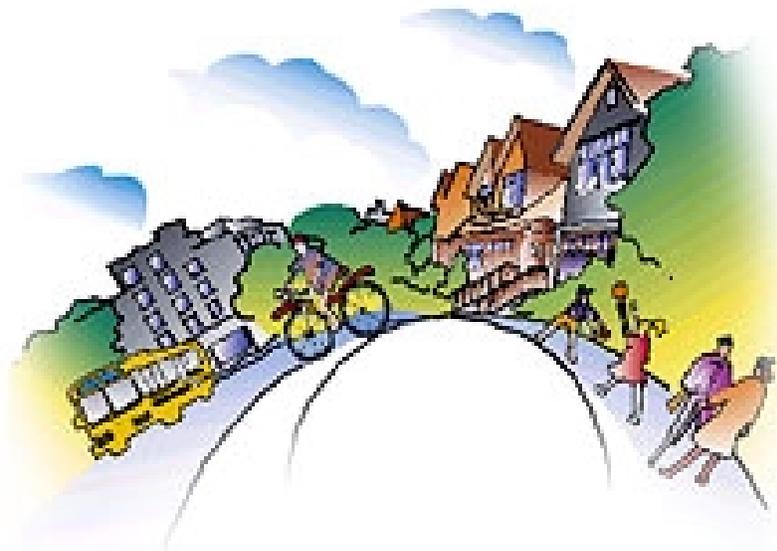


DRAFT

**AIR QUALITY AND LAND USE HANDBOOK:
A COMMUNITY HEALTH PERSPECTIVE**



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February 2004

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Introduction

The goal of this Handbook is to promote better, more informed decision-making by local land use agencies to improve air quality in their communities. While the California's State Air Resources Board (ARB) and local air pollution control districts share the overall responsibility for improving statewide air quality, local land use agencies also play an important public health role. The policy, planning, and siting activities of land use agencies can directly impact air quality and public health in local communities.

The idea for this handbook stemmed from the recognition that air pollution controls alone may not always prevent localized adverse health impacts. Land use policies and practices, including general plans, zoning, and project location should complement air quality programs and fill in program gaps that fall within land use agencies jurisdictions.

This Handbook has several objectives:

- Identify approaches that land use agencies can use to prevent or reduce potential air pollution impacts associated with new land use development, siting, and permitting;
- Improve and facilitate access to air quality data and evaluation tools for use in the land use decision-making process;
- Encourage stronger collaboration between land use agencies and local air districts to minimize community exposure to source-specific and cumulative air pollution impacts; and
- Emphasize community outreach approaches that promote active public involvement in the air quality/land use decision-making process.

The Handbook builds on upon California's 2003 General Plan Guidelines. These Guidelines, developed by the Governor's Office of Planning and Research (OPR), explain the land use planning process and applicable legal requirements. The handbook also builds upon a 1997 ARB report, "The Land Use-Air Quality Linkage."¹ This Report was an outgrowth of California Clean Air Act which, among other things, called upon local air pollution control districts to focus particular attention on reducing emissions from sources that indirectly cause air pollution by attracting vehicle trips. Such indirect sources include shopping centers, schools and universities, employment centers, warehousing, airport hubs, medical offices, sports arenas, and other facilities. The Linkage report summarizes available data on the relationships between land use, transportation, and air quality and highlights strategies that can help to reduce the use of single occupancy

¹ To access this report, please refer to ARB's website or click on:
<http://www.arb.ca.gov/ch/programs/link97.pdf>

automobile use. Such strategies complement ARB regulatory programs that continue to reduce motor vehicle emissions.

Regarding land use, the Handbook identifies the types of air quality-related information that land use agencies should consider in the land use decision-making process, including general, regional, and community plans and zoning ordinances, conducting environmental reviews, project siting, and permit issuance. In addition, the Handbook's appendices contain information on approaches and methodologies for evaluating whether a proposed new project may require a special air pollution assessment.

Much of this Handbook focuses on land use decisions related to industrial or commercial sources of air pollution. However, air pollution from non-industrial or "mobile" sources (e.g., cars, trucks, trains, construction equipment) that is linked to new projects, is also addressed in this Handbook and its Technical Supplements, and the Land Use Air Quality Linkage Report. Mobile sources continue to be the largest overall contributors to the State's air pollution problems, and air pollution from these sources represents the greatest air pollution health risk to most Californians. Based on current health risk information for air toxics, the most serious pollutants on a statewide basis are diesel particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are primarily emitted by motor vehicles.

At the State level, ARB continues to pursue new strategies to further reduce motor vehicle-related emissions in order to attain air quality standards and reduce air toxics risk. These efforts will reduce emissions, exposure, and risk from the most serious pollutants on a statewide and regional basis. However, local actions are also needed to ensure these benefits are shared fairly and consistently down to the neighborhood level.

This Handbook is an informational document and is not mandatory. It describes tools and approaches that can be used to address the potential for new projects to cause localized health risk or contribute to cumulative impacts where air pollution sources are concentrated. Our goal is to strengthen the relationship between air quality and land use agencies to effectively address community-level public health issues throughout California.

This Handbook was developed under the auspices of the ARB's Environmental Justice Stakeholders Group and reflects the ARB's commitment to community health and environmental justice. In December 2001, the California Air Resources Board (ARB/Board) adopted "Policies and Actions for Environmental Justice". These policies were the product of a nearly two year process led by the ARB, in coordination with a group of interested stakeholders of varied perspectives and insights, representing local land use and air agencies, community interest groups, academia, and business.

One of the environmental justice policies adopted by the ARB was to "assess, consider, and reduce cumulative emissions, exposure, and health risk when developing and implementing [ARB] programs." Consistent with this policy, the ARB committed to developing technical tools for performing cumulative impact

assessments on a neighborhood scale. ARB also committed to working with land use and transportation agencies, and local air districts to develop ways to identify, consider, and reduce public exposure to cumulative air pollution impacts associated with land use planning and decision-making. This Handbook is a first step in meeting that commitment.

Handbook Audience

While the primary users of the Handbook will likely be agencies responsible for air quality and land use planning, the ideas and technical issues presented in the Handbook may also be useful for:

- public and community organizations and community residents;
- federal, State and regional agencies that fund, review, regulate, oversee, or otherwise influence environmental policies and programs affected by land use policies; and
- private developers.

Organization of the Handbook

The Handbook is organized into 9 Sections. The Sections lead the reader through a sequence of questions aimed at framing the issue of localized and cumulative air pollution impacts, and identifying the available tools and approaches for addressing these issues.

The Sections discuss key land use-related air quality issues and the roles that State and local agencies play in the process. Land use and air quality-based mechanisms are discussed in the context of how they can be applied to assess the potential for new projects to contribute to air pollution impacts at the neighborhood level. One section discusses project categories or siting scenarios that may require special assessments by land use agencies, while other sections describe air quality-based tools and actions that can assist these agencies in the decision-making process and reduce the potential for cumulative impacts from new projects. The Handbook also discusses ways that public involvement in the process can be enhanced.

The Handbook also contains three appendices. Appendix A lists land use classifications and associated facility categories that could emit air pollutants. Appendix B poses questions that land use agencies should consider when reviewing new projects for potential air quality impacts. Appendix C contains general air quality information and tools that land use agencies can access for use in assessing air pollution impacts.

Technical Supplements

The Handbook is intended as a framework for informed decision-making. ARB, in conjunction with local air districts, is also developing supporting technical information. These Technical Supplements will provide additional reference

materials, including assessment tools and information on potential mitigation approaches.

Acknowledgments

The ARB staff would like to acknowledge the exceptional contributions made to this document by the ARB Environmental Justice Stakeholders Group. Since 2001, ARB staff has consistently relied on this group to provide critical and constructive input on implementing the specifics of ARB's environmental justice policies and actions. The Stakeholders Group is convened by the ARB, and comprised of representatives from local land use and air agencies, community interest groups, academia, and business. Their assistance and suggestions throughout the development of the Handbook have been invaluable.

1. What key issues should land use agencies consider to help reduce air pollution in their communities, including cumulative impacts?

California's air pollution control programs have helped to improve air quality and reduce health risk statewide. However, State and federal air quality standards are still exceeded in many areas of California and the statewide health risk posed by toxic air contaminants (air toxics) remains too high. Also, some communities experience higher pollution exposures than others -- making localized impacts, as well regional or statewide impacts, an important consideration.

The Air Resources Board (ARB) and local air pollution control districts (local air districts) have complementary air quality programs to reduce air pollution statewide. Local air districts are primarily responsible for regulating industrial and commercial air pollution sources in their regions (see section 2). However, local land use agencies can also play an important role in reducing air pollution impacts through policy, planning, and siting activities.

Avoiding incompatible land uses is a key to reducing localized air pollution exposures that can result in adverse health impacts, especially in sensitive individuals. From a public health standpoint, sensitive individuals include children, the elderly, and those with existing health problems. All of these groups are particularly vulnerable to the effects of air pollution.

Land use decisions that can pose a public health risk are often the result of the proposed location for a new project. Even with the best available control technology, some projects that are sited very close to homes, schools, and other public places can result in air pollution exposures that are too high. The reverse is also true – siting a new school or home too close to an existing source of air pollution can be a problem.

While not the general rule, poor land use policies and practices can generate or worsen air pollution and adversely impact public health by mixing incompatible land uses. Examples include locating housing or schools next to small plating facilities that use a highly toxic form of chromium, or near to large industrial facilities or freeways. Based on recent monitoring and health-based studies, we now know that air quality impacts from incompatible land uses can contribute to increased risk of illness, missed work and school, a lower quality of life, and higher costs for public health and pollution control.²

An individual siting decision, which results in incompatible land uses, can be of even greater concern when existing air pollution exposures in a community are considered. In general terms, this is often referred to as the issue of “cumulative impacts.” ARB is working with air pollution control districts to better define these situations, and to make information about existing air pollution levels (e.g., from

² For more information, the reader should refer to ARB's website on community health: <http://www.arb.ca.gov/ch/ch.htm>

Some mixed land uses may pose pollution problems from land use decisions that site emission sources close to the public, such as:

- Zoning which allows industrial land uses to be next to residential land uses;
- A residential housing tract that is downwind of a large industrial facility;
- A child care center with a playground that is adjacent to a gas station or a major roadway;
- A small business such as a dry cleaning operation, auto body shop, or chrome plater that is located next to or near a home or school;
- A housing development or school yard directly behind a light industrial or commercial area that has small businesses such as welding, auto repair, or painting;
- An elementary school or residential development immediately next to a freeway.

local businesses, motor vehicles, and other areawide sources) more readily available to land use agencies.

When siting new projects, local agencies should consider both project-related impacts and the health risk potential for cumulative impacts from existing sources of air pollution in a neighborhood or community.

Air agencies recognize that avoiding incompatible land uses can be a challenge in the context of mixed-use zoning. From a regional air quality standpoint, the concept of mixed-use development has been encouraged as a means to reduce vehicle trips and the associated emissions. However, adequate distance between air pollution sources and other land uses (e.g., homes and schools) is needed to avoid or reduce adverse health impacts. That distance will vary for different projects. Factors to be considered include the nature of the air pollution source, the nearby land uses, and the potential

health risk the local policy makers find acceptable.

Large industrial areas are not the only land uses that cause public health concern in mixed-use communities. Cumulative air pollution impacts can also occur where multiple commercial or light industrial sources are concentrated. Even “smart growth”, where mixed-use development balances housing, schools, commercial uses, and recreation, needs careful evaluation for potential localized impacts. For example, a concentration of truck traffic and multiple commercial sources in high-density residential areas can create air pollution exposures of concern.

