

2011

## 2011 Annual Report - Clean Air Every Day

Bay Area Air Quality Management District

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

# CLEAN AIR EVERY DAY

ANNUAL REPORT 2011



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## PUBLIC INFORMATION

(415) 749-4900

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## ENGINEERING SERVICES

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## WEBSITES

[www.baaqmd.gov](http://www.baaqmd.gov)

[www.sparetheair.org](http://www.sparetheair.org)

[www.twitter.com/@sparetheair](https://www.twitter.com/@sparetheair)

[www.facebook.com/sparetheair](https://www.facebook.com/sparetheair)

## AIR QUALITY INFO

(800) HELP AIR (435-7247)

- Daily Air Quality Forecasts
- Spare the Air Alerts
- Agricultural Burn Days

## REPORT SMOKING VEHICLES

(800) EXHAUST (394-2878)

[www.SmokingVehicleHelp.org](http://www.SmokingVehicleHelp.org)

## AIR POLLUTION COMPLAINTS

(800) 334-ODOR (6367)

## WINTER SPARE THE AIR ALERTS

(877) 4-NO-BURN (466-2876)



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# JACK P. BROADBENT

*Executive Officer / Air Pollution Control Officer*

The San Francisco Bay Area is widely known for its quality of life. Our region is formed by a tapestry of vibrant communities, enhanced by extraordinary open spaces, and powered by robust industry and infrastructure. Our regional economy has been resilient through difficult times, and many public, private, and nonprofit Bay Area organizations are deeply committed to improving the health of our residents, communities, and environment. Clean air is critical to our quality of life, and we at the Bay Area Air Quality Management District are continually pursuing new strategies for protecting and improving our healthy breathing environment.

This publication will introduce you to the Air District and explain how we are working to reduce local air pollution and protect public health. It shares our mission and history, educates readers about air pollution problems in the Bay Area, and demonstrates how we will improve air quality as we look to the future. Ultimately all of us who live, work, and do business in the Bay Area must help create a healthy future.

The Air District is leading the way. Our Spare the Air campaigns continue to help employers and individuals understand the air quality impacts of their own habits and encourage them to make positive changes. Our efforts to create new frameworks for public engagement will give the public a stronger voice in our work. And some of our largest, multi-year projects—such as our work with the California Air Resources Board, Port of Oakland, and local truck drivers to clean up the enormously important goods-movement industry—are paying off with real and lasting improvements.

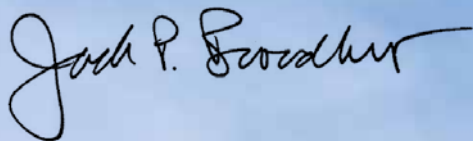
Today, most air pollutants are trending downwards. Over the past two decades, hazardous air pollution has diminished by 75 percent, and peak wintertime fine-particle pollution is down 50 percent since 1999. Airborne lead has been reduced to concentrations so low they are now difficult to even measure. And ozone, or smog, concentrations



have been reduced by 25 percent—with a 90 percent reduction in public exposure to unhealthy levels. These improvements translate directly into improved health, a stronger economy, and a better living environment. However, our work is far from done. Greenhouse gas emissions are rising, and our warming climate is expected to increase the number of high-heat days and wildfires in the Bay Area, which will threaten to compromise the improvements we've made. We must sustain the momentum of our work.

As Executive Officer of the Air District, I am deeply proud of everything our staff and our partners in government, industry, and the community have already accomplished. And I am very confident that we will continue to make great strides to improve our air quality in the months and years ahead. I hope this report will inspire you to join us in this good work. Together, we can ensure an exceptional quality of life in the Bay Area for years to come.

Sincerely,



Jack P. Broadbent

Executive Officer

Air Pollution Control Officer





# OUR CONTINUING

*Caring about the Air You Breathe*

## WHO WE ARE

The Bay Area Air Quality Management District is the public agency entrusted with protecting the air you breathe in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties.

The Air District is governed by a 22-member Board of Directors composed of locally elected officials from each of the nine Bay Area counties. The number of Board members from each county is proportionate to its population.

The Board oversees policies and adopts regulations for the control of air pollution within the district. The Board also appoints the Air District's Executive Officer / Air Pollution Control Officer, who implements

Board policies and gives direction to staff, as well as the District Counsel, who manages the legal affairs of the agency.

The Air District consists of more than 320 dedicated staff members, including engineers, inspectors, planners, scientists, and other professionals.

The Air District is assisted by an Advisory Council that provides input to the Board and the Executive Officer on air quality matters. The Council is made up of 20 representatives from community, health, environmental, and other organizations.

An independent, five-member Hearing Board serves to adjudicate regulatory compliance issues that may arise between the Air District and local industries, and also hears appeals of permitting decisions made by the Executive Officer.

# JOURNEY

## VISION

A healthy breathing environment for every Bay Area resident.

## MISSION

To protect and improve public health, air quality, and the global climate.

## CORE VALUES

### EXCELLENCE

Air District programs and policies are founded on science, developed with technical expertise, and executed with quality.

### LEADERSHIP

The Air District will be at the forefront of air quality improvement and will pioneer new strategies to achieve healthy air and protect the climate.

### COLLABORATION

Involving, listening, and engaging all stakeholders, including partner agencies, to create broad acceptance for healthy air solutions.

### DEDICATION

Committed staff that live and believe the Air District's mission.

### EQUITY

All Bay Area residents have the right to breathe clean air.





# LOOKING CLOSELY

## *Measuring and Analyzing Air Quality Is Our First Step to Reducing Air Pollution*

The air in our lower atmosphere is a dynamic, constantly shifting mixture of gases, liquid droplets, and small particles. It swirls and eddies around the globe like the water in the ocean, with winds and weather patterns resulting from this movement. It's also not as light as it seems. A column of air one foot square and extending from sea level to the outer limit of the atmosphere would weigh nearly one ton. And contrary to what one might expect, the air we breathe in the lower atmosphere is not primarily composed of oxygen. Instead, it contains 78 percent nitrogen, 21 percent oxygen, and less than 1 percent gases like argon and carbon dioxide. Unfortunately, it can also contain substances that are unhealthy for us to inhale.

In the Bay Area, as in the entire state of California, a certain amount of air pollution comes from stationary industrial sources, such as refineries and power plants. But a greater percentage of harmful air emissions come from cars and trucks, construction equipment, and other mobile sources. California has more cars per household (1.8) than any other state, along with a diverse business community and a continually expanding population. All of these factors contribute to the state's air quality challenges.

