

# City of Fort Collins



## WOOD SMOKE PROGRAM REVIEW

*Prepared by*

Intergovernmental Wood Smoke Committee

*For*

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# CONTENTS

<b>Executive Summary</b> .....	i
<b>I. Introduction</b> .....	1
<b>II. Existing City Wood Smoke Program</b> .....	2
<b>III. Key Findings</b>	
Scope of Fort Collins’ Wood Smoke Problem.....	5
Citizen Perspectives on Wood Smoke.....	5
Regulations to Reduce Wood Smoke.....	6
Health Aspects.....	6
<b>IV. Recommendations</b>	
Education.....	7
Incentive.....	9
Regulation.....	10
Actions Considered but Not Recommended.....	11
<b>V. Supporting Information</b>	
A. Other Existing Programs in Colorado	
State of Colorado.....	12
Larimer County.....	13
Poudre Fire Authority.....	13
City and County of Denver.....	14
Weld County/Greeley.....	14
Loveland.....	14
Boulder.....	14
El Paso County/ Colorado Springs.....	14
Mesa County.....	15
Grand Junction.....	15
Fruita.....	15
Telluride.....	15
B. Scope of Wood Smoke Problem in Fort Collins	
Estimates of Local Wood Smoke Emissions.....	16
Wood Smoke Complaint Summary.....	17
Citizen Perceptions about Wood Smoke.....	18
C. Health Aspects	
Background Information.....	21
State and Local Data.....	22
Recent Studies.....	23
D. Other Examples - Incentives.....	25
E. Other Examples – Regulation.....	26

## Appendix A – Fort Collins City Code

## **List of Terms**

### **A.I.R program area**

Automotive Inspection and Readjustment Program. Colorado's emissions testing program. In the north front range, the A.I.R. program area covers the southeast portion of the Larimer County, including Berthoud, Loveland, Drake, Fort Collins, and Wellington, but excluding Red Feather and Estes Park. In Weld County, the A.I.R. program area covers the Greeley urban area.

### **B(a)P**

Benzo(a)pyrene [B(a)P, CAS number 50-32-8] is a member of a class of compounds known as polycyclic aromatic hydrocarbons (PAHs). B(a)P is designated a probable human carcinogen by EPA and an animal carcinogen by the International Agency for Research on Cancer (IARC) (EPA, 1998a). Residential wood combustion has been estimated to account for the majority of B(a)P emissions in the Great Lakes Basin (USEPA, 1999). In a 1996 report produced by the Great Lakes Regional Air Toxic Emissions Inventory Project, over half of B(a)P emissions in the Great Lakes Basin are attributed to residential wood combustion (EPA, 1999).

### **Certified Units**

Wood stoves and fireplace inserts manufactured on or after July 1, 1990 -- or sold on or after July 1, 1992 -- are certified by the EPA to meet stringent emission standards.

### **CDPHE**

Colorado Department of Public Health and Environment

### **Colorado Phase III**

A State-designated rating for wood-burning devices. It is exactly the same as "EPA Phase II".

### **EPA Phase I**

July 1, 1988: The EPA's Phase I regulations go into effect. All woodstoves manufactured after this date must emit fewer than 8.5 grams of particulates per hour (5.5 grams/hr if catalytic equipped), and are to be exempted from local "burn bans". Existing inventories of non-approved woodstoves may continue to be sold until 1990. All woodstoves sold at retail after July 1, 1990 must comply with Phase I emissions regulations.

### **EPA Phase II**

July 1, 1990: Phase II regulations go into effect. All woodstoves manufactured after this date must comply with Phase II limits of 7.5 grams/hr (4.1 grams/hr if catalytic equipped). Existing inventories of Phase I approved woodstoves may continue to be sold until 1992. All woodstoves sold at retail after July 1, 1992 must comply with Phase II emissions regulations.

**High Pollution Days**

Under Colorado Regulation 4, CDPHE issues high pollution advisories in the winter. The five-month high pollution season (November to March) includes red and blue day public advisories. High pollution or "Red" days trigger mandatory wood-burning restrictions. Red days are also accompanied by a request to voluntarily reduce driving, along with information about how individuals can help improve air quality.

**No Burn Days**

Same as "High Pollution days" above.

**Nonattainment Area**

A geographical area in which the mean concentration of a specific criteria pollutant exceeds the national ambient air quality standard. Fort Collins is still officially designated nonattainment for carbon monoxide, but will be redesignated soon.

**POS - Point of Sale**

This refers to the time when homes are sold.

**SIP – State Implementation Plan.**

A document prepared by the state regulatory agency and approved by EPA which describes a comprehensive plan of action for achieving specified air quality objectives and standards for a particular locality or region within a specified time period.

**ZILCH – Zero Interest Loans for Conservation Help.**

The City of Fort Collins' zero interest loan program for wood stove removal or upgrade to gas-burning units.

## EXECUTIVE SUMMARY

### **BACKGROUND**

The City of Fort Collins has two policies on wood smoke; to reduce area-wide wood smoke emissions, and to reduce the number of non-certified wood stoves and conventional fireplaces. The City currently addresses wood smoke issues with a multi-pronged program of education, incentive, and regulation.

In recent years, the number of wood smoke complaints has been declining, yet the existing complaints are becoming more difficult to resolve successfully. In light of this situation, the City's Air Quality Action Plan was amended in 2001 to include a task to *"Evaluate City programs designed to reduce residential woodsmoke emissions and recommend improvements, if needed."*

An intergovernmental committee made up of representatives from the City of Fort Collins, Larimer County, Poudre Health Services District, and Poudre Fire Authority was convened in December 2001 for the purpose of reviewing the City's wood smoke program.

### **KEY FINDINGS**

Forty complaints (unique addresses) and 89 calls were received by the City's Wood Smoke Response Line between 1995 and 2001. An average of seven wood smoke complaints were documented since its inception in 1989. Since 1999, there have been less than seven wood smoke complaints each year. However, City staff still spends a significant amount of time trying to resolve wood smoke complaints. (NOTE: Some multiple complaints about the same location, and complaints to other departments and agencies are not reflected in these numbers.)

Estimates of local wood smoke emissions vary. Citizen survey data between 1990 and 2001 suggest that carbon monoxide emissions associated with wood smoke are declining, city-wide. However, the Colorado Department of Public Health and Environment projections show wood smoke emissions steadily increasing from 24 tons CO/day in 1992 to 27 tons CO/day projected for 2015. These projections assume the number of wood stoves would grow proportionally with population from 1990 levels, and amount of wood burned, by device type, would not change from 1990 levels. Better data are needed to accurately quantify local wood smoke emissions.

Recent surveys show that most Fort Collins citizens view wood smoke as a minor source of air pollution, yet 15% view it as a major source. Survey data also show citizen support for more stringent wood smoke controls. In 2001, 85% of citizens agreed or strongly agreed that the City should prohibit wood-burning and 60% of citizens agreed or strongly agreed that the City should require removal of non-certified units at point-of-sale.

The current City opacity restriction (40%) is seriously limited in its ability to resolve wood smoke problems because the readings are not made at night when woodburning typically occurs, and the certified opacity readers are not always available to make the

reading at the time of highest opacity. No opacity violations have ever been recorded in Fort Collins, and no air pollution nuisance cases have ever been brought to the City's Municipal Court.

An Internet search revealed that other communities limit opacity to 20%, and three states use a non-EPA-approved method to measure opacity at night.

Although wood smoke potentially affects everyone, children, people with respiratory diseases, and the elderly are more likely to be affected.

The number of local asthma-related emergency room visits has increased slightly since 1998, and the number of asthma-related hospital admissions has decreased slightly since 1998. Data on asthma-related doctor visits are not available.

## **RECOMMENDATIONS**

The Committee's recommendations are outlined below, in no special order of priority. They will be submitted to the City's Natural Resources Department, which has primary responsibility for implementing the City's wood smoke program. Recommended regulatory actions will be reviewed with the City government at appropriate levels, and recommendations that are deemed appropriate will be forwarded to City Council, with input from the Air Quality Advisory Board.

### **Education**

1. Manage expectations about the City's ability to resolve complaints.
2. Increase general education about the impacts of wood burning.
3. Modify the Wood Smoke Response Program, and promote widely.
4. Examine the feasibility of reducing smoke in homes.
5. Provide guidelines about how prospective home buyers can avoid smoky neighborhoods.
6. Work more closely with industry to promote wood burning education.
7. Publicize ZILCH more broadly.
8. Insure adequate communication between agencies.
9. Evaluate a voluntary "high pollution day" no burn program.

### **Incentive**

1. Do not offer City-funded incentives that support any wood-burning at all, such as chimney sweeping or stove maintenance.
2. Encourage retailers to develop their own rebate program for upgrade to gas units.
3. Seek grant funding to remove or upgrade problem units to gas.
4. Consider offering incentives for not burning.

### **Regulation**

1. Strengthen the City's opacity restriction.
  - Tighten opacity limit to 20%.
  - Certify a City employee to read opacity.

- Work with Municipal Judge and Prosecutor so they better understand the opacity limit.
  - Collect more data with each opacity reading.
  - Evaluate the opacity limitation for effectiveness two years after adoption.
2. Explore the option of using nighttime opacity measurements.
  3. Evaluate mandatory removal of non-certified units when homes are sold. Provide an incentive program to aid buyers/sellers in achieving this mandate.
  4. Review the general clause of City's Air Pollution Nuisance Ordinance and develop implementation guidelines.

