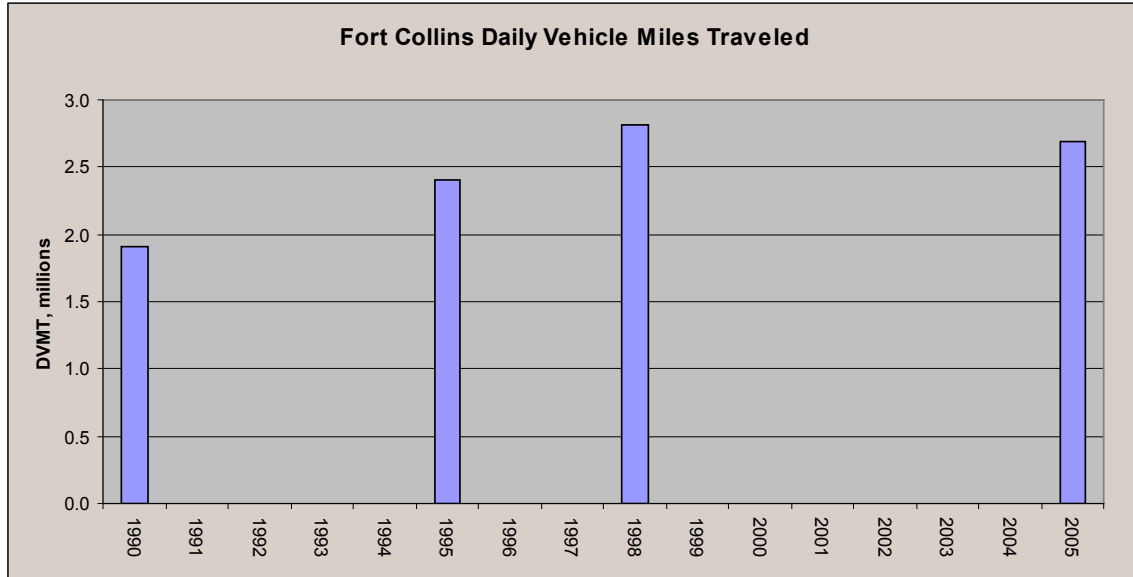
Fort Collins violates the State's visibility standard 24% of days, on average.



An alternate display of data from the above chart.

## VMT GROWTH RATE

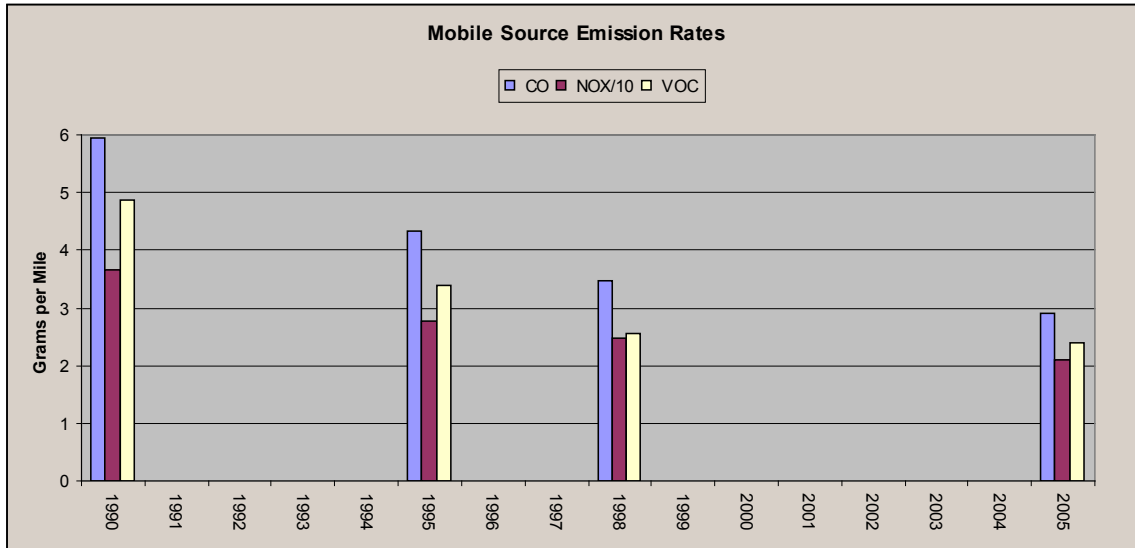
Vehicle miles travelled [VMT] is measured using a travel-demand model. Every few years, a transportation plan update produces a base-year model run that is then “calibrated” using ground count data, which provides the best available estimate of total VMT.



**Fort Collins VMT declined 7% from 1998 to 2005.**

## FLEET AVERAGE TAILPIPE EMISSIONS

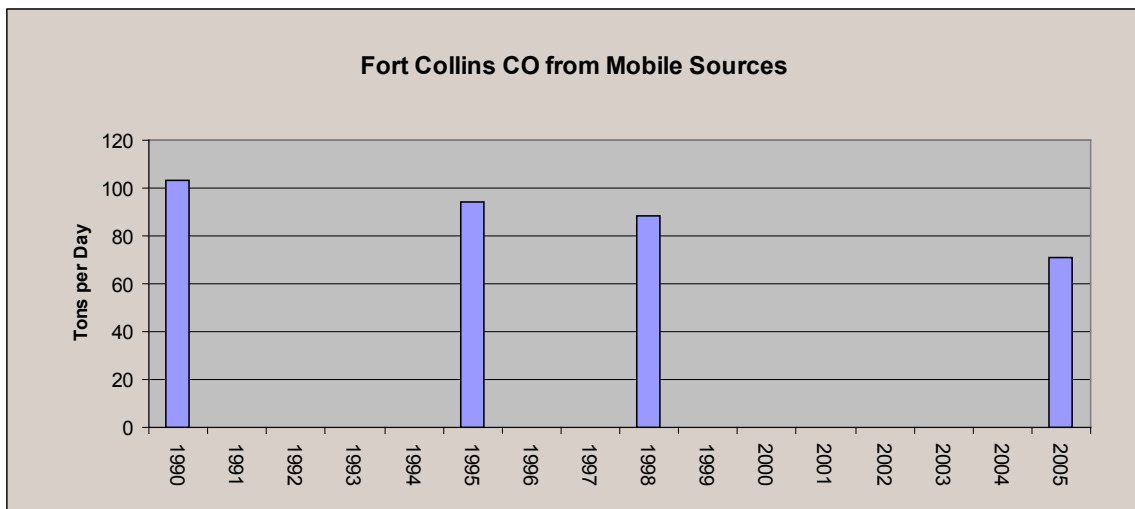
Mobile source emission factors were calculated using MOBILE, the USEPA-approved model for air quality planning, using assumptions suitable for community-wide analysis: they are year-round averages that include cars, trucks, busses, and motorcycles.



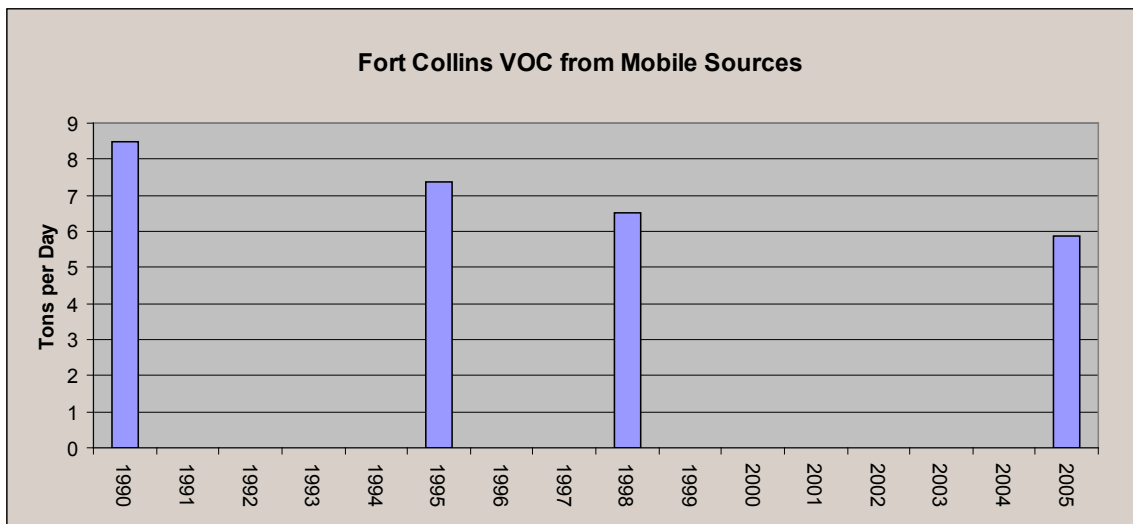
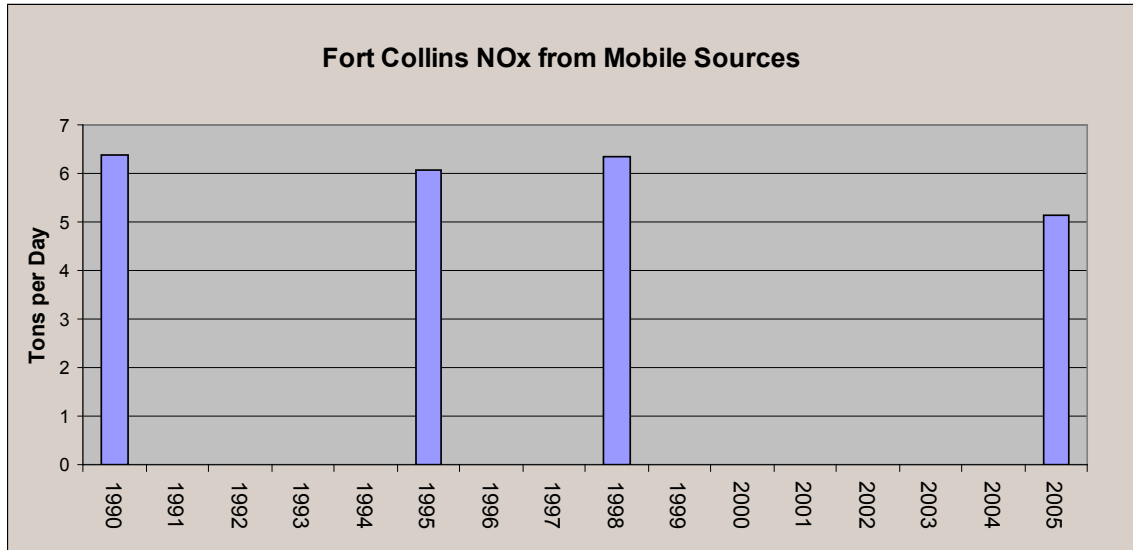
Emission rates have declined due to the federal New Motor Vehicle Control Program and vehicle inspection-maintenance programs.

## TOTAL MOTOR VEHICLE EMISSIONS

Total vehicle emissions are calculated as the product of each emission factor and total VMT for the year.







## VMT REDUCTION PROGRAM PERFORMANCE [MOBILITY MANAGEMENT]

The 2005 Mobility Management Best Practices Review gauges the City's VMT-reduction efforts compared with best practices among cities of comparable size and land use and transportation limitations.

Mobility Management (also called transportation demand management or vehicle miles traveled [VMT] reduction) includes various strategies and programs that improve travel options and encourage people to use more efficient forms of travel. It includes improvements to alternative modes (walking, cycling, ridesharing, public transit, and telecommuting), changes in traffic management, pricing reforms, and land use policies that create more multi-modal and accessible communities. Although individually these strategies only affect a small portion of total regional travel, their impacts are cumulative and synergistic (total impacts are greater than the sum of individual impacts). When all benefits and costs are considered, mobility management programs often turn out to be the most cost-effective way to achieve transportation planning objectives.

Because reducing the VMT growth rate has been identified as an important factor in meeting Fort Collins' goals for land use, transportation, air quality, and livability, the City intends that its overall VMT reduction program meet or exceed the performance of similar programs in comparable cities.

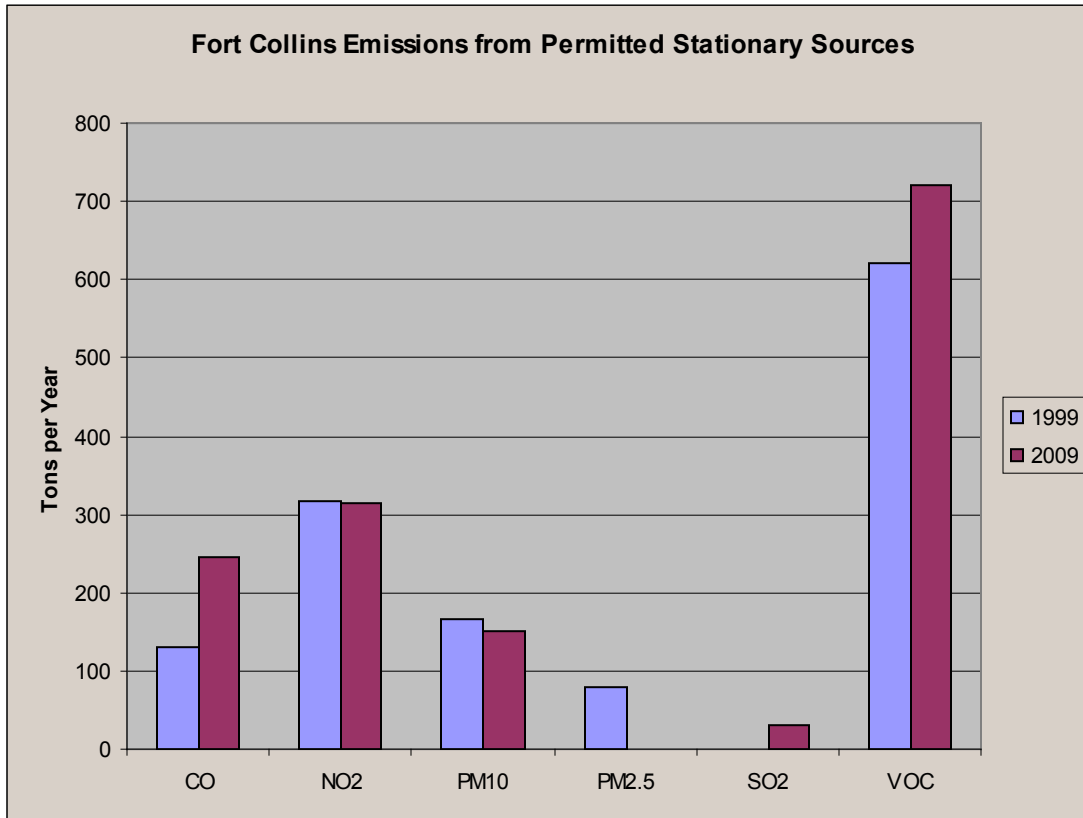
The Mobility Management Best Practices Report found that Fort Collins has implemented many good mobility management strategies, including outstanding pedestrian and cycling programs, land use planning to encourage more compact development, commute trip reduction programs, and plans to develop bus rapid transit service. However, like many other communities, **Fort Collins is not implementing all of the mobility management programs that are economically viable, taking into account all benefits and costs.** There is significant potential for the City to develop additional mobility management programs that could provide social, economic, and environmental benefits to the community and surrounding areas. In particular, it is paramount for the City to secure reliable long-term funding for alternative transportation infrastructure, services, and promotion programs in order to achieve its transportation improvement goals.