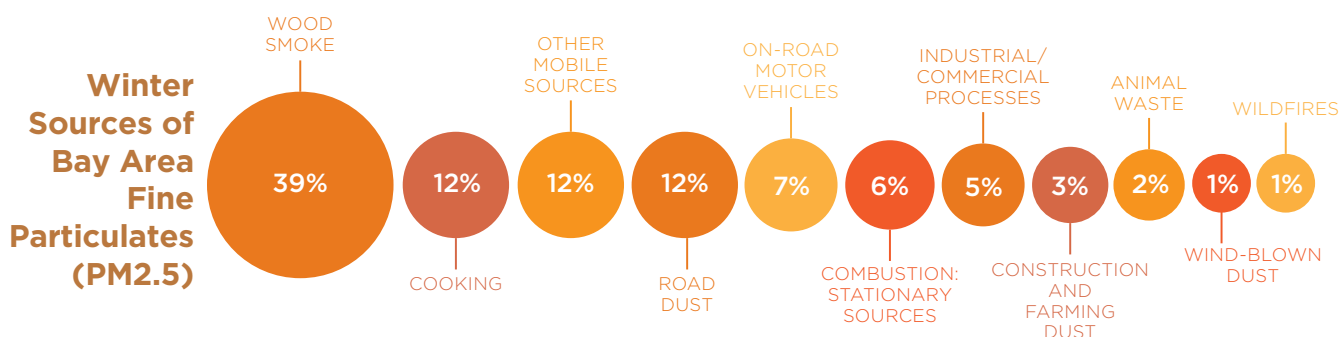
There are three major types of air pollutants that constitute a public health concern for the Bay Area: ozone, particulate matter, and toxic air contaminants.

### OZONE

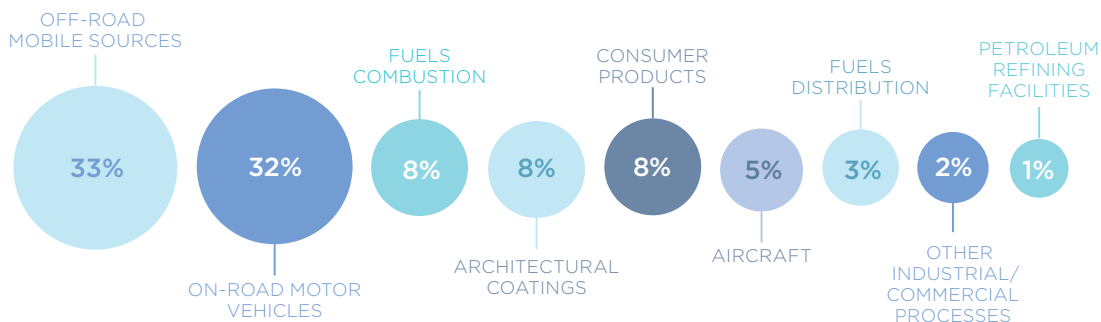
Ozone is the main ingredient in the pollution commonly called "smog." Primarily a problem in the summertime, ozone is a colorless gas formed through a complex series of photochemical reactions involving sunlight and heat. It is not emitted directly into the air in significant quantities, but is formed in the presence of sunlight from chemical reactions involving other directly released precursor pollutants: reactive organic compounds and oxides of nitrogen.

### PARTICULATE MATTER (PM10 AND PM2.5)

Particulate matter, or PM, consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air, or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in the winter, accumulating when cold, stagnant weather comes to the Bay Area.



## Summer Sources of Bay Area Ozone-Forming Pollutants



PM is usually measured and monitored in two size distributions: PM10 and PM2.5. PM10 refers to particles with diameters that are less than or equal to 10 microns in size (a micron is one-millionth of a meter), or about 1/7 the diameter of a human hair. PM2.5 consists of particles with diameters that are less than or equal to 2.5 microns in size. PM2.5 is a more serious health concern than PM10, since smaller particles can travel more deeply into our lungs and cause more harmful effects.

## TOXIC AIR CONTAMINANTS (TACS)

Toxic Air Contaminants, or TACs, are a category of air pollutants that in relatively small concentrations can potentially cause serious human health effects, such as cancer. The state of California has listed more than 180 TACs, which are emitted by mobile sources such as cars and trucks, large industrial plants such as refineries and power plants, and smaller facilities such as gas stations and dry cleaners. PM from diesel exhaust is listed as a TAC by the state of California.

## AIR MONITORING

The Air District maintains one of the most comprehensive air quality monitoring networks in the country, consisting of 27 monitoring stations distributed among the nine Bay Area counties. This network measures concentrations of pollutants for which health-based ambient air quality standards have been set by the U.S. Environmental Protection Agency, and by the California Air Resources Board, or CARB. These pollutants include ozone, particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The Air District's network also measures concentrations of 19 toxic air contaminants and various other pollutants of concern.

The Air District's network also includes two portable air monitoring stations similar to those used by CARB under the Children's Environmental Health Protection Program. These stations are placed in communities of interest for one to two years, in order to compare local air measurements with those obtained by the agency's monitoring network.

## LABORATORY

The Air District maintains an extensive laboratory with state-of-the-art equipment for testing air quality samples collected from ambient monitors, from source tests, or during accidental releases at Bay Area facilities. The laboratory also analyzes samples submitted by the Enforcement Division to assess compliance with Air District regulations.

## FORECASTING

Weather patterns play a fundamental role in determining, on any given day, whether air pollution will disperse or accumulate. Air District meteorologists collect and analyze data from a network of meteorological sensors located throughout the nine Bay Area counties. This information—in combination with air monitoring measurements, computer models, and satellite feeds from weather services—is used to make daily air quality forecasts for the public.

The Air District prohibits open burning throughout the Bay Area, with the exception of a few types of fires (generally for agricultural or natural-resource management purposes) that are allowed on designated "burn" days. The Air District's meteorological staff issues "burn" or "no-burn" notices for these types of permissible burns every day of the year.

# ENCOURAGING CLEAN AIR

## *Providing Incentives to Reduce Air Pollution*

The Air District administers grant and incentive programs to improve air quality in the Bay Area. These programs offer funding to public agencies, private companies, and Bay Area residents for projects that reduce or eliminate air pollution and greenhouse gases from mobile sources—such as cars, trucks, marine vessels, locomotives, and construction equipment. In the Bay Area, mobile sources are the greatest contributors to air pollution.

### TRANSPORTATION FUND FOR CLEAN AIR

Assembly Bill 434 authorized the Air District to levy a \$4 surcharge on all motor vehicles registered in the Bay Area in order to mitigate the impact of vehicular emissions. The Air District allocates these revenues through the Transportation Fund for Clean Air, or TFCA.

TFCA revenues are distributed in two ways. Forty percent of the TFCA funds, known as the TFCA County Program Manager Fund, are allocated directly to the region's nine county congestion management agencies for disbursement to eligible projects. The Air District distributes the remaining 60 percent, known as the TFCA Regional Fund, to eligible projects and programs that reduce motor vehicle emissions. In 2011, eligible projects included trip reduction (e.g., shuttles and ride sharing projects) and alternative fuel vehicle and infrastructure projects.