Vehicle emissions are associated with some categories of land uses don't directly emit air pollutants but result in increased traffic. These “indirect sources” include warehouses, truck stops, bus terminals, shopping centers, business parks, etc. In addition to contributing to regional air pollution, there is a potential for localized impacts from vehicle emissions associated with an indirect source. An example is when a community is located close to an indirect source that operates diesel engines on site or attracts diesel-fueled vehicles from nearby transportation corridors. These exposures are of concern because particulate matter from diesel engines has been identified by ARB as a toxic air contaminant and it also contributes to overall particulate matter pollution.

Some of the most common sources of diesel particulate matter (diesel PM) in a community are truck traffic in heavily-traveled transportation corridors, truck idling on site, and emissions from truck-mounted, diesel-powered refrigeration units and portable generators that are frequently located at distribution centers or warehousing facilities. The ARB is developing and adopting a number of measures to reduce diesel particulate emissions from these sources, however, these statewide measures may not address all localized exposures. Mitigation for specific projects may be necessary.

Based on what we know today, the key new project siting issues that land use agencies should consider relative to localized air pollution impacts are: (1) incompatible land uses in close proximity, and (2) and the potential for cumulative impacts.

- 1) **Incompatible Land Uses.** Localized air pollution impacts can occur when a polluting source, such as a heavily trafficked roadway, warehousing facilities, industrial or commercial facilities are located near a sensitive land use such as a school, hospital, or homes. Ways to avoid or reduce such impacts could include requiring adequate distance between an air pollution source and sensitive locations, and triggering a process to determine if the project design changes or mitigation can be used to reduce or avoid potential impacts.
- 2) **Cumulative Impacts.** In mixed-use areas, air pollution impacts can occur from a concentration of multiple sources that, individually, comply with air pollution control requirements or fall below risk thresholds, but in the aggregate, pose a public health risk to exposed individuals. These sources can be heavy or light-industrial operations or commercial facilities such as autobody shops, gas stations, dry cleaners, and chrome platers. Cumulative impacts can also result from transportation-related sources, such as truck idling and traffic congestion, or from indirect sources such as warehousing facilities that are concentrated in a community or neighborhood.

2. What are the respective roles of air quality and land use agencies?

A wide variety of federal, State, and local government agencies are responsible for regulatory, planning, and siting decisions that impact air pollution. They include land use agencies, regional councils of government, school districts, local air districts, ARB, the California Department of Transportation (Caltrans), and the Governor's Office of Planning and Research (OPR) to name a few. This Section will focus on the roles and responsibilities of local and State agencies. The role of school districts will be discussed in the next Section.

Local Air Districts

Under State law, air pollution control districts or air quality management districts (local air districts) are the local government agencies responsible for improving air quality and are generally the first point of contact for resolving local air pollution issues or complaints. There are 35 local air districts in California³ that have authority and primary responsibility for regional clean air planning. Local air districts regulate stationary sources of air pollutants within their jurisdiction, including industrial and commercial facilities, power plants, construction activities, outdoor burning, and other non-mobile sources of air pollution. Some local air districts also regulate public and private motor vehicle fleet operators such as public bus systems, private shuttle and taxi services, and commercial truck depots.

■ **Regional Clean Air Plans**

Local air districts are responsible for the development and adoption of clean air plans that protect the public from the harmful effects of smog, including ozone, particulate matter, and air toxics. These plans incorporate strategies that will prevent or reduce emissions from industrial and commercial pollution sources and products. ARB measures to reduce statewide emissions from mobile sources, consumer products, and air toxics are also included in these regional air plans.

■ **Facility-Specific Considerations**

Permitting. In addition to the planning function, local air districts adopt and enforce regulations, issue permits, and evaluate the potential environmental impacts of projects.

Pollution is regulated through permits and technology-based rules that limit emissions from operating units within a facility or set standards that vehicle fleet operators must meet. Permits to construct and permits to operate contain very specific requirements and conditions that tell each regulated source what it must do to limit its air pollution in compliance with local air district rules, regulations, and State law. Prior to receiving a permit, new facilities must go through a New

³ Contact information for local air districts in California is listed in the front of this Handbook.

Source Review (NSR) process that establishes air pollution control requirements for the facility. Permit conditions are typically contained in the permit to operate and specify requirements that businesses must follow; these may include limits on the amount of pollution that can be emitted, the type of pollution control equipment that must be installed and maintained, and various record-keeping requirements.

Local air districts also notify the public about new permit applications for major new facilities, or major modifications to existing facilities that seek to locate within 1000 feet of a school.

Local air districts can also regulate non-permitted stationary and areawide source activities to reduce emissions. These include regulations to reduce the following emissions sources:

- hazardous materials in products used by industry such as paints, solvents, and de-greasers;
- agricultural and residential burning;
- leaking gasoline nozzles at service stations;
- public fleet vehicles such as sanitation trucks and school buses; and
- fugitive or uncontrolled dust at construction sites.

However, while emissions from industrial and commercial sources are typically subject to the permit authority of the local air district, projects such as a day care center, convalescent home, or playground are not ordinarily subject to an air permit. Local air district permits address the air pollutant emissions of a project but not its location.

Air Toxics "Hot Spots" Program. Local air districts regulate air toxics emissions from stationary sources under the Air Toxics "Hot Spots" program.⁴ Under this program, districts require individual facilities to perform a health risk assessment if emissions at the source exceed district-specific health risk thresholds.^{5, 6}

⁴ AB-2588 (the Air Toxics "Hot Spots" Information and Assessment Act) requires local air districts to prioritize facilities by high, intermediate, and low priority categories to determine which must perform a health risk assessment. Each district is responsible for establishing the prioritization score threshold at which facilities are required to prepare a health risk assessment. In establishing priorities for each facility, local air districts must consider the potency, toxicity, quantity, and volume of hazardous materials released from the facility, the proximity of the facility to potential receptors, and any other factors that the district determines may indicate that the facility may pose a significant risk. All facilities within the highest category must prepare a health risk assessment. In addition, each district may require facilities in the intermediate and low priority categories to also submit a health risk assessment.

⁵ Cal/EPA's Office of Environmental Health Hazard Assessment has published a Guide to Health Risk Assessment for laypeople involved in environmental health issues, including policymakers, businesspeople, members of community groups, and others with an interest in the potential health effects of toxic chemicals. To access this information, please refer to <http://www.oehha.ca.gov/pdf/HRSGuide2001.pdf>

⁶ Section 44306 of the California Health & Safety Code defines a health risk assessment as a detailed comprehensive analysis that a polluting facility uses to evaluate and predict the dispersion of hazardous substances in the environment and the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

**Table 3-1
Local Sources of Air Pollution, Responsible Agencies,
and Associated Regulatory Programs**

Source	Examples	Primary Agency	Applicable Regulations
Large Stationary	Refineries, power plants, chemical facilities, certain manufacturing plants	Local air districts	Operating permit rules Toxic Hot Spots Law (AB 2588) Local district rules Air Toxic Control Measures (ATCMs)* New Source Review rules Title V permit rules
Small Stationary	Dry cleaners, auto body shops, welders, chrome plating facilities, service stations, certain manufacturing plants	Local air districts	Operating permit conditions, Toxic Hot Spot Laws (AB 2588) Local district rules ATCMs* New Source Review rules
Mobile (non-fleet)	Cars, trucks, buses	ARB	Emission standards Cleaner-burning fuels (e.g., unleaded gasoline, low-sulfur diesel) Inspection and repair programs (e.g., Smog Check)
Mobile Equipment	Construction equipment	ARB, U.S. EPA	ARB rules U.S. EPA rules
Mobile (fleet)	Truck depots, school buses, taxi services	Local air districts, ARB	Local air district rules ARB urban bus fleet rule
Areawide	Paints and consumer products such as hair spray and spray paint	Local air district, ARB	ARB rules Local air district rules

*ARB adopts ATCMs, but local air districts have the responsibility to implement and enforce these measures or more stringent ones.

The risk assessments submitted by the facilities are reviewed by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) and approved by the local air district.

Enforcement. Local air districts also take enforcement action to ensure compliance with air quality requirements. They enforce air toxic control measures, agricultural and residential burning programs, gasoline vapor control regulations,

laws that prohibit air pollution nuisances, visible emission limits, and many other requirements designed to clean the air. Local districts use a variety of enforcement tools to ensure compliance. These include notices of violation, monetary penalties, and abatement orders. Under some circumstances, a permit may be revoked.

■ **Environmental Review**

As required by the California Environmental Quality Act (CEQA), local air districts also review and comment on proposed land use plans and development projects that can have a significant effect on the environment or public health.⁷

State Air Resources Board

The ARB is the air pollution control agency at the State level. The ARB's primary responsibility is to reduce air pollution emissions for sources under its jurisdiction. Motor vehicles are the single largest emissions source category under ARB's jurisdiction as well as the largest overall emissions source statewide. ARB also regulates emissions from other mobile equipment and engines as well as emissions from consumer products such as hair sprays, perfumes, cleaners, and aerosol paints.

The ARB identifies pollutants as toxic air contaminants and adopts statewide air toxic control measures (ATCMs). Once ARB adopts an ATCM, local air districts must implement the measure, or adopt and implement district-specific measures that are at least as stringent as the State standard. Taken in the aggregate, these ARB programs will continue to further reduce emissions, exposure, and health risk statewide.

In conjunction with local air districts, ARB plays an advisory role in the land use decision-making process by providing technical information on land use-related air issues.

Local Land Use Agencies

Under the State Constitution, land use agencies have the primary authority to plan and control land use.⁸ Each of California's incorporated cities and counties are required to adopt a comprehensive, long-term General Plan.⁹

⁷ Section 4 of this Handbook contains more information on the CEQA process.

⁸ The legal basis for planning and land use regulation is the "police power" of the city or county to protect the public's health, safety and welfare. The California Constitution gives cities and counties the power to make and enforce all local police, sanitary and other ordinances and regulations not in conflict with general laws. State law reference: California Constitution, Article XI §7.

⁹OPR General Plan Guidelines, 2003:

http://www.opr.ca.gov/planning/PDFs/General_Plan_Guidelines_2003.pdf

The General Plan's long-term goals are into action through zoning ordinances. These are local laws adopted by counties and cities that describe, lot-by-lot, the kinds of development that will be allowed within their boundaries.

Land use agencies are also the lead for doing environmental assessments under CEQA for new projects that may pose a significant environmental impact, or for new or revised General Plans.

Other Agencies

Governor's Office of Planning and Research (OPR)

In addition to serving as the Governor's advisor on land use planning, research, and liaison with local government, OPR develops and implements the State's policy on land use planning and environmental justice. Most recently, OPR updated its General Plan Guidelines to highlight the importance of sustainable development and environmental justice policies in the planning process. OPR also advises project proponents and government agencies on CEQA provisions and operates the State Clearinghouse for environmental and federal grant documents.

Transportation Agencies

Transportation agencies can also influence mobile source-related emissions in the land use decision-making process. Local transportation agencies work with land use agencies to develop a transportation (circulation) element for the General Plan. These local government agencies then work with other transportation-related agencies, such as the Congestion Management Agency (CMA), Metropolitan Planning Organization (MPO), Regional Transportation Planning Agency (RTPA), and Caltrans to develop long and short range transportation plans and projects.

