

Air Quality is a National Health Problem

Sacramento is a Prime Example

A Report to Sierra Health Foundation

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Table of Contents	Page
<p>Air Quality is a National Health Problem and Sacramento is a Prime Example</p> <p style="padding-left: 40px;">Health Impacts of Air Pollution in the Sacramento Region Sacramento's Air Quality Status National and State Air Quality Efforts</p>	<p>3</p>
<p>The Response to the Ozone Air Quality Problem: Levels of Intervention</p> <p style="padding-left: 40px;">Strengthening Individual Skills and Knowledge Community Education Training Providers Changing Organizational Practices Influencing Policy and Legislation</p>	<p>8</p>
<p>Recommendations on Opportunities for Intervention</p> <p style="padding-left: 40px;">√ Attract Funders to Expand Community Capability √ Work Through the American Lung Association of Sacramento √ Focus on the Health Community √ Work from a Five Year Plan to Achieve Goals by 2005 √ Improve Community Leadership Involvement √ Specific Performance-based Projects</p>	<p>16</p>



Air quality is a National Health Problem. The Sacramento Region is a Prime Example

Health Impacts of Air Pollution in the Sacramento Region

On July 16, 2000, Sacramento area residents awoke to a front page Sacramento *Bee* article linking asthma suffering to excess ozone pollution in our region.¹ The new study, conducted by state scientists with Medi-Cal records, found high levels of ozone were correlated with the number of asthma-related hospital admissions and emergency room visits by low-income children and teenagers. While the study has yet to be finalized, it alerts local residents to the need for greater

vigilance and understanding of the relationship between ozone air pollution and lung health.²

Why Asthma?

There are many kinds of air pollution with a variety of health impacts.³ Sacramento region's ozone problem affects those with lung disease as well as otherwise healthy residents exposed to it. The link between air pollution and asthma is important because asthma is the most prevalent of respiratory conditions affected by air pollution. Asthma costs nationally in 1998 were estimated to exceed \$12 billion, including direct health care costs (\$7.5 billion) and indirect costs (3.8 billion).⁴ The largest indirect cost is lost school days (ten million days a year, estimated \$1 billion in costs). Asthma is the sixth ranking chronic condition in the nation and the leading serious chronic illness of children.⁵ It is the number one cause of school absences due to chronic conditions leading to an estimated 10 million school days lost annually.⁶

How Many People Have Asthma in Our Region?

The National Center for Disease Control estimates, based on national rates, that 5.5 percent of Sacramento County's population (62,000 residents) suffer from asthma, including 19,500 adolescents.⁷ Regionally, asthma is estimated to affect 62,144 adults and 25,624 children, a total of 87,768 individuals.⁸

The Cleaner Air Partnership⁹ Annual Public Opinion Survey in 1995 found that 26 percent of the households in Sacramento County reported that someone in the household had asthma. At a regional level, assuming about 676,000 households in the region at that time, the number of affected households would be 169,000, a much higher estimate of the incidence of asthma than the official estimate. A comparable national survey by the American Lung Association found "nearly one in five of America's households includes one or more family members who have asthma."¹⁰

What is asthma?
Asthma is a chronic lung disease, caused by inflammation of the lower airways and episodes of airflow obstruction. Recurrent breathing problems are caused by airway inflammation.

Symptoms of asthma

- Wheezing, shortness of breath, tightness of the chest
- Trouble controlling a cough
- Persistent cough at night
- Difficulty breathing after physical exertion or exercise
- Waking up at night because of one or more of these

Trouble Breathing?

Local survey data collected by the Cleaner Air Partnership shows that about one-third of the region's households (about 223,000) have health problems with unhealthy air during the summer. There is a variation of about 5 percent between years with severe versus moderate ozone-forming conditions, and when smoke

invades the area, that number rises to 40 percent. Nine percent of the households in the region reported that someone in the household had to go to the emergency room or to a short term medical appointment because of problems breathing during a period of unhealthy air during the summer of 1999.

Little research exists on the real world incidence of both asthma and of trouble breathing on smoggy days. Indications are that better research would provide more reliable estimates of the health impacts of ozone air pollution in our region. But unless research is adequately funded and researchers are sufficiently motivated, the resulting findings may languish and not be available to guide public action.



More rigorous research could provide more reliable estimates of the health impacts of ozone air pollution in our region

Sacramento's Air Quality Status

One of Ten Worst.

Sacramento is judged one of the ten worst metropolitan areas for ozone air pollution by the U.S. Environmental Protection Agency. Though ozone levels have dropped over the last twenty years, conditions remain unhealthy. Table 1 shows the number of exceedances of the state and federal ozone standards and the three year rolling average of federal exceedances. The Sacramento region presently meets federal standards for all other air pollutants [although particulates and specifically, diesel particulate, remain of concern because standards are changing.]

Causes of Variations in Ozone Levels.

Variations from year to year reflect both efforts to control emissions, growth in the population and associated emission increases, and weather.

Emissions.

Ozone is formed by chemical reactions between hydrocarbons (evaporative emissions) and oxides of nitrogen (combustion emissions) in the presence of sunlight. It is associated with surface temperatures in excess of 90 degrees F. Ninety percent of the NOx emissions are from mobile sources. Overall, it is estimated that 70 percent of the ozone precursors derive from gasoline and diesel engine use. The 1994 air quality plan outlines measures sufficient to eliminate federal ozone violations through the reduction of hydrocarbons emissions by 38 percent and NOx emissions by 40 percent from 1990 baselines, by 2005, while the region grows substantially.¹¹

The plan requires substantial voluntary compliance, but incentive funds are available. It is essentially on track, except for the enhanced smog check program, the single largest NOx reduction measure.

Weather.

Summers with extended hot and still periods (like 1998) result in high ozone and summers with cool and ventilated conditions (like 1999) are healthier because ozone doesn't form as readily. Both new controls and economic recession in the early nineties reduced ozone exceedances from an average of 19 days to an average of 7 days per year.



Very hot days are ozone days in Sacramento.

New standards.