The table below illustrates the City's efforts toward mobility management as of 2005, as well as recommendations for improving upon these efforts.

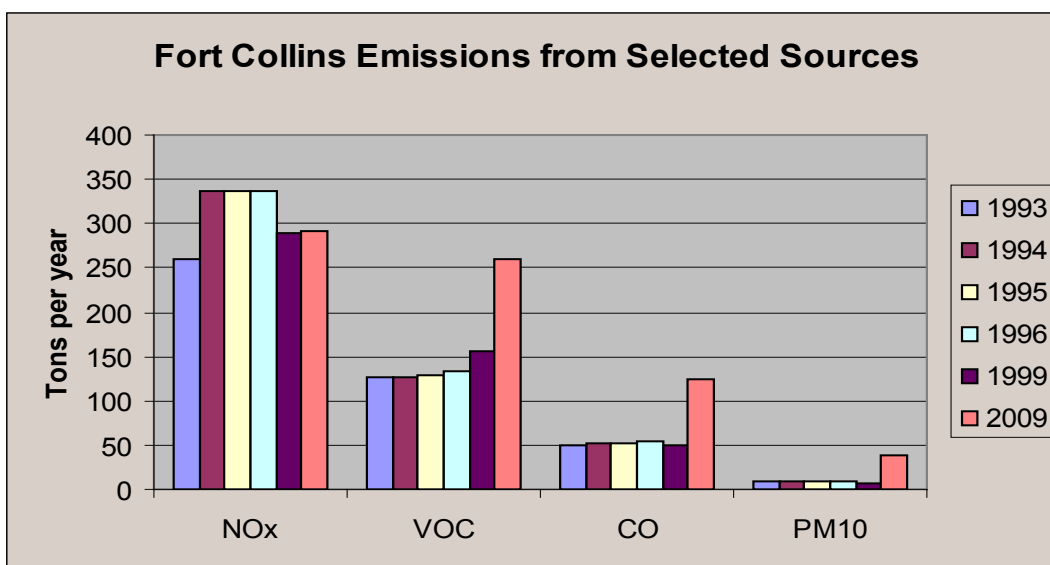
	Grade	Comments	Needed to Achieve an "A"
<b>Commute Trip Reduction (CTR) Programs</b>	B	Discontinuation of the Smart Trips program may reduce this grade.	Continue and expand services currently provided by Smart Trips. Encourage or require employers to support CTR, especially in sprawled areas.
<b>School Transport Management</b>	B	City has several good programs, but many are scheduled to end this year.	Expand so all schools have programs that support alternative modes.
<b>Campus Mobility Management</b>	C	UPass is good, but limited transit service and low parking prices reduce use of alternative modes.	Significantly increase transit funding and service, support vanpooling by Colorado State University (CSU) staff, and implement parking pricing on CSU campus.
<b>Walking and Cycling Programs</b>	B+	Good programs for new development.	More resources needed to improve walking and cycling in some existing areas.
<b>Transit Service Improvements</b>	C	Current funding and service is modest for city of this size.	Significantly increase transit service to attract discretionary riders. Implement Mason Corridor program.
<b>Rideshare Programs</b>	B+	Regional VanGo program is now expanding services and outreach.	Continue VanGo service expansion and marketing, and integrate with other mobility management programs, including CTR and transit promotion.
<b>Parking Management</b>	D	City provides increased flexibility for new development, but few other management strategies.	Implement more parking management strategies, including more sharing, regulating, and pricing in both downtown and automobile-oriented areas.
<b>Smart Growth Policies</b>	C	City has good policies for new development, but must overcome sprawl in many areas.	Implement strong policies and programs to create more compact, mixed, walkable redevelopment of sprawled areas developed before City Plan.
<b>Institutional Reforms</b>	B-	City has good policies on paper, but many are not being aggressively implemented because there is a lack of cooperation by stakeholders.	Continue to reform transportation and land use policies, planning, and funding practices. Continue to educate stakeholders concerning the benefits that can result from better planning. Encourage or require more cooperation by local businesses, CSU, regional organizations, and state agencies.

## STATIONARY SOURCES

The Colorado Air Pollution Control Division provides information on commercial and industrial sources that are required to report because they exceed a de minimus level. This table includes data from all reporting sources within the Fort Collins Growth Management Area.



Reported carbon monoxide and volatile organic compounds have increased since 1999.



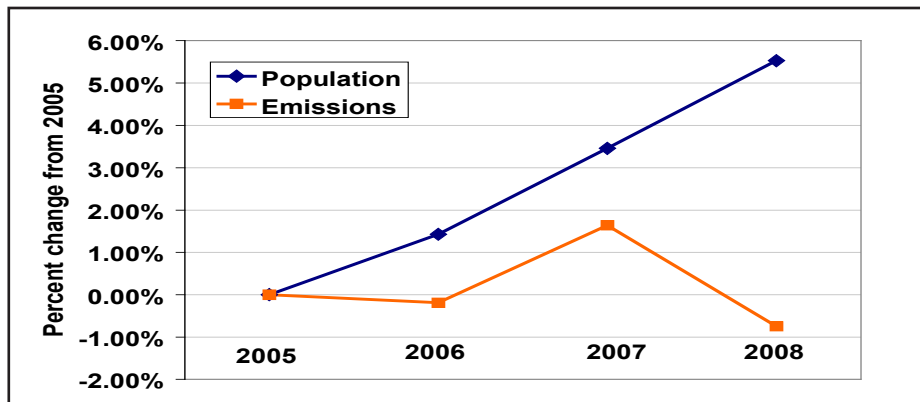
Selected larger sources include: Colorado State University, Anheuser Busch, Avago (was Hewlett Packard), Poudre Valley Hospital, City Wastewater treatment, and Intel (was Symbios Logic)

## GREENHOUSE GAS EMISSIONS

The 2008 Climate Action Plan Report summarized progress from 2005 to 2008:

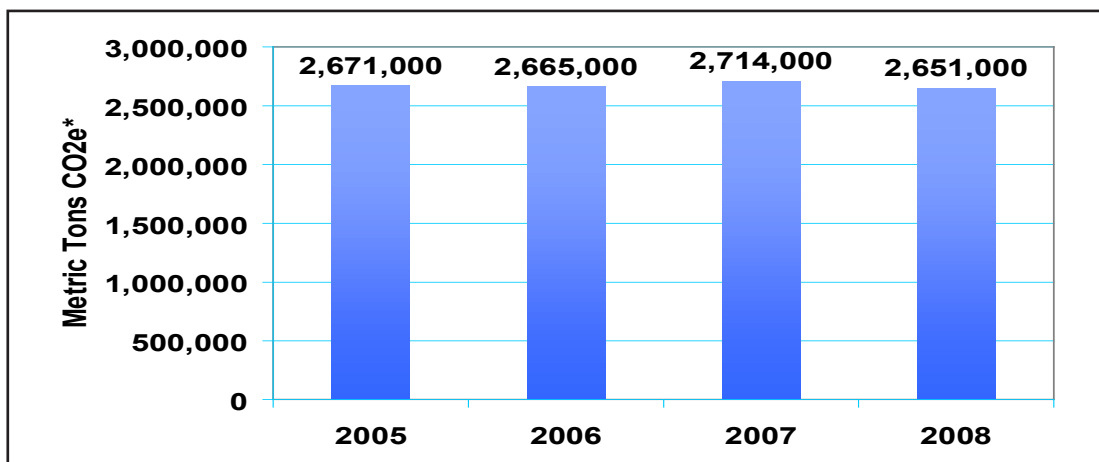
- Total net community-wide emission dropped by 0.8%; population grew by over 5%.
- Net per capita emissions dropped by 6%.
- Per capita electricity use dropped by 2.6%.
- Tons of waste sent to the landfill dropped by 21% from 2006 to 2008.
- Tons of recycling increased by over 15% from 2006 to 2008.
- Community waste diversion rates increased by from 21% in 2006 to 27% in 2008, a 28% increase in community waste diversion rates.

**Fort Collins change in population and per-capita emissions**



**Fort Collins per-capita GHG emissions dropped 6%.**

**Fort Collins Total GHG Emissions**

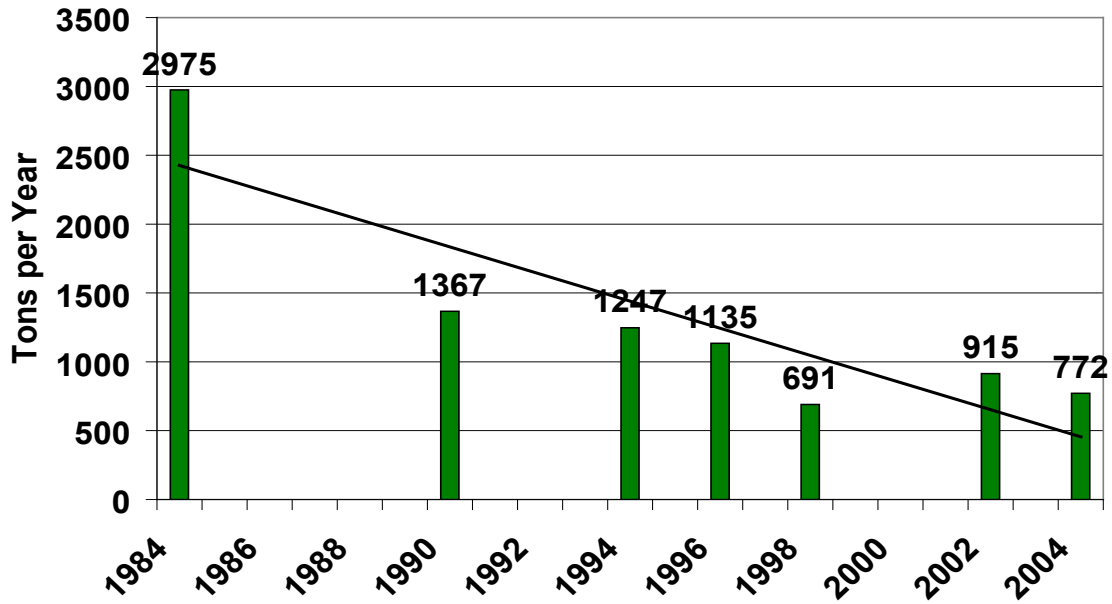


**Communitywide emissions of CO<sub>2</sub> equivalent dropped 0.8%**

## WOOD SMOKE EMISSIONS

Emissions from residential wood combustion are calculated from survey data. Respondents report the amount of fuel used in a year, and the number and type of wood-burning units. Regular wood smoke surveys have been discontinued for budget reasons.

**Fort Collins Wood Smoke CO Emissions**

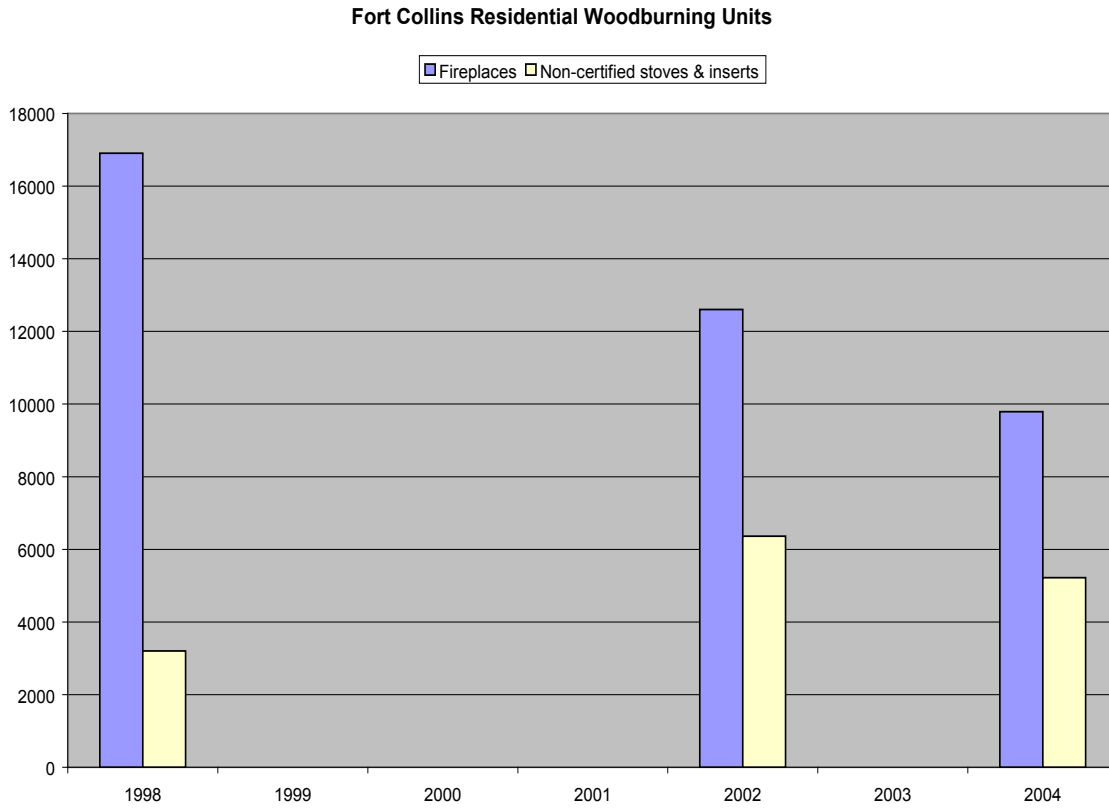


Wood-burning has declined substantially over 20 years.



## NON-CERTIFIED FIREPLACES AND WOOD STOVES

The number of non-certified wood-burning units is calculated from survey data. Stove data from 1996 are based on different survey questions than 2002 & 2004, so are not comparable.



**Non-certified fireplaces and stoves have declined**

## **APPENDIX B**

### **Air Pollutant Information**

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**ACID DEPOSITION**

**What is acid deposition?**

The term acid deposition is used to describe all possible forms of acid pollution that can be found in rain, sleet, snow, fog, cloud vapor, particles, and gasses. More commonly it is due to secondary pollutants that form from the oxidation of nitrogen oxides (NOx) or sulfur dioxide (SO<sub>2</sub>) gases that are released into the atmosphere from the combustion of fossil fuel. The process of altering these gases into their acid counterparts can take several days, and during this time these pollutants can be transferred hundreds of miles from their original source. Acid precipitation can also form at the Earth's surface when nitrogen oxides and sulfur dioxide settle on the landscape and interact with dew or frost.