Caltrans is the agency responsible for setting State transportation goals and for State transportation planning, design, construction, operations and maintenance activities. Caltrans is also responsible for delivering California's multibillion-dollar State Transportation Improvement Program, a list of transportation projects that are approved for funding by the California Transportation Commission in a 4-year cycle.

When safety hazards or traffic circulation problems are identified in the existing road system, or when land use changes are proposed such as a new residential subdivision, shopping mall or manufacturing center, Caltrans and/or the local transportation agency ensure the projects meet applicable State, regional, and local goals and objectives.

Caltrans also evaluates transportation-related projects for regional air quality impacts, from the perspective of travel-related emissions as well as road congestion and increases in road capacity (new lanes).

California Energy Commission (CEC)

The CEC is the State's CEQA lead agency for permitting large thermal power plants (50 megawatts or greater). The CEC works closely with local air districts and other federal, State and local agencies to ensure compliance with applicable laws, ordinances, regulations and standards in the permitting, construction, operation and closure of such plants. The CEC uses an open and public review process that provides communities with outreach and multiple opportunities to participate and be heard. In addition to its comprehensive environmental impact and engineering design assessment process, the CEC also conducts an environmental justice evaluation. This evaluation involves an initial demographic screening to determine if a qualifying minority or low-income population exists in the vicinity of the proposed project. If such a population is present, staff considers possible environmental justice impacts including from associated project emissions in its technical assessments.

Councils of Government (COG)

COGs are organizations composed of local counties and cities that serve as a focus for the development of sound regional planning, including plans for transportation, growth management, hazardous waste management, and air quality. They can also function as the metropolitan planning organization for coordinating the region's transportation programs.

Federal Agencies

Federal agencies have permit authority over activities on federal lands and certain resources, which have been the subject of congressional legislation, such as air, water quality, wildlife, and navigable waters. The U. S. Environmental Protection Agency generally oversees federal agencies having environmental jurisdiction and has broad authority for regulating certain activities such as the disposal of toxic wastes and the use of pesticides. The responsibility for implementing some federal regulatory programs such as those for air and water quality and toxics is delegated by management to specific state and local agencies. Although federal agencies are not subject to CEQA they must follow their own environmental process established under the National Environmental Policy Act (NEPA).

3. What special processes apply to school siting?

The [California Education Code](#) and the [California Public Resources Code](#) places primary authority for siting public schools with the local school district. The California Education Code requires public school districts to notify the local planning agency about siting a proposed new public school or expanding an existing school. The planning agency then reports back to the school district regarding a project's conformity with the adopted General Plan. However, school districts can overrule local zoning and land use designations for schools if they follow specified procedures.¹⁰

Before making a final decision on a school site acquisition, a school district must comply with CEQA and evaluate the proposed site for air emissions and health risk by preparing and certifying an environmental impact report or negative declaration. Both the California Education Code¹¹ and the California Public Resources Code¹² require school districts to consult with local air districts when preparing the environmental assessment. Such consultation is required to identify both permitted and non-permitted facilities in the affected area. These facilities include, but are not limited to, freeways and other busy traffic corridors, large agricultural operations, and rail yards, within one-quarter mile of the proposed school site, that might emit hazardous air emissions, or handle hazardous or acutely hazardous materials, substances, or waste.

As part of the CEQA process and before approving a school site, the school district must make a finding that either it found no significant air pollution sources. Alternatively, if the school district finds that there are significant sources, it must determine either that it poses no health risks, or that corrective actions would be taken so that there would be no actual or potential endangerment to students or school workers. State law also provides for cases in which the school district cannot make either of these two findings and cannot find a suitable alternative site. When this occurs, the school district must adopt a statement of over-riding considerations that the project should be approved based on the ultimate balancing of the merits.¹³

¹⁰ Government Education Code section 53091 requires a school district to comply with city or county zoning ordinances when such ordinance makes provisions for the location of public schools, and the city or county has adopted a General Plan. However, section 53094 of the Education Code allows the school district to render a city or county zoning ordinance inapplicable to proposed classroom facilities by vote of two-thirds of its School Board members.

¹¹ California Education Code section 17213.

¹² California Public Resources Code section 21151.8.

¹³ California Education Code section 17213 and California Public Resources Code section 21151.8 were amended in 2003 by SB352 (Escutia) to incorporate these changes.

Some school districts use a standardized assessment process¹⁴ to determine the environmental impacts of a proposed school site. In the assessment process, school districts can use maps and other available information to evaluate risk, including a local air district's database of permitted source emissions. School districts can also perform field surveys and record searches to identify and calculate emissions from non-permitted sources within a 1/4 mile radius of a proposed site. Traffic count data and vehicular emissions data can also be obtained for major roadways and freeways in proximity to the proposed site to model potential emissions impacts to students and school employees. This information is available from the local COG or Caltrans.

¹⁴ The LAUSD has a web site (http://www.laschools.org/oehs/s_siteassessment) that provides information pertaining to its school siting and environmental review procedures.

4. What general process is used by land use agencies to address air pollution impacts?

There are several separate but related processes for addressing the air pollution impacts of land use projects. One takes place as part of the planning and zoning function. This consists of preparing and implementing goals and policies contained in county or city General Plans, community or area plans, and specific plans governing land uses such as residential, educational, commercial, industrial, and recreational activities. It also includes recommending locations for thoroughfares, parks and other public improvements.

Land use agencies also have a permitting function that includes performing environmental reviews and mitigation when projects may pose a significant environmental impact. They conduct inspections for zoning permits issued, enforce the zoning regulations and issue violations as necessary, issue zoning certificates of compliance, and check compliance when approving certificates of occupancy.

Planning

■ General Plan¹⁵

The General Plan is a local government “blueprint” of existing and future anticipated land uses for long-term future development. It is composed of the goals, policies, and general elements upon which land use decisions are based. Because the General Plan is the foundation for all local planning and development, it is an important tool for implementing policies and programs beneficial to air quality. Local governments may choose to adopt a separate air quality element into their General Plan or to integrate air quality-beneficial objectives, policies, and strategies in other elements of the Plan, such as the land use, circulation, conservation, and community design elements.

More information on General Plan elements is contained in Section 5.

■ Community Plans

Community or area plans are terms for plans that focus on a particular region or community within the overall general plan area. It refines the policies of the general plan as they apply to a smaller geographic area and is implemented by ordinances and other discretionary actions, such as zoning.

¹⁵ In October 2003, OPR revised its General Plan Guidelines. An entire chapter is now devoted to a discussion of how sustainable development and environmental justice goals can be incorporated into the land use planning process. For further information, the reader is encouraged to obtain a copy of OPR’s General Plan Guidelines, or refer to their website at: http://www.opr.ca.gov/planning/PDFs/General_Plan_Guidelines_2003.pdf

■ **Specific Plan**

A specific plan is a hybrid that can combine policies with development regulations or zoning requirements. It is often used to address the development requirements for a single project such as urban infill or a planned community. As a result, its emphasis is on concrete standards and development criteria.

■ **Zoning**

Zoning is the public regulation of the use of land. It involves the adoption of ordinances that divide a community into various districts or zones. For instance, zoning ordinances designate what projects and activities can be sited in particular locations. Each zone designates allowable uses of land within that zone, such as residential, commercial, or industrial. Zoning ordinances can address building development standards, e.g., minimum lot size, maximum building height, minimum building setback, parking, signage, density, and other allowable uses.

Land Use Permitting

In addition to the planning and zoning function, land use agencies issue building and business permits, and evaluate the potential environmental impacts of projects. To be approved, projects must be located in a designated zone and comply with applicable ordinances and zoning requirements.

Even if a project is sited properly in a designated zone, a land use agency may require a new source to mitigate potential localized environmental impacts to the surrounding community below what would be required by the local air district. In this case, the land use agency could condition the permit by limiting or prescribing allowable uses including operating hour restrictions, building standards and codes, property setbacks between the business property and the street or other structures, vehicle idling restrictions, or traffic diversion.

Land use agencies also evaluate the environmental impacts of proposed land use projects or activities. If a project or activity falls under CEQA, the land use agency requires an environmental review before issuing a permit to determine if there is the potential for a significant impact, and if so, to mitigate the impact or possibly deny the project.

■ **Land Use Permitting Process**

In California, the authority to regulate land use is delegated to city and county governments. The local land use planning agency is the local government administrative body that typically provides information and coordinates the review of development project applications. Conditional Use Permits (Use Permits) typically fall within a land use agency's discretionary authority and therefore are subject to CEQA. Use Permits are intended to provide an opportunity to review the location, design, and manner of development of land uses prior to project

approval. A traditional purpose of the Use Permit is to enable a municipality to control certain uses that could have detrimental environmental effects on the community.

The process for permitting new discretionary projects is quite elaborate, but can be broken down into five fundamental components:

- Project application
- Environmental assessment
- Consultation
- Public comment
- Public hearing and decision

Project Application

The permit process begins when the land use agency receives a project application, with a detailed project description, and support documentation. During this phase, the agency reviews the submitted application for completeness. When the agency deems the application to be complete, the permit process moves into the environmental review phase.

Environmental Assessment

If the project is discretionary and the application is accepted as complete, the project proposal undergoes an environmental clearance process under CEQA to analyze and, if appropriate, mitigate the potential of the project to pose significant environmental impacts. The screening criteria to determine significance is based on a variety of factors, including local, State, and federal regulations, administrative practices of other public agencies, and commonly accepted professional standards. However, the final determination of significance for individual projects is the responsibility of the lead agency – in this case, the planning commission which is the land use agency's governing body.