## I. INTRODUCTION

The City of Fort Collins has two policies on wood smoke; to reduce area-wide wood smoke emissions, and to reduce the number of non-certified wood stoves and conventional fireplaces. The City currently addresses wood smoke issues with a multi-pronged program of education, incentive, and regulation. In recent years, the number of wood smoke complaints has been declining, yet the existing complaints are becoming more difficult to resolve successfully. In light of this situation, the City's Air Quality Action Plan was amended in 2001 to include a task to *"Evaluate City programs designed to reduce residential woodsmoke emissions and recommend improvements, if needed."*

An intergovernmental committee was convened in December 2001 for the purpose of reviewing the City's wood smoke program. Committee members included:

### City of Fort Collins

Sarah Fox,	Planning and Outreach Specialist
Ginny Sawyer,	Neighborhood Administrator
Beth Sowder,	Code Compliance Case Manager
Lucinda Smith,	Senior Environmental Planner

### Larimer County

Doug Bjorlo,	Environmental Health Specialist
Doug Ryan,	Environmental Health Planner

### Poudre Health Services District

Bruce Cooper,	Medical Director
Sue Hewitt,	Evaluation Coordinator

### Poudre Fire Authority

Rick Baldwin,	Assistant Fire Marshal - Investigation
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The Committee also received input from David Shohet, Natural Resources Intern, Zoe Shark, Natural Resource Education and Public Involvement Coordinator, and Mike Silverstein, Environmental Protection Specialist with the Colorado Department of Public Health and Environment (CDPHE).

This report contains the information compiled by the Committee on the issue, and the Committee's recommendations. These recommendations will be submitted to the City's Natural Resources Department. Recommended regulatory actions will be reviewed with the City government at appropriate levels, and recommendations that are deemed appropriate will be forwarded to City Council, with input from the Air Quality Advisory Board.

## II. EXISTING CITY WOOD SMOKE PROGRAM

The City currently addresses wood smoke issues with a multi-pronged program of education, incentive, and regulation.

### Education

**Wood Smoke Response Hotline** - The City has helped many residents resolve smoke and odor problems in their neighborhoods through its wood smoke response line. Residents who are concerned about excessive smoke or odor may contact the Natural Resources Department during normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. Callers are asked to identify the residence where the problem is occurring, or at least describe the approximate location. The City then sends a letter, a copy of City Law, and information about proper woodburning practices to all homes in the area, including the problem address. The City continues to work with the caller and the residence in question until the issue is resolved. While the caller may exercise the option of filing a formal complaint through Municipal Court, none of the complaints received over the past several years have resulted in legal action.

#### Existing Wood Smoke Response Line

Step	Details
1. Letters sent to neighborhood (occasionally to home owner also when rental properties).	Conducted by City staff in Fort Collins Urban Growth Area and by County staff in rural areas.
2. Letter sent directly to residence in question.	
3. In some cases, property visited by staff.	Background check with Building and Zoning to determine if the residence has a certified unit. In the past, this step brought positive results.
4. Opacity readings conducted by County staff.	Larimer County staff performs opacity readings. Chimney opacity is not measurable at night under existing system, when burning is most common.
5. Free mediation offered by City Neighborhood Resources.	This is a relatively new step in the process. It has not yet resulted in successful resolution, because usually at least one party does not want to participate in mediation.
6. The City Air Pollution Nuisance Ordinance may be invoked.	City Attorney's Office discourages this because the burden of proof is too difficult to establish. The air pollution nuisance ordinance has never been used to resolve a case.

### Incentive

**Zero Interest Loans for Conservation Help (ZILCH)** - Since 1990, the City has offered a ZILCH loan program to assist residents with the removal or replacement of older, non-certified wood stoves and wood stove inserts. The goal of the program is to reduce wood smoke emissions. Through ZILCH, the City loans between 80% to 95% of the cost of each project based on the pollution-reduction achieved. The maximum loan for upgrades is \$2,300. The maximum loan for removal of units is \$500. The applicant is responsible for any remaining costs.

ZILCH is advertised on the City’s Web site and retailers distribute ZILCH pamphlets at their stores. Anecdotal information suggests that wood stove retailers only promote this incentive to customers where a financial need is perceived. It is clear that the ZILCH program needs to be more widely publicized. An increased level of outreach is currently being planned in conjunction with Utilities staff.

**Summary of Recent ZILCH Activity**

Year	Misc Wood	Remove	Wood to Wood Upgrade	Wood to Gas	Total Loans	Total \$
1997	20	1		5	26	
1998	1			4	5	
1999			2	5	7	
2000				3	3	
2001			1	4	5	\$10,387 (2001 only)

**Regulation**

Fuel Restrictions. Fort Collins City Code prohibits the burning of treated wood and garbage. The only acceptable fuel that can be burned in a wood stove or fireplace is clean, dry, untreated wood or wood products, or other solid fuel products specifically made for woodburning units. Coal may be burned only in a coal-burning appliance that is the sole source of heat and where no other central heating system exists.

Chimney opacity limited to 40%. After the first fifteen minutes or so of startup, City Code requires smoke from a chimney or stovepipe be less than 40% opacity.

Certified units must be installed. City Code requires that only Colorado Phase III (same as EPA Phase II) units may be installed. This is enforced through building permit requirements.

Definition of general air pollution nuisance (City Code Sec. 20-1)

“The emission or escape into the open air from any source or sources of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors or any other substances or combination of substances in such manner or in such amounts as to endanger or tend to endanger the health, comfort, safety or welfare of the public or to cause unreasonable injury or damage to property or to interfere with the comfortable enjoyment of property or normal conduct of business is hereby found and declared to be a public nuisance. It is unlawful for any person to cause, permit or maintain any such public nuisance within the city.”

The City Code language has proved to be problematic in that it does not provide quantitative standards allowing a judge to rule favorably for a complainant. No air pollution nuisance cases have ever been brought to the City's Municipal Court.

Public Nuisance Ordinance applies indirectly. The City Public Nuisance Ordinance was passed in 2000 to remedy chronic problems at properties where City Code violations occur that annoy or disturb others. Property owners are held accountable for the use of their properties. The ordinance is invoked when three or more separate City Code violations occur at the same property within 12 months, or five or more occur within 24 months. Written notice must have been sent to the property owner and tenants within 30 days of each violation, except the last one. The last violation must have occurred at least 45 days after the last notice. Each complaint about a separate violation must result in the issuance of a municipal court citation.

This ordinance could be applied to chimney opacity readings, but it is not expected to be helpful, given the difficulty making nighttime opacity readings.

Appendix A provides complete sections of City Code discussed above.

**Existing City Department Roles in Implementation**

Natural Resources

The Natural Resources Department (NRD) takes the lead in implementing the City's wood smoke program. NRD staff conduct general education and outreach regarding wood smoke and administer the Wood Smoke Response program. NRD contacts other departments for assistance in resolving wood smoke complaints, as needed. NRD also receives and screens wood stove ZILCH loan applications and forwards them to Utilities for processing.

Health and Safety

Health and Safety staff are available to issue tickets to residents in violation of the City's opacity restriction. In addition, Health and Safety staff also are available to conduct site visits to wood smoke complaint residences.

Neighborhood Resources

Neighborhood Resources staff are available to offer mediation in an effort to resolve wood smoke complaints between neighbors. Neighborhood Resources also can provide education regarding wood burning to individual neighborhood groups.

City Attorney's Office

The City Attorney's Office provides legal advice regarding the air pollution nuisance ordinance.

Municipal Court

Any air pollution nuisance cases would be prosecuted through the City's Municipal Court.

Building and Zoning

The Building and Zoning Department tracks building permits required when wood burning devices are installed in homes.

Utilities

Utilities staff process wood stove ZILCH loan applications after receiving approved applications from Natural Resources.

**III. KEY FINDINGS**Scope of Fort Collins' Wood Smoke Problem

- Only 2% of residences in Fort Collins rely solely on wood burning as the primary source of heat. The number of residences using wood burning as a secondary source of heat dropped from 17% in 1997 to 13% in 2001, based on local survey data.
- Forty complaints (unique addresses) and 89 calls were received by the City's Wood Smoke Response Line between 1995 and 2001. An average of seven wood smoke complaints were documented each year between 1989 and 2001. (Some multiple complaints about the same location, and complaints to other departments and agencies are not reflected in these numbers.)
- City staff time spent on wood smoke complaints has ranged from two to more than forty hours per complaint.
- Carbon monoxide emissions associated with wood smoke appear to be declining citywide, based on local citizen survey data. However, the Colorado Department of Public Health and Environment shows wood smoke emissions steadily increasing from 23.9 tons CO/day in 1992 to 26.9 tons CO/day projected for 2015. Better data are needed to accurately quantify wood smoke emissions.
- 70% of complainants identify a specific residence as the source of wood smoke in their neighborhood.
- Building permit enforcement of the City Code requiring installation of certified units resolved 18% of wood smoke complaint cases. In other words, 18% of cases involved residences where a non-certified unit had been installed without a building permit. The Wood Smoke Response Line process led to the installation of certified units in 18% of the cases, and no further complaints were received.
- However, for the majority of complaints, it is not known whether the source is operating a certified unit or a non-certified unit. In only 13% of the complaints received has the City been able to establish that the source was operating a non-certified unit.
- ZILCH loans are not widely publicized. In recent years, only a small portion of the available fund has been used.

Citizen Perspectives on Wood Smoke

- Most citizens view wood smoke as a minor source of air pollution (39%) or a moderate source (39%), yet 15% view it as a major source.