**What are the effects of acid deposition?**

Acid deposition can have a variety of impacts to the ecosystem, including damage to crops, forests, and aquatic ecosystems. In addition, acid rain accelerates the decay of building materials and paints, including irreplaceable buildings, statues, and sculptures that are part of our nation's cultural heritage.

Acid deposition can influence human health through the following methods:

- Toxic metals, such as mercury and aluminum can be released into the environment through the acidification of soils. The toxic metals can then end up in the drinking water, crops, and fish and then be ingested by humans through consumption. If ingested in great quantities, these metals can have toxic effects on human health.
- Increased concentrations of sulfur dioxide and oxides of nitrogen have been correlated to increased hospital admissions for respiratory illness.
- Research on children from communities that receive a high amount of acidic pollution show increased frequencies of chest colds, allergies and coughs.

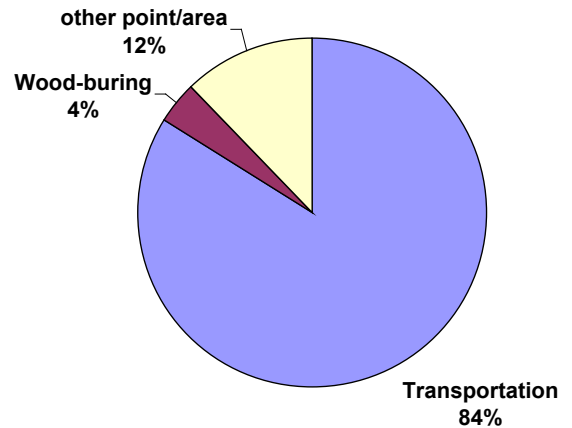
**What are the regional levels of acid deposition?**

Acid rain is not anticipated to be an issue in Fort Collins directly because of the soil's buffering alkalinity. However, regional urban emissions contribute to the ecosystem nitrification in Rocky Mountain National Park. A September 2002 report by the National Park Service indicated improvement of sulfate levels at Rocky Mountain National Park, but showed degradation of nitrate levels at the park. A 2003 study found that concentrations of nitrogen are increasing in many areas of the West (although sulfur levels are decreasing.) For example, nitrogen concentrations have been increasing in RMNP's rain and snow by about 2%/yr for the past 2 decades. Current baseline conditions in RMNP are 3.1 kg N/ha/yr. The desired level is 1/5 kg N/ha/yr and the background level is 0.2 kg N/ha/year.

**What is being done to control acid deposition?**

Title IV of the 1990 CAAA establishes the Acid Rain Program. EPA's Acid Rain Program limits, or "caps," sulfur dioxide emissions from power plants at 8.95 million tons annually, allows those plants to trade SO<sub>2</sub> allowances, and reduces nitrogen oxide emission rates. As a result, acid precipitation levels have decreased significantly, nationwide.

**2005 Fort Collins CO Inventory**



## **CARBON MONOXIDE (CO)**

### **What is carbon monoxide?**

Carbon monoxide (CO) is a colorless, odorless, tasteless gas that is slightly lighter than air. It is very stable, having an average lifetime of 2-4 months in the atmosphere.

### **Where does CO come from?**

The primary source of CO is incomplete combustion of fossil fuels used for transportation and heating. In Fort Collins, approximately 76% of the CO comes from motor vehicles and 13% comes from woodburning. Other sources include refuse and agricultural burning, natural forest fires, and by-products from some industrial sources. CO tends to build up when shallow cold air masses are trapped close to the ground by warmer air masses above and by the mountains to the west. These temperature inversions occur most commonly during fall and winter months.

### **How does CO affect human health?**

Carbon monoxide affects the central nervous system by depriving the body of oxygen. CO enters the body through the lungs, where it is absorbed into the bloodstream. Hemoglobin in the blood combines much more readily with CO than with oxygen, thus the amount of oxygen delivered by the blood is reduced in the presence of CO. CO can cause headaches, fatigue, vision and judgment impairment, dizziness, and drowsiness. The severity of the effects depends on the concentration and duration of exposure. Carbon monoxide is of even greater concern at our high elevations where the air is thinner and has less oxygen.

### **Who is most at risk?**

Particularly at risk are people with heart or breathing disorders, the elderly, pregnant women and their unborn children, and anemic individuals. Concern also exists for healthy children because of their increased oxygen requirements that result from their higher metabolism rate.

### **What are the EPA standards for CO?**

The primary National Ambient Air Quality Standard (NAAQS) for CO is 9 ppm (parts per million) averaged over an eight hour period and 35 ppm averaged over a one hour period. The EPA allows no more than one exceedance of the standard per year for any given location. Subsequent exceedances constitute violations of the NAAQS. Primary standards are designed to protect human health and secondary standards to protect human welfare. There are no secondary CO standards.

## **OZONE (O<sub>3</sub>)**

### **What is Ozone?**

Ozone is a highly reactive form of oxygen. At normal concentrations it is colorless and odorless. At high concentrations (often associated with thunderstorms or arching electric motors) it is an unstable bluish gas with a pungent odor. Ozone is a major component of photochemical smog, although the visibility reduction and odor resulting from smog are produced by other pollutants such as particulates and nitrogen oxides. Ground level ozone in high concentrations is considered an air pollutant, while stratospheric ozone in the upper atmosphere (12 - 30 miles above the ground) is critical for absorbing cancer-causing ultraviolet radiation.

### **Where does ozone come from?**

Ozone is a secondary pollutant formed when nitrogen oxides and hydrocarbons react in the presence of sunlight. Hydrocarbons come from automobile exhaust (and also some vegetation) and nitrogen oxides come from burning fuel. Most of the pollutants that form ozone come from cars and oil and gas wells. Large factories account for another portion of the emissions. Small businesses such as printing plants, service stations, and auto body shops, and people using lawnmowers, paints, and cleaning solvents account for another portion of the emissions.

### **How does ozone affect human health?**

The reactivity of ozone causes health problems because it damages lung tissue, reduces lung function, and increases the sensitivity of the lungs to other irritants. Symptoms of decreased lung function include chest pain, coughing, sneezing and pulmonary congestion. Ozone can also act as an irritant to the mucous membranes of the eyes and throat and can reduce immune system capacity. In high concentrations, ozone causes damage to plants and deteriorates materials such as rubber and nylon.

### **Who is most at risk?**

Scientific evidence suggests that ozone affects not only individuals with respiratory problems, but also affects healthy adults and children. Ozone pollution is of particular concern to the more than 14.4 million people with asthma and other respiratory problems nationwide, because when it is breathed into the lungs, ozone reacts with lung tissue. It can harm breathing passages, making it more difficult for the lungs to work. It also can cause eye and throat irritation and cause a greater susceptibility to infection.

There is an association between ozone levels in the outdoor air and increased hospital admissions for respiratory causes, such as asthma. Asthma is one of the leading causes of childhood hospital admissions. Ozone air pollution has been associated with as much as 10-20% of all summertime respiratory hospital visits and admissions. Children with respiratory problems are at greatest risk because of greater exposure to the outdoors during the summer months. (EPA-R8)

### **What are the EPA standards for ozone?**

In March 2008, EPA approved a revision to the ozone standard. Previously, the primary NAAQS for ozone was 0.085 ppm (parts per million), averaged over an 8-hour period. The new standard is 0.075 ppm, averaged over an 8 hour period, based on the three-year average of the fourth highest daily concentration. In January 2010, the EPA proposed again strengthening the standard to 0.060 to 0.070 PPM to ensure adequate protection of human health. A final standard will be issued by August 2010.



**What are ozone levels in Fort Collins?**

In November 2007, the U.S. EPA designated much of the entire Front Range region, including Fort Collins, as “non-attainment” for the 1997 federal health standard for ozone (0.085 PPM 8-hour standard.) The Fort Collins West monitor was installed at CSU’s foothills campus in 2006 and shows the highest readings in town. Due to these high readings, the FC West monitor is out of compliance with the current 8-hour ozone standard of 0.075 PPM because the 3 year average of the annual 4<sup>th</sup> highest value (2007-2009) is 0.078 PPM.

Fort Collins West	Days Exceeding Compliance	Ozone Action Alert Days	Standard	Exceedance
2006	12	48	80 PPM	Days 85 PPB or greater
2007	4	44	80 PPM	Days 85 PPB or greater
2008	5	39	75 PPM	Days 76 PPB or greater
2009	1	11	75 PPM	Days 76 PPB or greater

## **NITROGEN OXIDES (NO<sub>x</sub>)**

### **What is NO<sub>x</sub>?**

NO<sub>x</sub>, is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. NO<sub>x</sub> includes:

- NO<sub>2</sub> – nitrogen dioxide, a common pollutant that can often be seen as a reddish-brown layer over many urban areas,
- NO – nitric oxide
- N<sub>2</sub>O – nitrous oxide
- NO<sub>3</sub><sup>-</sup> - nitrates

### **Where does Nitrogen Oxides (NO<sub>x</sub>) come from?**

Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO<sub>x</sub> are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. 44% of Denver's NO<sub>2</sub> comes from major industrial sources such as power plants, 33% from motor vehicles, 15% from space heating, and %5 from misc. sources.

### **What are the health impacts of NO<sub>x</sub>?**

It is one of the main ingredients involved in the formation of ground-level ozone, which can trigger serious respiratory problems. NO<sub>x</sub> reacts to form nitrate particles, acid aerosols, as well as NO<sub>2</sub>, which also cause respiratory problems. In addition, NO<sub>x</sub> can have negative impacts on ecosystems through contributing to acid rain, water quality impacts, visibility impairment, and NO<sub>x</sub> contributes to global warming.

### **NO<sub>x</sub> Ecosystem Impacts**

The largest N sources in RMNP are mobile sources and point sources along Colorado's Front Range. Fort Collins mobile sources NO<sub>x</sub> are estimated to drop from 9 TPY in 2000 to 4.8 TPD in 2012 and to 2.7 TPD in 2020 as a result of emissions testing program and Tier II, III and IV gas and diesel emission standards for new vehicles. Collectively, Fort Collins is identified as a NO<sub>x</sub> point source > 100 TPY because of a few industrial sources.

As a result of this increasing N levels in RMNP, in 2004, Environmental Defense and Trout Unlimited petitioned before the U.S. Department of Interior to issue a Declaration of Adverse Impact on Air Quality Related Values at RMNP. A Nitrogen Reduction Plan was developed collaboratively with CDPHE, EPA and NPS. The AQCC endorsed a Nitrogen Deposition Reduction Plan in 2007, with the first interim reduction target set for 2012.

NO<sub>x</sub> reduction measures in the Plan include Tier II and coming Tier III and IV vehicle emissions standards, the emissions testing program, and various engine and other stationary controls implemented through the AQCC regulatory process.

### **What are the EPA standards?**

EPA's annual standard for NO<sub>2</sub> is 0.053 ppm expressed as annual arithmetic mean. In January 2010, EPA strengthened the standard by setting a new 1-hour standard of 100 PPB to protect against adverse health effects associated with short-term NO<sub>2</sub> exposure, which primarily occur near major roadways.

### **What are NO<sub>x</sub> levels in Fort Collins?**

NO<sub>2</sub> is not measured in any urban areas in Colorado. Fort Collins is not likely to receive a NO<sub>x</sub> monitor because it does not meet the population threshold of 500,000 people. NO<sub>2</sub> levels in Denver have dropped significantly since the mid 1970's:

- 1975 – 0.0515 PPM NO<sub>2</sub>
- 2008 – 0.0286 PPM No<sub>2</sub>

However, the NO<sub>2</sub> levels at the Denver CAMP monitor have been relatively flat over the past 10 years.

**What are the NOx contribution to fine particles in Fort Collins?**

1996/1997 North Front Range Air Quality Study – Fort Collins Data

Secondary Aerosol	WINTER % Contribution to PM <sub>2.5</sub>	SUMMER % Contribution to PM <sub>2.5</sub>
Nitrate	36 %	8 %
Organics	33 %	44 %
Sulfate	9 %	14 %
Elemental Carbon	12 %	16 %
Soil	10 %	18 %

The North Front Range Air Quality Study showed that during the winter, NOx emissions contribute more to PM<sub>2.5</sub> formation than any other air pollutant. NOx is also an important factor in ozone formation and visibility degradation.

## **SULFUR DIOXIDE (SO<sub>2</sub>)**

### **Where does Sulfur Dioxide (SO<sub>2</sub>) come from?**

SO<sub>2</sub> is a colorless gas with a pungent odor. Sulfur dioxide belongs to the family of gases called sulfur oxides (SO<sub>x</sub>). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes. SO<sub>2</sub> is highly soluble in water and is readily oxidized in the air to sulfates, contributing to acid rain associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and adverse health effects.

### **How does SO<sub>2</sub> affect human health?**

The major health concerns associated with exposure to high concentrations of SO<sub>2</sub> include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Children, the elderly, and people with asthma, cardiovascular disease or chronic lung disease (such as bronchitis or emphysema), are most susceptible to adverse health effects associated with exposure to SO<sub>2</sub>. SO<sub>2</sub> is a potential carcinogen.

### **What are the EPA standards?**

EPA's health-based national air quality standard for SO<sub>2</sub> is 0.03 ppm (measured on an annual arithmetic mean concentration) and 0.14 ppm (measured over 24 hours).

### **What are SO<sub>2</sub> levels in Fort Collins?**

SO<sub>2</sub> levels in Colorado have never been a major health concern according to CDPHE, since Colorado does not have the types of industry that burn large amounts of coal. SO<sub>2</sub> levels have been declining at monitoring sites in Denver, as they have nationally:

Denver max annual SO<sub>2</sub> concentrations:

- 1979 – 0.018 ppm
- 1990 – 0.010 ppm
- 2001 – 0.005 ppm
- 2008 - 0.0021 ppm

No increase in SO<sub>2</sub> is expected unless a significant coal-burning or oil industry is located in or near Fort Collins.

**PARTICULATE MATTER 10 Microns (PM<sub>10</sub>)**

**What is PM<sub>10</sub>?**

Particulate matter refers to tiny particles of solid or semi-solid material suspended in the atmosphere. PM<sub>10</sub> are particles that are 10 microns or less in diameter (~ 1/6 of a human hair).

**Where does PM<sub>10</sub> come from?**

Most manmade particles are in the range of 1 to 10 microns in diameter. PM<sub>10</sub> is generally created during the combustion of fossil fuels in industrial processes or heating and consists of fly ash from power plants, carbon black from diesel and gasoline engines, and soot from woodburning.