Recently the federal ozone standard was changed after health studies showed that longer exposures to lower levels of ozone resulted in health impacts. The new limit for 8 hour average exposure to ozone provides greater protection from longer exposures. In the Sacramento region, those areas most affected by longer periods of lower level ozone exposure are the foothills. The resulting change will significantly increase the number of days when the Sacramento area exceeds federal standards, and will expand the air basin to include new areas, including Nevada County.

At present there are about 7 days per year when the federal ozone standard is exceeded, and about 34 days when the state standard is exceeded. The new federal standard is much more like the state standard, so we can expect about a five-fold increase in unhealthy days with the new standard.

While the standard has been adopted, it will not be enforced until the Supreme Court affirms it.

Court review is expected to be completed by June 2001. A new federal air quality plan to meet the new standard will be prepared within the next two years. Meanwhile the new Air Quality Index reflects the shift in the standard. A new category "Unhealthy for Sensitive Populations" has been added, which provides an added margin of safety to those who suffer health consequences from ozone exposure.

The federal government also adopted a new particulate matter standard. It is expected that when this standard is finally implemented, Sacramento will be out of compliance with the federal particulate standard (PM 2.5) and a new air quality plan will be adopted to bring the area into compliance. Cleaner alternative fuels and retrofit controls for diesel engines will likely be key clean-up measures, the same strategy as used for NOx control today.

National and State Air Quality Efforts

Sacramento is not alone in facing air pollution related health problems. U.S. Environmental Protection Agency sets national standards for six air pollutants that are designed to protect human health. The federal Clean Air Act defines state and local responsibility for meeting national standards. Information about air quality across the nation is available on the Internet (www.epa.gov/airnow), on *The Weather Channel*, and in *USA Today*.



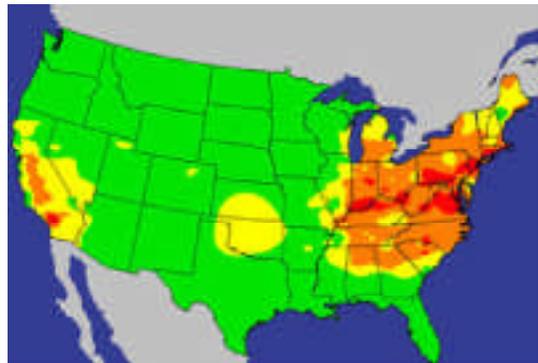
US EPA estimates that 25 percent of the nation's children live in areas that do not meet all national air quality standards. Major initiatives have been taken by private non-profits in recent years to increase asthma awareness and develop effective education, prevention and treatment programs.

Table 1: Ozone Exceedances 1979-1999

	State	Federal	Fed. 3 yr. ave.
1999	39	5	7.0
1998	42	13	7.3
1997	20	3	6.3
1996	48	6	7.3
1995	39	10	7.3
1994	35	6	7.0
1993	28	6	9.0
1992	58	9	9.7
1991	55	12	9.3
1990	29	8	15.0
1989	61	8	18.0
1988	81	29	22.7
1987	75	17	19.0
1986	48	22	21.0
1985	48	18	17.7
1984	58	23	17.3
1983	62	12	15.7
1982	56	17	16.7
1981	58	18	21.3
1980	43	15	
1979	72	31	

Pew Environmental Health Commission, funded by Pew Charitable Trust at the John Hopkins School of Public Health, recently completed a study targeting the nation's most prevalent air quality related health problem, asthma.¹² The Commission concluded:

“The nation is in the grip of a rapidly growing asthma epidemic whose victims will more than double by 2020. . . Asthma rates are going up dramatically across all demographic groups, all across America. . . . In just one year, 1995, asthma accounted for 1.8 million visits to hospital emergency rooms and more than 10 million missed school days. That makes asthma the number 1 cause of school absenteeism.”



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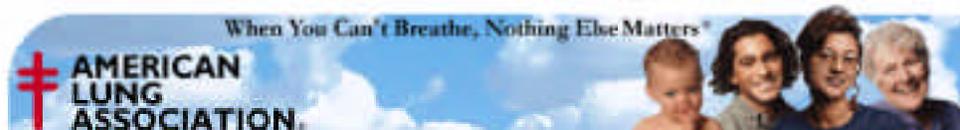
The Pew Environmental Health Commission's recommendations ask Congress and the Administration to track asthma trends, investigate asthma deaths, begin short and long term health studies on causes and prevention, conduct a public education program to combat environmental factors causing asthma, and empower the U.S. Surgeon General to marshal federal efforts.

Responding to the alarming news about asthma have been recent efforts to educate the public about asthma by the American Lung Association, the Allergy and Asthma Network, Mothers of Asthmatics, Inc., and the American College of Allergy, Asthma & Immunology (ACAAI). Recent studies by the American Lung Association (Spring 2000) and Asthma in America (December 1998) with asthma patients indicate that asthma care falls short of treatment standards, and asthma patients lack important tools to successfully manage this chronic condition.¹³

Here in California

The American Lung Association of California says that 600,000 children in California have asthma and rates have risen 160 percent since 1980. In 1998 the American Lung Association of California and the California Thoracic Society prepared a review of health studies.¹⁴ ALA/CTS' assessment emphasized that there are a number of different kinds air pollution episodes with health impacts, and that the ambient air pollution level is only one element in the complex causation of asthma. ALA/CTS points out that while air pollution levels have diminished in the last couple of decades, asthma rates have gotten worse. The ALA/CTS' assessment highlights the fact that there is not consensus in the medical community that reducing air pollution is a key to reducing suffering from asthma and other respiratory illnesses.

To develop better data, California Air Resources Board is currently investigating health effects of ambient air pollutants in California with researchers at the University of Southern California. The objectives of this study are to: 1) determine whether long-term exposure to ambient air pollutants during childhood leads to changes in lung function or adverse health effects, especially chronic respiratory effects; and 2) quantify the prevalence and severity of the observed effects, as well as the levels of exposure at which effects occur. The study will evaluate 5,400 school children residing in 12 southern California communities. Preliminary results have linked health impacts to ozone levels. In a July 2000 Board report, for example, the researchers reported that they observed an 83 percent increase in school absences with a 20 parts per billion increase in ozone. Sacramento was not included in this study.¹⁵



California lacks a comprehensive asthma program. Continuing efforts by a statewide coalition to define and fund a state asthma program have resulted in some progress, but a several million dollar program was vetoed (blue-penciled from the budget) by the Governor in June 2000. This issue is discussed below.