A portion of the TFCA Regional Fund revenues is distributed to project sponsors on a competitive basis, and a portion is used to fund several mobile-source emission-reduction programs directly administered by the Air District, such as the Smoking Vehicle Program.

### MOBILE SOURCE INCENTIVE FUND

AB 923, enacted in 2004, authorized local air districts to increase their motor vehicle registration surcharge up to an additional \$2 per vehicle. AB 923 stipulates that air districts may use the revenues generated by the additional \$2 surcharge for any of the four programs listed below:

- Projects eligible for grants under the Carl Moyer Program;
- New purchases of clean air school buses;
- Accelerated vehicle retirement or repair program; and
- Projects to reduce emissions from previously unregulated agricultural sources.

The revenues from the additional \$2 surcharge are deposited in, and administered via, the Air District's Mobile Source Incentive Fund, or MSIF.

### CARL MOYER PROGRAM

The Carl Moyer Program is a state-funded incentive program originally created by the California Legislature to reduce emissions from heavy-duty engines. Managed locally by the Air District, the Carl Moyer Program provides grants primarily for installing new, cleaner engines or emission-control devices in heavy-duty equipment, such as trucks and buses, marine vessels, construction equipment, locomotives, and agricultural irrigation pumps.

Heavy-duty diesel engines are major sources of oxides of nitrogen, reactive organic gases, and particulate matter.

### LOWER-EMISSION SCHOOL BUS PROGRAM

The Lower-Emission School Bus Program provides financial incentives for school districts to replace or retrofit older diesel-fueled school buses. The primary goal of this program is to reduce the exposure of schoolchildren to harmful diesel emissions.

### GOODS MOVEMENT PROGRAM

The emphasis of the Goods Movement Program is to quickly reduce air pollution emissions and health risk from freight movement at the Bay Area's ports and along the region's major roadways. The program funds the retrofit and replacement of older, higher-polluting diesel trucks, locomotives, cargo-handling equipment, and marine vessels, as well as the installation of shore-side power systems.



## COMMUTE STRATEGIES

### **BRENDA CHU**

*Senior Benefits Manager,*  
NEKTAR

To achieve the larger goal of cleaner air for the entire Bay Area, the Air District works with companies such as Nektar—providing assistance and resources to help them set up commuter programs for their employees.

As part of its commitment to green practices, Nektar implemented robust commute options for its employees after relocating to San Francisco. These programs include Caltrain GoPasses, a 50% transit subsidy, and working with building management to coordinate shuttle services to transit stops. Nektar actively participates in the *Great Race for Clean Air* and even holds various functions such as ice cream socials to promote alternative greener commuting.

# BUILDING BRIDGES

*Encouraging Clean Air Choices Through Public Education*

Everyday activities—driving, painting, mowing the lawn, wood burning and even using aerosol hairsprays and deodorants—add pollution to the air we breathe. Many of these activities fall outside the Air District’s regulatory jurisdiction. However, the Air District encourages Bay Area residents to “Spare the Air” every day through its public education campaigns.

## SPARE THE AIR EVERY DAY



The Spare the Air Every Day program educates the public about air pollution and promotes long-term behavior changes that improve air quality. From April to October, the Air District issues Spare the Air Alerts on days when ozone pollution is forecast to be unhealthy. On Spare the Air days, the Air District urges residents to reduce their driving by walking, biking, taking transit, or carpooling, as well as taking steps to lower their energy use and cut back on pollution. People sensitive to pollution, such as children and the elderly, are cautioned to limit outdoor exposure.

Spare the Air Alerts and daily air quality forecasts are posted at [www.sparetheair.org](http://www.sparetheair.org), recorded on the 1 (800) HELP AIR phone line, and announced in local media. Bay Area residents can also sign up on the website to be notified via email AirAlerts.

In 2011, the Air District continued to leverage its social media efforts through Facebook, Twitter, YouTube, Google+, and Pinterest, which are effective vehicles for delivering timely air quality information, and disseminating educational messages to the public. In addition, the first Spare the Air iPhone and Android apps were launched to provide helpful air quality information as well as real-time Spare the Air Alerts for Bay Area residents.

## WINTER SPARE THE AIR



The Winter Spare the Air program runs from November through February, when particulate matter from woodstoves and fireplaces becomes a major health concern in the Bay Area.

In 2011, the Winter Spare the Air season ended with the highest number of Winter Spare the Air Alerts in five years. There were 15 alerts, 11 days that exceeded the national air quality health standard, and another nine days that nearly exceeded the standard.

The Winter Spare the Air program and the Air District’s wood burning regulation have resulted in a 15 percent drop in the concentration of air pollution over the past five years, according to preliminary air quality monitoring data. Survey results have indicated that one-quarter of Bay Area residents have reduced their wood burning overall, but it is clear more needs to be done.

## SMOKING VEHICLE ASSISTANCE PROGRAM

The Air District’s Smoking Vehicle Assistance Program was implemented to decrease the number of vehicles spewing visible tailpipe exhaust on the region’s roads and highways.

In 2011, a new Smoking Vehicle outreach campaign was launched—urging residents to report smoking vehicles by calling 1 (800) EXHAUST, using the Spare the Air iPhone or Android app, or reporting online at [www.800exhaust.org](http://www.800exhaust.org). Owners are notified that their vehicle may be operating illegally and are encouraged to have it checked and repaired.

To assist owners of smoking vehicles, the Air District has also established a one-stop website, [www.SmokingVehicleHelp.org](http://www.SmokingVehicleHelp.org), where owners can obtain information about assistance programs for vehicle repair or retirement.



## MEDIA OVERVIEW FOR 2011

In 2011 our Spare the Air and Winter Spare the Air campaigns garnered more than 130 million media impressions. Those impressions were due in part to the 16,463 TV spots aired, 3,467 traditional media stories presented, and 2,870 social media hits received throughout the year.

Also, 2011 media events were held to publicize the Air District's participation in a plug-in electric vehicle demonstration project, Air District funding for a shoreside power project for docked ships, and a Winter Spare the Air kick-off event measuring the effects of fireplaces on indoor air quality.

## BREATHING EASY

### **CORRIN REYNOLDS**

*Transportation  
Supervisor,  
San Jose Unified  
School District*

Through a grant from the Air District, the San Jose Unified School District added seven new lower-emissions school buses equipped with engines that meet more stringent emissions standards. The new buses will reduce the exposure of school children to harmful airborne particulate matter, as well as oxides of nitrogen and reactive organic gases. Children are particularly sensitive to the effects of air pollution, and, as Corrin says, "Healthy children have more time for learning!"



# SETTING THE BAR

## *Implementing Standards, Guidelines, and Rules for Clean Air*

Air quality planning is an evolving process—the Air District continually updates and refines its rules to meet the highest clean air standards.