**How does PM<sub>10</sub> affect human health?**

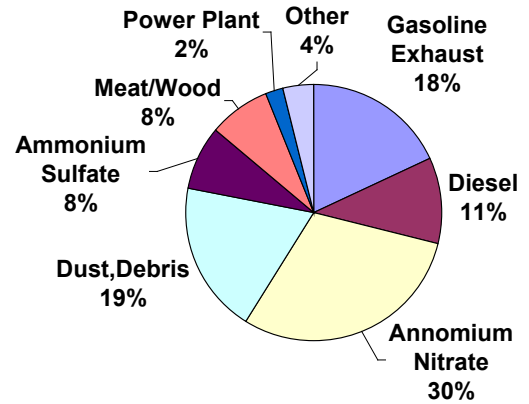
The health risk from particulates is a function of the size and concentration of the dose inhaled. PM<sub>10</sub> can be breathed into the lungs, and therefore, its health effects are more severe than large particles. Particulate matter can reduce lung functioning and can cause or aggravate respiratory conditions, and increase the long term risk of lung cancer or other lung disease such as emphysema, bronchiectasis, pulmonary fibrosis, and cystic lungs.

**What are the EPA standards?**

Concentrations of PM<sub>10</sub> are expressed in the weight of particulate matter found in a cubic meter of air. The current EPA standard for PM<sub>10</sub> is composed only of an acute (24 hour allowable average) standard. The annual standard was revoked in 2006 due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution.

- A 24 hour average not to exceed 150 micrograms per cubic meter of air (ug/m3) more than three times in three years.

**Fort Collins PM<sub>2.5</sub> Source Apportionment  
NFRAQS, 1998**



**PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>)**

**What is PM<sub>2.5</sub>?**

Particulate matter refers to tiny particles of solid or semi-solid material suspended in the atmosphere. PM<sub>2.5</sub> is particulate matter of 2.5 microns or less (approximately 1/20 the diameter of a human hair), also called “fine” particles.

**Where does PM<sub>2.5</sub> come from?**

Elemental and organic carbon make up a significant fraction of PM<sub>10</sub> and PM<sub>2.5</sub>. The fine particles (PM<sub>2.5</sub> and less) are typically secondary aerosols that form when chemical reactions occur between sulfate (from power plants) or nitrate (from industry and motor vehicles) and ammonia (from feedlots). Fine particles are also emitted from incomplete combustion of gasoline and diesel fuel.

**How does PM<sub>2.5</sub> affect human health and welfare?**

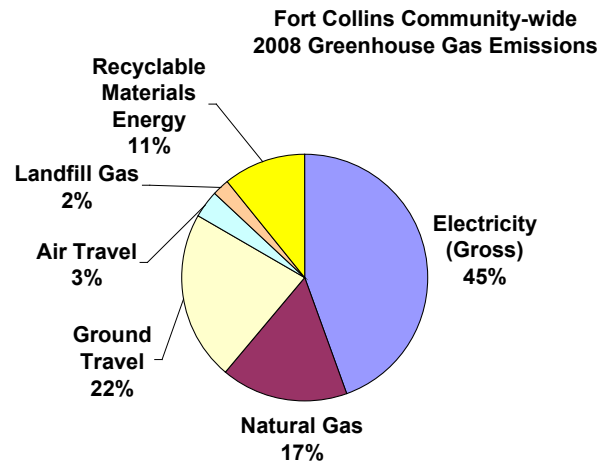
The health risk from particulates is a function of the size and concentration of the dose inhaled. PM<sub>2.5</sub> can be breathed deeply into the alveoli of the lungs, where they remain for a long time and can cause the greatest amount of damage. Particulate matter can reduce lung functioning and can cause or aggravate respiratory conditions, and increase the long term risk of lung cancer or other lung disease such as emphysema, bronchiectasis, pulmonary fibrosis, and cystic lungs. Other health problems associated with PM<sub>2.5</sub> include asthma attacks, increased emergency room visits and hospital admissions, death from cardiopulmonary causes, and lung cancer deaths.

**Who is most at risk?**

There is strong evidence that asthmatics are more sensitive to the effects of particulates than healthy people. Conversely, little scientific evidence exists that elderly people (>65 years) are particularly sensitive to particulates.

**What are the EPA standards for particulates?**

In July, 1997 the EPA approved a standard for fine particles of 65 ug/m3 (micrograms/meter-cubed), averaged over a 24-hour period, and 15 ug/m3 annual average. In 2006, the 24-hour standard was strengthened to be 35 ug/m3 over 24 hours. The annual arithmetic means standard is 15 ug/m3.





## **GREENHOUSE GASES (GHG)**

### **What are greenhouse gases?**

Atmospheric greenhouse gases (water vapor, carbon dioxide, and other gases) are those gases that trap some outgoing infrared energy emitted from the Earth and cause heat to be retained in the atmosphere, somewhat like the glass panels of a greenhouse. Without this natural “greenhouse effect,” temperatures would be much lower than they are now, and life as known today would not be possible. However, problems may arise certain human activities add to the levels of most of these naturally occurring gases.

### **Where do GHG come from?**

*Carbon dioxide (CO<sub>2</sub>)* is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned.

*Methane* is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic wastes in municipal solid waste landfills, and the raising of livestock.

*Nitrous oxide* is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.

Locally, the majority of CO<sub>2</sub> comes from electricity generation, followed by combustion of fuels for transportation, followed by combustion of natural gas for heating structures.

### **What is the risk of increasing GHG?**

There has been an “unequivocal” warming trend of about 1.0 to 1.7°F from 1906-2005. Global mean surface temperatures have increased 0.5-1.0°F since the late 19th century. The eight warmest years on record (since 1880) have all occurred since 2001, with the warmest year being 2005. The snow cover in the Northern Hemisphere and floating ice in the Arctic Ocean have decreased. Tide gauge measurements and satellite altimetry suggest that sea level has risen worldwide approximately 4.8-8.8 inches (12-22 cm) during the last century. Worldwide precipitation over land has increased by about one percent. The frequency of extreme rainfall events has increased throughout much of the United States.

Rising global temperatures are expected to raise sea level, and change precipitation and other local climate conditions. Changing regional climate could alter forests, crop yields, and water supplies. It could also affect human health, animals, and many types of ecosystems. Risks include increased frequency and severity of severe storms (and associated human and economic costs), spread of infectious diseases, changes in agricultural zones, etc. Deserts may expand into existing rangelands, and features of some of our National Parks may be permanently altered.

In December 2009, EPA confirmed an endangerment finding that GHGs threaten the public health and welfare of the American people. EPA also finds that GHG emissions from on-road vehicles contribute to that threat.

### **Are there standards for GHG?**

GHG emissions are not regulated in this country, so there are no standards or emission caps. Internationally however, the Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. 184 Parties of the Convention have ratified its Protocol to date. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. These amount to an average of five per cent against 1990 levels over the five-year period 2008-2012. Already, carbon is becoming monetized, and trading schemes and registries are emerging. In 2008, Fort Collins City Council adopted a goal to reduce community-wide GHG emissions 20% below 2005 levels by 2020 and 80% by 2050.

**LEAD (Pb)**

**Where does Lead come from?**

Currently, the most significant contributors to atmospheric lead emissions are lead gasoline additives, nonferrous smelters, and battery plants. In years past, the primary source of lead in ambient air was leaded gasoline. Besides leaded gasoline, sources of lead pollution in the air include metal smelters and the manufacture and reclamation of lead batteries.

**How does lead affect human health?**

Lead continues to pose a potential public health threat, in part because of its persistence in the environment. Lead poisoning can lead to retardation in cognitive development in children, reduced mental ability, and damaged nerves and organs like livers and kidneys. It also may interfere with the creation of blood and raise blood pressure, leading to cardiovascular disease.

**Who is most at risk?**

Children and pregnant women are most at risk from exposure to high lead levels. Because lead accumulates in the body organs, bones, and blood, even chronic exposure to small amounts can be harmful to both human and animal life.

**What are the EPA standards for Lead?**

In October 2008, EPA strengthened the national standard for lead by adding a standard of 0.15 ug/m<sup>3</sup> of lead in TSP (total suspended particulates), not to be exceeded as an average for a 3 month period any time in 3 years. The previous standard of 1.5 ug/m<sup>3</sup>, not to be exceeded as an average for a calendar quarter was also retained.

**What are lead levels?**

Between 1970 and 1997, air emissions of lead in the United States were reduced from 320,000 to 4,000 tons per year (over a 98% reduction), largely as a result of the country's phase-out of leaded gasoline. Lead levels are not measured in Fort Collins. CDPHE has only monitored lead levels in Denver. The monitor in Denver shows the last violation of the lead standard occurred in 1980. Since 1989, Denver's lead levels have been 0.25 ug/m<sup>3</sup> or below.

According to Environmental Defense's ScoreCard, Larimer County has the 6<sup>th</sup> highest lead levels in Colorado.

Rank	County	Lead Compounds (pounds)
1	Pueblo	3610
2	Moffat	221
3	Adams	133
4	Denver	50
5	Grand	35
6	Larimer	5

## **VISIBILITY**

### **What is “Visibility”?**

“Visibility” is a measure of how the air looks. It can be described as the maximum distance that an object can be perceived against a background sky. Visibility also can refer to the clarity of objects in the distance, middle or foreground. Visibility is unique among air pollution effects because it involves human perception and judgement.

### **What causes poor visibility?**

Along the Front Range, visibility impairment is caused primarily by fine particles (0.1 - 2.5 microns in diameter). Particles this size either scatter or absorb light coming from an object. Sulfates, nitrates, and elemental and organic carbon are most effective at scattering or absorbing light. Human-caused sources of these particles include woodburning, emissions from cars, trucks, and buses, soot from burning fields, and electric power generation. Visibility is also degraded by secondary aerosols, which are tiny gas and/or liquid droplets that are formed by chemical reactions between sulfate or nitrate and ammonia. Ground level ozone, which contributes to haziness in high concentrations, is formed when nitrogen oxides and volatile organic carbons (from motor vehicles and industry) combine with sunlight.

### **How does visibility affect humans?**

The visual quality of the air affects human welfare. Consequently, loss in visual quality may result in economic loss as the area becomes less attractive to residents, potential newcomers and industries. There is increasing information that shows a link between respiratory illness and fine particles, which also contribute to visibility impairment. Recent surveys of Fort Collins citizens indicate that more people perceive a negative impact from poor visibility than any other air pollution impact.

### **Are there standards for visibility?**

Yes, the State of Colorado has enacted a visibility standard based upon the visual preferences of Denver residents. However, the standard applies to all communities along the Front Range that are part of the AIR (Automobile Inspection and Readjustment) area. The visibility standard is an atmospheric extinction of .076 per kilometer, which means that 7.6% of light in a kilometer of air is blocked. The standard applies between the hours of 8:00 a.m. and 4:00 p.m., and only when the relative humidity is less than 70 percent.

### **What are visibility levels in Fort Collins?**

Visibility has been measured in Fort Collins since October 1993 by a transmissometer (a device which measures the amount of light attenuated by particles and gases in the air). In February 1995, a slide camera was added to record scene condition. Pictures are taken looking SW from the top of the Anheuser Busch Brewery three times each day, at 9:00 a.m., noon, and 3:00 p.m. In 2000, scene monitoring was shifted to the City's Web camera site. Scene monitoring was terminated by the City in 2006. Since 1993, Fort Collins exceeded the State visibility standard approximately one-in-four days.

### **Local Opinions**

Recent surveys of Fort Collins citizens show that more citizens are negatively impacted by the brown cloud and 'not being able to see the mountains' than by any other type of air quality impact.

## **MOBILE SOURCE HAZARDOUS AIR POLLUTANTS (Mobile HAPS)**

### **What are HAPS?**

The 1990 CAAA address a large number of air pollutants that are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects. 187 specific pollutants and chemical groups are identified as hazardous air pollutants (HAPs). Mobile source HAPs or air toxics are compounds emitted from highway vehicles and nonroad equipment which are known or suspected to cause cancer or other serious health and environmental effects. EPA has identified 21 mobile source HAPs including acetaldehyde, acrolein, 1,3 butadiene, benzene, diesel particulate matter plus diesel organic gases, and formaldehyde. This summary will only consider HAPS from mobile sources.

### **Where do Mobile Source HAPS come from?**

Mobile source HAPS come from the evaporation and incomplete combustion of fossil fuel for transportation.

### **Which Mobile Source HAPS are of greatest concern in Fort Collins?**

CDPHE has found that air toxic levels monitored in Denver (2002-2003) and Grand Junction (2001-2002) are higher than levels modeled by the 1996 and 1999 National Air Toxics Assessment. CDPHE's monitored data suggest the "most ubiquitous and/or greatest risk drivers in Colorado include 7 HAPs, five of which are mobile source HAPS: **acetaldehyde, benzene, 1,3 butadiene, formaldehyde, and manganese.**

CDPHE's "2001 Report of Urban Air Toxics in Denver" states that the majority of urban air toxics detected in Denver's air can be attributed to auto emissions. (See <http://apcd.state.co.us/documents/UrbanAirToxicsFinal.pdf>.) Of the few compounds measured that have EPA toxicity benchmarks, formaldehyde, acetaldehyde, 1,3 butadiene, benzene, and carbon tetrachloride are present in Denver's air at levels that may pose health problems. Fort Collins' mobile source toxic emissions may be similar in composition, although perhaps lower in concentration.

According to Environmental Defense's "ScoreCard" Web page evaluating HAPS. (Source: [http://www.scorecard.org/env-releases/hap/county.tcl?fips\\_county\\_code=08069#hazards](http://www.scorecard.org/env-releases/hap/county.tcl?fips_county_code=08069#hazards)), diesel emissions are the HAPS that pose the greatest cancer risk in Larimer County. They state that mobile source HAPS contribute 93% of all "contribution to added cancer risk" in Larimer County.

**Health effects of Mobile Source HAPS:** A May 2002 EPA assessment of the health risks from diesel engine exhaust, which is a mixture of gases and particles., concluded that long-term (i.e., chronic) inhalation exposure is likely to pose a lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure. Short-term (i.e., acute) exposures can cause irritation and inflammatory symptoms of a transient nature, these being highly variable across the population. The assessment also indicates that evidence for exacerbation of existing allergies and asthma symptoms is emerging.

Acetaldehyde, 1,3 Butadiene, Formaldehyde, and carbon tetrachloride are all classified as probable human carcinogens.

Benzene is classified as a human carcinogen. Acute (short-term) inhalation exposure of humans may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings.