Conclusions

- Increasing concern about the incidence and severity of lung disease, especially asthma, continues to highlight the importance of air quality to a community's health and quality of life.
- While lung disease and air pollution are closely linked, and recent evidence highlights that linkage, the connection between lung disease and air pollution is not compelling for everyone. Those focused on lung disease may find air pollution control far down their priority list as they seek ways to alleviate suffering and reduce costs of treatment.
- The Sacramento area violates federal health standards for air quality, and seems to have higher rates of asthma, indicating a need for both intensified effort to clean up pollution and a need for expanded education on asthma, causes and treatment.

Footnotes

- ¹ Sacramento *Bee*, page 1, July 16, 2000.
- ² The Medi-Cal study also illustrates the difficulties in linking research to action. The study results were first presented to the American Thoracic Society in April, 1999 ["Air Pollution and Pediatric Asthma Exacerbations in Sacramento California," M.J. Lipsett, S. Campleman, B. Ostro] and used data from January 1992 to April 1994. Researchers will not release findings to the public until the study has been published by a peer-reviewed medical journal. The Bee article was based on telephone interviews, not the released study. At present there is no expected date for release of the data to the public.
- ³ Material in the appendix to this report describes the variety of air quality public programs.
- ⁴ American Lung Association, *Trends in Asthma Morbidity and Mortality, November 1999*. Source data: Kevin b. Weiss, M.D., Peter J. Gergen, M.D., M.P.H., and Thomas A. Hodgson, Ph.D., An Economic Evaluation of Asthma in the U.S., *The New England Journal of Medicine*, Vol. 326, No. 13, March 26, 1992, Morbidity and Mortality, Chartbook of Cardiovascular, Lung and Blood Diseases, NHLBI, May 1998. Estimates derived by using mortality and health survey data from the National Center for Health Statistics, health expenditure data from the health care financing administration, and income data from the U.S. Bureau of the Census.
- ⁵ American Lung Association, *Lung Disease Data 2000*, p. 5.
- ⁶ *Ibid.*
- ⁷ Sacramento *Bee*, page 1, July 16, 2000.
- ⁸ American Lung Association, *Estimated Prevalence and Incidence of Lung Disease*, April 2000
- ⁹ The Cleaner Air Partnership is a Sacramento region coalition jointly sponsored by the American Lung Association of Sacramento-Emigrant Trails and the Sacramento Metropolitan Chamber of Commerce. 1823 Eleventh Street, Sacramento, Ca. 95814. 916-447-4956. The most recent survey report is for 1999.
- ¹⁰ American Lung Association, "American Lung Association Survey Reveals Startling Misunderstandings About Living with Asthma," July 26, 2000.
- ¹¹ The *California State Implementation Plan for Ozone*, Vol. IV, P. IV-24, "Local Emissions control Plan and Attainment Demonstrations", November 15, 1994, p. IV-24.
- ¹² Pew Environmental Health Commission, *Launching America's War on Asthma*, May 2000.
- ¹³ Asthma in America, "Asthma Care in America Falls Far Short of National Treatment Standards," December 4, 1998; American Lung Association, "American Lung Association Survey Reveals Startling Misunderstandings About Living with Asthma," July 26, 2000.
- ¹³ CTS/ALAC, *Research Update: Health Effects of Ambient Air Pollution*, August 7, 1998.
- ¹⁴ "Southern California Children's Health Study," conducted by the University of Southern California, supported by the California Air Resources Board, report presented to the Board, July 2000.

The Response to the Ozone Air Quality Problem, Levels of Intervention

Strengthening Individual Knowledge and Skills

A number of efforts are underway in the region to educate individuals about the prevention and treatment of air quality related health problems. Individual primary care providers, health maintenance organizations, the American Lung Association, and health educators offer support to those suffering from health impacts of ozone pollution.

Recent national studies have shown that asthma management falls below standard. Sacramento is no exception. The Asthma in America survey sample for Sacramento found, among other things, the following:¹⁵

- only 5 percent of asthma patients could name inflammation as the underlying cause of asthma symptoms;
- more than half (54%) thought it was possible to treat only asthma attacks and symptoms, not the underlying cause;
- many patients appear to be treating only the symptoms of asthma and not the underlying cause;
- 92 percent of the doctors say anti-inflammatory drugs are very important in long-term management but only 19 percent of the asthma patients report using this medication within the last four weeks.

In 1998, 17 percent of the respondents to the Cleaner Air Partnership survey reported that they had heard (seen or read) about air pollution in the last year from their physician, health care organization or pharmacist.¹⁶ Health care organizations are also offering asthma information on their web sites. It is not unusual for health organization member newsletters to contain articles about summer smog, and prevention and exposure avoidance measures.

The American Lung Association conducts the Open Airways for Schools program. It teaches children how to prevent asthma episodes and emergencies, and to help schools control asthma by creating partnerships in asthma care with school personnel, physicians, families, and local American Lung Association volunteers. *Open Airways for Schools* consists of six lessons for children with asthma, aged 8-11. The chief limitation in delivering this program to children through the schools is space available and the difficulty of scheduling. The program is also limited by funding available.¹⁷

Local air districts, US EPA and the California Air Resources Board provide information about prevention of ozone episodes and what individuals can do to avoid exposure and help reduce levels of ozone in the community. Community education efforts will be discussed more thoroughly in the next section.

Knowledge of Air Quality and What to Do

Data from the Cleaner Air Partnership public opinion survey (1999) show statistically significant differences between respondents with affected household members and others (See Table 2):

- in how often they notice the air quality index,
- whether they make changes in their behavior on unhealthy air quality days,
- whether they recall advertising and ozone maps, and
- whether they believe that personal change is necessary to achieve clean air in the area.¹⁸



Youngsters meet Bronkie at an asthma help line linked to the ALA web site.