### AIR QUALITY STANDARDS

The Air District's regulations and programs are formally guided by a set of federal and state air quality standards that establish health-based concentration limits for specific pollutants, including ozone and particulate matter.

When an air district meets these standards, its region is considered to be in attainment for a given pollutant category. If it does not meet these standards, the air district is required to outline measures designed to reduce emissions and bring its region into attainment.

### PLANNING ACTIVITIES

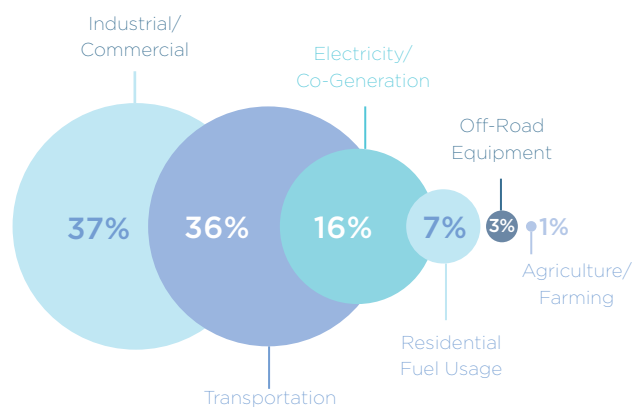
In 2011, the Air District continued to focus its planning efforts on the reduction of emissions from industrial and commercial activity. However, as mobile sources are significant emitters of air pollutants and greenhouse gases, our planning activities also included collaboration with local and regional agencies to address sources over which we do not have regulatory authority, such as local land use and transportation planning. The Air District also implemented a number of projects that targeted fine particulate matter, or PM, which research shows is the air pollutant with the most significant health impact in the Bay Area.

Our emphasis on fine PM promises to result in reduced human exposure—leading to significant health benefits. Air District activities aimed at reducing PM exposure include preparation of PM reduction plans; modeling and technical analyses to better understand PM sources, formation, transport, and health effects; ongoing improvement of the PM emission inventory; development of regulations to reduce PM emissions; and collaboration with local jurisdictions to develop and implement local programs to reduce PM emissions and exposure.

Partnerships with local governments and other agencies present opportunities for additional and

innovative air quality initiatives, such as integrating air quality considerations into local plans and programs. We've worked with local agencies to incorporate air quality provisions in transportation and land use strategies that reduce motor vehicle use and emissions, local general plans and specific plans, environmental review processes, local air quality studies, and community risk reduction plans that reduce local exposure to air toxics and fine particulate matter.

### Bay Area Sources of Greenhouse Gas Emissions (2011)



The Air District has also developed and implemented a variety of greenhouse gas, or GHG, reduction policies and programs. These include collaborating with the Association of Bay Area Governments and the Metropolitan Transportation Commission to create a Sustainable Communities Strategy pursuant to SB 375 to reduce GHG emissions via transportation and land use plans, assisting local jurisdictions in developing local climate action plans, identifying and emphasizing the air quality co-benefits of GHG reduction strategies, and maintaining a Bay Area region-wide GHG emission inventory.

### BAY AREA CLEAN AIR PLAN

The Bay Area 2010 Clean Air Plan, an update to the Bay Area 2005 Ozone Strategy, was developed in association with the Air District's regional agency partners, the Metropolitan Transportation Commission, the Association of



## LEADING THE WAY

**BRENDON HARRINGTON**  
*Transportation Operations Manager*

**ANNA WALTERS**  
*Transportation Customer Service Specialist*

**ROSS BENDON**  
*Transportation Program Manager*

**KEVIN MATHY**  
*Transportation Manager (Chelsea's owner)*

**CHELSEA MAY MATHY**  
*Team puppy :)*

**(NOT PICTURED) ROLF SCHREIBER**  
*Technical Program Manager*

With over 200 electric vehicle charging stations on their campuses, Google has built one of the largest car-sharing programs in the country. Its GFleet includes the newest generation of plug-in vehicles, and its low-impact employee shuttles keep thousands of Googlers out of their cars and sparing the air. The shuttles and GFleet result in net annual savings of more than 5,400 metric tons of CO<sub>2</sub>—equivalent to taking almost 2,000 cars off the road or reducing 14 million vehicle miles every year. Google employees walk, bike, unicycle, skateboard, scooter, and even kayak to work.

Bay Area Governments, and the San Francisco Bay Conservation and Development Commission. The Plan includes a review of air quality progress to date in the Bay Area and control strategies for achieving California's ozone standards. For the first time, the Air District took a multi-pollutant approach by addressing ozone, particulate matter, air toxics, and greenhouse gas emission reductions in a single integrated plan. The primary purpose of the Plan is to protect air quality, public health, and the climate.

The Bay Area 2010 Clean Air Plan includes new, revised, and updated control measures in the three traditional categories of stationary sources, cleaner mobile source engines and fuels, and transportation strategies to promote carpooling, transit, bicycling, and walking. The Plan also introduces two new categories of control measures: for land use and local impacts, and energy and climate. Measures relating to land use and local impacts promote mixed-use, compact development to reduce motor vehicle travel and emissions, and to ensure that the region plans for focused growth in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. Measures relating to energy

and climate protect our climate by reducing greenhouse gas and air pollutant emissions.

## RULE DEVELOPMENT

Rule development is the Air District's process of putting into place regulations that limit emissions of air pollutants from stationary sources of pollution, like gas stations and refineries. These rules help the Bay Area meet federal and state air quality standards, reduce risk caused by emissions, and improve public health. The Air District's rules are adopted by the Board of Directors at public hearings which are open for public comment.

Rules are derived from documents like the 2010 Clean Air Plan. Rules and rule amendments are the product of extensive technical research, cost and environmental analyses, and public input. Public participation is an integral element of this process, and the Air District engages in extensive outreach to both affected industries and members of the public. Draft rules are reviewed at public workshops, and comments are considered and integrated prior to proposing final rules to the Board.

A current list of the Air District's rules and regulations is available at [www.baaqmd.gov](http://www.baaqmd.gov).




# SCIENCE MATTERS

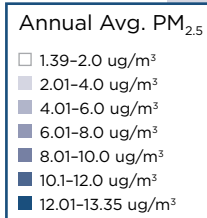
## *The Science of Predicting the Impact of Particulate Matter in the Bay Area*


The Air District routinely applies air quality modeling to better understand the health and social benefits of reductions in air pollution. Current research indicates that fine particle, or PM<sub>2.5</sub>, pollution is one of the most significant air quality-related public health threats in the Bay Area. A recent study employed the Air District's PM<sub>2.5</sub> modeling system, a health impacts model, and air quality measurements for estimating current population exposure to PM<sub>2.5</sub> and associated public health impacts, as well as the health and economic benefits of reducing exposure to PM<sub>2.5</sub>.