### **What are the EPA standards for HAPS?**

There are no air quality standards for Mobile Source HAPs as there are for criteria pollutants, (except for lead, which is discussed elsewhere). EPA and state governments (e.g., California) have reduced emissions of benzene, toluene, and other air toxics from mobile sources by requiring the use of reformulated gasoline and placing limits on tailpipe emissions.

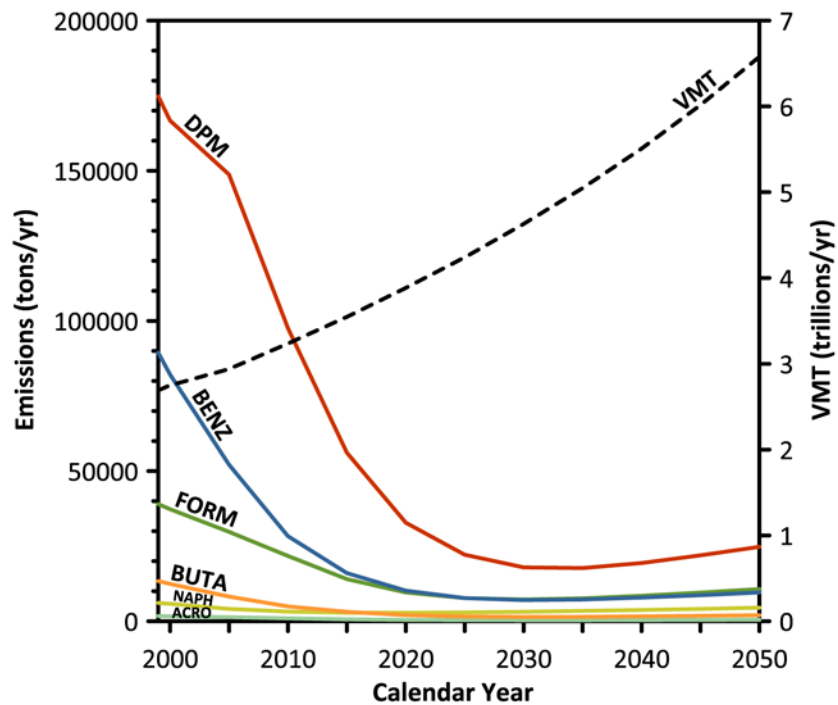
### **What is being done to reduce Mobile Source HAPS?**

In February 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources (**Control of Hazardous Air Pollutants from Mobile Sources**). The rule will limit the benzene content of gasoline

(beginning 2011) and reduce toxic emissions from passenger vehicles (beginning 2010) and gas cans (beginning 2009).

EPA estimates that existing programs will result in ~a 65% reduction of on-road mobile source air toxic between 1999 and 2030, despite large increases in vehicle miles traveled. Taken together, all programs are estimated to reduce the emissions of mobile source air toxics by 330,000 tons in 2030, including 61,000 tons of benzene, and VOC emissions by over 1 million tons. For further information about additional mobile source programs and actions see Mobile Source Air Toxics. (Source: <http://www.epa.gov/ttn/atw/allabout.html>)

**Modeled National Trends in Air Toxics (per EPA's MOVES model)**



Source: 2009 FHWA presentation from [http://www.metro4-sesarm.org/userfiles/file/5%20Victoria%20Martinez-MSAT%20Guidance\\_Stateofpractice.ppt](http://www.metro4-sesarm.org/userfiles/file/5%20Victoria%20Martinez-MSAT%20Guidance_Stateofpractice.ppt)

**INDUSTRIAL SOURCE HAZARDOUS AIR POLLUTANTS (Ind HAPS)**

**What are HAPS?** The 1990 CAAA address a large number of air pollutants that are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects. 187 specific pollutants and chemical groups have been identified as hazardous air pollutants (HAPs). This summary only considers industrial source HAPS; those emitted from small and large commercial and industrial sources.

**Where do HAPS come from?** “Industrial” HAPS come from major industrial facilities and power plans as well as from small sources like dry cleaning, gas stations, and auto body painting shops.

**Which Industrial HAPS are of greatest concern in Fort Collins?  
Larimer County Health Risks from HAPS**

	Contribution to added cancer risk	Contribution to cumulative hazard index
“Industrial” (Point & area sources)	7 %	46%
Mobile	93 %	54%

Source: Environmental Defense’s “ScoreCard” ([http://www.scorecard.org/env-releases/hap/county.tcl?fips\\_county\\_code=08069#hazards](http://www.scorecard.org/env-releases/hap/county.tcl?fips_county_code=08069#hazards)), last update 2005.

- Toluene – The largest permitted industrial source of HAPS emissions in 2010 in Fort Collins is toluene (2.2 tons per year).
- Acrolein - Environmental Defense’s “ScoreCard” indicates acrolein is the HAP that poses the greatest non-cancer hazard in Larimer County. However, no industries in Fort Collins report acrolein emissions.

**2008 TRI Data – HAPS releases for Fort Collins (Source: <http://www.epa.gov/triexplorer>)**

Zip Code	# of reporting sources	On- and Off-site emissions in 2000 (lbs)
80521	0	NA
80524	1	N-hexane- 255 pound
80525	1	Ethylene glycol = 116 lbs Hydrogen Fluoride = 117 lbs
80526	0	NA

**NOTE:** The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. It now covers approximately 650 chemicals. Information is based on monitor data or estimates, and reflect emissions levels, not public exposure levels.

**Health effects:** About ½ of the HAPs listed in the CAA are known or suspected human carcinogens. Toluene is not classifiable as to human carcinogenicity, but is known to affect the central nervous system. Generally, HAPs can damage living tissue, impair the central nervous system, cause birth defects, cancer, or other illness when inhaled or absorbed through the skin. Health effects vary widely depending on several variables. Research suggests the typical person is exposed to more HAPS from small sources that from large sources. Indoor concentrations of HAPS are typically higher than outdoor concentrations.

**What are the EPA standards for HAPS?**

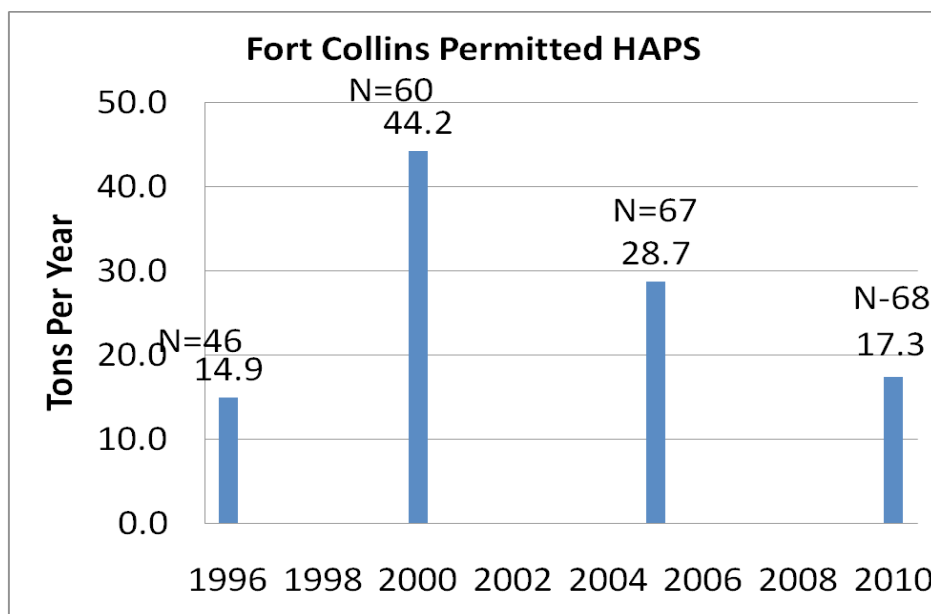
EPA has issued rules limiting emissions covering many categories of major industrial sources, such as chemical



plants, oil refineries, aerospace manufacturers, and steel mills, as well as categories of smaller sources, such as dry cleaners, commercial sterilizers, secondary lead smelters, and chromium electroplating facilities. These National Emission Standards for Hazardous Air Pollutants (NESHAPS), issued under Section 112 of the Clean Air Act (40 CFR Part 63), regulate 187 HAPs from particular industrial sources. These industry-based NESHAPS are also called **Maximum Achievable Control Technology (MACT) standards**. MACT standards are designed to reduce HAP emissions to a maximum achievable degree, taking into consideration the cost of reductions and other factors.

EPA's MACT standards are based on emissions levels already achieved by best-performing similar facilities. This is a straightforward, performance-based approach. Sources subject to MACT standards are classified as either **major sources** (emit 10 tons per year of any of the listed HAPs, or 25 tons per year of a mixture of HAPs) or **area sources** (smaller-size facilities that release less than 10 tons per year of a single HAP or less than 25 tons per year of a combination of HAPs).

[http://www.deq.state.id.us/air/prog\\_issues/toxics/haps.cfm](http://www.deq.state.id.us/air/prog_issues/toxics/haps.cfm)



N= the number of sources

**Local HAPS levels**

The chart above shows HAPS emissions in Fort Collins from permitted sources, per CDPHE. These data include emission from gas stations and auto repair shops as well as industrial facilities.

## **INDOOR AIR POLLUTANTS (including Environmental Tobacco Smoke and Radon)**

### **Why is indoor air pollution an issue?**

- Indoor air is often more polluted than outdoor air.
- Ninety percent (90%) or more of each day is spent in our home, school, workplace, or car.
- The elderly, the very young, pregnant women, and those with allergies, asthma and other respiratory ailments are often the first to notice indoor air pollution problems.
- The Environmental Protection Agency has declared indoor air two to five times more polluted than outdoor air, and placed it among the top five environmental risks to public health.
- Indoor air pollution is among the top five environmental risks to public health, according to EPA.

### **Where does indoor air pollution come from?**

Sources include asbestos from insulation, biological pollutants including molds, carbon monoxide from appliances and heaters, formaldehyde from pressed wood products and building materials, household cleaning products, personal care products, hobby products, lead from old paint and pipes, pesticides, radon gas escaping from basement soils, and smoking cigarettes.

### **Health Effects**

Immediate effects can include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. The likelihood of immediate reactions to indoor air pollutants depends on several factors including age and preexisting medical conditions.

Other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure. These effects, which include some respiratory diseases, heart disease, and cancer, can be severely debilitating or fatal. There is considerable uncertainty about what concentrations or periods of exposure are necessary to produce specific health problems.

Regarding radon, the U.S. Surgeon General has determined that radon is the second leading cause of lung cancer in the US today. Fort Collins is in EPA's Zone 1 (high radon levels). Three of four homes tested for radon have levels above 4 pCi/l (the level at which EPA recommends home owners take action to reduce radon.)

Regarding secondhand smoke, numerous studies have found that tobacco smoke is a major contributor to indoor air pollution, and that breathing secondhand smoke is a cause of disease, including lung cancer, in non-smokers.

### **Standards**

For many indoor air pollutants. OSHA has established health standards which are designed to protect adult workers. In Colorado, CDPHE has regulatory authority over lead and asbestos.

### **Status**

"To address IAQ issues, EPA does not generally regulate, but rather develops and implements voluntary outreach and partnership programs to education the public about IAQ..."

### Education

The City of Fort Collins' role in IAQ involves education, incentive, and regulation. General information is provided to the public through brochures, the Web, community events. The City sells reduced price short-term radon test kits, and offers workshops of radon mitigators.

### Incentive

Zero-interest loans are available to low income residents for radon mitigation systems.

### Regulations

- Every seller shall provide radon information to the party purchasing seller's property prior to the execution of any contract for such property.
- Radon mitigation systems must meet building code requirement
- Starting October 1, 2003, smoking will be prohibited in all public places, with a few minor exceptions.

## **MERCURY**

(Primary info source: <http://www.cdphe.state.co.us/hm/mercury/envhealthissues.htm>.)

### **What is mercury pollution?**

Mercury (Hg) is a naturally occurring metal found throughout the environment. Mercury can be released in the environment from natural sources, such as volcanic and geothermal activity, marine environments or forest fires, or it can be released from man-made sources like coal-fired power plants and other industrial activities. Once mercury enters the environment, it circulates in and out of the atmosphere until it ends up in the bottoms of lakes and oceans. Mercury is among a group of pollutants called persistent bio-accumulative toxins or PBTs. These pollutants “persist” in the environment, meaning that they do not break down or go away. Mercury cannot be destroyed, it cannot be combusted and it does not degrade.

When mercury is deposited in waterways, bacteria convert it to methylmercury. Methylmercury builds up in the tissue of fish, which may then be eaten by wildlife (e.g., eagles, osprey, common loons, river otters, minks) and by people. Although human exposure to mercury occurs most frequently through eating contaminated fish, other human exposures to mercury can occur. People have been exposed to mercury from inhaling mercury vapors from broken fluorescent lamps, gas regulators or even home fever thermometers. There have been cases of mercury exposures from accidental swallowing, but these cases are rare.

### **Where does it come from?**

Recent studies suggest that human activity contributes 50-70% of the mercury in the environment globally (Office of Air Quality and Standards Report to Congress, 1997). In 2005, power plants were estimated to account for about 43% of total U.S. mercury emissions (STAPPA/ALAPCO, 2005) and were the largest uncontrolled source of mercury emissions nationally. Medical and municipal waste incinerators had significantly reduced mercury emissions 90% between 1990 and 1999, due to regulations. In 2009, CDPHE reported that the main source of mercury in Colorado water bodies is air deposition - mercury in the air being deposited in lakes and streams and reservoirs.

### **What are the health effects and environmental effects?**

Mercury is a potent neurotoxin, meaning that it interferes with the way nerve cells function. Mercury poisoning causes a decreased ability to see, hear, talk and walk. It can cause personality changes, depression, irritability, nervousness, and the inability to concentrate. It can also cause damage to the brain, kidneys and lungs. Mercury is a particularly serious problem for pregnant women and children. Fetuses and young children suffer the greatest risk because their nervous systems are still developing. They are four to five times more sensitive to mercury than adults.

Three water bodies in the region have fish consumption advisories due to elevated mercury, including Horsetooth Reservoir, Boyd Lake and Carter Lake.

### **Standards/Regulations**

The CAA Amendments of 1990 require EPA to develop a program to establish national emission standards for hazardous air pollutants, including mercury, to protect the public with an ample margin of safety. In 2005, EPA issued the Clean Air Mercury Rule (CAMR) to permanently cap and reduce mercury emissions from coal-fired power plants by establishing “standards of performance” and creating a market-based cap-and-trade program. In 2007 and 2008, the Air Quality Control Commission adopted regulations more stringent than the federal CAMR that require dramatic reduction of mercury emissions from Colorado coal-fired power plants; 80 percent reductions for existing facilities by 2014, increasing to 90 percent in 2018, and limiting interstate trading. PRPA (Rawhide) and Xcel (Pawnee) voluntarily agreed to achieve to 80% reduction by 2012, sooner than the remaining Colorado facilities deadline of 2014. The AQCC also authorized the installation of monitors to measure mercury emissions from power plants.