- In 2001, 85% of citizens agreed or strongly agreed that the City should prohibit wood-burning and 60% of citizens agreed or strongly agreed that the City should require non-certified units to be removed or upgraded when homes are sold.

Regulations to Reduce Wood Smoke

- The City's general air pollution nuisance code has proved to be problematic in that it does not provide quantitative standards allowing a judge to rule favorably for a complainant. No air pollution nuisance cases have ever been brought to the City's Municipal Court.
- The State's odor regulation (Regulation 2) is violated when an odor is detectable even after it is diluted seven times with clean air. To date, wood smoke has never caused a violation of the State's odor regulation.
- Current City opacity restrictions are seriously limited in their ability to resolve wood smoke problems because readings are not made at night when woodburning typically occurs. Furthermore, Larimer County staff are not always available to make the reading at the time of highest opacity. No opacity violations have ever been recorded in Fort Collins.
- An Internet search revealed that most other government agencies that regulate residential wood smoke limit chimney opacity to 20%.
- California, Hawaii and Alaska use a non-EPA-approved method to measure residential wood smoke chimney opacity at night.

Health Aspects

- Although wood smoke potentially affects everyone, children, people with respiratory diseases, and the elderly are more likely to be affected.
- Scientific studies that were reviewed when EPA revised the national particulate matter (PM) standards in 1997 showed no threshold level dose-response for particulate matter, a component of wood smoke (i.e., PM has an impact regardless how small the dose).
- The number of local asthma-related emergency room visits has increased slightly since 1998, and the number of asthma-related hospital admissions has decreased slightly since 1998. Data on asthma-related doctor visits are not available.

## **IV. RECOMMENDATIONS**

### **EDUCATION**

#### **1. Manage Expectations**

Clearly define up front with complainants what the City can and can't do regarding their wood smoke complaint.

The City's Wood Smoke Response Program will continue to:

- Educate the neighborhoods (send a letter to neighborhood residents with City Code and information about proper burning practices),
- Work with the source of the problem,
- Promote mediation, and
- Insure the source is complying with all existing regulations.

Despite these efforts, the Wood Smoke Response Program still may not be able to resolve all cases satisfactorily.

#### **2. Increase general education about the impacts of wood burning.**

Increase education efforts about the air quality and health impacts of wood burning, discourage burning, discuss the importance of proper stove maintenance, and provide tips on how to burn clean, etc. through the following actions.

- a) Recognizing pollution prevention as a priority approach, continue to promote the "don't burn if you don't have to" philosophy.
- b) Meet with neighborhood groups in the older part of town to discuss wood smoke.
- c) Print an annual article in City News early each fall, including tips on how to burn clean.
- d) Include articles about wood burning in newsletters printed by neighborhood groups and the City's Neighborhood Resources Office.
- e) Add wood stove information to the *Environmental Homes* curriculum for school children.
- f) Provide one-on-one education to wood burners to resolve complaints.
- g) Consider distributing door-hangers with general wood burning information.
- h) Include standard information about the health impacts of wood smoke in outreach materials, especially identifying at-risk populations.
- i) Encourage Poudre Fire Authority to include wood smoke in their general public education efforts. Capitalize on advertising opportunities to raise public awareness about wood smoke issues and the importance of stove maintenance.

**3. Modify the Wood Smoke Response Program, and promote widely.**

- a) Accept e-mail complaints on the Web.
- b) Conduct a site visit in every case where the problem is not resolved by letters. Insure that City staff have adequate training to identify certified units and to educate wood burners on proper burning practices. Make sure staff have adequate support to insure their safety during visits.
- c) Continue to promote mediation. Work closely with Neighborhood Resources and Health and Safety staff.
- d) Expand the type of data collected when complaints are made. To the extent possible, document:
  - Weather conditions.
  - Whether there any individuals at the complainant residence who have respiratory problems, and if so, what type of problem.
  - Whether the caller or anyone in their household is experiencing respiratory problems as a result of the wood smoke.
  - Whether it is a high pollution “Red” day in Denver.
  - Whether the wood stove being complained about is certified.
  - What is the type and condition of fuel being burned.
- e) Seek assistance of Police Services in chronic cases. For chronic, difficult-to-resolve cases (historically 1-2 each year), City staff should ask a police officer to accompany them when visiting residents who have been complained about. This would provide increased safety for staff.

**4. Examine the feasibility of reducing wood smoke in homes.**

Examine the feasibility of providing suggestions to citizens on how wood smoke can be kept out of their homes (e.g., research feasibility of moving vent locations to minimize outside smoke intake), This must be done in conjunction with Wood Smoke Response Program efforts to reduce wood smoke from the source residence, in order not to imply that this problem can and should only be solved by those who are negatively impacted by smoke.

**5. Provide guidelines about how prospective homebuyers can avoid smoky neighborhoods.**

Provide general guidelines to help prospective homebuyers who are anxious to avoid wood smoke pollution on how to avoid neighborhoods where wood smoke problems occur. General recommendations can be made on the Web, in brochures, in articles, etc. Specifically, provide information about the age of housing stock in relation to the year that the installation of non-certified units was prohibited.

**6. Work more closely with industry to promote wood burning education.**

Work with wood stove retailers and chimney sweep companies to boost education to customers about the importance of proper stove maintenance and burning practices. Coordinate with the Colorado Department of Public Health and Environment to the extent possible.

**7. Publicize ZILCH more broadly.**

Publicize ZILCH more broadly for the removal of non-certified units or upgrade to gas units.

**8. Insure adequate communication between agencies.**

Insure that all government parties in the region clearly know to refer Fort Collins chimney wood smoke complaints to the City of Fort Collins Natural Resources Department and to refer opacity reading requests to the Larimer County Health Department.

**9. Evaluate a voluntary “high pollution day” no burn program**

The Committee believes this approach merits further consideration by staff, but lacked adequate information to make specific recommendations regarding forecasting, notification, and enforcement of such a program. The Committee is very interested in this option, primarily as a means of strengthening education and outreach efforts, rather than as a means of reducing emissions on high pollution days in order to avoid exceedances of the federal standard.

**Pros**

It is simple and straightforward.

Some citizens think it already exists in Fort Collins.

If the program was included in Fort Collins' CO Maintenance Plan, the City could gain credit in its State Implementation Plan for a voluntary program implemented according to EPA guidelines.

**Cons**

It might be construed to be in conflict with the year-round pollution prevention message of “Don't Burn if You Don't have to.”

It might *encourage* burning on Blue days.

If the program was included in Fort Collins' CO Maintenance Plan, the City would be obligated to carry it out for the fifteen year period of the CO Maintenance Plan.

**Information Needs**

Comparison of Fort Collins' meteorology to Denver's to determine how well Denver's high pollution day forecast fits Fort Collins.

Estimation of costs vs. air pollution benefits.

**INCENTIVE****1. Do not offer City-funded incentives that support any wood-burning at all, such as chimney sweeping or stove maintenance.****2. Encourage retailers to develop their own rebate program for upgrades to gas units.**

Work with wood stove retailers, distributors, and the Hearth Products Association to develop a retailer-run rebate program for upgrades to gas units. (This has been done with EPA funding in several other areas around the country.)

**3. Seek grant funding to remove or upgrade problem units to gas.**

Explore revenue sources (e.g., the gas company) to fund replacement of problem wood-burning units with gas units or better, in the case of intractable problems.

**4. Offer incentives for not burning.**

Consider an incentive program offering money for not burning, along the lines of the SMART BUCKS program that offers employees money for not driving.

**REGULATION****1. Strengthen the City's opacity restriction.****a) Tighten opacity limit to 20%.**

Put teeth into the City's air pollution nuisance ordinance by tightening the chimney opacity limit to 20%. A Web search reveals that all other municipalities use a 20% opacity restriction for residential wood burning. When preparing this recommendation for Council, identify the visible difference between 20 and 40% and the emissions associated with each level. Be clear that even the tighter opacity standard will not insure resolution of all cases, but it will make this tool more effective for resolving wood smoke complaints.

**b) Certify a City employee to make opacity readings.**

One of the limitations of the opacity restriction is that a County inspector may not be available to make a reading during the periods of highest opacity. In order to increase capability to make timely opacity readings, certify a City employee to read opacity. Having two certified opacity readers (one City, one County) is expected to substantially increase the response time for opacity reading requests. In addition, provide training to the certified City employee so they can educate residents about wood burning practices and impacts when making opacity readings.

**c) Work with the City's Municipal Judge and Prosecutor so they understand the opacity restriction and measurement methods.****d) Collect more data with each opacity reading.**

Institute a tracking system for Fort Collins opacity requests indicating when the request was made, when the reading was made, and the outcome. These data on opacity requests will supplement the enhanced complaint data collection recommended under Education, Item 3 (d).

**e) Evaluate the opacity limitation for effectiveness two years after adoption.****2. Explore the use of nighttime opacity measurements.**

Alaska, California, and Hawaii use a method to read chimney opacity during the nighttime. Evaluate whether this method would increase the practical effectiveness of the opacity restriction.

**3. Evaluate mandatory removal of non-certified units when homes are sold. Provide an incentive program to aid buyers/sellers in achieving this mandate.**

Committee members feel this is an option worth considering and support the Air Quality Advisory Board's intent to explore this measure. The Committee suggests instituting the program in a voluntary mode first, and providing an incentive program to aid buyers and sellers in removal of non-certified units. This mirrors the approach used by Utilities when requiring water meters at residences.

**Pros**

It is in direct support of City policy to "reduce the number of non-certified wood stoves."