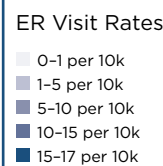
The Air District's complex modeling capabilities are leading the way in the field of air quality research. Modeling for meteorology, emissions, and pollution patterns helps us understand how air pollution is formed and how it can be reduced most effectively. These models allow the Air District to study the impacts of proposed regulations, pollutant transport, and climate change upon Bay Area air quality.

Air quality research is a dynamic field, and the Air District stays on the forefront through partnerships with researchers around the country.

**Figure 1**  Annual average PM<sub>2.5</sub> levels (estimated as the average of the quarterly averages over four seasons).



**Figure 2**  Reductions of asthma-related emergency room visits per 10,000 population of children under 18 years of age, if PM<sub>2.5</sub> were reduced to natural background levels (man-made emissions reduced by 90 percent).



## BY THE NUMBERS

These tables show the dramatic public health and financial benefits that result from reductions in PM<sub>2.5</sub>. These benefits are directly related to decreases in cases of premature death and various illnesses that result when fine particle pollution is diminished.

**TABLE 1** Monetary Values Associated with Health Impacts (2006 USD)

County	Social Costs of Mortality (in millions)	Social Costs of Illness (in millions)	Total (in millions)	Social Costs of Illness Per Capita
Alameda	\$2,715	\$201	\$2,917	\$1,751
Contra Costa	\$2,206	\$154	\$2,360	\$2,050
Marin	\$410	\$25	\$436	\$1,618
Napa	\$216	\$11	\$228	\$1,515
San Francisco	\$1,893	\$119	\$2,013	\$2,314
San Mateo	\$1,000	\$69	\$1,069	\$1,357
Santa Clara	\$2,728	\$237	\$2,965	\$1,485
Solano	\$614	\$44	\$658	\$1,392
Sonoma	\$806	\$50	\$856	\$1,626
<b>Grand Total</b>	<b>\$12,590</b>	<b>\$915</b>	<b>\$13,505</b>	<b>\$1,712</b>

**TABLE 2** Benefits of Reducing PM<sub>2.5</sub> to Natural Background Levels (90% Reduction in Man-Made Emissions)

Health Effects	Total Cases Reduced
Mortality (all causes)	1,705
Chronic bronchitis	1,446
Heart attacks (non-fatal)	1,569
Emergency room visits, respiratory	1,116
Acute bronchitis	2,723
Acute respiratory systems	1,722,345
Work loss days	294,127
Asthma exacerbation	35,363

**TABLE 3** Benefits of each 1 µg/m<sup>3</sup> Reduction in PM<sub>2.5</sub>

Health Effects	Cases Reduced
Mortality (all causes)	66
Chronic bronchitis	61
Heart attacks (non-fatal)	71
Emergency room visits, respiratory	46
Acute bronchitis	117
Acute respiratory systems	68,348
Work loss days	11,530
Asthma exacerbation	1,362

# CONTROLLING SOURCES

## *Ensuring Compliance of Pollution Sources*

### PERMITS

The Air District evaluates permit applications and issues permits for stationary sources and abatement devices to comply with regulatory standards, including requirements to use the Best Available Control Technology, give public notice, or provide emissions offsets. The Air District Permit Program is also responsible for emissions banking and interchangeable emission reduction credit activities in the Bay Area, as well as California Environmental Quality Act review.

Permit applications evaluated by the Air District include those for Prevention of Significant Deterioration, Acid Rain, and federal Title V permits. The federal Title V Permit Program enhances compliance with the Clean Air Act by explicitly including all applicable federal, state, and local air quality requirements into a single permit. Information that is gathered in the Air District Permit Program is used to develop the emissions inventory from permitted facilities.

### TOXICS

The Air District's Toxics Evaluation Program integrates federal and state requirements concerning toxic air contaminants into the Air District's Permit Program. The Air District performs health risk screening analyses for all new projects in the region that require air quality permits and emit toxic air contaminants in quantities greater than *de minimis* levels. Facilities that emit significant quantities of toxic air contaminants are required to prepare health risk assessments that estimate the facility's health risks for local residents and offsite workers. A facility that is determined to pose an unacceptable health risk must implement measures to reduce risks to acceptable levels.

### COMPLIANCE AND ENFORCEMENT

The Air District's Compliance and Enforcement Program ensures a high degree of compliance with air quality-related federal, state, and Air District laws, regulations, and permit conditions. A full range of educational and compliance assistance activities are provided to help companies and residents proactively comply with air quality regulations. Air quality inspectors investigate air pollution complaints from the public and conduct regular compliance inspections to promote compliance with air quality regulations. When violations of air quality regulations are discovered, the Air District provides an appropriate level of enforcement action to expedite a return to compliance and assesses monetary penalties to provide an effective deterrence.

### SOURCE TEST

The Air District monitors emissions from facilities with stationary pollution sources. The Air District's Source Test staff collect samples that can usually be analyzed on-site with instrumentation in specially outfitted vans. An immediate determination can typically be made as to whether or not emissions are in compliance with Air District regulations and permit conditions. The Air District also conducts source tests in support of its Rule Development, Permitting Services, Compliance and Enforcement, and Emission Inventory efforts.



# MAKING CONNECTIONS

## *Working with Communities to Improve Air Quality*

Each of the Bay Area's nine counties is made up of smaller communities and neighborhoods with unique air quality concerns. It is the Air District's job to adopt rules and policies that are fair and equitable to all residents of the Bay Area, and to ensure that community-level air pollution problems are not eclipsed by larger-scale policy issues.

### COMMUNITY OUTREACH

As part of our community outreach program, the Air District organizes and facilitates meetings that provide an opportunity for local residents to share and receive information about air quality-related topics. Through these meetings the Air District provides information and seeks input on pending regulations, clean air plans and strategies, or other issues of interest to a particular community.

### COMMUNITY INITIATIVES

The Air District's community outreach staff serve as liaisons to the many communities that comprise the varied and diverse Bay Area region. They work closely with community-based organizations and advocates to address local air quality concerns. In 2011, Air District staff worked closely with communities in the Bayview neighborhood of San Francisco, an umbrella organization of local non-profits, and many civic organizations throughout the region.

### COMMUNITY SPARE THE AIR RESOURCE TEAMS

One of the Air District's innovative efforts to engage the public involved the formation of local resource teams, in conjunction with the creation of the Spare the Air program in 1991. From that point to the current day local civic groups, agencies, businesses, and environmental organizations have worked

collaboratively to implement projects that promote cleaner air. The Air District currently operates nine resource teams in the region, which meet regularly to select and coordinate work on team projects. Past projects have included commute-solutions workshops, car-free tourism resources, and programs that encourage walking and biking to schools to reduce traffic congestion.