### **Voluntary Programs**

CDPHE also has a “Mercury Free Colorado” campaign to inform citizens, businesses and the medical industry about the serious health threat associated with exposures to mercury and to develop strategies to keep mercury out of our environment. This includes mercury switch, thermostat and CFL bulb recycling programs.

**APPENDIX C**  
**Correlation of 2004 AQ Policies**  
**with 2011 AQ Policies**

## AIR QUALITY POLICY UPDATE

This table identifies the relationship between 2004 air quality policies and 2011 air quality policies. Policies highlighted in yellow were included in 2004 City Plan; all others were in the 2004 Air Quality Plan.

Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>PRINCIPLE ENV-1: Continually improve Fort Collins' air quality as the city grows.</b></p> <p><b>Policy ENV-1.1 Air Quality Plan.</b> The City will adopt and implement a comprehensive Air Quality Plan that addresses the following issues:</p> <ul style="list-style-type: none"> <li>Emissions from vehicles</li> <li>Emissions from commerce and industry</li> <li>Wood burning</li> <li>Visual air quality</li> <li>Certain indoor air pollutants and greenhouse gases</li> </ul>	<p><b>Continually improve Fort Collins' air quality.</b></p> <p><b>Policy ENV 8.1 – Implement Air Quality Plan</b> Develop and implement a comprehensive Air Quality Plan that contains:</p> <ul style="list-style-type: none"> <li>Air quality policies that are reviewed and adopted by City Council in conjunction with periodic comprehensive plan updates,</li> <li>Air quality strategies to meet adopted policies that are evaluated and updated prior to each biennial budget cycle,</li> <li>Prioritized air pollutants, and</li> <li>A list of air quality indicators to track future progress.</li> </ul>	<p>The end clause 'as the city grows' was removed at City Council's suggestion.</p> <p>City Plan Policy ENV-1.1 modified to identify contents of Air Quality Plan (process), not specific action areas which will be dictated by the periodic identification of priority pollutants.</p>
<p><b>Policy ENV-1.2 City-Wide approach.</b> The City's primary approach to improving air pollution is to reduce total city-wide emissions over the long term. The City's secondary approach is to assure that localized air pollution exposures conform to adopted health standards.</p>	<p><b>Policy ENV 8.3 – Employ a City-wide Approach</b> Focus on improving air pollution by reducing total city-wide emissions over the long term and assuring that localized air pollution exposures conform to adopted health standards.</p>	<p>Slightly modified to set equal priorities for long-term improvements and complying with standards.</p>
<p><b>Policy AQ-1.3 Pollution Prevention.</b> The City will promote prevention of air pollution at its source as the highest priority approach in reducing air pollution emissions.</p>	<p><b>Policy ENV 8.6 – Prevent Pollution</b> Promote prevention of air pollution at its source as the highest priority approach in reducing air pollution emissions.</p>	<p>New to City Plan, carried forward Policy AQ1.3 with no change from Air Quality Plan</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy AQ-1.4 Priority Pollutants.</b> The City will focus its efforts on reducing high priority air pollutants including ozone, fine particles, mobile source hazardous air pollutants, and greenhouse gases, followed by efforts to reduce medium priority pollutants including indoor air pollutants, nitrogen oxides, PM<sub>10</sub>, industrial hazardous air pollutants, and carbon monoxide.</p>	<p><b>Policy ENV 8.2 – Focus on Priority Air Pollutants.</b> Focus air quality policies and strategies on identified high-priority pollutants to promote program cost-effectiveness. To that end, the City will regularly prioritize air pollutants in conjunction with comprehensive plan updates, considering such criteria as health impacts, air pollution trends, compliance with current state and federal standards, aesthetics, and ability to effect improvements at the local level.</p>	<p>New to City Plan, refined from Air Quality Plan Policy AQ1.4 to clarify process for prioritizing pollutants, rather than naming specific pollutants.</p>
<p><b>Policy AQ-1.5 Toolbox of Approaches.</b> The City will seek to achieve local air quality goals through education, incentives and price mechanisms, and regulation.</p>	<p><b>Policy ENV 8.7 – Involve and Inform the Public about Air Quality</b>  <u>Raise awareness</u> about local air quality, report available air quality information to the public on a regular basis, <u>assist citizens in finding existing local air quality information that is of interest to them</u>, and involve citizens and businesses in programs to improve air quality.</p> <p><b>Policy ENV 8.9 – Air Quality Regulation</b>  The City will use local regulation as needed to improve air quality, in addition to public education and incentives.</p>	<p>“Toolbox of Approaches” policy deleted by Plan Fort Collins Team; considered strategy. As a result, these two new policies were added to cover some of the concepts in “Toolbox of Approaches.”</p>
<p><b>Policy AQ-1.6 Measurement.</b> The City will measure, review, and report the progress of key air quality indicators at least twice prior to the next update of the Air Quality Plan to determine whether action strategies are having the desired effect or need to be amended.</p>	<p><b>Policy ENV 8.7 – Involve and Inform the Public about Air Quality</b>  <u>Raise awareness</u> about local air quality, <u>report available air quality information to the public on a regular basis</u>, <u>assist citizens in finding existing local air quality information that is of interest to them</u>, and involve citizens and businesses in programs to improve air quality.</p>	<p>Detailed reporting commitments will be identified in the Air Quality Plan document.</p>
<p><b>Policy AQ-1.7 Air Quality Information.</b> The City will report available air quality information to the public on a frequent and regular basis. The City will assist citizens in finding existing air quality information that is of interest to them.</p>	<p><b>Policy ENV 8.7 – Involve and Inform the Public about Air Quality</b>  <u>Raise awareness</u> about local air quality, <u>report available air quality information to the public on a regular basis</u>, <u>assist citizens in finding existing local air quality information that is of interest to them</u>, and involve citizens and businesses in programs to improve air quality.</p>	

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy AQ-1.8 Enforcement.</b> The City will support the provision of adequate responsibility, authority, and resources (funding and personnel) to agencies charged with the enforcement of federal, state, county, and local air quality regulations.</p>	<p>Delete</p>	<p><b>Captured in Legislative Policy Agenda,</b> “Support legislation to assure that Federal, State and County agencies have adequate authority and resources (funding and personnel) to enforce air quality regulations.”</p>
<p><b>Policy AQ-1.9 Local Authority.</b> The City will oppose any action of the State Legislature that restricts local government authority to improve air quality beyond minimum State requirements, even as the City recognizes and supports the vital role of the State of Colorado in improving air quality.</p>	<p>Delete</p>	<p><b>Covered in Legislative Policy Agenda as</b> “Oppose legislation that restricts local government authority to improve air quality beyond minimum State or Federal requirements.”</p>
<p><b>PRINCIPLE ENV-2:</b> The City will reduce total motor vehicle emissions of high priority pollutants by focusing on both technology (tailpipe emissions) and behavior (driving patterns).</p>	<p><b>Principle ENV 9: The City will reduce total mobile source emissions by focusing on both technology (i.e., tailpipe emissions) and behavior (i.e. driving patterns).</b></p>	<p>Change “motor vehicle” to “mobile source”. Remove “of high priority”</p>
	<p><b>Policy ENV 9.1 - Promote Alternative and Efficient Transportation Fuels and Vehicles</b>            Promote alternative and efficient transportation fuels and vehicles that improve air quality. Invest in infrastructure throughout the City to support alternative fuel vehicles and promote the use of such vehicles through education and incentives.</p>	<p>New to <i>City Plan</i>. Introduced through Key Policy Choice Discussion. Addresses the technology aspect of mobile sources.</p>
<p><b>Policy ENV-2.1 Actions on Vehicle Miles Traveled.</b>            The City will slow the growth of vehicle-miles of travel by employing strategies that reduce vehicle trip rates, reduce vehicle trip length, and increase vehicle occupancy.</p>	<p><b>Policy T1.1 – Physical organization.</b>            The physical organization of the city will be supported by a framework of transportation alternatives that balances access, mobility, safety, and emergency responses throughout the city while working towards reducing the rate of growth of vehicle miles of travel and dependence on private automobiles.</p>	<p>Concepts covered in Transportation section</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy ENV-2.2 Actions on VMT.</b> To reduce VMT, the City will encourage its customers to use telephone, Internet, or other methods to register for City offerings and purchase tickets. The City will also minimize the need for driving by organizing offerings with a neighborhood focus, so participants don't have to travel long distances.</p>	<p><b>Policy T3.4 – Travel Demand Management</b> Manage development in a manner that minimizes automobile dependence, maximizes choice among other modes of local and regional travel, and encourages the use of telecommunications.</p>	<p>Concepts covered in the Transportation section</p>
<p><b>Policy ENV-2.3 Price Mechanisms.</b> The City will use price mechanisms of the free market to help shift citizen and business choices toward actions that reduce vehicle miles traveled, including identifying and removing hidden cost subsidies to motor vehicle users, employing economic incentives and disincentives, and other market approaches.</p>	<p><b>Policy T 27.1 – Transportation Mode Management</b> Promote local and regional transportation options that reduce dependence on automobile trips and promote alternative travel modes (e.g. carpool, regional vanpool, telecommuting, electronic access, new vehicle types, vehicle sharing, transit, walking, biking, employee programs, market pricing, etc.)</p>	<p>Concepts covered in the Transportation section</p>
<p><b>PRINCIPLE AQ-12 The City will reduce tailpipe and evaporative emissions from highway and non-road mobile sources.</b></p>	<p><b>Principle ENV 9: The City will reduce total mobile source emissions by focusing on both technology (i.e., tailpipe emissions) and behavior (i.e. driving patterns).</b></p>	<p>Covered under the principle "The City will reduce total mobile source emissions by focusing on both technology (tailpipe emissions) and behavior (driving patterns)."</p>
<p><b>Policy ENV-2.4 Actions on Tailpipe Emissions.</b> The City will employ strategies to reduce per-mile emissions such as promotion of car maintenance, mechanic training, encouraging use of alternative fuels, purchasing clean vehicles, use of clean lawn and garden equipment, prohibition of smoking vehicles, consideration of a local emissions testing and repair program, and reducing traffic delays.</p>	<p>Delete</p>	<p>These are implementation strategies, not policy language. Strategies to reduce tailpipe emissions will be listed in the AQP.</p>
<p><b>Policy AQ 12-1 Non-Road Emissions.</b> The City will employ incentive programs and other strategies to reduce emissions from lawn and garden equipment, small and large construction equipment, and other non-road engines.</p>	<p>Delete</p>	<p>These are implementation strategies, not policy language. Strategies to reduce tailpipe emissions will be listed in the AQP.</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>PRINCIPLE ENV-3</b> By 2010 the City will reduce greenhouse gas emission 30% below predicted worst-case 2010 levels in order to reduce the impact of the Fort Collins community on global warming.</p>	<p><b>Principle ENV 11:</b> To help engender a more economically efficient, successful, and resilient community, and to reduce the impact of the Fort Collins community on global climate change, the Fort Collins community will reduce greenhouse gas emissions 20% below 2005 levels by 2020 and 80% by 2050.</p>	<p>Formerly <i>City Plan Principle ENV-3</i>. Adds text identifying the need to reduce carbon emissions and updates the GHG goals. Now in new "Climate" section of City Plan.</p>
<p><b>Policy ENV-3.1. Local Action Plan.</b> The City will adopt and implement a local action plan to reduce greenhouse gas emissions.</p>	<p><b>Policy ENV 11.1 – Implement and Update the Climate Action Plan</b> Adopt, implement, report progress on and periodically update a Climate Action Plan and consider low impact carbon scenarios in all major City planning efforts that impact greenhouse gas emissions.</p>	<p>This new policy combines former <i>City Plan Policies ENV 3.1-Local Action plan and ENV 3.2-Biennial Report</i>. Now in new "Climate" section of City Plan.</p>
<p><b>Policy ENV-3.2. Biennial Report.</b> The City Manager will prepare a biennial report outlining the City's progress on achieving its greenhouse gas reduction goal and recommending future actions.</p>	<p><b>Policy ENV 11.1 – Implement &amp; Update the Climate Action Plan</b> Adopt, implement, report progress on and periodically update a Climate Action Plan and consider low impact carbon scenarios in all major City planning efforts that impact greenhouse gas emissions.</p>	<p>This new policy combines former <i>City Plan Policies ENV 3.1-Local Action plan and ENV 3.2-Biennial Report</i>. Now in new "Climate" section of City Plan.</p>
	<p><b>Policy ENV 11.2 – Update Regulations</b> Regularly update codes to include effective environmental and resource conservation provisions to reduce greenhouse gas emissions by increasing energy-efficiency of buildings.</p>	<p>New policy in new "Climate" section of City Plan.</p>
	<p><b>Principle ENV 12: The City will plan and integrate strategies to adapt to a changing climate into City operations, and will promote climate adaptation actions in the community.</b></p>	<p>New policy in new "Climate" section of City Plan.</p>
	<p><b>Policy ENV 12.1 – Develop a Climate Adaption Plan and Strategies for Municipal Operations</b> Integrate strategies to adapt to a changing climate into City operations and promote adaptation actions in the community.</p>	<p>New policy in new "Climate" section of City Plan.</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>PRINCIPLE AQ-13</b> The City will reduce commercial and industrial emissions in the Fort Collins area, focusing on priority pollutants.</p>	<p><b>Policy ENV 8.5 – Focus on Sources</b> Rather than addressing pollutants individually, reduce air pollution by developing strategies that focus on key sources of air pollution (i.e., on-road, non-road, commercial and industrial, and residential), recognizing that multiple pollutant reductions can be achieved this way.</p>	<p>New to <i>City Plan</i>; This policy summarizes and replaces the following principles and policies that specifically refer to each sources areas; AQ12.1 non-road emissions; AQ13- commercial and industrial emissions, AQ14- residential emissions.</p>
<p><b>Policy AQ-13.1 Business Assistance.</b> The City will offer programs and assistance to local businesses interested in reducing their environmental impacts such as the voluntary business Climate Wise program.</p>	<p><b>Policy ENV 11.3 – Provide Assistance</b> Offer education, programs and other assistance to citizens and local businesses interested in reducing their environmental impacts, such as the voluntary Climate Wise program.</p>	<p>This policy is based on existing AQ policy language on business assistance (AQ13-1). Now proposed in <i>Climate</i>” section of <i>City Plan</i>.</p>
<p><b>PRINCIPLE AQ-14</b> The City will reduce residential emissions of priority pollutants in the Fort Collins area.</p>	<p><b>Policy ENV 8.5 – Focus on Sources</b> Rather than addressing pollutants individually, reduce air pollution by developing strategies that focus on key sources of air pollution (i.e., on-road, non-road, commercial and industrial, and residential), recognizing that multiple pollutant reductions can be achieved this way.</p>	<p>New to <i>City Plan</i>; This policy summarizes and replaces the following principles and policies that specifically refer to each sources areas; AQ12.1 non-road emissions; AQ13- commercial and industrial emissions, AQ14- residential emissions.</p>
<p><b>Policy AQ 14-1 Residential Wood Smoke.</b> The City will reduce wood smoke emissions and the number of non-certified wood stoves and fireplaces in the Fort Collins area by, for example, insuring compliance with existing regulations, promoting alternatives to wood burning, and helping to resolve neighborhood wood smoke conflicts.</p>	<p><b>Policy ENV 8.2 – Focus on Priority Air Pollutants.</b> Focus air quality policies and strategies on identified high-priority pollutants to promote program cost-effectiveness.....</p> <p><b>Policy ENV 8.5 – Focus on Sources</b> Rather than addressing pollutants individually, reduce air pollution by developing strategies that focus on key sources of air pollution (i.e., on-road, non-road, commercial and industrial, and residential)....</p>	<p>Concepts of Policy AQ 14-1 are covered by the Priority Pollutants (fine particles) policy and the Focus on Sources (residential emissions) policy. Strategies can be listed in AQ Plan.</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy AQ-14.2 Ozone Reduction.</b> The City will reduce evaporative emissions associated with residential activities (lawn mowing, fueling, paint selection and storage) by, for example, educating citizens and providing incentives.</p>	<p><b>Policy ENV 8.8 – Seek Ozone Compliance</b> Fort Collins and other North Front Range communities do not meet the National Ambient Air Quality Standard for ozone and have therefore been designated as a non-attainment area under the Clean Air Act. Participate in planning for compliance within the non-attainment area and develop strategies to reduce ozone precursor emissions in Fort Collins.</p>	<p>New to <i>City Plan</i>; refined from <i>Air Quality Plan Policy AQ14.1</i> on ozone reduction. This policy broadens the scope beyond residential.</p>
<p><b>PRINCIPLE AQ-15 Recognizing the strong relationship between air quality and human health, the City will, within the scope of its ability, strive to protect and improve the air so it is healthy to breathe and free of levels of pollutants that harm human health.</b></p>	<p><b>Principle ENV 10: The City will, within the scope of its ability, strive to protect and improve the air so it is healthy to breathe and free of levels of pollutants that harm human health (and public welfare).</b></p>	<p>New to <i>City Plan</i>; refined from <i>Air Quality Plan Principle AQ15</i>.</p>
<p><b>Policy AQ-15.1 Health Partnerships.</b> The City will solicit the cooperation and active participation of a diverse range of knowledgeable health professionals and members of the environmental health community to guide the development of policies so that they reflect priority health issues.</p>	<p><b>Policy ENV 10.1 – Forge Health Partnerships</b> Because air pollution strongly affects human health, consult with a diverse range of experts from the public health and environmental health communities to assure City policies and strategies address priority health issues.</p>	<p>New to <i>City Plan</i>; refined from <i>Air Quality Plan Policy AQ15.1</i> to shorten and broaden scope of policy recognizing the strong relationship between air quality and human health.</p>
<p><b>Policy AQ-15.2. Seek Solutions.</b> The City will work to protect air quality by seeking solutions to high priority health-related air quality issues using already adopted health standards.</p>	<p><b>Policy ENV 8.2 – Focus on Priority Air Pollutants.</b> Focus air quality policies and strategies on identified high-priority pollutants to promote program cost-effectiveness. To that end, the City will regularly prioritize air pollutants in conjunction with comprehensive plan updates, considering such criteria as health impacts, air pollution trends, compliance with current state and federal standards, aesthetics, and ability to effect improvements at the local level.</p>	<p>The new policy gets at the 2 key concepts: 1) focus on high priority pollutants and 2) use already-adopted health standards.</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy AQ-15.3 Air Toxics Coordination.</b> The City will work with County, State and Federal health officials to reduce the health risks posed by toxic air pollutants.</p>	<p><b>Policy ENV 10.1 – Forge Health Partnerships</b> Because air pollution strongly affects human health, consult with a diverse range of experts from the public health and environmental health communities to assure City policies and strategies address priority health issues.</p> <p><b>Policy ENV 8.4 – Coordinate Regionally</b> Work with local and regional partners to improve air quality, recognizing that air pollution does not follow jurisdictional boundaries.</p>	<p>The concepts of AQ-15.3 are covered in the Health Partnerships and the Coordinate Regionally policies.</p>
<p><b>Policy AQ-15.4 Indoor Air Quality.</b> Because indoor air pollution can be a serious issue, the City will educate and encourage its residents to reduce their exposure to indoor air pollution.</p>	<p><b>Policy ENV 8.2 – Focus on Priority Air Pollutants.</b> Focus air quality policies and strategies on identified high-priority pollutants to promote program cost-effectiveness. To that end, the City will regularly prioritize air pollutants in conjunction with comprehensive plan updates, considering such criteria as health impacts, air pollution trends, compliance with current state and federal standards, aesthetics, and ability to effect improvements at the local level.</p> <p><b>Policy ENV 8.7 – Involve and Inform the Public about Air Quality</b> <u>Raise awareness</u> about local air quality, report available air quality information to the public on a regular basis, <u>assist citizens in finding existing local air quality information that is of interest to them</u>, and involve citizens and businesses in programs to improve air quality.</p>	<p>The concepts of AQ-15.4 are covered in Priority Pollutants (indoor air quality is a priority pollutant) and Inform the Public policies.</p>
<p><b>PRINCIPLE AQ-16 The City will lead by example in efforts to improve local air quality.</b></p>	<p><b>Policy ENV 11.4 – Lead by Example and Reduce Municipal Greenhouse Gas Emissions</b> Lead by example in efforts to improve local air quality by identifying and implementing best practices in municipal operations to prevent air pollution at its source and reduce greenhouse gas emissions from municipal operations 20% below 2005 levels by 2020.</p>	<p>Moved by Plan Fort Collins Team to the "Climate" Section and combined with municipal GHG goal.</p>