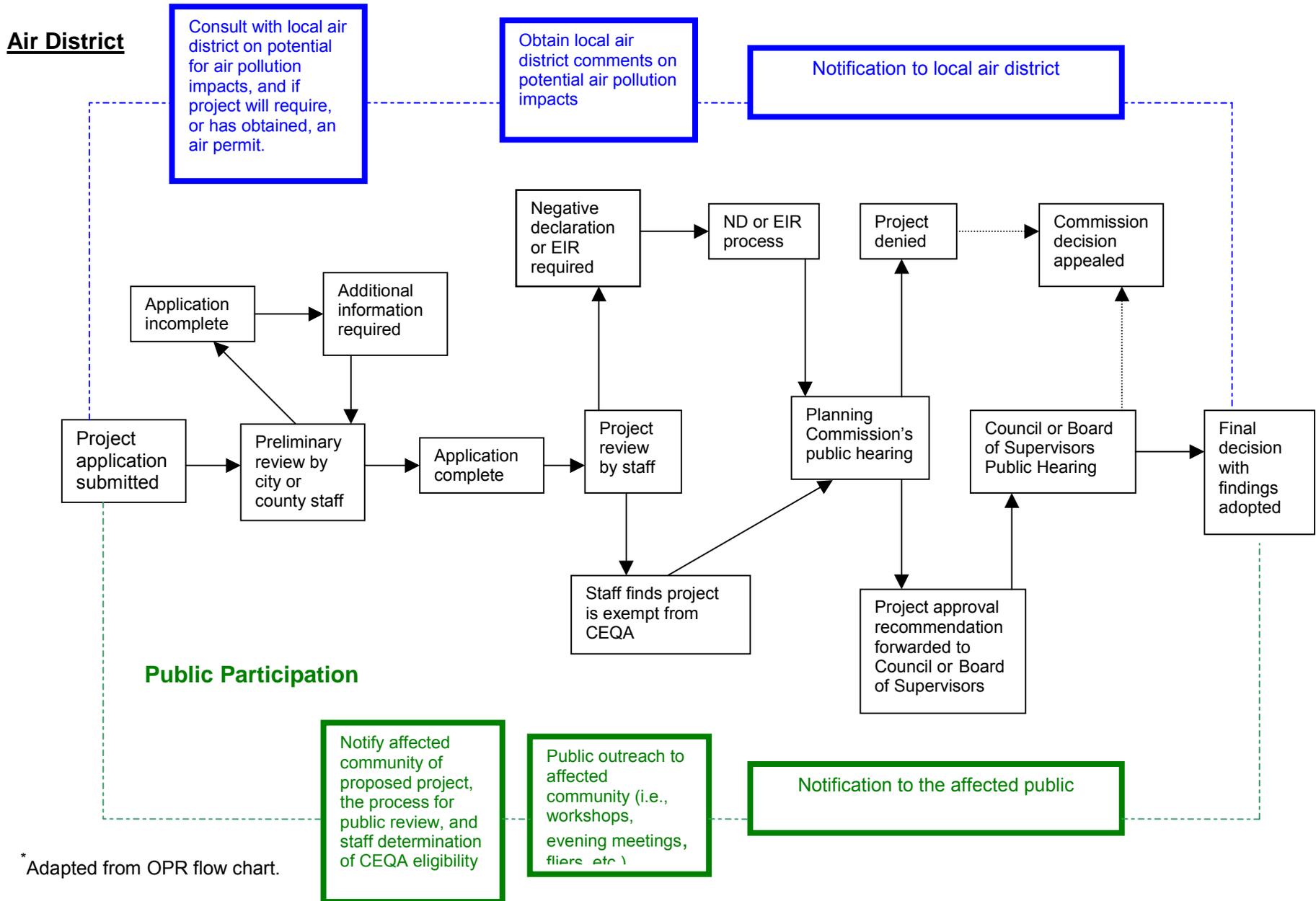
Consultation

Application materials are provided to various departments and agencies that may have an interest in the project (e.g., air pollution, building, police, fire, water agency, Fish and Game, etc.) for consultation and input.

Public Comment

Following the environmental review process, the Planning Commission reviews application along with the staff's report on the project assessment and a public comment period is set and input is solicited.

USE PERMIT (DISCRETIONARY ACTION) REVIEW PROCESS*



* Adapted from OPR flow chart.

Public Hearing and Decision

Permit rules vary depending on the particular permit authority in question, but the process generally involves comparing the proposed project with the land use agency standards or policies. The procedure usually leads to a public hearing, which is followed by a written decision by the agency or its designated officer. Typically, a project is approved, denied, or approved subject to specified conditions.

Environmental Assessment

Projects that trigger an environmental review are evaluated under CEQA procedures.¹⁶ Its purpose is to consider potential adverse environmental impacts of a proposed plan or project, suggest methods to minimize those impacts, and discuss alternatives to mitigate any potential impacts. The CEQA process provides elected and appointed officials with information needed for decision-making. The CEQA process also provides an opportunity for other agencies, including air agencies, interested parties, and the general public to comment on the proposed plans or projects.

Under CEQA, public agencies have different responsibilities to prepare, review, and comment on environmental documents that describe the potential environmental effects of proposed plans, projects, and activities.

To assist in determining the environmentally significant effects of a project, agencies use criteria, termed

What is a “Lead Agency”?

A lead agency is the public agency that has the principal responsibility for carrying out or approving a project that is subject to CEQA. In general, the land use agency is the preferred public agency serving as lead agency because it has jurisdiction over general land uses. The lead agency is responsible for determining the appropriate environmental document, as well as its preparation.

What is a “Responsible Agency”?

A responsible agency is a public agency with discretionary approval authority over a portion of a CEQA project (e.g., projects requiring a permit). As a responsible agency, the agency is available to the lead agency and project proponent for early consultation on a project to apprise them of applicable rules and regulations, and provide guidance as needed on applicable methodologies or other related issues.

What is a “Commenting Agency”?

A commenting agency is any public agency that comments on a CEQA document, but is neither a lead agency nor a responsible agency. For example, a local air district, as the agency with the responsibility for comprehensive air pollution control, could review and comment on an air quality analysis in a CEQA document for a proposed distribution center, even though the project was not subject to a permit or other pollution control requirements.

¹⁶ The Governor’s Office of Planning and Research maintains comprehensive information on the California Environmental Quality Act, including the statute, guidelines, reference documents, supplemental materials, and case law. The reader may also refer to the California Resources Agency CEQA website at http://ceres.ca.gov/topic/env_law/ceqa/

Thresholds of Significance, to assess the potential impacts, including air quality, of a given project.

A new land use plan or project can also trigger an environmental assessment under CEQA if, among other things, it will expose sensitive receptors such as schools, day care centers, hospitals, retirement homes, convalescence facilities, and residences to substantial pollutant concentrations. Readers interested in learning more about CEQA should contact OPR or visit their website at <http://www.opr.ca.gov/>.

CEQA only applies to “discretionary projects.” Discretionary means the public agency must exercise judgment or deliberation when deciding to approve or disapprove a particular activity. Examples of discretionary projects include the issuance of a conditional use permit, re-zoning a property, or widening of a public road. Projects that do not require a discretionary decision and can be approved administratively are referred to as ministerial projects. Examples of typical ministerial projects include the issuance of a building permit or a license for a business that is located in an area that is zoned for that activity. As a general rule, CEQA does not apply to ministerial projects.¹⁷

Once a potential environmental impact associated with a project is identified through an environmental assessment, mitigation should be considered. A land use agency could incorporate mitigation measures that are suggested by the local air district as part of the project review process. A land use agency could also consider mechanisms such as conditional use

¹⁷ See California Public Resources Code section 21080(b)(1).

5. What mechanisms can land use agencies use to avoid or help reduce air pollution related health risk associated with new projects?

As discussed earlier, there are two key issues to consider relative to new projects – incompatible land uses resulting from project location and cumulative impacts in terms of multiple air pollution sources in a community. The broad concept of cumulative air pollution impacts reflects the combination of regional air pollution levels and any localized impacts. Many factors contribute to air pollution levels experienced in any location. These include urban air pollution background, historic land use patterns, the prevalence of freeways and other transportation corridors in proximity to homes and schools, the concentration of industrial and commercial businesses in mixed-use communities, and local meteorology. While mobile sources are the predominant contributor to regional as well as community-level health risk from air pollution, the impacts of project location and the concentration of facilities emitting air pollution need to be considered in the land use decision-making process.

Sometimes, new projects that would comply with zoning and air pollution control requirements may still pose a health risk, either individually or in combination with existing air pollution sources in a community. Because the proposed project would comply with zoning requirements, an environmental assessment may not always be triggered, and air pollution impacts could go undiscovered until after the project is sited and operating. These potential problems might be reduced or avoided by taking a closer look at project categories in the context of proposed locations. A screening process could help determine when a special air pollution assessment may be needed prior to project approval. The appendices to the Handbook offer information that land use agencies should consider when determining if a proposed project may require a special assessment.

Appendix A identifies land use classifications and associated facility categories that could emit air pollutants. The purpose of this appendix is to alert land use agencies to the types of air pollutants that are typically emitted by different project categories, including commercial and retail businesses, industry, transportation, and home building and construction.

Appendix B poses a range of questions that land use agencies should consider when reviewing new projects for potential air quality impacts. These questions are intended to raise the awareness of land use agencies to the possibility that, even after addressing applicable air pollution control and zoning requirements, a proposed new project may still contribute to air pollution impacts in particular neighborhoods. Additional scrutiny, beyond the routine land use decision-making process, could help reduce or avoid health risk from new projects.

The questions contained in this appendix suggest a two-part process for evaluating projects within the land use decision-making process. Appendix B-1

includes questions designed to help assess project impacts, especially incompatible land use. Appendix B-2 includes questions related to cumulative impacts assessment. It is primarily designed to identify whether there is a concentration of multiple sources in the neighborhood or community that should be considered as part of the land use decision-making process for a proposed project.

These questions do not imply any particular action that should be taken by land use decision-makers. Rather, the questions are intended to improve the assessment process and facilitate informed decision-making.

Appendix C provides a description of air quality information and tools for assessing potential cumulative impacts. This appendix will be described in greater detail in Section 6.

A land use agency or school district can consider the potential health risk associated with a new project by using available analytical methodologies and the current land use planning, zoning, and permitting processes. The technical information and assessment tools currently range from screening type assessments to more sophisticated methods. Local air districts and ARB are working together to make the existing information more readily available to project applicants, local land use agencies, and the public.

The following concepts provide some general and specific approaches that land use agencies (or, as applicable, school districts) could use to address the potential for land use-related air pollution impacts from new projects. Each of these approaches can help to reduce the potential impacts that projects may have on public health.

Planning and Zoning

1) Update General Plan Policies

The OPR General Plan Guidelines provides an effective and long-term approach to reduce cumulative air pollution impacts. In 2003, OPR revised its General Plan Guidelines, highlighting the importance of incorporating sustainable development and environmental justice policies in the planning process.

Land use agencies should consider updating General Plan policies to address the issue of cumulative impacts. For instance, specific policies within the General Plan could include actions to reduce diesel PM emissions from land use activities and indirect sources where diesel-fueled vehicles are concentrated.

As indicated in Section 4, the General Plan can also address or integrate air quality-beneficial objectives, policies, and strategies in a number of ways. One way is to include air quality considerations into any one or several General Plan

elements aimed at preventing or reducing air pollution emissions, exposure, and risk that might be associated directly or indirectly from General Plan policies or actions.

OPR's General Plan Guidelines discuss how different elements can be used to address potential environmental impacts. For instance, a safety element with an air quality component could be used to incorporate policies or objectives that are intended to protect the public from environmental hazards, including air toxics. Likewise, an air quality component of the circulation element could include policies or standards to prevent or reduce local exposure from diesel exhaust from trucks and other vehicles by establishing alternative routes for heavy-duty diesel trucks and buses away from residential areas. By considering the relationship between air quality and transportation, the circulation element could also include air quality policies to prevent or reduce trips and travel, and thus vehicle emissions. Land use element policies that identify areas appropriate for future industrial, commercial, and residential uses can also address design and distance parameters that reduce emissions, exposure, and risk from commercial or industrial land uses that are in close proximity to residential areas or schools.

Land use agencies could also consider a stand-alone air quality element that serves as a policy level document that establishes regional as well as community health goals.¹⁸ Currently, approximately 100 cities and counties in California have adopted air quality elements.

The air quality element can also provide a general reference guide that informs local land use planners about regional and community level air quality, regulatory air pollution control requirements and guidelines, references emissions and pollution source data bases and assessment and modeling tools. As will be further described in Section 6 and Appendix C of the Handbook, new neighborhood assessment tools developed by the ARB can be included into the air quality element by reference. For instance, ARB's statewide risk maps could be referenced in the air quality element as a tool that developers or land use agencies should consider as part of the decision-making process. ARB or district technical supplements could also be generally referenced in an air quality element as a resource for use in the land use decision-making process.

2) Review Zoning Requirements

Zoning requirements may not always reflect the most recent policies and findings regarding community health and cumulative air pollution impacts. Where this is

¹⁸ Several jurisdictions in California have adopted air quality elements, including the City of Roseville, Palm Desert, and Sacramento County. For further information, please refer to the California Resources Agency web site at: http://elib.cs.berkeley.edu/cgi-bin/doc_query?where-location=&where-doc_type=generalplan&special=ceres

the case, new projects may exacerbate poor land use practices of the past and contribute to existing air pollution problems in the community.