### YOUTH OUTREACH

The Air District is working collaboratively with its regional agency partners, the Metropolitan Transportation Commission and the Association of Bay Area Governments, to promote air quality and climate education through the Climate Initiatives Youth and School Outreach Program. The goal of the program is to identify best practices for climate education in the Bay Area and to ensure that students have access to the latest climate education resources.

### GOODS MOVEMENT AND LOCAL PLANNING

The environmental impact of goods movement activities on communities near ports and rail yards remains a central concern. Mobile sources are the largest sources of diesel particulate matter and other toxic air contaminants. Although these sources are regulated at the federal and state levels, the Air District has worked closely with the California Air Resources Board, the Metropolitan Transportation Commission, the Port of Oakland, and other stakeholders to reduce air quality impacts from goods movement in the Bay Area.

The Air District also assumes an advisory role on air quality issues related to land-use development, housing, and transportation, and reviews and comments on local general plans and environmental documents.

# PLUGGED IN

## MIKE HARRIGAN

*eFleet Program  
Manager,*  
City CarShare,  
San Francisco

In 2011, Air District grants funded local nonprofit City CarShare's 10 new plug-in hybrids to add to its fleet. The PHEV40 Prius cars get twice the mileage of a standard Prius—and with a 40-mile electric range before the gas engine even kicks in, many trips create no emissions at all.

By making these innovative cars available in the Bay Area, the Air District and City CarShare are giving members an even greener way to get around.



# MOVING

## HEALTH IMPACTS

**SAFFET  
TANRIKULU**

*Research &  
Modeling Manager,  
Bay Area Air Quality  
Management District*

The Air District's recent study of the health effects of fine particle pollution (*see graphic, page 14*) illustrates the benefits of even small reductions in PM2.5 concentrations.

The study relies on air quality modeling and population data to estimate the regional health impacts of changes in pollutant levels, as well as the associated social costs that small changes in levels of PM2.5 can cause as a result of illness and mortality. The study helps the Air District predict the impacts of our programs and proposed regulations on Bay Area air quality and public health.





# FORWARD

## *Toward a Healthy Breathing Environment*

Everyone has the right to breathe clean air. That core belief is at the heart of the Air District's commitment to protecting and improving public health, air quality, and the global climate. In recent years, we've built upon our traditional programs and introduced new initiatives to reduce fine particle pollution, address climate change, and expand outreach through innovative approaches and partnerships. As we seek to create a healthy breathing environment for every Bay Area resident, our path forward spans a wide variety of programs to improve air quality, shrink the Bay Area's greenhouse gas footprint, use sound science to develop public health policy, and build a model of clean-air leadership toward which agencies around the world can aspire.

### SPARE THE AIR GOES SOCIAL

The Spare the Air Every Day program—which encourages Bay Area residents to reduce driving, keep their vehicles maintained, carpool, take transit, walk, and bike—continues to develop better ways to educate the public, business, and industry about air pollution. The various social media channels that have gained popularity over the last several years provide the Air District with an opportunity to communicate to the public more effectively than ever before. Facebook, Twitter, YouTube, Google+, and Pinterest are effective vehicles for delivering timely air quality information, disseminating educational messages, and encouraging engagement in clean air activities.

In 2011, the Air District redesigned its Facebook and Twitter pages to reflect the new look of the Spare the Air campaign. Last year, the Air District created a series of videos featuring staff interviews with members of the public about their air-friendly commutes. These videos were posted on YouTube and shared on the Spare the Air Facebook page. In 2011, we also began recording podcasts to inform residents about air quality programs and issues. And our newly developed Spare the Air iPhone and Android apps provide the public real-time alert notification and helpful air quality information.

This past Winter Spare the Air season ended with the highest number of Winter Spare the Air Alerts in five years. Dry, stagnant weather frequently trapped air pollution close to the ground throughout the region, resulting in 15 alerts, 11 days that exceeded the national air quality health standard, and another nine days that nearly exceeded the standard.

This was the fourth winter season that the Air District has enforced its wood burning regulation, which restricts wood

burning in fireplaces, wood stoves and outdoor fire pits throughout the Bay Area when air quality is forecast to be unhealthy. New preliminary air quality monitoring data has indicated that air pollution from wood smoke is down 15 percent over the past five years in the Bay Area. And the Air District's survey results show that one-quarter of Bay Area residents have reduced their wood burning, even when wood burning is allowed.

### EMPOWERING EMPLOYERS & COMMUNITIES

The Spare the Air Employer Program connects employers and their employees to resources and information that can help them reduce air pollution and greenhouse gas emissions, especially from driving. Helping commuters understand the direct connection between air quality and their everyday actions is a critical task, and participating companies have been extremely receptive. The Employer Program continues to grow: in 2012 it will build upon its popular webinar series for employers by introducing a new "employer breakfast" event to share tools and information about implementing clean air policies and practices.

In recent years, the Bay Area-wide Great Race for Clean Air has been a great success. It's a friendly competition among Bay Area employers to encourage their employees to adopt commute alternatives—such as taking transit, carpooling, vanpooling, walking, and bicycling—rather than drive alone to work. The Air District hopes to build on the momentum of last year's campaign, which drew 1,619 employees from 189 companies and saved approximately 435 tons of CO<sub>2</sub>.

The Great Race for Clean Air started as a Spare the Air resource team project, but has grown to regional proportions. In the coming years, the Air District will continue to encourage the creativity and innovation that has made the Spare the Air resource teams so successful in developing new and exciting programs that empower local communities to reduce air pollution.

### NEW OPPORTUNITIES

Air District programs have traditionally focused on reducing emissions from industrial and commercial activities, sources for which the agency has regulatory authority. That work continues, but our focus has expanded to address sources outside our regulatory

authority—such as local land-use and transportation planning. By partnering with local governments, regional agencies, community groups, businesses, public agencies, and other stakeholders, we are pursuing new opportunities such as:

- Helping local governments integrate air-quality considerations into local plans and environmental reviews
- Conducting local air-quality studies
- Developing climate action plans to reduce greenhouse gas emissions
- Creating transportation and land-use strategies to reduce motor vehicle use
- Drafting community risk-reduction plans for air toxics and fine particulate matter

In addition, through a new memorandum of understanding with the California Air Resources Board, the Air District is working to achieve significant methane-emission reductions at landfills across the Bay Area. The Air District is the first air quality agency in the state to enter into this type of groundbreaking MOU.

## PLUGGING IN

Recognizing the promise that plug-in electric vehicles, or PEVs, show for reducing tailpipe emissions, the Air District and its regional agency partners will complete an extensive, 18-month regional PEV-readiness planning process in the Bay Area. The Air District has already allocated over \$6 million to fund the purchase and installation of PEV charging infrastructure. The project aims to have 36 DC Fast Charging stations in service by the end of 2012, and a second phase of the project should yield another 64 stations by summer 2013. In addition, more than 260 publicly available Level 2 chargers are scheduled to be in service by the end of the year.