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Principle / Policy in 2004 Air Quality Plan	Principle / Policy in 2011 Air Quality Plan	Notes
<p><b>Policy AQ-16.1 Lead by Example.</b> The City will make efforts to reduce and mitigate its own air pollution emissions before asking or requiring others to reduce and mitigate their emissions.</p>	<p><b>Policy ENV 11.4 – Lead by Example and Reduce Municipal Greenhouse Gas Emissions</b> Lead by example in efforts to improve local air quality by identifying and implementing best practices in municipal operations to prevent air pollution at its source and reduce greenhouse gas emissions from municipal operations 20% below 2005 levels by 2020.</p>	<p>Moved by Plan Fort Collins Team to the “Climate” Section and combined with municipal GHG goal.</p>
<p><b>Policy AQ-16.2 Cooperation.</b> The City will initiate and cooperate with other efforts to improve air quality, while avoiding unproductive duplication of effort. Others include government entities (other City departments, county, regional, state, national, global), the non-profit sector, businesses, and educational institutions.</p>	<p><b>Policy ENV 8.4 – Coordinate Regionally</b> Work with local and regional partners to improve air quality, recognizing that air pollution does not follow jurisdictional boundaries.</p>	<p>New policy. “Regionalism” often comes up at City Council.</p>
<p><b>Policy AQ-16.3 Innovations.</b> The City will consider adoption of successful air quality improvement strategies in effect elsewhere, including municipal practices, public information campaigns, incentives and price mechanisms, and regulations.</p>	<p><b>Policy ENV 11.4 – Lead by Example and Reduce Municipal Greenhouse Gas Emissions</b> Lead by example in efforts to improve local air quality by <u>identifying and implementing best practices in municipal operations</u> to prevent air pollution at its source and reduce greenhouse gas emissions from municipal operations 20% below 2005 levels by 2020.</p>	<p>This is a strategy more than a policy and will be included as an operational principle in AQ.</p>

## **APPENDIX D**

# **“Long List” Air Quality Strategies**

This appendix contains the Long List of air quality implementation strategies that could later be developed into funding proposals. This is a living document, a snapshot of current ideas that will be updated regularly. Suggestions offered during the 2011 Air Quality Plan public comment period have been included in each section.

Each strategy that appears on this list should be regarded as an idea for further consideration, rather than intent to implement it. Implementation of any strategy is ultimately approved by City Council either through adoption of City budgets for program implementation or through Council actions adopting policy or ordinance, accepting grant funding, etc.

## I. MOBILITY MANAGEMENT TO REDUCE EMISSIONS FROM DRIVING

### ***a) Incorporate Mobility Management Best Practices into the City's transportation plans and programs***

Reducing the vehicle miles traveled (VMT) growth rate has been identified as an important factor in meeting Fort Collins' goals for land use, transportation, air quality, and livability. The City intends that its overall VMT reduction program meet or exceed the performance of similar programs in comparable cities. A report was prepared in 2006 to gauge the City's VMT-reduction efforts compared with best practices among cities of comparable size and land use and transportation limitations. It included a scan of then-current practice and various recommendations. An implementation summary from the best-practices report appears at the end of this Appendix. This strategy would select and implement mobility management actions from that list, in cooperation with the City's Transportation Planning Department. A Commute Trip Reduction program has already been selected for further development in to a funding/implementation proposal.

Least-Cost Planning (or Integrated Planning) is one of the identified best practices which should be considered for implementation in the next Transportation Master Plan update. It is an approach to transportation resource planning that:

- Considers demand management solutions equally with strategies to increase capacity.
- Considers all significant impacts (costs and benefits), including non-market impacts.

Least Cost Planning reflects best practices in transport evaluation and planning. Current planning practices tend to overinvest in road and parking capacity and undervalue TDM strategies. When all impacts are considered, TDM is often the most cost effective solution to transportation problems. Least-Cost Planning first developed in the field of energy planning, when decision-makers realized that it could be cheaper to invest in conservation than to build additional electrical generation and distribution capacity. The same approach is now being applied to transportation planning.

For example, Least Cost Planning means that transit improvements, rideshare programs, or road pricing can be implemented instead of roadway capacity expansion, if they improve mobility at a lower total cost, including costs to governments, businesses, consumers and the environment. If a particular demand management strategy can reduce traffic or parking demand by 10%, it is considered to be worth at least as much as a 10% increase in road or parking facility capacity, and often more when indirect impacts, such as environmental and safety impacts, are considered.

Another best practice to consider is Low Carbon Transportation Plans for metropolitan regions. Low Carbon Transportation Plans would chart a course for short- and long-term greenhouse gas (GHG) reductions by specifying a comprehensive set of policy, infrastructure and funding measures, assessing full costs and co-benefits, modeling GHG emission reductions and identifying key implementation steps. An effective plan would likely include public transportation; bicycling and walking infrastructure; smart growth land-use planning; efficient vehicles; low carbon fuels; and economic measures such as congestion pricing.

**b) *Combine Transport Utility Fee and Trip-reduction Program***

A Transportation Utility Fee (TUF) would charge both households and businesses a fee based on their respective vehicle-trip production rates. For example, households may generate 15 trips/day, while a mail store may generate 300 trips/day. A citizen election would be needed to approve a TUF. A TUF could be coupled with a trip-reduction program, in which households and business could voluntarily reduce their trip generation rates in return for partial reduction [or rebate] of their TUF. For example, a vehicle-free household may reduce their TUF to near-zero, or a business could establish a commute-trip reduction program to lower its TUF.

**c) *Revisit subsidy study and communicate results to the public***

In 1999, Fort Collins partially completed a study to evaluate the current level of subsidy to private automobile travel in comparison with subsidies to other travel modes such as transit, cycling, or walking. The approach is to compare local government expenditures and income related to each travel mode. Any excess expenditure relative to income is called subsidy. This information would provide a level playing field among travel modes.

**d) *Trip-reduction programs for school & campus & work trips***

Partner with North Front Range MPO to promote VMT reduction at schools and campuses, e.g., carpooling for school-of-choice families, extension of Safe-Route-to School program to all modes. A commute trip reduction program is already a component of Fort Collins 2008 Climate Action Plan.

**e) *City follow-through on City Administrative Policy to reduce employee and customer vehicle miles traveled***

Current policy calls for departments to follow VMT-reduction & vehicle-purchase guidelines. This strategy proposes an internal City program to assist department managers to address the policy. Implementation would require support from the City Manager.

**f) *Public comment: Provide information about the amount of CO2 that is saved or avoided by walking to work or riding your bike.***

## II. IMPROVE INDOOR AIR QUALITY

**a) *Radon- increase the number of home mitigations in homes with high radon tests***

“Acceptance rate,” is the fraction of high radon tests that result in mitigation, now thought by some to be as low as 10%. Use State Indoor Radon Grant funds to determine the current acceptance rate and to study the effectiveness of one or more intervention methods to increase acceptance rate. Intervention could be mailing information to homes where radon tested high, with confidentiality provided by Air Chek.

**b) *Enhance the zero interest loan program for radon mitigation loans***

Enhance the zero interest loan program by increasing the funding pool available for radon mitigation loans and by increasing the limit on loan amount.

**c) *Public comment: Provide displays about actions to improve air quality (green cleaning, low VOC paint, radon, etc.) at home improvement stores.***

### III. REDUCE TAILPIPE EMISSIONS

**a) Inspection/Maintenance- - partner with CDPHE on public outreach**

Assist CDPHE in informing the public about vehicle emission impacts, the importance of car maintenance, and providing mechanic training opportunities.

**b) Persuade CSU to close the loophole that allows students to ignore I/M requirements**

The state Inspection and Maintenance (I/M) program requires that all vehicles being driven in the program area (including Fort Collins again as of November 2010) for more than 90 days/year be tested. However, there is little-to-no enforcement of this requirement for vehicles not registered locally. This is especially true at CSU. This program would work together with CSU Parking Services to raise awareness of the emissions test requirement for students, perhaps using "OOPS" tickets (voluntary warnings.)

**c) Anti-idling ordinance**

EPA estimates that heavy-duty vehicles consume, annually, over 950 million gallons of diesel fuel, and emit approximately 200,000 tons of NOx and over 10 million tons of carbon dioxide (CO2). Anti-Idling ordinances can play an important role in reducing truck idling and emissions. Approximately fifteen states and dozens of local jurisdictions currently have idling laws (i.e. Denver limits idling to 5 minutes each hour with exceptions for safety.) EPA has developed a model state idling law that allows up to 5 minutes of idling in any 60 minute period, except during required loading and unloading and specified exemptions for health, safety and law-enforcement, and allows up to 30 minutes of idling during periods of loading and unloading, such as distribution centers, retail stores and ports. Fort Collins could study then, if warranted, implement a law to limit idling.