Sometimes, especially in mixed-use zones, commercial and/or industrial operations can result in cumulative impacts to nearby communities. For example:

- A sensitive receptor project could be sited in a mixed-use zone adjacent to an existing chrome plating facility;
- A project subject to air regulations is sited near an apartment building in an area where there is a concentration of multiple pollution sources;
- A new housing development is sited downwind or adjacent to a business that uses or emits air toxics; or
- A new housing development or sensitive receptor location is sited within a major transportation corridor without providing for measures that can reduce the potential for emissions, exposure, and risk from traffic congestion.

By separating incompatible land uses (for instance with transitional or buffer zone areas), zoning requirements can prevent or reduce air pollution impacts. This is most often done with schools, but can also include other community locations, such as residences, hospitals, convalescent homes, or day care centers. However, separating land uses is not always feasible. When this happens, land use agencies should consider conditional use permits (see discussion below) for new projects to prevent or reduce health risk attributable to the proximity of an air pollution source and a sensitive land use. For instance, land use agencies could consider property separation requirements, as well as operational restrictions (such as limitation of hours, or use of an indoor air filter for the sensitive receptor location).

Zoning codes could be updated to require the separation of incompatible land uses for proposed new projects. The use of buffer zones, which separate industrial and residential land uses, or transitional use zones such as green spaces, should be considered. As part of the public process for making zoning changes, local land use agencies could work with community planning groups, local businesses, and community residents to determine how best to address existing incompatible land uses.

Land Use Permitting

1) Ask Appropriate Questions

While the ARB and local air districts are primarily responsible for programs to improve air quality, land use agencies can make tangible improvements to neighborhood-scale air quality in their communities. For instance, new commercial uses or industrial facilities can be sited some distance away from populated areas so that the potential for emissions, exposure, and risk is avoided. Land use agencies can also set permit conditions that impose property setbacks,

or design standards that mitigate or reduce emissions exposure to the nearby community.

It is important for land use decision-makers to ask appropriate questions about the potential impacts of proposed projects – both project specific impacts and the nature of existing air pollution sources in the same impact area. Land use information can answer questions about the proximity of air pollution sources to sensitive receptors, the potential for incompatible land uses, and the location and nature of nearby air pollution sources. Air pollution information, available from the ARB and local air districts, can provide information about the types and amounts of air pollution emitted in an area, regional air quality concentrations, and health risk estimates for specific sources.

General Plans, parcel maps, and zoning maps are an excellent starting point to understand the impact potential in different locations. These documents contain information about existing or proposed land uses for a specific location as well as the surrounding area.

Often, just looking at a map of the proposed location for a facility and its surrounding area will help to identify possible adjacent incompatible land uses.

Some types of useful information that land use agencies should have on hand include:

- Base map of the city or county planning area and terrain elevations.
- General Plan designations of land use (existing and proposed).
- Zoning maps.
- Land use maps that identify existing land uses, including the location of facilities that are permitted or otherwise regulated by the local air district. Such maps can be developed with the assistance of local air districts. Using risk-based maps that have been developed by ARB, land use agencies can also identify potential incompatible land uses of different project types within zones (e.g., a proposed hospital that would be located next to an existing distribution center, or a proposed mining operation near a recreational area).
- Demographic data, e.g., population location and density, distribution of population by income, distribution of population by ethnicity, and distribution of population by age. The use of population data is a normal part of the planning process. However, from an air quality perspective, socioeconomic data is useful to identify potential community health issues, including incompatible industrial facilities and land uses in neighborhoods whose ethnic or minority makeup may predispose them to certain genetic-related diseases.

- Emissions, monitoring, and risk-based maps created by the ARB or local air districts that show air pollution-related health risk by community across the State.
- Location of public facilities that enhance community quality of life, including parks, community centers, and open space.
- Location of industrial and commercial facilities and other land uses that use hazardous materials, or emit air pollutants. These include gas stations, dry cleaners, auto body shops, metal plating, and finishing shops, printing, and publishing facilities.
- Location of sources or facility types that result in diesel on-road and off-road emissions, e.g., stationary diesel power generators, forklifts, cranes, construction equipment, on-road vehicle idling, and operation of transportation refrigeration units. Distribution centers, marine terminals and ports, rail yards, large industrial facilities, and facilities that handle bulk goods are all examples of complex facilities where these types of emission sources are frequently concentrated.¹⁹ Very large facilities, such as ports, marine terminals, and airports, could be analyzed regardless of proximity to a receptor if they are within the modeling area.
- Location and acreage of existing and proposed schools and other sensitive receptors.
- Location and density of existing and proposed residential development.
- Zoning requirements, property setbacks or buffer zone policies, traffic flow requirements, idling restrictions for trucks, trains, yard hostlers²⁰, construction equipment, or school buses.
- Traffic counts (including diesel truck traffic counts), within a community to validate or augment existing regional motor vehicle trip and speed data.

¹⁹ The ARB is currently evaluating the types of facilities that may act as complex point sources and developing methods to identify them.

²⁰ Yard hostler means a tractor less than 300 horsepower that is used to transfer semi-truck or tractor-trailer containers in and around storage, transfer, or distribution yards or areas and is often equipped with a hydraulic lifting fifth wheel for connection to trailer containers.

2) Strengthen Mitigation

In addition to considering the appropriateness of the project location, opportunities for mitigation of air pollution impacts should be considered. Sometimes, a land use agency may find that selection of a different location for a project would not be desirable, timely, or feasible. When that happens, land use agencies should also consider if design improvements or other strategies would reduce health risk. Such strategies could include conditional use permits, performance or design standards, and mitigation measures. Potential mitigation measures could take into account feasible, cost-effective solutions within the available resources and authority of implementing agencies to enforce.²¹

■ Conditional Use Permits

Some types of land uses are only allowed upon approval of a conditional use permit (also called a CUP or special use permit). These uses might include community facilities (i.e., hospitals or schools), public buildings or grounds (i.e., public fleet garages), or uses with potentially significant environmental impacts (i.e., hazardous chemical storage or surface mining). Local zoning ordinances specify the uses for which a conditional use permit is required, the zones they may be allowed in, and public hearing procedures. When allowing a project, the conditional use permit imposes special requirements to insure that the use will not be detrimental to its surroundings. Conditional use permits can include non-regulatory performance standards that are not typically imposed on the project by a local air district and can include such things as additional landscaping, soundproofing, limited hours of operation, property setbacks, or road improvements. A conditional use permit does not re-zone the land.

Conditional use permits can sometimes be useful in siting a project to prevent or reduce emissions that might otherwise pose an unacceptable impact to public health. Land use agencies should consider a range of conditional use options that could be applied generically to source categories of greatest concern.

■ Performance Standards

In the context of land use planning, performance standards are requirements imposed on projects through conditional use permits to ensure compliance with general plan policies, local ordinances, or permit conditions. These standards could apply to such project categories as distribution centers, gas stations,

²¹ A land use agency has the authority to deny a project based upon information collected and evaluated through the land use decision-making process. However, any denial would need to be based upon identifiable, generally applicable, articulated standards set forth in the local government's General Plan, zoning codes, and other applicable local ordinances. One way of averting this drastic step is to conduct early and regular outreach to the community and the local air district so that community and environmental concerns can be addressed and accommodated into the project proposal.

autobody shops, dry cleaners, metal melters, and print shops. Such standards would provide certainty and equitable treatment to all projects of a similar nature, and reserve the more resource intensive conditional or special use permits to projects that require a more detailed analysis. In development of project design or performance standards, land use agencies should consult with the local air district to avoid duplication or inconsistency with district air pollution control requirements when considering the site-specific aspects of a project.

Examples of air quality-specific performance standards include the following:

- Placing a process vent away from the direction of the local playground that is nearby or increasing the stack height so that emissions are dispersed to have a reduced impact on surrounding homes or schools.
- Buffer zones or property setbacks between the project fence line and the population center.
- A reduced-idling ordinance to apply to all operators of motor vehicle fleets (over a certain size) that use diesel-fueled engines.
- An ordinance that requires fleet operators to purchase clean-fueled vehicles before project approval (if a new business), or when expanding the fleet (if an existing business);
- Increasing the number of permit inspections (either by the land use agency or the local air district); and
- Designing alternative routes for truck operations to discourage congestion detours into residential neighborhoods.

Land use agencies may wish to consider changes to zoning ordinances in mixed-use communities to address incompatible land uses or to include performance standards for certain project categories.

3) Consult Local Air Districts and Other Agencies

When questions arise regarding the air quality impacts of projects, including potential cumulative impacts, land use agencies should consult the local air district. Land use agencies should also consider the following suggestions to avoid creating new incompatible land uses:

- Consult with the local air district on land use-based approaches and strategies that can be used to avoid or prevent air pollution impacts from new projects.
- Continue to check with the ARB for new information on Technical Supplements and modeling tools that would be applicable to projects seeking to site within your jurisdiction. Also make use of ARB's

²² As indicated in Section 3, OPR serves as the State coordinator for several environmental programs, including CEQA. As such, it advises project proponents and land use agencies on CEQA provisions. For further information on the CEQA process, the reader should refer to the Governor's Office of Planning and Research (see <http://www.opr.ca.gov/>)

clearinghouse for information on what measures other jurisdictions are using to address comparable issues or sources.

- Become familiar with ARB's Land Use-Air Quality Linkage Report to determine whether approaches and evaluation tools contained in the Report can be used to reduce transportation-related impacts on communities.
- Contact the local air district to determine if existing or future effective regulations or permit requirements will affect the proposed project or other sources in the vicinity of the proposed project.
- Contact and collaborate with other State agencies that play a role in the land use decision-making process, e.g., the State Department of Education, the California Energy Commission, and Caltrans, for information on mitigation measures and mapping tools that could be useful in addressing local problems.

4) Use Public Outreach Effectively

Above all, actively soliciting input, sharing information, and offering incentives for good projects is critical to breaking the cycle of poor land use practices. Land use agencies should consider using existing outreach mechanisms to reduce the potential of cumulative impacts from new sources.

- **Community-Based Planning Committees**

Neighborhood-based or community planning advisory councils could be established to invite and facilitate direct citizen participation into the planning process. With the right training and technical assistance, such councils can provide valuable input and a forum for the review of proposed amendments to plans, zone changes, land use permits, and suggestions as to how best to prevent or reduce cumulative air pollution impacts in their community.

- **Regional Partnerships**

Consider creating regional coalitions of key growth-related organizations from both the private and public sectors, with corporations, communities, other jurisdictions, and government agencies. Such partnerships could facilitate agreement on common goals and win-win solutions tailored specifically for the region. With this kind of dialogue, shared vision, and collaboration, barriers can be overcome and locally acceptable sustainable solutions implemented. Over the long term, such strategies will help to bring about clean air in communities as well as regionally.

- **Direct Community Outreach**

In conjunction with local air districts, land use agencies should consider designing an outreach program for community groups and local government agency staffs that address the problem of cumulative air pollution impacts, and the public and government role in reducing these impacts. Such a program could consider

analytical tools that assist in the preparation and presentation of information in a way that supports sensible decision-making and public involvement. More detailed information can be found in section 9.

- **Information Clearinghouse**

Land use agencies should consider using the ARB statewide clearinghouse that will be used to post the Handbook's technical supplements and other relevant information.