Specifically, 42 percent of those who reported someone had trouble breathing in their household noticed the Air Quality Index nearly every day or every day, compared with 27 percent of those who did not report any air quality-related problem in the household. **Significantly, however, 40 percent of the respondents with household health problems related to air quality, reported noticing the AQI only once in a while or less.** Forty percent of those in air quality impacted households reported seeing ozone maps, either on television or the internet. To avoid impacts, those sensitive must know the air quality index each day, and avoid exposing themselves to levels which cause them inflammation.



This population should be targeted for more education about the availability of mapped air quality information to improve efforts to avoid exposure to excessive ozone levels. Of special import is the need to educate those who experience trouble breathing (and their parents or caregivers) that ozone's impacts are usually felt 24 or more hours after initial exposure.¹⁹

Importantly, 72 percent of those in households with air quality-related health problems say they already change their behavior in some way on days with unhealthy air. Interviews in 1995 indicated that most of the changes reported were to stay at home or indoors, to not exercise, to drive less, to not use gas powered lawn and garden equipment, to not use the barbecue grill and to use alternatives to driving. Twenty-six percent reported that someone in the household took medication on those days.²⁰ It may be more important to increase awareness of the air quality index so that more families are taking the precautions needed on such days.

Gender and Race Differences.

Nationally, there are race and gender differences in the incidence of asthma and asthma mortality. Females are more susceptible to asthma than males, and blacks have more severe impacts than whites. Gender differences have been shown to be significant in the health impacts of air pollution, and in the awareness of air quality.²¹ A 1996 study by Loma Linda University, University of Arizona and U.S. Environmental Protection Agency found gender differences in the relationship of air pollution to asthma. It found that ozone appeared to be more important for males, with men having "more than ten times the risk of getting asthma for every .05 parts per million increase in ozone."²² Men in the study reported spending an average of 18 hours per week outdoors compared with an average of eleven hours for women.



The Cleaner Air Partnership has documented strong statistical differences between men and women in their awareness of the air quality index, their reported change of behavior when air quality is unhealthy and in awareness of advertising. Specifically men are:

- less likely to be notice the air quality index on a regular basis;
- less likely to report changing their behavior on forecasted unhealthy air days;
- more likely to be aware of advertisements telling them what they can do to reduce air pollution; and
- more likely to have seen ozone maps on television or the Internet.

While 30 percent of the men notice AQI almost every day or more, 37 percent of the women do. While 44 percent of the men say they change something they do when the air quality is forecast to be unhealthy, 61 percent of the females say they make some change on those days. Sixty-seven percent of the men, compared

Table 2: Someone in HH Had Trouble Breathing Last Summer during Period of Unhealthy Air [all findings below are statistically significant, p<.05 at 95% confidence level]

Compares those who reported someone in their household had trouble breathing last summer during a period of unhealthy air with those who reported no one in their household had trouble breathing. In the regional sample, 40 percent of those interviewed said yes, and 60 percent said no to the question about trouble breathing.

	HH Breathing Incident n=557	No HH Breathing Incident n=783	Total n=1349
Did you notice the AQI . . .			
every day or almost every day	42%	27%	34%
about half the time	17%	17%	17%
once in a while	33%	43%	39%
never	7%	11%	9%
depends/dk	1%	2%	1%
Do you change your behavior on days when air quality is unhealthy?			
Yes	72%	40%	
No	28%	60%	
Do you feel that you personally will have to change anything you do if the metropolitan area is to have clean air?			
Yes	58%	45%	50%
No	40%	53%	48%
Don't Know	2%	2%	2%
Recall seeing or hearing any advertisements in the past year about how you can help reduce our metropolitan area's air pollution?			
Yes	62%	65%	64%
No	37%	34%	35%
Don't Know	1%	1%	1%
Notice any maps on television or the internet about ground level ozone air pollution in our region?			
Yes	40%	28%	
No	58%	70%	
Don't Know	2%	2%	

to 61 percent of the women, said they recalled advertising, and 35 percent of the men, compared to 30 percent of the women, said they had seen ozone maps on television or the Internet. Athletes, outdoor workers, and others who experience sustained exposure to ozone should be better informed about the direct health im-



Because of the greater health impact of ozone on men in the community and their apparent lower level of attention and concern with daily air quality, men exposed to ozone pollution should be targeted with more information about how to recognize ozone impacts on their health and to avoid exposure.

pacts, how to recognize ozone impacts on their health, and ways to avoid exposure.

Footnotes:

¹⁵ Asthma in America, "Sacramento Not Reaching Asthma Goals," www.asthmainamerica.com/cities/sacramento.html

¹⁶ Cleaner Air Partnership, *1999 Annual Report on Air Quality and Transportation Attitudes in the Sacramento Region*, July 1999, p.2.

¹⁷ Information about American Lung Association programs is available on the web: www.saclung.org for our region; www.lungusa.org for national programs.

¹⁸ Data analysis conducted specifically for this report from the 1999 Cleaner Air Partnership data set, using the weighted regional sample of 1,395 residents.

¹⁹ Susan Stone, U.S. EPA, Environmental Health Scientist for Office of Air Quality Planning and Standards, as reported in the Cleaner Air News, June, 2000.

²⁰ The Cleaner Air Partnership 1995 Public Opinion Survey on Air Quality and Transportation

²¹ American Lung Association, *Lung Disease Data 2000*.

²² Sacramento *BEE*, May 14, 1996, A-10

Community Education

Community education on the treatment and prevention of air quality-related health problems is a shared public-private responsibility, with the Sacramento Metropolitan Air Quality Management District taking the lead with its Summer Smog Season Public Education Program, and the American Lung Association focused on the health effects of ozone air pollution.

The American Lung Association.

The American Lung Association of Sacramento Emigrant Trails (ALASET) conducts a range of education activities on ozone and its health effects. Included are building youth leadership, managing a health effects task force and a clean air committee, conducting Clean Air Month educational activities, and asthma support (described above), and related media outreach. Its High School Challenge Youth Leadership program reached thousands of students, and the Annual Clean Air Awards luncheon was attended by more than 400 persons. (Learn more at the www.saclung.org website.) ALASET's new Asthma Collaborative will add program strength in the next three years; it is described below under coalitions and networks.