**d) Diesel anti-smoking ordinance**

Diesel "defiant" vehicles and "chipped" diesel vehicles are those whose owners install non-certified computer chips to override the vehicle On Board Diagnostic (OBD) system for the ostensible purpose of improving either fuel economy or performance. However, placing non-certified chips in the OBD systems is considered illegal tampering under federal law. Poorly tuned "chipped" systems can emit excessive amounts of smoke as a result of too much unburned fuel. The City would encourage the state to find ways to address this problem. In addition the City would explore best-practice ordinances that address smoking diesel vehicles. Although state statute forbids excessive diesel smoke, the penalties are trivial and it is not enforced. However a local ordinance such as those in effect in Denver and Boulder could have much more severe penalties for excessive diesel smoke.

**e) Reformulated gasoline, to enable PZEV, which requires it**

A Partial Zero Emissions Vehicle (PZEV) has zero evaporative emissions, meets SULEV (Super Ultra Low) emission standards, and has a 15-year (or at least 150,000-mile) warranty. In order to meet PZEV standards, it must have access to reformulated gasoline. Currently, vehicles that meet PZEV standards are only available in states that have adopted the California clean car standards (CA, ME, MA, NY OR, and VT). Other states such as AK, CT, NJ, PA, RI and WA are considering adopting these standards.

**f) Driver training for fleet and new drivers - - how to drive for conservation and low pollution**

The Auto\$mart Student Driver Education Program is a Canadian program that provides classroom tools to teach students how to drive more safely while saving \$ and protecting the environment. On average, participants reported that fuel-efficient driving behaviours had increased by 5-10%, and by more than 20% for the key practices that were stressed. Knowledge of fuel economy improved by 13%. Key attitudes towards fuel efficient and fuel-efficient driving improved by 20%.

A social marketing study was conducted on driving behaviors of postal workers in the Netherlands. Tips

on how to drive more efficiently were provided, followed by weekly feedback on gasoline consumption. This resulted in a 7.3% energy savings, compared to the control group.

**g) Public comments:**

- Set up care tire/air pressure station/ fill up and education stand at large centers like grocery stores
- Add public access to CNG vehicle re-fueling stations
- Complete truck by-pass around/north of Fort Collins
- Make zero emissions vehicles available to rent in Fort Collins
- Make it against the law to modify diesel trucks to blow black smoke. Unburnt hydrocarbon emissions have carcinogens that are toxic – test vehicles on the street.
- Provide assistance to those considering a vehicle purchase with selecting the most efficient vehicle that can meet their needs.
- Provide rewards for complying with emissions testing

## IV. REDUCE EMISSIONS FROM NON-ROAD MOBILE SOURCES

**a) Education and incentives to reduce emissions from lawn & garden equipment**

In Colorado's ozone non-attainment area, residential lawn and garden (L&G) equipment is responsible for an estimated 2.5% of VOCs and commercial L&G for an estimated 6%, in 2010. The City has offered a residential lawn mower rebate program for almost 10 years. This strategy would continue the residential program and add incentives for commercial and residential purchase of 4 cycle L&G/snow equipment instead of two-cycle. It would also seek other ways to assist commercial L&G reductions, perhaps through promotion of low smoke two-stroke oils, encouraging replacement of lawns by trees or xeriscape (as proposed in Houston) and encouraging No Mow days on Ozone Action Alerts days.

**b) Modify City procurement guidelines for products and services that would reduce non-road emissions**

As one recent example, the state of New York DOT incorporated Green Construction Practices into contract specifications for all projects let after September 2009. The four key elements required in the new policy for all new construction contracts include:

- Using ultra-low sulfur diesel (ULSD) fuel in all non-road diesel construction equipment.
- Banning the idling of diesel-powered construction equipment for longer than three minutes, with some exceptions.
- Restricting diesel exhaust fumes from buildings and/or other facilities, such as schools, hospitals and housing.
- Including more measures to control dust at the project site.

The City could also require that construction equipment on City-sponsored jobs must meet a designated emissions standard. This could be made easier for contractors if the City were to develop its own test and testing capability locally.

## V. REDUCE EMISSIONS FROM RESIDENTIAL WOOD COMBUSTION

**a) Ordinance to reduce the impact of outdoor wood burning, e.g. in chimineas**

Review best practices in other cities and, if appropriate, adopt a restriction on outdoor wood burning. Poudre Fire Authority may be a partner in this effort.

**b) Ordinance to remove/replace non-certified stove/insert at point of sale**

Such an ordinance would increase the rate or turn-over from non-certified wood burning units to either removal of the unit or replacement with a certified unit.



## VI. REDUCE VOLATILE ORGANIC COMPOUNDS [VOC] THAT CONTRIBUTE TO OZONE

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**a) Partner with RAQC & CDPHE on public outreach for VOC reduction**

Provide public information [simple tips] and incentives to reduce ozone precursor emissions, e.g., “stop at the click” partnership with petroleum marketers, gas cap exchange, “Mow when the sun is low,” gas can trade in, lawnmower rebates, exchanges. Grant funds may be available for this.

**b) Public comment: Work with the City Forester to have VOC emission considered as optimal tree lists are developed for the city.**

## VII. REDUCE FUGITIVE DUST

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**a) Fugitive Dust Initiative**

This strategy would evaluate and compare current City practices with best practices, with respect to unpaved roads and alleyways, dust control on paved roads, including residue from deicing operations, track-out of dirt from construction sites, and control of dust from disturbed soils.

**b) Public comment: Require roads to be wet down during construction to reduce dust.**

## VIII. JOINT PROPOSAL FOR CLIMATE AND AIR QUALITY:

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**a) Expand recycling, e.g., add yard waste**

This strategy would reduce the volume of land filled materials, and would be implemented within the City's solid waste reduction program.

**b) Public comment: Implement a climate-wise program for multi-family residents.**

## IX. IMPROVE DATA COLLECTION

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**a) Expand the air quality monitoring program**

This strategy would evaluate current air monitoring in Fort Collins in order to fill any significant gaps in needed air quality information.

**b) Study to determine statistics on all vehicles registered in the City**

Until recently, the average age of vehicles in Colorado was ~ 10 years and fleet turn-over progressed at a regular pace. In light of the slowing economy, citizens may be holding onto to their vehicles longer. This project would compile info from DMV on the range of model years and vehicle type to enable better emissions analysis and targeting of programs to certain vehicle ages or types.

## X. PROMOTE INDIVIDUAL ACTION THROUGH INFORMATION & OUTREACH

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### a) *Public comments:*

- Publish a series of articles informing the broad public with regard to priority pollutants
- Coordinate with the FortZED Community Energy Challenge to leverage citizen outreach opportunities.

## RELATIONSHIP OF LONG LIST TO AIR QUALITY POLICIES

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Table A (see next page) shows how the Long List strategies relate to the air quality policies contained in City Plan. Individual strategies have been grouped into categories for clarity.

**Table A. Air Quality Policies Addressed by Long List Categories (each category has several strategies)**

<b>AIR QUALITY POLICIES ADDRESSED BY LONG LIST CATEGORIES</b>								
	Mobility Management	Indoor air quality	Mobile sources	Non-road mobile sources	Residential wood burning	Volatile organic compounds	Fugitive dust	Data collection
<b>Principle 8: Continually improve Fort Collins air quality as the city grow</b>								
ENV 8.1 – Implement Air Quality Plan	X	X	X	X	X	X	X	X
ENV 8.2 – Focus on Priority air Pollutants	X	X	X	X	X	X	X	X
ENV 8.3 – Employ city-wide approach	X	X	X	X	X	X	X	X
ENV 8.4 – Coordinate Regionally	X	X	X			X		
ENV 8.5 – Focus on sources	X	X	X	X	X	X	X	
ENV 8.6 – Prevent Pollution	X	X	X	X	X	X	X	
ENV 8.7 – Involve and inform the public about air quality	X	X	X		X	X		X
ENV 8.8 – Seek Ozone Compliance	X		X	X		X		
ENV 8.9 – Air Quality Regulation		X	X		X		X	
<b>Principle 9: The City will reduce total mobile source emissions by focusing on both technology (i.e., tailpipe emissions) and behavior (i.e., driving patterns)*</b>								
ENV 9.1 – Promote alternative and efficient Transportation fuels and vehicles			X	X				
<i>Transportation Master Plan*</i> • <i>Mobility Options</i> • <i>Increase Awareness</i>	X							
<b>ENV 10: ...strive to protect and improve the air so it is healthy to breathe and free of pollutants that harm human health and public welfare</b>								
ENV 10.1 – Forge Health Partnerships		X						

\* Transportation Master Plan contains those policies that focus on travel behavior in two sections. The Mobility Options section deals with infrastructure for public transit, bicycling and walking. The Increase Awareness section deals with encouraging travelers to chose them.

## **APPENDIX E**

# **History of Fort Collins Air Quality Program**

Prior to the adoption of the City's first official air quality plan, City programs addressed carbon monoxide from cars, wood smoke in neighborhoods, and control of new emission sources through the development review process. The City first adopted its own air quality plan in 1993 in response to City Council priorities that called for expansion and emphasis of the Air Quality Element of the City's Framework for Environmental Action.

The City Council appointed an Air Quality Task Force whose members had a key role in development of the plan: they had the responsibility to recommend the Plan to the Planning and Zoning Board and to City Council. Many interest groups were affected by the Plan because it would amend both the City's Comprehensive Plan and the State Implementation Plan. Interest groups included Fort Collins area civic, business, and environmental groups, City Council Boards (Planning and Zoning Board, Transportation Board, Natural Resources Advisory Board), the North Front Range MPO, County and State Health Departments, and USEPA.

The plan identified high priority pollutants and sources, and set forth goals, objectives, and action strategies for each. Action strategies included policies, incentive programs, performance standards, ordinances, etc. The plan supplemented the State Implementation Plan for carbon monoxide and the 1985 Air Quality Monitoring and Control Plan for the City of Fort Collins.

The new Air Quality Strategic Plan (consisting of the Air Quality Policy Plan and the Air Quality Action Plan) addressed three issues. First, it provided a more comprehensive planning framework to protect air quality over the long term. Second, it integrated existing strategies and programs with new and/or long-term strategies. Finally, it expanded air quality programs into new areas of concern, such as visibility reduction, air toxics, and greenhouse gasses.

Since the adoption of the first Air Quality Action Plan, it has been periodically updated by City Council. Table B.1 shows the timeline of City air quality efforts.

**Table B.1 Air Quality Planning Efforts**

AIR QUALITY PLANNING EFFORTS	
Year	What
1985	Fort Collins Air Quality Monitoring and Control Plan
1992	Framework for Environmental Action (Air Quality Element)
1993	Air Quality Policy Plan (AQPP) adopted
1994-'95	Air Quality Action Plan (AQAP)
1995	Congestion Management Plan adopted, with complementary goals to reduce VMT growth
1996-'98	Air Quality Action Plan Update
1997	City Plan adopted (air quality policies incorporated)
1999	Air Quality Action Plan Update
2000-'03	Air Quality Action Plan Update
2004	2004 Fort Collins Air Quality Plan (combining policy and implementation)
2011	2011 Air Quality Plan incorporates Council-adopted air quality policies and the remainder of the Plan is updated administratively.

**APPENDIX F**  
**Resolution 2011-015 Adopting City Plan,**  
**including the Air Quality Policies**



RESOLUTION 2011-015  
OF THE COUNCIL OF THE CITY OF FORT COLLINS  
ADOPTING REVISIONS TO “CITY PLAN,” THE CITY’S  
COMPREHENSIVE PLAN

WHEREAS, in 1996 and 1997, the City Council, through an extensive planning effort, created and adopted a new comprehensive plan for the City known as “City Plan,” which consists of various additional subparts and elements, among them, the Transportation Master Plan and its related Master Street Plan, and the Pedestrian Plan; and

WHEREAS, City Plan contemplates periodic review and update to ensure that, as the City’s principal planning policy document, it was meeting current needs and expectations; and

WHEREAS, in keeping with the City Plan goal of periodic update, in 2010 the City staff embarked upon a process to prepare major updates to City Plan, the Transportation Master Plan, the Master Street Plan, and the Pedestrian Plan; and

WHEREAS, City staff, having completed the update effort with the assistance of consultants, and having conducted an extensive public outreach process, has presented proposed amendments to City Plan, the Transportation Master Plan, the Master Street Plan, and the Pedestrian Plan for consideration; and

WHEREAS, these proposed amendments have been reviewed by the Planning and Zoning Board and the Transportation Board and have received favorable recommendations; and

WHEREAS, City Council has determined that the proposed amendments embody the vision of the City Council to be innovative by leading and serving as a model for other communities, and to be sustainable by focusing on long-term human, economic, and environmental health of the City and by attempting to connect the community both physically, technologically, and socially; and

WHEREAS, City Council has further determined that the 2010 planning effort respects and advances the sustainability tenets of the City of economic, environmental, and human analysis; and

WHEREAS, City Council has determined that the 2010 “Plan Fort Collins” effort to update the City’s Comprehensive Plan is in the best interests of the citizens of the City; and

WHEREAS, accordingly, City Council has determined that the proposed revisions to City Plan, which is the City’s Comprehensive Plan, should be adopted.

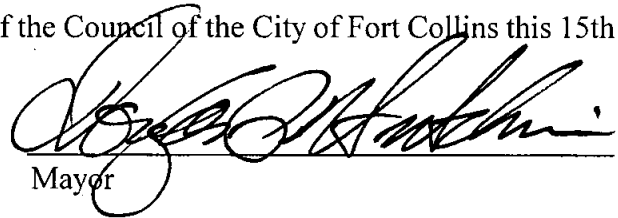
NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS as follows:

Section 1. That the City Council hereby finds that the existing Comprehensive Plan known as "City Plan" is in need of amendment and that the 2010 "Plan Fort Collins" effort to update the City's Comprehensive Plan is in the best interests of the City.

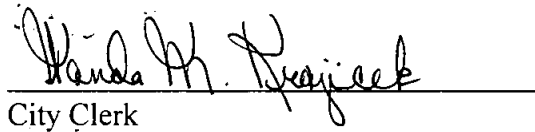
Section 2. That the City Council hereby finds that the "Plan Fort Collins" proposed amendments to City Plan will promote the public welfare and will be consistent with the vision, goals, principles and policies as previously established in City Plan and as presently enunciated by the City Council through these amendments.

Section 3. That the City's Comprehensive Plan, known as "City Plan", dated February 15, 2011, a copy of which is on file in the Office of the City Clerk, is hereby adopted.

Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 15th day of February, A.D. 2011.

  
\_\_\_\_\_  
Mayor

ATTEST:

  
\_\_\_\_\_  
City Clerk