**Cons**

Absent a subsidy, this will likely increase the cost of a housing transaction.

**Information Needs**

Cost of removal.

Details on how to handle fireplaces.

Better data on number of non-certified units associated with wood smoke complaints.

**4. Review the general clause of City's Air Pollution Nuisance Ordinance and develop implementation guidelines.**

Seek assistance from the City Attorney's staff to identify and review alternatives to the City's air pollution nuisance ordinance that could aid in increasing the ability to quantify "nuisance" so that it is defensible in court. (This pertains to all air pollution nuisances, not just wood smoke.) Further, develop internal policy guidelines for interpretation and enforcement of this ordinance.

**Actions Considered but not Recommended****1. Mandatory disclosure of wood-burning device type and/or maintenance at point of sale.**

The Committee considered other actions at point-of-sale such as mandatory disclosure of type of wood-burning device and/or maintenance status, but felt stove maintenance would be more effectively promoted through the wood stove industry (retailers, chimney sweeps, etc.).

**2. Restrict installation of wood stoves older than five years.**

CDPHE staff reported that EPA data show emission control devices on wood stoves degrade with time, lessening their efficiency. CDPHE staff suggested a ban on the installation of wood stoves older than five years. The Committee was not able to obtain more information on this item in a timely manner, and therefore did not include it in this report.

**3. Create a map of neighborhoods with high potential for wood smoke problems.**

The Committee abandoned the idea of producing a map showing neighborhoods with older home because complete data on the presence or absence of wood burning devices in homes are not available, and the presence of a wood-burning device does not necessarily mean it will be used.

## **V. SUPPORTING INFORMATION**

This section provides relevant information that was identified through the committee process and is used to support the findings and recommendations of the Committee.

### **A. OTHER EXISTING PROGRAMS IN COLORADO**

#### **State of Colorado**

##### Education

The Colorado Department of Public Health and Environment has an extensive outreach program to notify citizens in the Denver-metro area about high-pollution (“Red”) advisory days and when associated woodburning restrictions are in effect. Citizens are notified through the Web and on TV Channel 9.

##### Incentives

CDPHE does not offer any incentive program to reduce wood smoke.

##### Regulation

The Colorado Air Quality Control Commission, a body appointed by the Governor, establishes State regulations governing air pollution in Colorado. Below is a brief summary of state regulations that relate to wood smoke.

Regulation 1: PM, Smoke, CO, Sox. – Regulation 1 limits emissions from stationary or intermittent sources to 20% opacity or less. Recreational or non-commercial (i.e., residential) fireplaces, fireplace inserts, and wood stoves are exempt.

Regulation 2: Odor. Regulation 2 limits detectable odors in residential and commercial areas. A violation occurs if the odor is detectable when the odorous air is diluted seven times with clean air.

Regulation 4: Wood Burning Devices. Regulation 4 requires mandatory woodburning restrictions during high pollution (“Red”) days for everyone in the entire six-county Denver metro area, which includes Boulder County. Exceptions from the restriction include citizens who live above 7,000 feet and citizen who use Colorado Phase III (EPA Phase II) certified woodburning stoves, Colorado approved pellet stoves, approved masonry heaters or those whose stoves or fireplaces are their primary source of heat.

Regulation 4 is enforced largely by local agencies that have adopted restrictions into their own municipal code. Currently, 19 local governments, including Boulder and Longmont, have local control ordinances. The Colorado Department of Public Health and Environment enforces Regulation 4 in the remaining areas that do not have local authority.

**Larimer County**

Department of Health and Environment Mission Statement

“To promote a healthy community and reduce unnecessary suffering caused by preventable disease, disability, or death. This mission is accomplished by providing community health and environmental health services, communicable disease control, health education, vital records management, health data assessment, development of policies that advance the public's health, and advocacy for community-based services that provide needed health care.”

Policy

Larimer County Master Plan Section 7.3.1, Action Item 16, states the objective of reducing the use of non-certified wood stove and fireplaces.

Education

Larimer County uses education as the first approach to resolve wood smoke problems. A letter is sent to the probable offending property owner in unincorporated and rural areas of the county. Municipalities handle education within their own boundaries. County staff report problems ranging from wet wood to poor burning practices. Most complaints are from individuals with respiratory problems or other sensitivities to wood smoke. Resolution is sometimes achieved through education.

Incentive

Larimer County does not offer incentive-based programs to reduce wood smoke.

Regulation

Larimer County prohibits the installation of any new, non-certified wood stoves or wood stove inserts in the County. Larimer County restricts installation of non-certified masonry fireplaces in the A.I.R. program area only, but as of December 2001, allows installation of new non-certified masonry fireplaces outside the A.I.R. program area.

The County is the enforcement agency for State air emissions regulations as well as County regulations. County staff also enforce Fort Collins’ chimney opacity restriction using EPA Method 9. This requires making 24 consecutive readings over a six-minute period. County staff must be recertified every 6 months. Recertification involves passing 100 reading tests and paying the twice-yearly recertification fee of \$100.

County staff are also certified to “read” odor levels for compliance with the State regulation, using a “scentometer”. This involves diluting the odor with a charcoal filter. It is extremely difficult for odors to violate the state odor standard. There are no known violations of the odor standard from wood smoke sources.

**Poudre Fire Authority**

Poudre Fire Authority issues more than 300 open burning permits for slash piles/open pit fires within its jurisdiction each year. This is up from ~ 100 permits a decade ago. They receive about five citizen complaints each year from these permitted open fires.

PFA 1997 Uniform Fire Code, Article 11, allows the Fire Chief (or his representative) the discretion to put out open fires if he determines that smoke emissions are causing a threat to an individual's health or property.

PFA does not receive many wood smoke complaints because most citizens complain about wood smoke after 5:00 p.m., when PFA's call-in number is closed. The option after 5:00 p.m. is to call 911. PFA refers the few wood smoke complaints they receive to the City of Fort Collins Natural Resources Department or Larimer County Health Department.

### **City and County of Denver**

The City and County of Denver prohibit solid fuel burning in any solid-fuel-fired device during a "high pollution day" unless a permit has been granted by the Denver Department of Environmental Health. Permits are granted only for Environmental Protection Agency (EPA) Phase II certified wood stoves, fireplace inserts, approved pellet stoves, and for residential sole source of heat and effective heating systems. This is enforced only when citizens complain. They try to resolve complaints through education first.

### **Weld County/Greeley**

Currently, wood smoke issues are addressed through education and outreach. Staff makes a contact and talks to the source of the wood smoke. City and County Code allow only wood to be burned in wood burning devices. When Greeley was designated a carbon monoxide non-attainment area, they participated in the mandatory No Burn program under Colorado Regulation 4. The Weld County Health Department performed high-pollution day forecasting for Greeley, and notification was done through a telephone hot line. Greeley no longer participates in the mandatory No Burn program.

### **Loveland**

Loveland is listed on the State Health Department's Web site as participating in a voluntary No Burn program. (<http://www.cdphe.state.co.us/ap/woodlocal.asp>)

### **Boulder**

The City of Boulder participates in the mandatory No Burn program on "Red" days. Boulder's Code Enforcement staff, who are commissioned officers, enforce the program. They work in pairs during the night shift on high pollution days, and receive paid overtime. Boulder maintains a database of wood burning devices, by residence. If a complaint is reported, or if the Code Enforcement Officers notice visible chimney smoke, they will knock on the door, explain the situation, and ask about the type of device. When the mandatory No Burn program was initially adopted in the late 1990's, initial enforcement efforts were very high. Within six months, the community had largely accepted the program. Boulder does not have a chimney opacity restriction.

### **El Paso County / Colorado Springs**

El Paso County's Clean Air Campaign administers a voluntary "No Burn" program asking residents to voluntarily refrain from using uncertified wood stoves and open wood-burning fireplaces when high pollution days are forecast or are in effect. However, citizens can burn

if using an EPA Certified Phase II wood stove or fireplace insert, a Colorado-approved Phase III pellet stove, pellet fireplace insert or masonry heater, a gas stove, gas fireplace insert, or a gas fireplace.

"No Burn" announcements are made through the radio, television and newspapers, and through the Clean Air Campaign office.

### **Mesa County**

The Mesa County Health Department asks residents to voluntarily refrain from burning on high pollution days. On those days, anyone not using an EPA Certified Phase II wood stove or fireplace insert, a Colorado Phase III pellet stove, pellet fireplace insert or masonry heaters, or a gas hearth product is asked not to burn a fire in their hearth. The Mesa County Health Department monitors air quality in the Grand Valley and issues "No Burn" advisories to the public through radio, television, and newspapers on high pollution days. The advisories are issued in the morning from November through February and are in effect for 24 hours.

### **Grand Junction**

A new ordinance passed in March 1997 by Grand Junction's City Council requires that new hearth products (wood stoves, pellet stoves, masonry heaters) installed after this date meet current state standards for clean burning. Wood stoves must be EPA Certified Phase II products, and pellet stoves and masonry heaters must be Colorado Phase III products. The ordinance also prohibits burning in non-clean stoves and fireplaces on high pollution days as declared by the Mesa County Health Department.

In addition, after September 1, 1997, residents who sell a house with a non-clean burning hearth product are required to either replace it with a gas stove, an EPA Certified Phase II wood stove or a Colorado Phase III pellet stove or masonry heater. Fireplaces are not subject to this ordinance.

### **Fruita**

In Fruita, new dwellings and remodeled portions of existing structures cannot contain wood stoves, fireplaces, coal burning or similar heating devices, but gas fireplaces and pellet stoves may be installed.