The Sacramento Metropolitan Air Quality Management District.

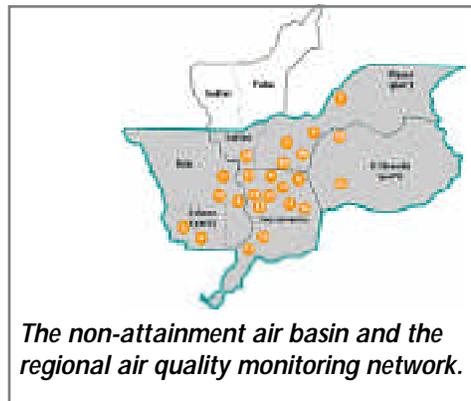
The Sacramento Metropolitan Air Quality Management District (SMAQMD) conducts extensive regional public education about the air pollution problem, solutions and avoidance of exposure. Its budget for community education is about one million dollars a year, and included in the last year:

- 12-million message impressions via TV and radio advertising and Spare The Air advisories;
- "Ozone movie" maps on the web page and for broadcast on television weather programs;
- distributed air quality forecasts and advisories to over 500 contacts, including news media;
- media contacts resulting in more than 350 air quality-related stories on television news and weathercasts;
- implemented an interactive air pollution simulator program on the web;
- provided funding and support for grassroots and community events.



A dominant element of this program is the Spare The Air campaign, which focuses on days likely to violate the federal health standard for air quality, and alerts the public through media and employer networks. The

employer network included 400 companies covering 190,600 employees. In 1999, the SMAQMD issued 12 Spare the Air advisories, and spent \$37,869 on Spare The Air advertising placements. It aired 102 general awareness television spots and 206 general awareness radio spots during the season. There were 1600 individuals receiving Spare The Air information by email and over 45,000 web site consultations.



The Cleaner Air Partnership conducts Spare The Air day surveys to determine the awareness and response of the public to the Spare The Air day message. In 1999 interviews were conducted on two Spare The Air days and showed that 45 percent of those surveyed (400 drivers residing in Sacramento County) were aware of the request not to drive, and 23 percent of the aware drovers reported driving less than usual.²³ The survey also documented that 32 percent of the respondents reported someone had trouble breathing because of unhealthy air in their household.



Additional advertising, with collaborative or corollary messages, could expand the awareness of the program and of the appropriate episodic responses, both for prevention of episodes and prevention of exposure during episodes.

Footnotes

²³ Judith Lamare, Ph.D., *Evaluation of Participation in the Sacramento Air Basin 1999 'Spare The Air' Ozone Day Driving Reduction Program*, May 2000.

Training Providers

U.S. Environmental Protection Agency, American Medical Association's Continuing Medical Education Program, the University of North Carolina School of Medicine and the American Lung Association have teamed up to provide ozone education to primary health providers nationally. The video, entitled "Ozone and Your Patients' Health," and certified test and form for credit, will be presented at medical meetings this year, and will be available for interactive sessions at the local level through American Lung Association. It will also be available on a web site. The program is targeted to family practice, pediatricians, nurse practitioners and respiratory therapists.



The video "Ozone and Your Patients' Health" features medical researchers and provides health-care professionals in the public and private sectors and other interested parties, with information on the health effects resulting from ozone exposure. It acquaints viewers with the physiological effects of ozone on the respiratory system and the clinical manifestations of these effects, especially on children and people with asthma. It also informs about tools available to reduce exposure to air pollutants. A regional program to ensure this training is provided to primary care providers throughout the region could greatly expand the potential impact of this training program.



A regional program to ensure this EPA/ALA training is provided to primary care providers throughout the region could greatly expand the potential impact of this training program.

Fostering Coalitions and Networks

The Sacramento area is well-served by coalitions and networks concerned with air quality and its health impacts, and with solutions to the air pollution problem.

In 1986, the American Lung Association of Sacramento-Emigrant Trails and the Sacramento Metropolitan Chamber of Commerce began a partnership to build consensus among community leadership for efforts to solve the Sacramento regional ozone air pollution problem. It focuses on the mobile sources of ozone pollution. The resulting "Cleaner Air Partnership" has evolved over the years to attract and educate the various sectors in the community about the causes and solutions, and the role of community organizations and individuals in reducing air pollution. The Partnership's Steering Committee, newsletter to 5,000 community leaders, web site and on-going research program into community attitudes and behaviors have created a network drawing business, government, environmental and public health interests together. The Partnership brings state and federal regulators to the table with local interests to build a common agenda for air quality improvement. Medical and health organizations have taken part in the Cleaner Air Partnership, but there has been little effort to consistently organize a network of medical and health organizations to implement more sustained and more thorough education projects within these communities.

The American Lung Association of Sacramento-Emigrant Trails (ALASET) has formed the Asthma Collaborative, a new project initially funded by GlaxoWellcome, bringing together physicians, pharmacists, respiratory therapists, hospital administrators, parents and school nurses to focus on three priorities:

- raising public awareness of the seriousness of asthma
- developing a resources toolbox for physicians to use with asthma medications;
- partnering with school administrators to improve policies and practices that facilitate self-care by children.



*Part of the cartoon page on
www.cleanerairpartnership.org*

Using traditional public policy tools of education, advocacy and research, the Asthma Free Communities Initiative for the 21st Century will expand existing asthma programs with schools to implement the community collaborative's recommendations in the next three years.

An Air Quality Summit will be held in December 2000, which will focus on community leadership on the ozone problem and solutions. This effort could set the stage for further leadership coalition or network building.

Changing Organizational Practices

There are several areas where efforts have been made to change organizational practices to prevent or ameliorate the results of ozone episodes. There have been many successes, and there remain a number of opportunities for substantial impact. Two areas that are on the forefront are:

"Spare The Air" day participation by individuals and organizations, including businesses, trade unions and health care providers.