School Siting

As the demand for new schools rises, finding suitable and affordable land remains at a premium. This is especially true for the State's major metropolitan areas with high-density inner city space limitations. In such cases, school districts should engage throughout the siting process with land use agencies and local air districts to devise design standards and mitigation measures that can reduce to the maximum feasible extent the potential for cumulative emissions, exposure, and health risk to students and school workers.

Such a collaborative effort could involve holding joint public meetings and disseminating information materials to parents, school workers, and the community and seek input on actions that can be taken to avoid harmful pollution exposure and health risk.

Land use-specific mechanisms can go a long way toward addressing cumulative impacts from new air pollution sources. Additionally, close collaboration and communication between land use agencies and local air districts in both the planning and project approval stages can further reduce these impacts. Local agency partnerships can also result in early identification of potential impacts from proposed activities that might otherwise escape environmental review. When this happens, pollution problems can be prevented or reduced before projects are approved, when it is less complex and expensive to mitigate.

The next section addresses available air quality assessment tools that land use agencies can use to evaluate the potential for localized or cumulative impacts in their communities.

6. What assessment approaches are available to provide information on potential cumulative air pollution impacts?

Until recently, California has traditionally approached air pollution control from the perspective of assessing whether the pollution was regional, category-specific, or from new or existing sources. This methodology has been generally effective in reducing statewide and regional air pollution impacts and risk levels. However, such an incremental, category-by-category, source-by-source approach may not always address community health impacts from multiple sources – including mobile, industrial, and commercial facilities.

As a result of air toxics and children's health concerns over the past several years, ARB and local air districts have developed new tools to present, evaluate, and address cumulative air pollution impacts at the neighborhood scale where the potential for significant health impacts may exist.

For example, ARB has produced regional risk maps that show statewide trends for Southern and Central California in estimated inhalation cancer risk from air toxics between 1990 and 2010.²³ Additionally, ARB's Neighborhood Assessment Program builds on California's long-standing program to provide information to the public on air toxics in communities. Additionally, over the past 12 years, local air districts have collected air toxics data for individual industrial sources, notified the public of potentially high risk, and developed risk reduction plans for those sources that pose the highest risk to the public.

Community-Level Assessment Tools

One aspect of ARB's programs now underway is to consolidate and make accessible air toxics emissions and monitoring data by region, using modeling tools and other analytical techniques to take a preliminary look at emissions, exposure, and health risk in communities.

The ARB is taking two tracks for assessing cumulative impacts. The first track is to take a community-level approach that is designed to answer basic questions about community health, such as, "What is the air pollution risk in my community?" and "What are the important sources of air pollution near where I live?" While these questions are clearly of interest to community members, this information can also be useful to local land use agencies when making permitting and siting decisions.

²³The ARB has produced State Trends and Local Cancer Risk Maps, which can be found at the ARB web site at: <http://www.arb.ca.gov/toxics/cti/hlthrisk/hlthrisk.htm>

The second track for assessing cumulative impacts is to develop technical tools that will allow for a more rigorous cumulative impact analysis at a specific location or to assess the impact of a new facility.

Appendix C provides a general description of the impact assessment process and micro-scale, or community level modeling tools that are available to evaluate potential cumulative air pollution impacts. Modeling protocols will be provided as Technical Supplements to this Handbook. Additionally, the models will be accessible on ARB's website as they become available. The ARB will also provide land use agencies and local air districts with statewide regional modeling results and information regarding micro-scale modeling.

Following from the Neighborhood Assessment Program and other Board efforts, the ARB has developed multiple tools to assist land use agencies and local air districts perform assessments of cumulative emissions, exposure, and risk on a neighborhood scale. These include:

- Statewide risk maps that show statewide and regional-scale air toxics cancer risk trends for select areas in California.
- Neighborhood scale risk assessments for Wilmington and Barrio Logan. Based on these prototypes, ARB is collecting data and developing a modeling protocol that could be used to assess cumulative impacts in other locations. When completed, these maps and user protocols will be published as a separate document.
- Community Health Air Pollution Information System (CHAPIS) which is a user-friendly, internet-based procedure for identifying and evaluating cumulative emissions in geographic areas defined by the program user. CHAPIS uses Geographical Information System (GIS) software to deliver "live" maps over the Internet. As local air districts provide data into the System, land use planners can use CHAPIS to quickly and easily identify pollutant sources and emissions within specified areas, including industrial sources, and smaller commercial sources.
- Hot Spots Analysis and Reporting Program (HARP) is a free software database package designed for air quality professionals. HARP evaluates emissions from a facility or multiple facilities to determine a neighborhood's potential health risk based on the latest risk assessment guidelines published by the State Office of Environmental Health Hazard Assessment (OEHHA).
- Urban Emissions Model (URBEMIS) is a computer program that can be used to estimate emissions associated with land development projects in California such as residential neighborhoods, shopping centers, office buildings, and construction projects. URBEMIS uses emission factors available from the ARB to estimate vehicle emissions associated with new land uses.

Land use planners, local air districts, and others can use these tools to assess the potential air pollution impacts from a new project, or a plan revision. For example, these tools can help to:

- Conduct an environmental review of a large, new or expanded land use project;
- Examine the impacts of a project variance from a zoning requirement;
- Assess cumulative air pollution impacts in a community as part of a general plan update or air quality element review;
- Consider the adequacy of pollution control requirements for sources in the affected community;
- Consider whether to issue a permit to a new source of pollution in an already impacted area;
- Consider whether permit conditions for a new source of pollution are adequate to protect public health, or whether additional mitigation measures may be necessary; and
- Provide information to decision-makers and key stakeholders on the potential for cumulative emissions, exposure, and health risk within a defined community.

Although these tools show promise for assessing cumulative air pollution impacts, micro-scale air quality modeling is still an evolving science. Such tools are very data intensive, requiring current emissions data from businesses and industry, transportation sources, sensitive receptors, mobile sources, and land uses.

If a land use agency wishes to perform its own cumulative air pollution impact analysis using any of these tools, it should consult with the ARB and/or the local air district to obtain information or assistance on the data inputs and procedures necessary to operate the program. In addition, land use agencies could consult with local air districts to determine the availability of land use and air pollution data for entry into an electronic Geographical Information System (GIS) format. GIS is an easier mapping tool than the more sophisticated models described in Appendix C. GIS mapping makes it possible to superimpose land use with air pollution information so that the spatial relationship between air pollution sources, sensitive receptors, and air quality can be visually represented.

For further information on these methodologies, please refer to Appendix C.

7. What types of projects or siting scenarios may require special assessment?

Even after addressing applicable air pollution control and zoning requirements, a proposed new source or project may still pose health risks due to the localized impacts or a concentration of air pollution sources in a particular neighborhood. This can be the case even if the project is sited in an appropriate development zone. For instance, a project could be proposed in a community that is already exposed to a cumulative air pollution impact because of the concentration of sources in the area. Alternatively, a sensitive receptor project could be subject to a localized impact because of its proximity to an existing source that has no buffer between its fence line and the new project. Even indirect sources such as distribution centers, or infrastructure projects, such as lane widening or other transportation projects, could pose an air pollution impact if upwind of, or in close proximity to a densely populated area. Therefore, it is important for a land use agency to ask some fundamental questions before it sites a project, such as:²⁴

1. Is this project proposed for the right location?
2. Is there something about this project that requires a second screening?
3. Does the second screening indicate that the project could potentially affect the health of the surrounding public (i.e., would it contribute to localized or cumulative air pollution impacts)?
4. If so, should project approval be conditioned on additional mitigation beyond that imposed by local air district regulations?
5. Is there a more appropriate location for the project?

Appendix B contains additional questions that land use agencies should review for relevance to new projects. Even if a project does not appear to trigger CEQA, or would comply with local air district requirements, a land use agency should still consider additional analysis based in on the answers to these kinds of questions. Some examples of projects and scenarios include:

- An industrial facility that emits air toxics that would be located near a residential area or school;
- A small business or light-industrial facility that would emit air toxics, even in minute amounts, such as hexavalent chromium, upwind of a residential or sensitive receptor location;
- A commercial facility or commercial transportation corridor that would induce diesel truck traffic adjacent to a residential area or school yard.
- Housing or sensitive receptor projects e.g., a school or convalescent home that would be located adjacent to any of the above sources.

²⁴ The ARB is developing a checklist as a technical supplement to the Handbook. The checklist will provide more detailed information regarding the modeling and evaluation tools that land use agencies can use to identify and address potential air pollution impacts that may be associated with a proposed new project.

Table 7-1 – Examples of Facility Types That May Emit Toxic Air Contaminants

Categories	Facility Type	Potentially Emitted Toxics
Commercial	Dry Cleaners Gas Stations Autobody Shops Furniture Repair Film Processing Services Warehouses and Supermarkets Printing Shops Diesel Engines	Perchloroethylene Benzene Metals, Solvents Solvents ¹ Solvents Diesel Particulate Matter Solvents Diesel Particulate Matter
Industrial	Construction Manufacturers Metal Platers, Welders, Metal Spray (flame spray) Operations Chemical Producers Gasoline Refineries Furniture Manufacturers Shipbuilding and Repair Rock Quarries and Cement Manufacturers Hazardous Waste Incinerators Power Plants Research and Development Facilities Freight Distribution Centers	Particulate Matter Solvents, Metals Hexavalent Chromium, Nickel, Metals Solvents, Metals Benzene, Solvents, Metals, PAHs, Dioxin Solvents Hexavalent chromium and other metals, Solvents Particulate Matter Dioxin, Solvents, Metals Benzene, Formaldehyde, Particulate Matter Solvents, Metals, etc. Diesel Particulate Matter
Public	Landfills Waste Water Treatment Plants Medical Waste Incinerators Recycling, Garbage Transfer Stations Municipal Incinerators	Benzene, Vinyl Chloride, Diesel Particulate Matter Hydrogen Sulfide Dioxin, Benzene, PAH, PCBs, 1,3-Butadiene Diesel Particulate Matter Dioxin, Benzene, PAH, PCBs, 1,3-Butadiene
Transportation	Port Facilities Airports Rail Yards Freeways and Roadways	Diesel Particulate Matter Benzene, Formaldehyde Diesel Particulate Matter Diesel Particulate Matter, Benzene, 1,3-Butadiene, Formaldehyde

¹Not all solvents are toxic air contaminants. As contained in this table, “solvents” include those products that contain toxic air contaminants.

Each of these scenarios has the potential, either individually or combined with other sources in the area, to result in elevated local levels of air pollution, including air toxics. Table 7-1 provides some of the more common pollutants that are emitted by the various facility types. In addition, Appendix A provides a more

extensive matrix that compares standardized land use activity classifications to examples of facilities or projects that may fall under such classifications, along with associated air pollutants and whether they normally require local air district permits.

Sections 5 and 6 of the Handbook provide information that a land use agency can use to evaluate, address, or otherwise avoid projects that may contribute to cumulative air pollution impacts. ARB is working with local air district on Technical Supplements that will provide additional information on assessment and mitigation approaches for several emission source categories. Example categories are gas stations, metal melting facilities, medical waste incinerators, stationary and portable diesel engines, and chrome plating.

8. How will the actions taken by ARB and local air districts to improve air quality complement the land use decision-making process?

ARB's regulatory programs reduce air pollutant emissions through statewide strategies that improve public health in all California communities. ARB's overall program addresses motor vehicles, consumer products, air toxics, air-quality planning, research, education, enforcement, and air monitoring. Community health and environmental justice concerns are a consideration in all these programs. ARB's programs are statewide but recognize that extra efforts may be needed in some communities due to historical mixed land-use patterns, limited participation in public processes in the past, and a greater concentration of air pollution sources in some communities.