### **Telluride**

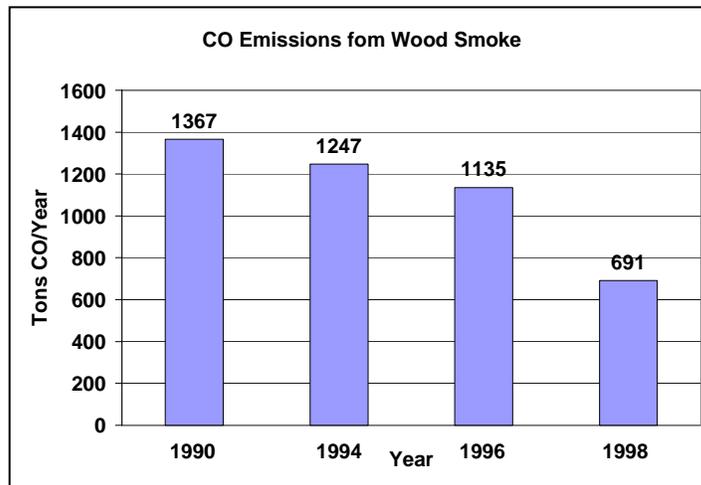
According to town code, all wood-burning devices must be permitted. Telluride has capped the number of available permits, so new wood burning devices can only be installed if an old device is removed, and that permit becomes available.

## B. SCOPE OF WOOD SMOKE PROBLEM IN FORT COLLINS

### Estimates of Local Wood Smoke Emissions

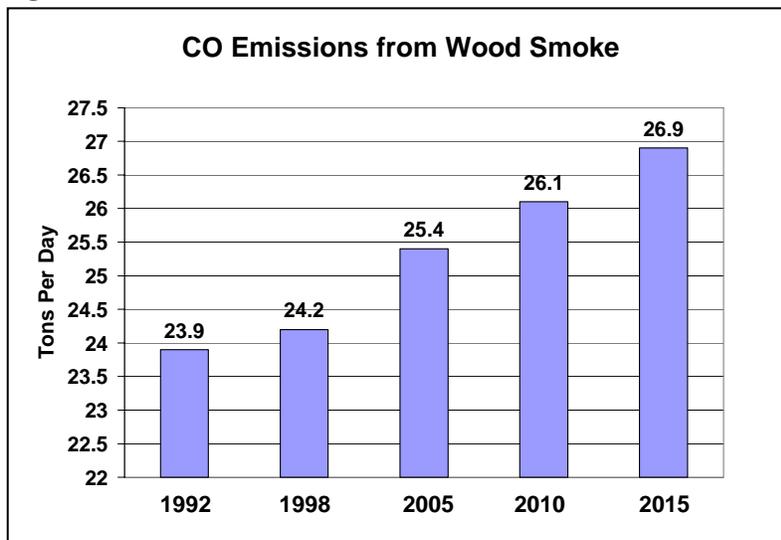
The major emissions from wood stoves are carbon monoxide, organic gases, particulate matter, and nitrogen oxides. Wood smoke contains small amounts of harmful organic compounds including formaldehyde, benzopyrene, and dioxins.

**Figure 1. Survey-based Estimates of Local Wood Smoke Emissions**



The above emissions estimates were based on responses to “amount of wood burned” questions in Fort Collins citizen surveys.

**Figure 2. State Estimates of Local Wood Smoke Emissions**



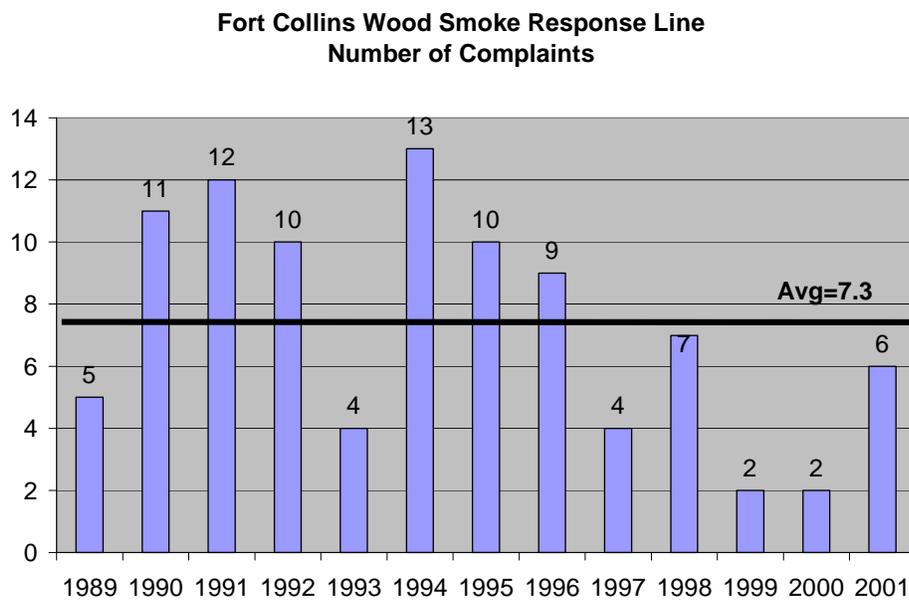
These wood smoke emission estimates were made by CDPHE when developing the carbon monoxide emission analysis for Fort Collins’ redesignation to attainment using the following assumptions:

- \* New stoves after 1992 were equal to population growth times existing stoves.
- \* The number of fireplaces was held constant at 1990 levels.
- \* The amount of fuel burned, by device type, was held at 1990 levels.

Source: Wood Smoke Emissions Inventory; Draft CO Redesignation Technical Support Document, Colorado Department of Public Health and Environment, March 2002.

**Wood Smoke Complaint Summary**

**Figure 3. Wood Smoke Complaint Summary**



NOTE: Some multiple complaints about the same location, and complaints to other departments and agencies are not reflected in these numbers.

**Figure 4. Wood Smoke Complaint Details**

Year	# Complaints	# of calls	Residence known?	KNOWN Non-certified unit?	Opacity readings	KNOWN No Building permit
1995	10	35	9	3	1	1
1996	9	16	6	2	0	3
1997	4	4	2	0	0	1
1998	7	7	3	0	0	0
1999	2	9	2	0	0	0
2000	2	11	2	0	1	2
2001	6	7	4	0	0	0
<b>TOTAL</b>	<b>40</b>	<b>89</b>	<b>28</b>	<b>5</b>	<b>2</b>	<b>7</b>
Percent of complaints			70.00%	12.50%	5.00%	17.50%

complaint = unique address being complained about

**Fort Collins Citizens' Perceptions about Wood Smoke**

Source: Fort Collins Air Quality Survey data, 1997, 1999, 2001

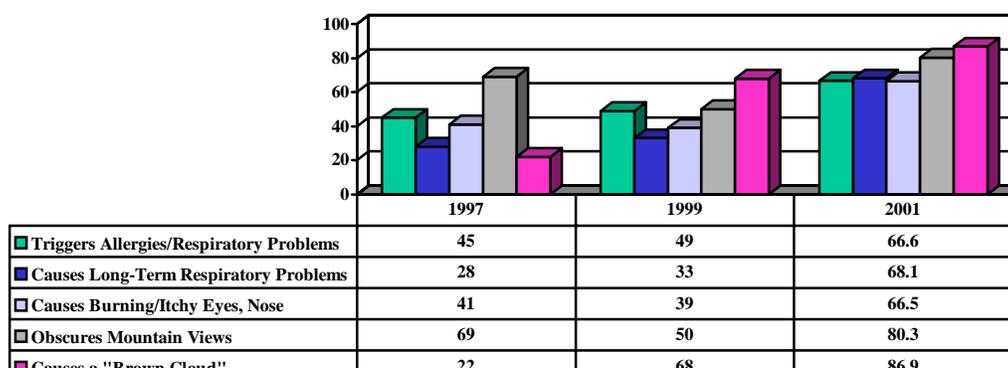
Based on Fort Collins' air quality survey data from 1997, 1999, and 2001, most people (41%) view wood smoke as a minor source of air pollution, 34% view it as a moderate source, 15 % view it as a major source and 5% feel it doesn't contribute at all.

**Figure 5. Sources of Air Pollution in Fort Collins Comparison: 1997, 1999, 2001**

<b>Sources of Air Pollution in FC</b>	<b>Major</b>			<b>Moderate</b>			<b>Minor</b>			<b>Doesn't Contrib.</b>		
	<b>1997</b>	<b>1999</b>	<b>2001</b>	<b>1997</b>	<b>1999</b>	<b>2001</b>	<b>1997</b>	<b>1999</b>	<b>2001</b>	<b>1997</b>	<b>1999</b>	<b>2001</b>
Gasoline Vehicles	57	65	70	32	26	22	9	9	7	<1	<1	.3
Diesel Vehicles	56	50	56	33	35	30	9	12	9	<1	<1	.7
Transfort Buses	20	25	21	37	36	39	37	36	35	2	1	1.7
Industry in Fort Collins	8	11	13	39	37	40	43	39	35	4	5	4
Woodburning Stoves	17	12	15	32	32	39	40	45	39	6	6	2
Street Dust	16	17	20	32	38	36	44	37	31	5	5	5
Off-Road Construction		15	22		45	37		32	31		3	3
Sources Outside FC	11	14	18	33	30	32	27	30	29	6	4	3

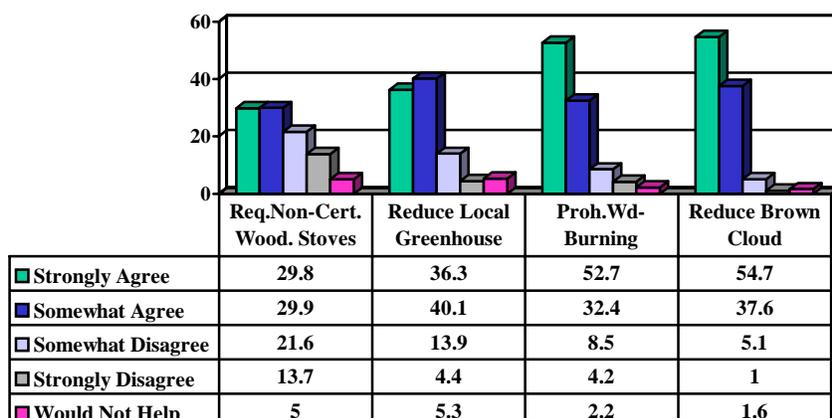
The number of citizens who blame their allergies or respiratory problems on air pollution in general jumped significantly in 2001 to about 67%, compared to only 30-50% response in 1997 and 1999 (see Figure 6 below).