As noted above, the Spare The Air program has penetrated both media and employer networks with some impact on practices. Also, we know that on and after ozone exceedance days, there are higher rates of hospi-

tal emergency and short-term medical appointments by Medi-Cal recipient children and adolescents. Also, we know that reported medical visits by others because of unhealthy air impacts can range up to 9 percent of the households in the region.

More targeted, sustained and coordinated outreach efforts on the Spare The Air program could reduce both exposure to ozone air pollution and motor vehicle emissions that contribute to it. The 1999 Spare The Air survey showed that when drivers made trips on Spare The Air days, despite their desire and intention to reduce driving, it was related to work. Efforts to educate employers to delay discretionary work trips on Spare The Air days could improve performance of the Spare The Air program. Outreach within the medical community might have some impact because of the greater sensitivity to health impacts of air pollution in that community.

Heavy-duty vehicle NOx emission reductions by owners of heavy-duty vehicles.

To meet air quality goals, the region must reduce on-road motor vehicle emissions of NOx by two tons in 2002 and five tons in 2005. Since 1994, the Sacramento Metropolitan Air Quality Management District has offered incentives to owners of heavy-duty diesel vehicles to acquire low emission vehicles. In 2001, options for retrofitting existing diesel vehicles to lower NOx emissions will be available, with incentive funds to encourage their use. A major outreach program to these vehicle owners is underway (see www.cleanerairpartnership.org). The Clean Fuels Forum educates fleet managers about cleaner fuels and vehicles. A corollary Air Quality Project of the American Lung Association of California focuses on the zero emission vehicle goals in California.



UPS is switching to natural gas in order to reduce air pollution.

Since many factors enter into vehicle owners' decisions, and since achieving these goals is critical for public health in our region, a special outreach program to health organizations could be very useful. If health organizations in the region adopted procurement policies to give preference to vendors and shippers who use low emission heavy-duty vehicles, an additional incentive would exist for vehicle owners to take advantage of the financial assistance to upgrade, repower or retrofit their fleets.



A regional program to support outreach through the American Lung Association of Sacramento-Emigrant Trails with the health community could strengthen the community's response to ozone air pollution by fostering networks and solutions by changing organizational practices.

Influencing Policy and Legislation

The community has made a sustained effort to change policy and legislation with substantial positive results. In the 2000 legislative session, the region achieved funding to fully implement the NOx reduction program in the 1994 State Implementation Plan. Other gaps remaining include shortfalls in the Smog Check program (including full implementation in the Sacramento region, and extension of NOx reduction requirements to the Bay Area).

On the health effects side, however, fortune has not been so bright. Years of effort to achieve a state level asthma program continue to be frustrated. The only advance for this legislative session might be a \$1.5

million allocation to target low income, ethnic minority communities for asthma related programs in FY 2000/2001.

The American Lung Association of California's 2000 legislative agenda included:

- increased funding for heavy-duty NOx reduction incentive programs;
- support and expansion of the California Zero Emission Vehicle Program (ZEV);
- full implementation of the Smog Check program in the State Implementation Plan;
- mandate clean/alternative fuel vehicle purchases in state government fleets;
- more work on identifying toxic air contaminants and control measures for them;
- support for reformulation of diesel and gasoline vehicles to reduce sulfur content;
- improve access to environmental health care for all Californians, including toxic risks;
- \$12 million in funding for statewide asthma programs, including prevention, research studies, surveillance, and assistance to community prevention and intervention projects, managed care, medical groups and community clinics.



Some progress was made in 2000 on this agenda, but efforts to fund the statewide asthma program fell far short of goal. The greatest success came in the funding of heavy-duty NOx reduction incentive programs. The school bus clean fuel replacement program received a substantial boost. Efforts to fully implement the Smog Check program languished, but may become a focus in the next legislative session because of the publication of the state's performance report on the program showing program shortfalls.

ALAC is part of a statewide network in a legislative campaign to increase state action and responsibility for asthma prevention, education, research and assistance to under-served populations. Omnibus asthma legislation was included in Senate Bill 1111 (Sher); however, a budget allocation of \$12 million was blue penciled by the governor. A state level program may be the best way to achieve progress toward treatment, education and research on the region's asthma problem. AB 2788, the 2000 California budget bill, contained language establishing such a program.



Sacramento area school districts are state leaders in using clean fuels. The state recently expanded funds available to school districts to replace diesel buses with alternative, cleaner fuels.



In December 2005, Sacramento area residents want to hear the news that they have achieved national air quality standards on schedule. Until that time, we face a dual path: to implement the 1994 plan to reduce emissions, and to ensure that residents affected by air pollution know how to prevent and treat exposure until air is safe to breath in the region.

This report has found that:

- Increasing concern about the incidence and severity of lung disease, especially asthma, continues to highlight the importance of air quality to

a community's health and quality of life.

- While lung disease and air pollution are closely linked, and recent evidence highlights that linkage, the connection between lung disease and air pollution is not compelling for everyone. Those focused on lung disease may find air pollution control far down their priority list as they seek ways to alleviate suffering and reduce costs of treatment.

- The Sacramento area violates federal health standards for air quality, and seems to have higher rates of asthma, indicating a need for both intensified effort to clean up pollution and a need for expanded education on asthma, causes and treatment.

This report has reviewed progress and opportunities on both tracks, and makes the following recommendations.

✓ Attract Funders to Expand Community Capability

This report identifies a variety of levels of intervention that would be desirable, and the cost of acting on all these levels merits outside funding. A number of successful efforts are underway upon which interested donors could build, according to their specific interests.

✓ Work Through the American Lung Association of Sacramento

The American Lung Association is the lead health non-profit organization in the region on air quality related issues. It has a track record of success and the organizational capability to manage projects.

✓ Focus on the Health Community

Health organizations can help change polluting practices as well as provide health education and services.

✓ Work from a Five Year Plan to Achieve Goals by 2005

The 2005 deadline for meeting federal public health standards sets a time frame for community action.

✓ Improve Community Leadership Involvement

A continuing community leadership forum like the December 2000 air quality summit can strengthen community leader involvement in solving the air quality problem.