The Air District's new website, [BayAreaPEVReady.org](http://BayAreaPEVReady.org), provides information about Air District grants to support early PEV use, and serves as a clearinghouse to assist drivers, local governments, and infrastructure providers seeking information about plug-in electric vehicles.

## POWERED BY PEDALS

A pioneering bike-sharing pilot program, conceived in 2010 with seed funding from the Air District, is now set to launch with the addition of federal and other funding sources in the region. The program will provide 1,000 bicycles at kiosks in San Francisco, Redwood City, Palo Alto, Mountain View, and San Jose. Bike sharing will provide a viable, self-supporting first- and last-mile solution for many public transit riders. If the pilot is successful, the Air District will seek to expand the project.

## QUICK TAKES

This year, as part of a U.S. Environmental Protection Agency program, the Air District will establish air monitoring sites to test for lead emissions at three local airports in close proximity to residential housing—in San Carlos, Palo Alto, and Santa Clara. The data generated from this project will guide future policy decisions affecting the health of communities near airports.

The Air District is launching a new inspection program to locate and identify unregistered and unpermitted boilers and backup generators. New emission standards and registration requirements are being put into place for small boilers, which provide base heating in larger commercial buildings and typically run on natural gas. Backup generators, typically used in smaller buildings, also face new permit requirements.

## IMPROVING EFFICIENCY & TRANSPARENCY

In order to improve the experience of more than 15,000 Bay Area permit holders, the Air District is revising its permitting rules to incorporate new mandatory requirements and improve consistency and clarity.

The Air District continues to work internally to create a comprehensive online permitting system for businesses, providing “smarter” forms to let applicants know if they are missing crucial information, and enabling some businesses to receive their permits online, instantly. The new system is being rolled out to select industries this year, and will eventually streamline permit activity for all of our 15,000-plus permit holders.

In 2011, the Air District began developing a Public Participation Plan that will affirm and clarify our commitment to engaging the public in decision-making activities. We will conduct a series of public meetings in 2012 to solicit input and feedback on the document. Ultimately, the plan will benefit the public by articulating how and when individuals and stakeholders can become involved in Air District actions. It will also guide Air District staff in ensuring that the public receive appropriate opportunities for comment or information gathering.

The Air District launched a number of foreign-language assistance services in 2011, including a Spanish-language portal on the Air District website, a multilingual services hotline, a multilingual landing page for the Spare the Air program, and a multiple language expansion of Spare the Air Phone Alerts. Looking ahead, the Air District is committed to delivering stronger, more inclusive engagement opportunities to the diverse communities of the Bay Area.



# BY THE NUMBERS

## BAY AREA AIR QUALITY

### 2011 Exceedances of Air Quality Standards

#### OZONE

Days over National 8-Hour Standard	4
Days over California 1-Hour Standard	5
Days over California 8-Hour Standard	10

#### PARTICULATE MATTER

Days over National 24-Hour PM10 Standard	0
Days over California 24-Hour PM10 Standard	4
Days over National 24-Hour PM2.5 Standard	8

## RULEMAKING ACTIVITY

### 2011 Rules Adopted or Amended

#### MAY 4, 2011

*Regulation 9:* Inorganic Gaseous Pollutants, *Rule 7:* Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters – amendments adopted

#### MAY 4, 2011

*Regulation 3:* Fees – amendments adopted

#### MAY 18, 2011

*Regulation 11:* Hazardous Pollutants, *Rule 17:* Limited Use Stationary Compression Ignition (Diesel) Engines in Agricultural Use – new rule adopted

## PERMITTING ACTIVITY

### 2011 Bay Area Permitted Facilities

Refineries	5
Gasoline-Dispensing Facilities	2,532
Major Facilities Excluding Refineries	91
Smaller Industrial Facilities	6,703
<b>Total</b>	<b>9,331</b>

### 2011 New Permit Applications Received

Major Facility Review (Title V)	71
Gasoline-Dispensing Facilities	145
Other Facilities	913
<b>Total</b>	<b>1,129</b>

## TOXIC PROGRAM ACTIVITY

### 2011 Health Risk Screening Analyses

Diesel Engines	247
Gasoline-Dispensing Facilities	10
Other Commercial/Industrial	35
<b>Total Number of Analyses</b>	<b>292</b>
<b>Total Number of Facilities</b>	<b>267</b>

## COMPLIANCE & ENFORCEMENT ACTIVITY STATS

### 2011 Compliance Inspections

Source Inspections	7,559
Air Pollution Complaints (Excluding Smoking Vehicles)	5,880
Gasoline-Dispensing Facility Inspections	591
Asbestos Inspections	1,872
Reportable Compliance Activities	497
Diesel Compliance and Grant Inspections	5,957
<b>Total</b>	<b>22,356</b>

### 2011 Violations and Penalties

Violations Resolved	507
Civil Penalties Collected	\$2,260,996

### Air Pollution Complaint Categories

<b>Total Complaints</b>	<b>12,087</b>
Smoking Vehicles	51.4%
Wood Smoke	28.6%
Odor	13.0%
Dust	1.8%
Outdoor Fires/Open Burning	1.4%
Smoke	1.3%
Asbestos	1.0%
Gas Stations	0.6%
Other	0.8%
Idling	0.2%

## SOURCE TEST ACTIVITY

### 2011 Number of Source Tests

Refinery Source Tests	178
Compliance Rate	99.4%
Title V Facility Source Tests (excluding Refineries)	129
Compliance Rate	99.2%
Gasoline Cargo Tank Source Tests	416
Compliance Rate	97.6%
Gasoline-Dispensing Facility Source Tests	35
Compliance Rate	77.1%
Other Miscellaneous Source Tests	13,438
Compliance Rate	99.9%
<b>Total Source Tests</b>	<b>14,172</b>
<b>Total Violations</b>	<b>31</b>
<b>Compliance Rate</b>	<b>99.8%</b>

## LABORATORY

### 2011 Samples Analyzed in Lab\*

PM10	3,850
PM2.5	1,200
Toxics	12,400
Cartridge/Aldehyde	780
VOC and Speciation	280
Metals by XRF	1,820
Metals	88
Microscopy	10
VOC	24
Misc.	130
<b>Total</b>	<b>20,582</b>

## GRANT AND INCENTIVE PROGRAMS

### Carl Moyer Program / Mobile Source Incentive Fund - 2011

Total Funds Awarded	\$9 million
Number of Engines Covered by Grant Projects	64
Number of Shore Power Berths Installed	3
Percent of Funding Awarded to Projects in Impacted Communities	82%

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

Reactive Organic Gases (ROG)	27
Oxides of Nitrogen (NOx)	728
Particulate Matter (PM10)	19
<b>Total</b>	<b>775</b>