**Figure 6. Adverse Affects of Air Pollution: Changes From 1997, 1999**



In 2001, 85% of citizens agreed or strongly agreed that the City should prohibit wood burning. Data from 1997, 1999, and 2001 consistently show that approximately 60% of citizens agreed or strongly agreed that the City should require removal of non-certified units at point of sale.

**Figure 7c City Air Quality Programs and Plans Should...**



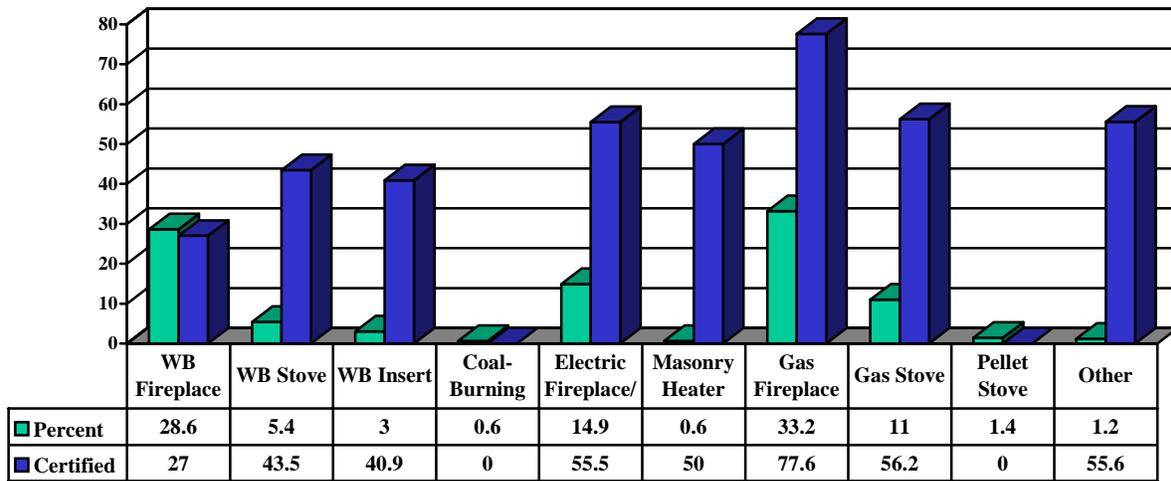
**Figure 8. Citizen Views on Mandatory Removal at Point of Sale.**

Response	Strongly Agree			Somewhat Agree			Somewhat Disagree			Strongly Disagree		
	'97	'99	'01	'97	'99	'01	'97	'99	'01	'97	'99	'01
Require non-certified wood-stoves to be removed/replaced at time of home sale.	33	35	30	26	27	30	19	16	22	15	18	14

**Figure 9. Survey Data on Wood-burning**

	1997	2001
Wood is the main source of heat in homes.	No data	1.9%
Wood is an additional source of heat in homes.	17%	12.4 %

**Figure 10. “If Resident Has a Wood-Burning Fireplace or Stove, How Often Was it Used Last Winter?”**



Source: Fort Collins 2001 Outdoor Air Quality Survey

## C. HEALTH ASPECTS

### Background Information

(Source: “Health Effects of Wood Smoke”, a brochure published by the Washington State Department of Ecology, Olympia, WA, 1997. This document can be found at <http://www.ecy.wa.gov/biblio/92046.html>.)

“Wood smoke is a complex mixture of substances produced during the burning of wood. The major emissions from wood stoves are carbon monoxide, organic gases (containing carbon or derived from living organisms), particulate matter, and nitrogen oxides. Wood smoke contains many organic compounds known to cause cancer (such as benzopyrenes, dibenzanthracenes, and dibenzocarbazoles), and other toxic compounds (such as aldehydes, phenols, or cresols). The particulate fraction is composed of solid or liquid organic compounds, carbon char (elemental or soot carbon – similar to charcoal), and inorganic ash.

The particles in wood smoke are too small to be filtered by the nose and upper respiratory systems, so they wind up deep in the lungs. They can remain here for months causing structural damage and chemical changes. Poisonous and cancer-causing chemicals often enter the lungs by adhering to tiny particulate matter (such as wood smoke particles).

These tiny particles are emitted in neighborhoods, both indoors and out, where people spend most of their time. Unfortunately, wood smoke is not only in the outdoor air we breathe. The particulate matter in wood smoke leaving chimneys is so small that it is not stopped by closed door and windows, and often seeps into the neighboring houses. Even more smoke is released inside homes that heat with wood.

Wood smoke exposure causes a decrease in lung function and an increase in the severity of existing lung disease with increases in smoke concentrations or exposure time. It also aggravates heart conditions and carbon monoxide causes heart pain. The occurrence of respiratory illnesses in children has been shown to increase with increased exposure to wood smoke. This includes lower respiratory infections such as acute pneumonia, or bronchitis, which are major causes of disease and death in young children.”

Although wood smoke potentially affects everyone, children, people with respiratory diseases and the elderly are more likely to be affected.

**Colorado State and Local Data**

**Figure 11. Relative Health of the Region**

Percents	Pop	Under 14	Over 65	Ped Asthma	Adult Asthma	Adult Chronic Br.	Adult Emph	O <sub>3</sub> Orange	Grade
Adams	323,427	24.5%	7.8%	1.6%	2.4%	3.2%	1.1%	2	B
Arapahoe	472,579	21.8%	9.2%	1.4%	2.5%	3.3%	1.1%	2	B
Boulder	266,671	19.2%	8.4%	1.2%	2.7%	3.5%	1.2%	6	C
Denver	498,402	19.7%	12.1%	1.2%	2.6%	3.5%	1.1%	4	C
Douglas	141,044	25.8%	3.4%	1.6%	2.4%	3.2%	1.0%	3	C
El Paso	490,044	22.8%	8.7%	1.5%	2.5%	3.3%	1.1%	0	A
Jefferson	500,805	20.8%	10.6%	1.4%	2.6%	3.4%	1.1%	11	F
<b>Larimer</b>	<b>231,104</b>	<b>21.1%</b>	<b>9.9%</b>	<b>1.4%</b>	<b>2.6%</b>	<b>3.4%</b>	<b>1.1%</b>	<b>2</b>	<b>B</b>
Montezuma	22,365	24.8%	13.7%	1.6%	2.4%	3.2%	1.1%	0	A
Weld	159,501	24.0%	9.6%	1.5%	2.4%	3.2%	1.1%	0	A
<b>AVG</b>	<b>310,594</b>	<b>22.5%</b>	<b>9.3%</b>	<b>1.4%</b>	<b>2.5%</b>	<b>3.3%</b>	<b>1.1%</b>		

Source: American Lung Association Statistics (State of the Air – Colorado, 2001)

Local Data

Data from the Colorado Hospital Association indicate that asthma-related emergency room visits have increased slightly over the past three years, while asthma-related in-patient admissions have declined slightly over the past three years. Data on asthma-related doctor visits are not available at this time.