✓ Specific Performance-based Projects

This report has identified the following specific performance-based projects which would be desirable to implement over the period 2001-2004 to enhance and expand the community's air quality effort:

- More rigorous research to provide more reliable estimates of the health impacts of ozone air pollution in our region.
- Educate those who experience trouble breathing (and their parents or caregivers) how to use ozone maps and the air quality index to avoid exposure, and that ozone's impacts are usually felt 24 or more hours after initial exposure.
- Target men exposed to ozone pollution with more information about how to recognize ozone impacts on their health and to avoid exposure.
- Additional Spare The Air advertising, with collaborative or corollary messages, to expand the awareness of the program and of the appropriate episodic responses, both for prevention of episodes and prevention of exposure during episodes.
- A regional program to ensure this EPA/ALA training is provided to primary care providers throughout the region to expand the potential impact of this training program.
- A regional program to support outreach through the American Lung Association of Sacramento-Emigrant Trails with the health community to strengthen the community's response to ozone air pollution by fostering networks and coalitions and by changing organizational practices.
- Legislative advocacy for full Smog Check implementation and a state level asthma tracking and treatment program by the state.



Appended Material

“Dirty Air in the Sacramento Region, The Health Effects of Air Pollution”
Sacramento Metropolitan Air Quality Management District

“Knocking NO_x, The Next Step to Cleaner Air”
Sacramento Region’s Cleaner Air Partnership

“Federal and State Air Quality Programs”
Material catalogued by SHF staff

APPENDIX A

AIR QUALITY PUBLIC PROGRAMS

FEDERAL/STATE

Environmental Protection Agency

- Among major new programs of the Clean Air Act are acid rain provision, the operating permits program, and provisions to phase out ozone-depleting substances.
- Major changes to existing programs include attainment provisions for National Ambient Air Quality Standards (NAAQS) and the National Emissions Standards for Hazardous Air Pollutants (NESHAP) program.
- Hazardous air pollutants (HAP) are carbon monoxide, sulfur dioxide, oxides of nitrogen, lead, particulates, and ozone.
- Some of the primary standards and programs addressing the criteria pollutants include New Source Review (NSR), State Implementation Plans (SIPs), and New Source Performance Standards (NSPS).
- Section 112(l) of the CAA describes how states and local agencies that wish to implement NESHAP programs can apply to the EPA for delegation of implementation and enforcement authority. This section also allows states to demonstrate equivalency with NESHAP, thus allowing states to implement their rules instead of the NESHAP. Program contact is Tom Driscoll: driscoll.tom@epa.gov
- The only California program of EPA Region 9 Air Programs in the Foundation's funding region is San Joaquin Valley Ozone Reclassification Proposal (see County/Regional Programs below).

California Air Resources Board

Programs

- Air Quality & Transportation Planning
- Air Toxics Program
- Consumer Products
- Fuels Program
- Industry, Manufacturing & Permitting Activities
- Mobile Sources
- Research Activities
- Vapor Recovery Program

Air Quality & Transportation Planning:

- State Implementation Plan
 - Plan to attain national ambient air quality standards (NAAQS).
 - Not a single document but a compilation of new and previously submitted plans, programs, district rules, state regulations, and federal controls.
 - Information available on SIP activities for ozone, carbon monoxide, and particulate matter includes:
 - ~ 1994 Ozone SIP

- ~ 1999 Bay Area SIP
 - ~ Carbon Monoxide SIP
 - ~ Air Quality and Agricultural Forum
 - ~ Exploring New Technologies for Clean Air
 - ~ Particulate Matter Technical Activities
 - ~ Air Quality Standards
- California Clean Air Act Plans
 - The California Clean Air Act, established in 1988, provides a framework for air quality planning and other actions to meet the health-based State Ambient Air Quality Standards.
 - Regional Haze
 - U.S. EPA regulations require states to improve visibility in national parks and wilderness areas. California is working with other western states to understand and improve visibility.

Air Toxics Program:

- The AB 1807 Program, established in 1983, involves identification of toxic air contaminants (TAC), assessment of the potential for human exposure, and evaluation of the health effects. After much public comment, a final risk assessment report is prepared, then draft regulation to formally identify the substance as a TAC.
 - In step two, the ARB reviews the emission sources of an identified TAC to determine if any regulatory action is necessary.
 - In 1993, legislation (AB 2728) amended AB 1807 requiring the ARB to identify the 189 federal hazardous air pollutants as TACs.
- AB 2588 “Hot Spots” Program
 - Established in 1987, this program requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks.

Consumer Products Program:

- The ARB works with all stakeholders to develop technologically and commercially feasible regulations that help to reduce volatile organic compound (VOC) emissions from consumer products.
- Investigators of the Consumer Products program purchase samples of regulated consumer products from outlets all over California. They inspect product containers for compliance with registration and dating requirements and send selected products to the laboratory for testing. They investigate violations and present their findings for suitable resolution. The investigators present violations of criminal laws to prosecutors.

Fuels Program:

- The ARB has been charged by the Health and Safety Code to achieve a 55% reduction of reactive organic gases and at least a 15% reduction in the emissions of oxides of nitrogen from motor vehicles, and the maximum feasible reductions in particulate matter, carbon monoxide, and TACs from vehicular sources by December 31, 2000.
- Fuel specifications have been established for alternative fuels, cleaner-burning gasoline, and diesel fuel.

- Enforcement programs:
 - Cargo Tank Vapor Recovery Certification Program
 - Fuel Distributor Registration
 - Vapor Recovery Certification Program
 - Vapor Recovery for Bulk Plants and Above Ground Tanks
 - Vehicle Fuels Enforcement

Industry, Manufacturing & Permitting Activities:

- Abrasive Blasting Program
- Agricultural Burning
- Architectural Coatings
- Best Available Control Technologies (BACT) Clearinghouse
- Federal Clean Air Act (CAA) - Title III Activities
- Federal CAA - Title V Activities
 - Requires stationary sources to obtain operating permits
- Fugitive Hydrocarbon Leaks Emissions
- Independent Contractor Program
- Interchangeable Emission Reduction Credits
- Rice Straw Burning

Mobile Sources:

- Buyer’s Guide to Cleaner Cars
- Voluntary Accelerated Vehicle Retirement Program (AKA “scrappage program”)

COUNTY/REGIONAL PROGRAMS

Air Quality Management Districts and Air Pollution Control Districts

All districts administer the California and Federal Clean Air Acts via guidelines set forth by state and federal agencies. The ARB makes state area designations for nine criteria pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM10), sulfates, lead, hydrogen sulfide, and visibility-reducing particles. The districts regulate, permit and inspect stationary sources of air pollution. While the state is responsible for controlling actual tailpipe emissions from vehicular sources, the districts are required to implement transportation control measures. The districts also respond to citizen complaints and administer residential and commercial burn programs, where applicable.