### Goods Movement Program - 2011

Total Funds Awarded	\$26.7 million
Number of Engines Covered by Grant Projects	160
Number of Shore Power Berths Installed	8
Percent of Funding Awarded to Projects in Impacted Communities	100%

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

NOx	3,372
PM10	81
<b>Total</b>	<b>3,453</b>

### TFCA Regional Fund Grants - 2011

Total Funds Awarded	\$5.9 million
Number of Projects/Programs Awarded Grants	14

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

ROG	26
NOx	26
PM10	36
<b>Total</b>	<b>88</b>
Carbon Dioxide (CO2) - a Greenhouse Gas (tons)	24,000

### TFCA County Program Manager Fund Grants - FY 2011/2012

Total Funds Awarded	<i>\$8.1 million</i>
Number of Projects Awarded Grants	55

### Estimated Emissions Reduction for the Projects Funded (tons)

ROG	48
NOx	46
PM10	30
<b>Total</b>	<b>124</b>
CO2	60,000

### Lower Emission School Bus Program

Replacement (MSIF funds)	
Total Funds Awarded	<i>\$16.1 million</i>
Number of Projects Awarded Grants	37
Retrofit (Prop 1B funds)	
Total Funds Awarded	<i>\$7.0 million</i>
Number of Projects Awarded Grants	30

## PUBLIC OUTREACH ACTIVITIES

### 2011 Spare the Air Program

Spare the Air Days	8
AirAlert Registrations	110,871
Employers Registered	1,794
Winter Spare the Air Alerts (2011-12 season)	15

### 2011 Smoking Vehicle Program

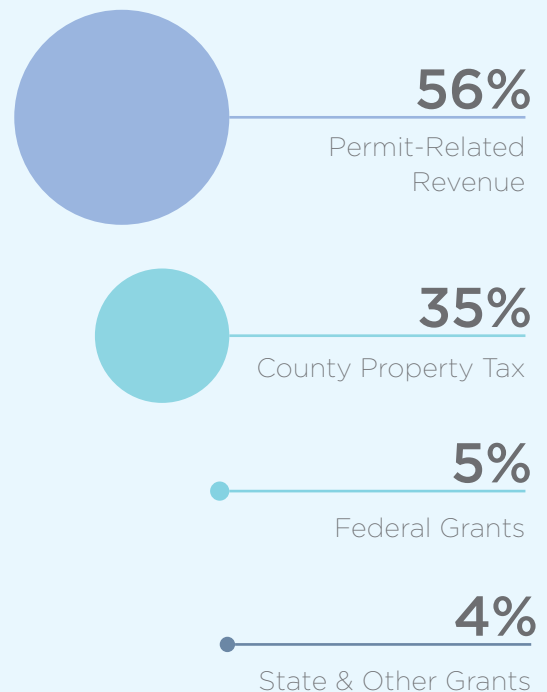
Vehicles Reported	5,180
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### 2011 Community Outreach Meetings/Events

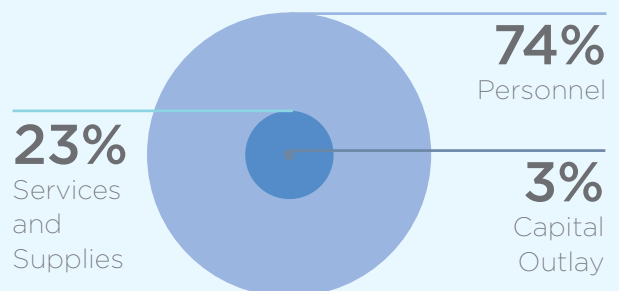
Public Meetings and Workshops Held by the District	15
Meetings with Local Organizations	98
Spare the Air Resource Team Meetings	52
Fairs and Events	54
<b>Total</b>	<b>219</b>

## 2011 FINANCIAL BREAKDOWN

### REVENUE



### EXPENDITURES



## COMMUNITY AIR RISK EVALUATION (CARE) PROGRAM 2011 ACCOMPLISHMENTS

- Continued working with the Air District's Strategic Incentives Division to target incentive funds in the six impacted communities identified through the CARE program.
- Worked with Air District planners to provide assistance to cities and project leads in assessing and reducing impacts of new development projects.
- Completed draft modeling and technical analysis to support the city of San Francisco's Community Risk Reduction Plan. Draft analyses include assessments of impacts of PM and cancer risk from on-road cars and trucks, permitted stationary sources, CalTrain, ships and harbor craft, and construction projects. Based on these technical analyses, worked with San Francisco staff to develop programs to reduce emissions and exposure.
- Worked with the Air District's Research and Modeling Section to estimate Bay Area regional improvements in health outcomes from PM2.5 reductions (presented at the annual conference of the American Association for Aerosol Research) and from reductions in toxic air contaminants (presented at the annual conference of the American Geophysical Union).
- Supported the work of researchers at UC Berkeley to repeat mobile van sampling of diesel truck exhaust plumes in West Oakland to ensure that emission reductions from drayage truck retrofits and replacements are maintained over time.
- The Air District's Strategic Incentives Program continued to prioritize projects in communities the CARE Program has identified as significantly impacted by air pollution. Projects included grants for replacement of 160 on-road trucks and funding for 11 shoreside power berths.

## 2011 LEGISLATIVE SUMMARY

The Air District adopted positions on 18 bills during 2011. Last year, California's ongoing fiscal problems continued to affect the legislative climate, with very few significant environmental bills making it out of the Legislature.

The District opposed 12 measures that were introduced this year to curb air quality regulations and programs. Eleven of these failed to pass out of Legislature, and one was vetoed by the Governor.

The following five measures supported by the Air District were passed by the Legislature and signed into law by the Governor.

- AB 462 (Lowenthal), which allows air districts to use AB 923 funds to replace older CNG tanks on school buses.
- AB 470 (Haldeman), which allows air districts to use AB 923 funds to retrofit existing school buses.
- SB 170 (Pavley), which allows the South Coast Air District to receive intellectual property benefits or revenues from projects funded with grant funds controlled by the South Coast.
- SB 209 (Corbett), which prevents homeowners associations from blocking EV residential charging installations.
- SB 739 (Lowenthal), which requires ports to assess infrastructure and air quality needs, in consultation with the local metropolitan planning organization and air district, specifying needed projects, funding, and timelines.

In addition, the Air District co-sponsored SB 582 by Senator Leland Yee, which would have allowed metropolitan planning organizations and air districts to jointly adopt regional commute benefit policies, with requirements for employers. SB 582 moved through the State Senate with strong bipartisan support, but was vetoed by the Governor.

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**DAKOTA PRESS**

Printed on elemental chlorine-free,  
30-percent post-consumer recycled  
paper, using soy-based inks.

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