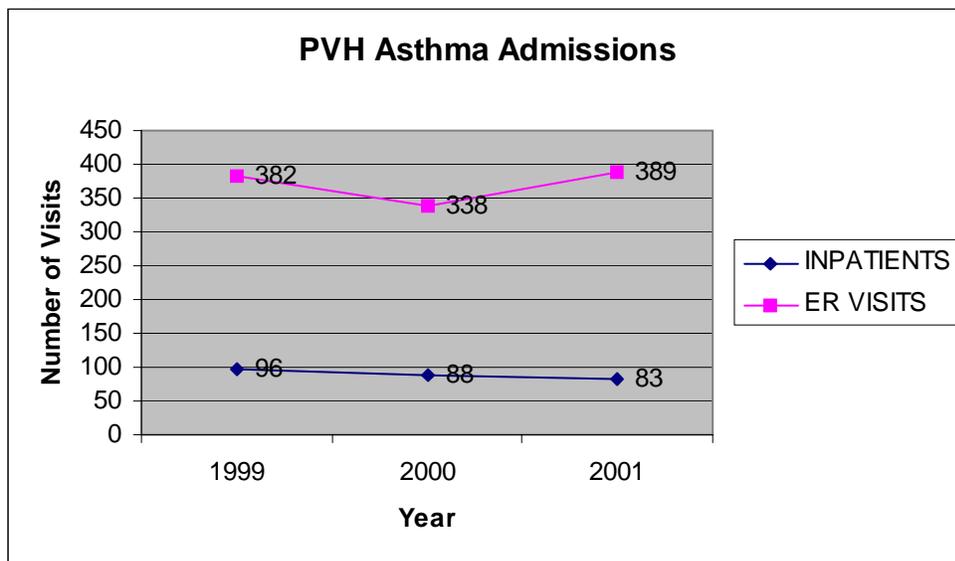
**Figure 12. Poudre Valley Hospital Asthma-Related Visits**

**POUDRE VALLEY HOSPITAL PATIENTS ADMITTED WITH PRINCIPAL DIAGNOSIS OF ASTHMA**

YEAR		INPATIENTS	ER VISITS	O/P VISITS
1999	TOTALS	96	382	32
1999	TOTAL YEAR ADMISSIONS	14272	40229	259813
1999	PERCENT ASTHMA	0.67%	0.95%	0.01%
2000	TOTALS	88	338	30
2000	TOTAL YEAR ADMISSIONS	14117	40385	265565
2000	PERCENT ASTHMA	0.62%	0.84%	0.01%
2001	TOTAL ASTHMA	83	389	41
2001	TOTAL YEAR ADMISSIONS	15073	41934	259013
2001	PERCENT ASTHMA	0.55%	0.93%	0.02%

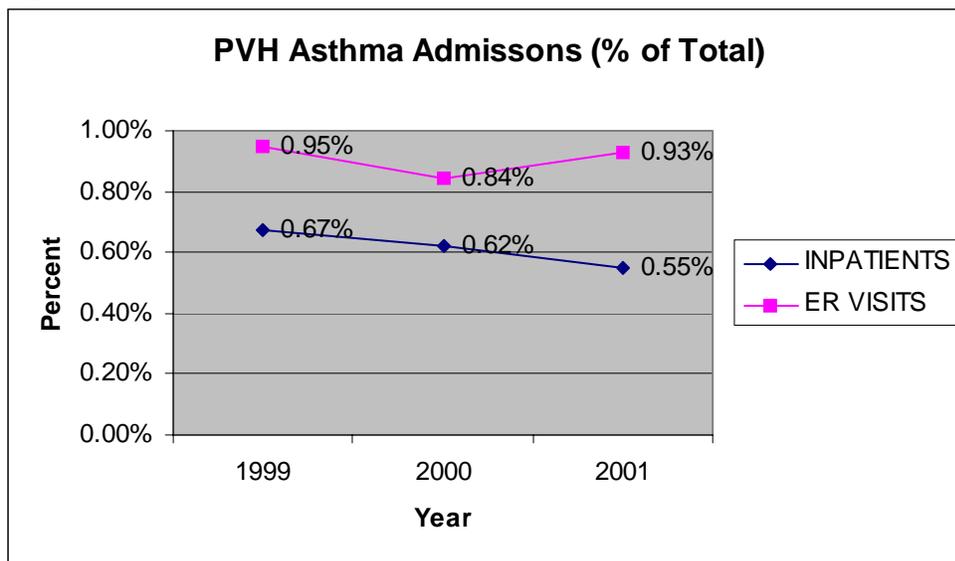
(Data provided by Poudre Health Services District; February 2002)

Figure 13. PVH Asthma-Related Admissions



(Data provided by Poudre Health Services District; February 2002)

Figure 14. PVH Asthma-Related Admissions; Percent of Total Admissions



(Data provided by Poudre Health Services District; February 2002)

Asthma-related hospital visits are less than one percent of all hospital visits over the past three years.

**Recent Studies**

**Pollution May Cause Asthma**

A study conducted by the University of Southern California and published in The Lancet (2002) has shown that exposure to elevated ozone levels ozone can *cause* asthma in children, not just

exacerbate it. It has long been known that smog can trigger asthma attacks, but this is the first study indicating that children (especially active ones) can develop asthma in heavily polluted areas. Wood smoke contains ozone precursors including nitrogen oxides.

(McConnell, R., et.al. Asthma in exercising children exposed to ozone: A Cohort Study. Lancet 2002 Feb 2; 359 (9304): 386-91)

#### Pollutants Linked to Birth Defects

University of California Los Angeles School of Public Health and the California Birth Defects Monitoring Program researchers published a study in the American Journal of Epidemiology in 2002. This study showed that the greater the exposure to carbon monoxide (or ozone) during a woman's critical second month of pregnancy, the greater the chance the child would have a serious cardiac birth defect. These conclusions were drawn after studying 9,000 babies born between 1987 and 1998. However, researchers cautioned that they are not certain that CO and ozone were directly causing the birth defects. They said those pollutants could be a "marker" for something associated with the real cause.

(Ritz, B., et. al. Ambient air pollution and risk of birth defects in Southern California. American Journal of Epidemiology 2002 Jan 1; 155(1): 17-25)

#### Study Finds Soot Particles Strongly Linked to Lung Cancer

Prolonged exposure to air tainted with tiny particles of soot significantly raises the risk of dying of lung cancer or other lung and heart diseases, according to a new study of 500,000 people in 116 American cities. In fact, the authors say, many city residents face a long-term risk of fatal lung cancer similar to that of someone living with a smoker.

Because lung cancer is so rare among nonsmokers, that translates into just two additional lung cancer fatalities per 100,000 people, said a leader of the research project, Dr. George D. Thurston, associate professor of environmental medicine at the New York University School of Medicine. But, Dr. Thurston added, the finding helps suggest a cause for many otherwise unexplained lung cancer deaths and adds urgency to efforts to reduce fine-particle pollution, which comes from power plants and motor vehicles.

Earlier studies had hinted at a link between fine soot particles and lung cancer. But this one was the first with sufficient breadth (involving the 500,000 subjects) and duration (16 years) to show a strong relationship.

(Pope, C.A., et. al. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. JAMA: The Journal of the American Medical Association 2002 Mar 6; 287(9): 1132-41)

#### Studies Show Particulate Matter Impacts at Low Concentrations

Epidemiological studies have reported a linear relationship between exposure to particulate matter and effects. In other words, the higher the concentration of particles, the greater the effect on the health of populations. Effects have been demonstrated at levels well below the current National Ambient Air Quality Standards. Scientists have not been able to identify a threshold below which health effects from particulate matter do not occur.

(NRDC Internet site –<http://www.nrdc.org/air/pollution/qbreath.asp#level>)

## **D. OTHER EXAMPLES - INCENTIVES**

### **Melville, Australia teams with gas company to offer upgrade incentives**

(Source: [http://lash.une.edu.au/~drobinso/woodheat\\_ban.htm](http://lash.une.edu.au/~drobinso/woodheat_ban.htm))

The City of Melville's Health Services teamed up with the local gas company, AlintaGas, to offer incentives to citizens to replace existing wood heaters with gas appliances. Natural gas is the cleanest burning fossil fuel - it provides heat without smoke. It is also a reliable and economically viable heat alternative to burning wood. As an incentive, AlintaGas is offering local people discounts on gas heaters, free connections to the AlintaGas main supply, and special deals on heater installation.

### **Arizona Tax Deductions**

Starting in 1993, Arizona taxpayers are allowed to take a personal tax deduction of up to \$500 for the cost of converting an existing wood fireplace to a qualifying wood stove. Qualifying wood stoves must meet the standards of performance for new wood heaters manufactured after July 1990, or sold after July 1992.

### **Idaho Tax Deductions**

Idaho taxpayers can deduct 40% of the total cost (including purchase price and professional installation) of a certified wood stove, pellet stove, and natural gas or propane heating device in the year it was installed. They can deduct 20% of the total cost for the next three years. Total deductions may not exceed \$5,000.

### **Great Stove Change-Out Programs**

#### **EPA**

(source: EPA – Feb 2001: <http://detnews.com/2001/metro/0102/08/d06d-185247.htm>)

Homeowners in 12 states were able to receive a discount on a new (certified) wood burning stove from an area retailer participating in the program until April 30, 2001.

#### **Michigan**

(Source: [http://www.epa.gov/bns/baphcb/BaP\\_Rdcn.html#Intro](http://www.epa.gov/bns/baphcb/BaP_Rdcn.html#Intro))

The Great Lakes Wood Stove Changeout program was co-sponsored by a consortium of public and private sector parties, with support from EPA Region 5. This program offered incentives for residents in northern Michigan to trade in their old wood-stoves for newer, cleaner burning hearth products. The newer technology stoves reduce wood smoke emissions by about 85 percent and generate less B(a)P and particulate matter emissions.

#### **Minnesota**

(Source: <http://www.woodstove-changeout.org/Lable.htm>)

The Hearth Products Association offers discounts of 10 to 15 percent on new stoves and inserts at participating dealers. Discounts ranging from \$100 to \$300 are provided when old equipment is returned and destroyed.

Nevada and California

Dealers and manufacturers have teamed up to offer cash rebates of up to 15% off the list price of certified units. Some air pollution control districts offer cash incentives on top of the point-of-sale discounts.

Eastern Ontario

Residential wood burning is a significant source of air pollution in Canada, estimated to emit about 25 % of fine particulates in Canada’s air, 15 % of volatile organic compounds, and 10 % of carbon monoxide. More than 25 participating Eastern Ontario wood stove retailers offer special trade-in rebates to encourage people to replace older technology stoves or fireplaces with approved, cleaner wood-burning appliances.

**E. OTHER EXAMPLES – REGULATION**

**Chimney Opacity Regulations**

An Internet search of opacity regulations reveals that most regulations restrict residential chimney opacity to 20%.