ARB's strategies are intended to result in better air quality and reduced health risk to residents throughout California. The ARB's priority is to prevent or reduce the public's exposure to air pollution, including from toxic air contaminants that pose the greatest risk, particularly to infants and children who are more vulnerable to air pollution.

In October 2003 ARB updated our statewide control strategy to reduce emissions from source categories within our regulatory authority. A primary focus of the strategy is to achieve federal and State air quality standards for ozone and particulate matter throughout California, and to reduce health risk from diesel particulate matter. Along with local air districts, ARB will continue to address air toxics emissions from regulated sources (see Table 8-1 for a summary of ARB activities). As indicated earlier, ARB will also provide analytical tools and information to land use agencies and local air districts to help assess and mitigate cumulative air pollution impacts.

While statewide in nature, ARB's strategies will result in substantial air quality improvement in individual communities. ARB is developing regulations to address emissions from mobile sources such as extended idling from vehicles, trucks, and buses, exhaust and evaporative emissions from small off-road engines, solid waste collection vehicles, and on- and off-road diesel and gasoline engines. In addition, the ARB will consider regulations that address emissions from fuels including portable fuel containers and spouts, reformulated fuels, and fuel standards and additives. Statewide measures will also address emissions from areawide sources such as household cleaning products and personal care products.

The ARB will also consider the adoption of several air toxics control measures including stationary diesel engines, portable engines, transport refrigeration units, thermal spraying, chrome plating and chromic acid anodizing, welding operations, harbor craft, formaldehyde from composite wood products, and possible amendments to perchloroethylene dry cleaning.

As part of its effort to reduce particulate matter and air toxics emissions from diesel PM, the ARB has developed a Diesel Risk Reduction Program²⁵ that lays out several strategies in a 3-pronged approach to reduce emissions and their associated risk:

- Stringent emission standards for all new diesel-fueled engines;
- Aggressive reductions from in-use engines; and
- Low sulfur fuel that will reduce PM and still provide the quality of diesel fuel needed to control diesel PM.

A few of the initial diesel risk reduction strategies include measures to reduce emissions from refuse haulers, urban buses, and stationary and portable diesel engines -- sources that are important from a community perspective.

The ARB also has a website that lists information on all mobile source related programs. Information on these programs can be found at:

<http://www.arb.ca.gov/msprog/msprog.htm>

The ARB will continue to evaluate the health effects of air pollutants while implementing programs with local air pollution control districts to reduce air pollution in all California communities.

²⁵ For a comprehensive description of the program, please refer to ARB's website at <http://www.ARB.ca.gov/diesel/dieselrrp.htm>.

Table 8-1
ARB ACTIONS TO ADDRESS
CUMULATIVE AIR POLLUTION IMPACTS IN COMMUNITIES

Information Collection

- Improve emission inventories, air monitoring data, and analysis tools that can help to identify areas with high cumulative air pollution impacts
- Conduct studies in coordination with OEHHA on the potential for cancer and non-cancer health effects from air pollutants emitted by specific source categories
- Establish web-based clearinghouse for land use strategies implemented at the local level

Emission Reduction Approaches (2004-2006)*

- Consider development and/or amendment of regulations and related guidance to prevent or reduce air toxic emissions at a statewide and local level for the following sources:
 - Diesel PM sources such as stationary diesel engines, transport refrigeration units, portable diesel engines, on-road public fleets, off-road public fleets, heavy-duty diesel truck idling, harbor craft vessels, diesel fuel and waste haulers
 - Other air toxics sources, such as formaldehyde in composite wood products, hexavalent chromium for chrome plating and chromic acid anodizing, thermal spraying, and perchloroethylene dry cleaning
- Develop technical supplements and/or guidance documents for the following:*

 - Modeling tools such as HARP and CHAPIS
 - Stationary diesel engines
 - Gas stations
 - Medical waste incinerators
 - Ethylene oxide sterilizers
 - Asbestos
 - Auto painting shops
 - Lead sources/risk management

- Adopt rules and pollution prevention initiatives within legal authority to reduce emissions from mobile sources and fuels, and consumer products
- Develop and maintain Air Quality Handbook as a tool for use by land use agencies and local air districts to address cumulative air pollution impacts

Other Approaches

- Support additional funding for high priority mobile source emission reduction projects

*Because ARB will continue to review the need to adopt or revise statewide measures, the information contained in this chart will be updated on an ongoing basis. For current information, see ARB's website at: (actual URL will be identified in the final document).

Local air districts also have ambitious programs to reduce criteria pollutants and air toxics from regulated sources in their region. Many of these programs also benefit air quality in local communities as well as in the broader region. For more information on what is being done in your area to reduce cumulative air pollution

impacts through air pollution control programs, you should contact your local air district.²⁶

²⁶ Local air district contacts can be found on the inside cover to this Handbook.

9. How can meaningful public participation and access to information be enhanced?

Community involvement is an important part of the land use process. The public is entitled to the best possible information about the air they breathe and what is being done to prevent or reduce unhealthful air pollution in their communities. In particular, information on how land use decisions can affect air pollution and public health should be made accessible to all communities, including low-income and minority communities.

Effective community participation consistently relies on a free, two-way flow of information – from public agencies to community members about opportunities, constraints, and impacts, and from community members back to public officials about needs, priorities, and preferences. The outreach process needed to build understanding and local neighborhood involvement requires data, methodologies, and formats tailored to the needs of the specific community. More importantly, it requires the strong collaboration of local government agencies that review and approve projects and land uses to improve the physical and environmental surroundings of the local community.

Many land use agencies, especially those in major metropolitan areas, are familiar with, and have a long-established public review process. Nevertheless, public outreach has traditionally been passive, requiring the public to take the initiative in order to participate, and with little effort invested by an agency to actively solicit participation. Many residents are concerned that even when they do participate in a public process, it has little or no impact on the agency's decision. Active public involvement requires engaging the public in ways that do not require their previous interest in or knowledge of the land use or air pollution control requirements, and a commitment to taking action to address the concerns that are raised.

Land use agencies and local air districts should consider seeking out the public in places where they are already gathering to provide information on what local government is doing to prevent or reduce health risk from air pollution. The outreach could involve presentations and briefings, distribution of printed information, or staffing an information booth. Agencies can then engage people who would not otherwise come to a formal public meeting about a local land use decision.

Table 9-1 contains some general outreach approaches that might be considered.

To improve outreach, local land use agencies should consider the following activities:

- Hold meetings in communities affected by agency programs, policies, and projects at times and in places that encourage public participation, such as

evenings and weekends at centrally located community meeting rooms, libraries, and schools.

- Provide childcare services at meetings.
- Assess the need for and provide translation services at public meetings.
- Hold community meetings to update residents on the results of any special air monitoring programs conducted in their neighborhood.

**Table 9-1
Public Participation Approaches**

- Staff and community leadership awareness training on environmental justice programs and community-based issues
- Surveys to identify the website information needs of interested community-based organizations and other stakeholders
- Information materials on local land use and air district authorities
- Community-based councils to facilitate and invite direct citizen participation in the planning process
- Neighborhood CEQA scoping sessions that allows for community input prior to technical analysis
- Public information materials on siting issues are under review including materials written for the affected community, and in different media that widens accessibility
- Public meetings
- Operating support for community-based organizations

- Hold community meetings to discuss and evaluate the various options to address cumulative impacts in their community,
- In coordination with local air districts, make staff available to attend meetings of community organizations and neighborhood groups to listen to and, where appropriate, act upon community concerns.
- Establish a specific contact person for environmental justice issues.
- Increase student and community awareness of local government land use activities and policies through outreach opportunities.
- Make air quality and land use information available to communities in an easily understood and useful format, including fact sheets, mailings, brochures, public service announcements, and Web pages, in English and other languages.
- On the local government web-site, dedicate a page or section to what the land use program is doing regarding environmental justice and cumulative environmental impacts, and, as applicable, activities conducted with local air districts such as neighborhood air monitoring studies, pollution prevention, air pollution sources in neighborhoods, and risk reduction.
- Allow, encourage, and promote community access to land use activities, including public meetings, General Plan or Community Plan updates, zoning changes, special studies, CEQA reviews, variances, etc.
- Distribute information in multiple languages, as needed, on how to contact the land use agency or local air district to obtain information and assistance

regarding environmental justice programs, including how to participate in public processes.

- Create and distribute a simple, easy-to-read, and understandable public participation handbook, which may be based on the “Public Participation Guidebook” developed by ARB.

APPENDIX A
LAND USE CLASSIFICATIONS AND ASSOCIATED FACILITY CATEGORIES
THAT COULD EMIT AIR POLLUTANTS

(1) Land Use Classifications – by Activity ⁱ	(2) Facility or Project Examples	(3) Key Pollutants ⁱⁱ	(4) Air Pollution Permits ⁱⁱⁱ
RESIDENTIAL			
Housing	Housing developments; retirement developments; affordable housing; woodburning fireplaces; water heaters	Fireplace emissions (PM10, NOx, VOCs, CO, air toxics); Water heater combustion (NOx, VOCs, CO)	No ^{iv}
ACADEMIC AND INSTITUTIONAL			
▲ Schools, including school-related recreational activities	Schools; school yards; vocational training labs/classrooms such as auto repair/painting and aviation mechanics	Air toxics	Yes/No ^v
▲ Medical waste	Incineration	Air toxics, NOx, CO, PM10	Yes
▲ Clinics, hospitals, convalescent homes		Air toxics	Yes
COMMERCIAL/ LIGHT INDUSTRIAL: SHOPPING, BUSINESS, AND COMMERCIAL			
▲ Primarily retail shops and stores, office, commercial activities, and light industrial or small business	Dry cleaners; drive-through restaurants; gas stations; auto body shops; metal plating shops; photographic processing shops; textiles; apparel and furniture upholstery; leather and leather products; appliance repair shops; mechanical assembly cleaning; printing shops	VOCs, air toxics, including diesel PM, NOx, CO, SOx	Limited; Rules for applicable equipment
▲ Goods storage or handling activities, characterized by loading and unloading goods at warehouses, large storage structures, movement of goods, shipping, and trucking.	Warehousing; freight-forwarding centers; drop-off and loading areas; distribution centers	VOCs, air toxics, including diesel PM, NOx, CO, SOx	No ^{vi}

