

## Air Quality

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### Introduction

Achieving and maintaining good air quality is crucial to the public health and economic vitality of San Francisco. As a leader in developing and implementing policies to support good air quality, San Francisco should aim to provide its residents and visitors with the benefits of clean air and a healthy environment at home, at work and at play. By setting standards that further the achievement of global sustainability, the City of San Francisco stands to become a model of a responsible global city.

The surrounding air, both outdoors and indoors, has the potential to affect human health, attitudes, productivity, and people's ability to enjoy their lives. It is important to maintain the quality of the outdoor air since all life forms depend on it, and since the quality of indoor air is dependent on that of the outdoors. In addition, a recent study reveals that Americans spend 90% of their lives indoors, with the result that there is now an increased awareness of the importance of the quality of the indoor air.

### Outdoor Air Quality

Automobiles are the major source of air pollution in California, and measures must be taken to reduce public dependence on gasoline-fueled personal vehicles as a primary means of transportation. Advances are being made in the design of alternatively fueled vehicles, which reduce tail-pipe emissions, and there are many accommodations that San Francisco could make to encourage less-polluting modes of transportation.

In addition, environmental tobacco smoke, fireplaces, barbecues, construction practices, improper building ventilation and many industrial activities have a negative impact on the quality of the air in San Francisco. Notable examples of stationary sources of pollution in the City of San Francisco include roof tar, power-transmitting stations, dry cleaning establishments (which emit perchlorethylene), and asphalt paving.

The economic health of the City of San Francisco and the surrounding Bay Area is dependent on good air quality. Acids from air pollution corrode metals, building exteriors, and painted surfaces. As an esthetic matter, clear air is crucial for tourism as well as for attracting and keeping other employment centers in the Bay Area. Creating and maintaining superior air-quality conditions provides a high quality of life and makes good business sense.

Although pollution from point sources in the City of San Francisco is less harmful than in many major urban areas, there are regions of the City which are more prone to pollution. In a 1996 study of emissions from all permitted point sources issued by the Bay Area Air Quality Management District, Bayview/Hunters Point had the 19th highest relative cancer risk in the region

and the highest San Francisco. Thus it should be a priority to reduce emissions of volatile organic compounds and heavy metals which have an impact on the air in this area.

In addition, nitrogen oxides from combustion-related air pollution make up a surprisingly large one-third of total sources of ocean pollution. The presence of excess nitrogen in standing bodies of water leads to runaway growth of algae, which blocks sunlight and suffocates fish. In addition, a growing opinion in the scientific community blames airborne chemicals for the increasingly violent and unpredictable weather being experienced around the world, leading to undefined, but potentially enormous costs. The international insurance industry has recognized this risk to its livelihood by establishing an emergency task force on global climate change.

### Indoor Air Quality

Many complex and interrelated factors affect indoor air quality. These factors involve the emission of odors, particulates, volatile organic compounds (VOCs), microbial volatile organic compounds (MVOCs), and radon into the air. Examples of such factors include the outdoor air quality; emissions from construction, building materials, indoor occupant activities, building maintenance products, cleaning products, personal care products, and equipment (computers, copy machines, etc.); molds and mildew; building ventilation systems; radon emissions from below-grade rock; and environmental tobacco smoke. Research is increasingly showing links between these factors and human health. Particulates, VOCs, MVOCs and radon can have a negative impact on human health. Some of these impacts have short-term and reversible health effects, while others cause more serious, long-lasting and even life-threatening health effects. Health problems that may result from indoor air quality are classified as follows:

- **Sick Building Syndrome** describes a collection of symptoms experienced by building occupants that are generally short-term and disappear after the individual has left the building. Examples of such symptoms include sore throat, fatigue, lethargy, dizziness, lack of concentration, respiratory tract irritation, headache, eye irritation and other cold- and allergy-like symptoms.
- **Building-Related Illnesses** are more serious than sick building condition ailments and are clinically verifiable diseases that can be attributed to a specific source or pollutant within a building. Examples of such conditions include cancer, Legionnaire's disease, and carbon monoxide poisoning.
- **Multiple Chemical Sensitivities.** While much more research is needed to understand multiple chemical sensitivities, it appears that for some people, exposure to low levels of a variety of chemicals can produce many diverse symptoms in more than one body-organ system.

Unacceptable indoor air quality also carries an economic impact. Costs due to lost productivity when employees are affected by sick building syndrome are significant to local companies. Furthermore, when building occupants experience sick building syndrome or building-related illness, the building owners and responsible design professionals may be exposed to increased liability. Moreover, when poor air quality has a negative impact on the health of residents, there are increased demands on the health care system, which ultimately translates into increased health care costs for all businesses and residents. Finally, when cities begin to implement standards for good indoor air quality, the global effect will be to reduce ozone depletion and to minimize climate changes. These effects are difficult to quantify, but are ultimately some of the more important goals of a sustainable world.