<b>Location</b>	<b>Regulation</b>	<b>Reference</b>
State of Idaho	20% for wood smoke	<a href="http://www.nicon.org/sos/howmuchislegal.html">http://www.nicon.org/sos/howmuchislegal.html</a>
Iowa, Linn County	20% opacity (40% for 6 minutes with each new fire)	<a href="http://www.air.linn.ia.us/ordinance/ordinance4.html">http://www.air.linn.ia.us/ordinance/ordinance4.html</a>
Nebraska, Lincoln/Lancaster Counties	20 % opacity w/ 6 min start up limited to 27%. (Exceptions = 30% for teepee wood waste burner, 40% for alfalfa dehydration)	<a href="http://www.epa.gov/region07/programs/artd/air/rules/nebraska/llc2-20.pdf">http://www.epa.gov/region07/programs/artd/air/rules/nebraska/llc2-20.pdf</a>
Oregon, Jackson County	During Green (clean) advisory periods, 50 % opacity, with 30 minute start-up exceptions in any four-hour period. (NO visible smoke during Red and Yellow advisory periods)	' <a href="http://www.co.jackson.or.us/pdf/CodeOnline/Part18.pdf">www.co.jackson.or.us/pdf/CodeOnline/Part18.pdf</a> And <a href="http://www.co.jackson.or.us/Page.asp?NavID=338">http://www.co.jackson.or.us/Page.asp?NavID=338</a>
State of Washington	20% chimney opacity; future spot checks lead to escalating fines	<a href="http://www.scapca.org/document/regs/r1a8.pdf">http://www.scapca.org/document/regs/r1a8.pdf</a>

The “industry standard” for efficient combustion (after the period of start-up) is 15% opacity, as stated in the Hearth, Patio, and Barbecue Association’s “Straight Answers to Burning Questions” Web page at <http://hpba.org/communications/FactSheets/answers.shtml>.

**State of Oregon**

**Mandatory removal of non-certified units at point of sale.**

Starting in 1995, the State of Oregon requires removal of non-certified units at point of sale in PM<sub>10</sub> non-attainment areas, with some exemptions.

(See <http://www.leg.state.or.us/ors/468a.html>)

**Two Stage Curtailment Program**

State Statute requires that any programs adopted to curtail wood smoke emissions during periods of air stagnation must provide for two stages of curtailment based on the severity of the projected air quality conditions.

**State of Washington**

Local burn bans are called when wood smoke pollution is measured at unsafe levels. This is a two stage plan:

Stage I: The use of all uncertified wood heating devices, including fireplaces, is prohibited when pollution approaches unhealthful levels. Certain models of pellet stoves are exempt.

Stage 2. The use of all wood heating devices is prohibited, including pellet stoves.

## APPENDIX A

### CITY CODE Chapter 5 – Buildings and Building Regulations.

#### Section 5-110. Solid Fuel Burning Appliances

a) No person shall install or modify a solid fuel-burning appliance without first having obtained a building permit in accordance with this Chapter.

(b) Except as is otherwise provided in Subsections (d), (e) and (f) of this Section, no person shall install or modify a solid fuel-burning appliance (including, without limitation, any wood stove or any solid fuel cooking stove) unless, both prior and subsequent to installation or modification, it meets the most stringent emission standards set forth in Subparagraphs (1) and (2) of Federal Regulation 40 CFR Part 60, Subpart AAA, Subsection 60.532(b) as of the time of installation of the solid fuel-burning appliance. All such appliances shall be tested and certified to be in conformance with the preceding emission standards in accordance with the testing and certification methods and procedures in Federal Regulation 40 CFR Part 60, Subpart AAA.

(c) For the purposes of this Section, the following definitions shall apply:

(1) A *wood stove* shall be defined as any solid fuel-burning appliance designed for the purpose of burning wood for space heating or aesthetic purposes in either domestic or commercial buildings.

(2) A *solid fuel cooking stove* shall be defined as any solid fuel-burning appliance designed to burn wood or any other solid fuel for the purpose of cooking, flavoring, curing or preparing food for domestic or commercial purposes.

(d) No person shall install or modify any solid fuel-burning appliance for the purpose of burning coal.

(e) No person shall install or modify a pellet stove unless, both prior and subsequent to installation or modification, it meets all requirements for pellet stoves as set forth in Regulation No. 4, Section III, as established by the Colorado Air Quality Control Commission as of the time of installation of the pellet stove.

(f) No person shall install or modify any fireplace unless it is one of the following:

(1) A gas-burning appliance;

(2) An electric appliance; or

(3) A fireplace insert that, both prior and subsequent to installation or modification, meets the most stringent emission standards as set forth in Subparagraphs (1) and (2) of Federal Regulation 40 CFR Part 60, Subpart AAA, Subsection 60.532(b) as of the time of installation of the fireplace.

(g) Exemptions. The following solid fuel-burning appliances and processes are exempt from the provision of this Section:

(1) Portable household solid fuel-burning appliances such as camping stoves, barbecue grills and smokers.

(2) Commercial cooking processes which utilize small quantities of wood for food flavoring, provided that the following conditions are met:

- a. The primary fuel source for any fuel-burning (nonelectric) commercial cooking and food preparation appliance must be either natural gas or liquefied petroleum gas, unless the appliance complies with the emissions standards set forth in Subsection (b) of this Section.
- b. Only the minimum amount of wood sufficient to flavor the food may be used in this cooking process, and the wood must be cured and dry.
- c. Operation of the appliance must comply with § 20-1(c) of this Code, which prohibits the emission of smoke exceeding forty (40) percent opacity.

(Ord. No. 25, 1991, § 1, 3-19-91; Ord. No. 32, 1997, 3-4-97)

**CITY CODE – Chapter 20. Nuisance Ordinance.**

**Article 1 – In General**

**Sec. 20-1. Air pollution nuisances prohibited.**

(a) The emission or escape into the open air from any source or sources of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors or any other substances or combination of substances in such manner or in such amounts as to endanger or tend to endanger the health, comfort, safety or welfare of the public or to cause unreasonable injury or damage to property or to interfere with the comfortable enjoyment of property or normal conduct of business is hereby found and declared to be a public nuisance. It is unlawful for any person to cause, permit or maintain any such public nuisance within the city.

(b) No person shall cause or allow the emission of smoke exceeding forty (40) percent opacity from any flue or chimney, except for a single fifteen-minute period for cold start-up. Any emission in excess hereof is hereby declared to be a nuisance and is prohibited.

(c) After October 1, 1988, no person shall cause or allow, for the purpose of residential or commercial space heating, the burning of coal in a solid fuel-burning appliance, unless that appliance is designed to burn coal, and unless it is the sole source of heat for the building. No solid fuel-burning appliance shall be considered to be the sole source of heat if the building is equipped with a permanently installed furnace or heating system that is designed to use natural gas, fuel oil, electricity or propane, whether connected or disconnected from its energy source.

(d) Except as is provided in paragraph (c) hereof, no person shall cause or allow the burning of any solid fuel in a solid fuel-burning appliance other than clean, dry, untreated wood or wood products, or other solid fuel products specifically manufactured for the purpose of space heating.

(Ord. No. 184, 1986, § 4, 11-18-86; Ord. No. 180, 1987, § 2, 12-1-87; Ord. No. 89, 1994, § 1, 6-21-94; Ord. No. 130, 1996, 11-5-96)

**PUBLIC NUISANCE ORDINANCE**

(source <http://fcgov.com/cityattorney/pub-key-points.php>)

Fort Collins' Public Nuisance Ordinance was passed by the City Council on April 4, 2000, and went into effect April 14, 2000. Key points of the Nuisance Ordinance are discussed below.

**1. Purpose**

To remedy chronic problems at properties where City Code violations occur that annoy or disturb others. To hold property owners accountable for the use of their properties.

**2. Definition of "Public Nuisance"**

Three or more separate City Code violations at the same property within 12 months or 5 or more within 24 months. Written notice must have been sent to the property owner and tenants within 30 days of each violation, except the last one. The last violation must have occurred at least 45 days after the last notice. Each complaint about a separate violation must result in the issuance of a municipal court citation.

**3. Commencement of Nuisance Action**

Another notice must be posted at the property and mailed to the property owner at least 10 days before filing the action. After that ten-day period, the City may then file the action in municipal court and serve the summons and complaint on any person(s) that the City believes is responsible for the nuisance.

**4. Voluntary Agreement**

At any time after a notice has been sent out, a property owner can enter into a voluntary abatement plan with the City. If the property owner and the City reach such an agreement and the property owner does what he or she has agreed to do, no public nuisance action will be filed. Even without an agreement, a notice of violation will be stricken (not counted) if a landlord goes to court to evict a tenant that has caused the problem and does everything reasonably possible to avoid more of the same kinds of problems.

**5. City's Remedies**

If no voluntary abatement agreement is reached, the City can ask the Municipal Court to order the parties causing the nuisance to do whatever is necessary to put an end to the nuisance. Only in an emergency can the City get such an order without a court hearing. If the City gets such an order, the persons affected by the order can ask the Court to remove it at any time. At no time can the City seek or obtain a court order that would take away or close the property or place the property into "special receivership". A person who knowingly disobeys an abatement order issued by the court could be prosecuted for committing a misdemeanor criminal offense.

**6. Effect of Sale of the Property**

All previous notices of violations will be stricken (will not count) if the property is sold unless the property is sold simply to avoid the public nuisance ordinance.