The following districts are within the Sacramento Metropolitan Area:

- El Dorado County APCD - El Dorado County
- Feather River AQMD - Sutter and Yuba counties
 - FRAQMD is part of the Sacramento Valley Air Basin (SVAB) that includes Butte, Colusa, Glen, Tehama, Shasta, Yolo, Sacramento, Yuba, Sutter, and parts of Placer and Solano counties. See attached information on FRAQMD for the following:

~ Standard Mitigation Measures Applicable to All Projects

- ~ Supplemental Mitigation Measures for Residential Projects
- ~ Supplemental Mitigation Measures for Commercial Projects
- ~ Definitions

- Placer County APCD - Placer County
- Sacramento Metropolitan AQMD - Sacramento County
- San Joaquin Valley APCD - Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare, and western portion of Kern counties
- Yolo/Solano AQMD - Yolo and eastern portion of Solano counties

Sacramento Metropolitan Air Quality Management District (SMAQMD)

The SMAQMD is organized into five divisions:

- The Administration Division includes the Air Pollution Control Officer (APCO) and the district Counsel position.
- The Mobile Source Division develops and implements market-based innovative programs to reduce emissions associate with on- and off-road mobile sources in Sacramento.
- The Stationary Source Division processes permits, determines whether the conditions of those permits have been met, and ensures compliance with SMAQMD rules and regulations.
- The Program Coordination division coordinates the SMAQMD’s planning efforts, including development of rules and regulations.
- The Strategic Planning Division is responsible for the long-term planning of the SMAQMD and is the primary source of information to the general public.

Solutions for Environment and Economic Development (SEED) Program:

The SEED program was developed by a consortium of community groups including the Cleaner Air Partnership, American Lung Association, California Air Resources Board, U.S. EPA, Sacramento Metropolitan Chamber of Commerce and the Sacramento Metropolitan Air Quality Management District.

The purpose of the SEED program is twofold: 1) Provide regulatory flexibility to new industry, and 2) Fund innovative emission reduction technologies beyond those that are committed to in current air quality plans.

In this current fourth funding cycle the District Board of Directors will select a list of emission reduction programs for funding later this year. Total funding available will be up to \$290,000. The intent of the SEED program funding is to replace existing activities with less pollutant-emitting activities. Eligible projects will meet the following criteria:

USEPA Criteria means eligible projects will have emission reductions that are:

1. Quantifiable
2. Enforceable
3. Real - Verified reductions actually occur with implementation
4. Permanent
5. Surplus - Reductions are not anticipated or required of any law, regulation or plan

Seed program criteria requires that eligible projects must also demonstrate:

1. Cost Effectiveness. Measured by dollar per pound of emissions reduced.
2. Emission Reduction Potential. Full implementation could affect significant portion of the emissions inventory.
3. Technical Feasibility. Processes and procedures are based on accepted concepts and protocol.
4. Innovation. Project is an innovative emission reduction program.

Examples of projects that may be eligible include:

1. Locomotives.
2. Non-regulated agricultural pumps.
3. Refrigerated trailer units.
4. Large fork lifts (new electric).
5. Airport tugs.
6. Commercial lawnmowers (catalyst or LPG).
7. Regulated boilers and internal combustion engines operating beyond current regulatory requirements.

Sacramento County Department of Environmental Review and Assessment (DERA)

The department's primary mission is:

- To implement the requirements of the California Environmental Quality Act (CEQA) in an objective and unbiased manner.
- To produce clear, concise, objective and legally defensible environmental documents for use by decision makers and the general public.
- To formulate reasonable mitigation measures and project alternatives that avoid, minimize, rectify or compensate for adverse impacts to the environment.
- To provide quality customer service in a timely and efficient manner.

DERA provides the following services:

- Prepares or assists in the preparation and processing of environmental documents for all projects initiated by various county departments.

- Reviews environmental documents prepared by other entities and coordinates the review of such documents by other departments of the County. The department acts as a clearinghouse for comments by all concerned county departments and prepares a coordinated response for those entities.
- Reviews all projects initiated by the private sector that require public agency approval.
- Provides mitigation monitoring and reporting programs in accordance with the Public Resources Code and adopted county ordinances.

Sacramento County Planning and Community Development Department

Programs include:

- Long range planning services, including updating of the Sacramento County General Plan.
- Specific and Community planning services, including preparation and adoption of a series of Specific and Community Plans.
- Current Planning and Zoning services.
- Code Enforcement.

Sacramento County Business Environmental Resource Center (BERC)

BERC was established by Sacramento County in 1993 in response to the business community's need for multi-media regulatory assistance (e.g., air, water, hazardous substances, waste). It is a joint project of the Sacramento Metropolitan Air Quality Management District, Sacramento County Public Works Agency, the Sacramento County Environmental Management Department, and the Sacramento County Planning and Community Development Department. BERC is a non-regulatory office and does not issue permits nor conduct enforcement inspections. Among other things, BERC was established to act as a neutral third party to help resolve issues between the business community and regulatory agencies.

BERC's consultative services help businesses understand and comply with air quality and other environment regulations. BERC provides free and confidential consultation and information on the environmental regulations that apply to businesses in Sacramento County including:

- Regulatory/technical consultation;
- Identification of permitting requirements and the associated fees;
- Facilitation between business representatives and appropriate agency staff to simplify and expedite the permitting process; and
- Identification of pollution prevention opportunities and suggestions on establishing and implementing cost-effective pollution prevention programs.

Compiled and Summarized by Amy Birtwhistle