This section of the sustainability plan outlines measures that will make San Francisco a model for sustainable air quality and assure that air-quality concerns are an integral part of the decision-making process and social consciousness. The matrix below suggests modifications of practices and procedures for individuals, government entities and businesses that will have a positive impact on air quality. Fundamental to the success of any initiative is the quality of information available on appropriate actions and the availability of this information to the target audience. For San Francisco to improve the quality of the air in indoor and outdoor environments, it is crucial to have a designated "air quality coordinator" in the city government to monitor and coordinate the many factors which affect the quality of the air. Although many policies and practices to improve air quality are most effectively handled at the federal level, the City can lobby the federal government to institute regulations to ensure that product prices reflect the environmental costs created by the full life-cycle of the product. In addition, the residents of San Francisco should encourage lawmakers to enact taxes on products that pollute the environment and eliminate subsidies of industries that pollute or otherwise harm the environment. Only through the cooperation of an enlightened San Franciscans will the City become a leading global citizen.

### Sustainability Strategy

GOALS	LONG-TERM OBJECTIVES TO REACH SUSTAINABILITY	OBJECTIVES FOR THE YEAR 2001 (5 year plan)	ACTIONS
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<p>1. To assure level of air quality that has no negative impact on the health of humans or the ecosystems of the natural environment.</p>	<p>1-A. Means of travel, power production and industrial production that do not cause chemical, heat, or particulate pollution of the atmosphere have been adopted.</p> <p>1-B. Healthy indoor air quality is pervasive throughout the city.</p> <p>1-C. The City has air quality standards for:</p> <ul style="list-style-type: none"> <li>• Procurement programs,</li> <li>• Maintenance practices for buildings and grounds, and</li> <li>• All new construction of municipal buildings</li> </ul> <p>and incentives for the private sector to do the same.</p> <p>1-D Environmental education is offered at all levels and environmental awareness is incorporated into the social consciousness.</p>	<p>1-1. The environmental health function of the City is staffed at a level that enables it to develop, implement, and monitor air quality objectives.</p> <p>1-2. City and other key decision-makers include air-quality goals when making policy choices.</p> <p>1-3. All new municipal building projects meet specifications that incorporate air-quality concerns (including specifications for the use of integrated pest management).</p> <p>1-4. Five to ten auto-free zones have been developed in San Francisco as model projects.</p> <p>1-5. Vehicle-miles traveled in private automobiles have been reduced by 10%.</p> <p>1-6. The City purchases only clean fueled vehicles for its fleet.</p> <p>1-7. 25% of conventionally fueled (gasoline and diesel) vehicle-miles traveled have been replaced with alternatively fueled vehicle-miles traveled.</p> <p>1-8. Air quality exceeds federal and state air quality standards on an ongoing basis.</p> <p>1-9. Indoor air quality standards have been established for all indoor environments.</p> <p>1-10. Residential and commercial buildings have modified the purchasing specifications for cleaning and maintenance products to minimize airborne toxicity.</p>	<p>1-a. Develop participatory process to identify and plan for auto-free zones.</p> <p>1-b. Increase the use of clean-fuel vehicles. <i>(Suggested for the private sector and city government)</i></p> <p>1-c. Reduce individual vehicle-miles traveled. <i>(Suggested for individuals)</i></p> <p>1-d. Adopt a program to phase out conventionally fueled vehicles from the City fleet and investigate possibilities to replace conventionally fueled heavy equipment and public transit vehicles. INDOOR</p> <p>1-e. Design publicly funded buildings with indoor-air-quality design criteria and develop incentives to encourage the private sector to use the criteria.</p> <p>1-f. Establish a budget for and hire an indoor-air-quality coordinator. <i>(Suggested for the Department of the Environment)</i></p> <p>1-g. Endorse and, as appropriate, adopt technical manuals and standards such as those issued by ASHRAE and the U.S. Green Building Council. * <i>(Suggested for city government)</i></p> <p>Use these guidelines and incorporate new codes to assure good indoor air quality. <i>(Suggested for the Department of Building Inspection)</i></p> <p>1-h. Establish guidelines for purchasing low-emitting products and distribute them widely to</p>
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			<p>syllabus on indoor and outdoor air quality for use in the schools.</p> <p>1-n. Implement a city-wide notification program so that the public can be informed in advance of the release of air-borne toxins, such as pesticides and roofing-tar fumes.</p>
<p>2. To maintain a level of air quality that prevents damage to buildings and infrastructure.</p>	<p>2-A. [See Objective 1-A]</p>	<p>2-1. [See Objectives 1-1, 1-2, and 1-4 through 1-8]</p>	<p>2-a. Study research on effective policies to improve air quality done in other cities and countries and apply it to local policies and practices.</p> <p>2-b. [See Actions 1-a through 1-d, 1-l and 1-m]</p>
<p>3. To eliminate human causes of climate change and prevent depletion of natural barriers against ultraviolet rays.</p>	<p>3-A. San Francisco's contribution to greenhouse gases has been minimized and the production and use of stratospheric ozone-depleting gases has been eliminated.</p> <p>3-B. [See Objective 1-A]</p>	<p>3-1. [See Objectives 1-2 and 1-4 through 1-8]</p>	<p>3-a. [See Actions 1-a through 1-d, 1-m and 2-a]</p>
<p>4. To link air quality and energy issues.</p>	<p>4-A. [See Objectives 1-A and 1-B]</p>	<p>4-1. [See Objectives 1-1, 1-2, 1-11, and 1-12]</p>	<p>4-a. [See Actions 1-e through 1-g, and 1-m]</p>
<p>5. To maintain air clarity.</p>	<p>5-A. [See Objective 1-A]</p>	<p>5-1. [See Objectives 1-4 through 1-8]</p>	<p>5-a. [See Actions 1-a through 1-d and 2-a]</p>