APPENDIX A

(1) Land Use Classifications – by Activity ⁱ	(2) Facility or Project Examples	(3) Key Pollutants ⁱⁱ	(4) Air Pollution Permits ⁱⁱⁱ
LIGHT INDUSTRIAL: RESEARCH AND DEVELOPMENT			
▲ Medical waste at research hospitals and labs	Incineration; surgical and medical instruments manufacturers	Air toxics, NOx, CO, SOx	Yes
▲ Electronics, Electrical Apparatus, Components, and Accessories	Computer manufacturer; integrated circuit board manufacturer; semi-conductor production	Air toxics, VOCs	Yes
▲ College or university lab or research center	Medical waste incinerators; lab chemicals handling, storage and disposal	Air toxics, NOx, CO, SOx, PM10	Yes
▲ Research and development labs	Satellite manufacturer; fiber-optics manufacturer; defense contractors; space research and technology; new vehicle and fuel testing labs	Air toxics, VOCs	Yes
▲ Commercial testing labs	Consumer products; chemical handling, storage and disposal	Air toxics, VOCs	Yes
INDUSTRIAL: NON-ENERGY-RELATED			
▲ Assembly plants, manufacturing facilities, industrial machinery	Adhesives; chemical; textiles; apparel and furniture upholstery; clay, glass, and stone products production; asphalt materials; wood products; paperboard containers and boxes; metal plating; metal and canned food product fabrication; auto manufacturing; food processing; printing and publishing; drug, vitamins, and pharmaceuticals; dyes; paints; pesticides; photographic chemicals; polish and wax; consumer products; metal and mineral smelters and foundries; fiberboard; floor tile and cover; wood and metal furniture and fixtures; leather and leather products; general industrial and metalworking machinery; musical instruments; office supplies; rubber products and plastics production; saw mills; solvent recycling; shingle and siding; surface coatings	VOCs, air toxics, including diesel PM, NOx, PM, CO, SOx	Yes
INDUSTRIAL: ENERGY AND UTILITIES			
▲ Water and sewer operations	Pumping stations; air vents; treatment	VOCs, air toxics, NOx, CO, SOx, PM10	Yes
▲ Power generation and distribution	Power plant boilers and heaters; portable diesel engines; gas turbine engines	NOx, diesel PM, NOx, CO, SOx, PM10, VOCs	Yes

(1) Land Use Classifications – by Activityⁱ	(2) Facility or Project Examples	(3) Key Pollutantsⁱⁱ	(4) Air Pollution Permitsⁱⁱⁱ
▲ Refinery operations	Refinery boilers and heaters; coke cracking units; valves and flanges; flares	VOCs, air toxics, including diesel PM, NOx, CO, SOx, PM10	Yes
▲ Oil and gas extraction	Oil recovery systems; uncovered wells	NOx, diesel PM, VOCs, CO, SOx, PM10	Yes
▲ Gasoline storage, transmission, and marketing	Above and below ground storage tanks; floating roof tanks; tank farms; gas stations; pipelines	VOCs, air toxics, including diesel PM, NOx, CO, SOx, PM10	Yes
▲ Solid and hazardous waste treatment, storage, and disposal activities.	Landfills; methane digester systems	VOCs, air toxics, NOx, CO, SOx, PM10	Yes
CONSTRUCTION (NON-TRANSPORTATION)			
	Building construction; demolition sites	PM (re-entrained road dust), asbestos, diesel PM, NOx, CO, SOx, PM10, VOCs	Limited; State and federal off-road equipment standards
DEFENSE			
	Ordnance and explosives demolition; range and testing activities; chemical production; degreasing; surface coatings; vehicle refueling; vehicle and engine operations and maintenance	VOCs, air toxics, including diesel PM, NOx, CO, SOx, PM10	Limited; prescribed burning; equipment and solvent rules
TRANSPORTATION			
▲ Vehicular movement	Residential area circulation systems; parking and idling at parking structures; drive-through establishments; car washes; special events; schools; shopping malls, etc.	VOCs, NOx, PM (re-entrained road dust) air toxics e.g., benzene, diesel PM, formaldehyde, acetaldehyde, 1,3 butadiene, CO, SOx, PM10	No
▲ Road construction and surfacing	Street paving and repair; new highway construction and expansion	VOCs, air toxics, including diesel PM, NOx, CO, SOx, PM10	No
▲ Trains	Railroads; switch yards; maintenance yards	VOCs, NOx, CO, SOx, PM10, air toxics, including diesel PM	Limited; Applicable State and federal MV standards, and possible equipment rules
▲ Marine and port activities	Recreational sailing; commercial marine operations; hotelling operations; loading and un-loading; servicing; shipping operations; port or marina expansion; truck idling		
▲ Aircraft	Takeoff, landing, and taxiing; aircraft maintenance; ground support activities		
▲ Mass transit and school buses	Bus repair and maintenance		

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(1) Land Use Classifications – by Activity ⁱ	(2) Facility or Project Examples	(3) Key Pollutants ⁱⁱ	(4) Air Pollution Permits ⁱⁱⁱ
NATURAL RESOURCES			
▲ Farming operations	Agricultural burning; diesel operated engines and heaters; small food processors; pesticide application; agricultural off-road equipment	Diesel PM, VOCs, NOx, PM10, CO, SOx	Limited ^{vii} ; Agricultural burning requirements, applicable State and federal mobile source standards; pesticide rules
▲ Livestock and dairy operations	Dairies and feed lots	Ammonia, VOCs, PM10	Yes ⁷
▲ Logging	Off-road equipment e.g., diesel fueled chippers, brush hackers, etc.	Diesel PM, NOx, CO, SOx, PM10, VOCs	Limited; Applicable State/federal mobile source standards
▲ Mining operations	Quarrying or stone cutting; mining; drilling or dredging	PM10, CO, SOx, VOCs, NOx, and asbestos in some geographical areas	Applicable equipment rules and dust controls

ⁱ These classifications were adapted from the American Planning Association’s “Land Based Classification Standards.” The Standards provide a consistent model for classifying land uses based on their characteristics. The model classifies land uses by refining traditional categories into multiple dimensions, such as activities, functions, building types, site development character, and ownership constraints. Each dimension has its own set of categories and subcategories. These multiple dimensions allow users to have precise control over land-use classifications. For more information, the reader should refer to the Association’s website at <http://www.planning.org/LBCS/GeneralInfo/>

ⁱⁱ This column includes key criteria pollutants and air toxic contaminants that are most typically associated with the identified source categories.

Criteria air pollutants are those air pollutants for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. Criteria pollutants include ozone (formed by the reaction of volatile organic compounds and nitrogen oxides in the presence of sunlight), particulate matter, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead.

Volatile organic compounds (VOCs) combine with nitrogen oxides to form ozone, as well as particulate matter. VOC emissions result primarily from incomplete fuel combustion and the evaporation of chemical solvents and fuels. On-road mobile sources are the largest contributors to statewide VOC emissions. Stationary sources of VOC emissions include processes that use solvents (such as dry-cleaning, degreasing, and coating operations and petroleum-related processes (such as petroleum refining, gasoline marketing and dispensing, and oil and gas extraction). Areawide VOC sources include consumer products, pesticides, aerosols and paints, asphalt paving and roofing, and other evaporative emissions.

Nitrogen oxides (NOx) are a group of gaseous compounds of nitrogen and oxygen, many of which contribute to the formation of ozone and particulate matter. Most NOx emissions are produced by the combustion of fuels. Mobile sources make up about 80 percent of the total statewide NOx emissions. Mobile sources include on-road vehicles and trucks, aircraft, trains, ships, recreational boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment.

Stationary sources of NO_x include both internal and external combustion processes in industries such as manufacturing, food processing, electric utilities, and petroleum refining. Areawide source, which include residential fuel combustion, waste burning, and fires, contribute only a small portion of the total statewide NO_x emissions, but depending on the community, may contribute to a cumulative air pollution impact.

Particulate matter (PM) refers to particles small enough to be breathed into the lungs (under 10 microns in size). It is not a single substance, but a mixture of a number of highly diverse types of particles and liquid droplets. It can be formed directly, primarily as dust from vehicle travel on paved and unpaved roads, agricultural operations, and construction and demolition.

Carbon monoxide (CO) is a colorless and odorless gas that is directly emitted as a by-product of combustion. The highest concentrations are generally associated with cold stagnant weather conditions that occur during winter. CO problems tend to be localized.

An Air Toxic Contaminant (air toxic) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. Similar to criteria pollutants, air toxics are emitted from stationary, areawide, and mobile sources. They contribute to elevated regional and localized risks near industrial and commercial facilities and busy roadways. The ten compounds that pose the greatest statewide risk are: acetaldehyde; benzene; 1,3-butadiene; carbon tetrachloride; diesel particulate matter (diesel PM); formaldehyde; hexavalent chromium; methylene chloride; para-dichlorobenzene; and perchloroethylene. The risk from diesel PM is by far the largest, representing about 70 percent of the known statewide cancer risk from outdoor air toxics. The exhaust from diesel-fueled engines is a complex mixture of gases, vapors, and particles, many of which are known human carcinogens. Diesel PM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute about 26 percent of statewide diesel PM emissions, with an additional 72 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and other equipment. Stationary engines in shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations contribute about two percent of statewide emissions. However, when this number is disaggregated to a sub-regional scale such as neighborhoods, the risk factor can be far greater.

Additional information on specific air toxics that are attributed to facility categories can be found in ARB's Emission Inventory Criteria and Guidelines Report for the Air Toxics Hot Spots Program (May 15, 1997). This information can be viewed at ARB's web site at <http://www.arb.ca.gov/ab2588/final96/guide96.pdf>.

ⁱⁱⁱ Indicates whether facilities activities listed in column 4 are generally subject to local air district permits to operate. This does not include regulated products such as solvents and degreasers that may be used by sources that may not require an operating permit per se, e.g., a gas station or dry cleaner.

^{iv} Local air districts do not permit woodburning fireplaces inside private homes. However, some local air districts and land use agencies do have rules or ordinances that require new housing developments or home re-sales to install U.S. EPA –certified stoves. Some local air districts also ban residential woodburning during weather inversions that concentrate smoke in residential areas. Likewise, home water heaters are not permitted; however, new heaters could be subject to emission limits that are imposed by federal or local agency regulations.

^v Technical training schools that conduct activities normally permitted by a local air district could be subject to an air permit.

^{vi} Generally speaking, warehousing or distribution centers are not subject to local air district permits. However, depending on the district, motor vehicle fleet rules may apply to trucks or off-road vehicles operated and maintained by the facility operator. Additionally, emergency generators or internal combustion engines operated on the site may require an operating permit..

^{vii} Authorized by recent legislation SB700.

APPENDIX B QUESTIONS TO CONSIDER WHEN REVIEWING NEW PROJECTS

The questions contained in this appendix suggest a two-part process for evaluating projects within the land use decision-making process.

B-1 suggests project related questions designed to help identify localized project impacts, particularly incompatible land uses.

B-2 focuses on the issue of potential cumulative impacts by including questions about existing emissions and air quality in the community.

The questions address potential public concerns and as well as environmental and public health factors. Answers to these questions are intended to provide the decision-maker with a better understanding of the community and its potential for cumulative air pollution impacts to help determine if a new project warrants a more detailed review.

These questions do not imply any particular action should be taken by land use agencies. Rather the questions are intended to improve the assessment process and facilitate informed decision-making.

Building specific air pollution questions into the decision-making process can alert land use agencies that a project may pose a health risk, and promote selection of alternatives or mitigation measures that would reduce that risk.

Section 5 of the Handbook discusses mechanisms that land use agencies can use to avoid or reduce air pollution related health risk associated with new projects.

PART B-1. PROJECT-RELATED QUESTIONS

This section includes project-related questions that, in conjunction with the questions in Part B, can be used to tailor the project evaluation. These questions are designed to help identify localized project impacts, particularly incompatible land uses.

Project-Related Questions

1. Is the proposed project:
 - ▲ A business or commercial license renewal
 - ▲ A new or modified commercial project
 - ▲ A new or modified industrial project
 - ▲ A new or modified public facility project
 - ▲ A new or modified transportation project
 - ▲ A housing or sensitive receptor development

2. Will the proposed project:
 - ▲ Conform to the zoning designation?
 - ▲ Require a variance to the zoning designation?

3. Has the local air district provided comments or information to assist in the analysis?

4. Have public meetings been scheduled with the affected community to solicit their involvement in the decision-making process for the proposed project?

5. If the proposed project is regulated by the local air district:
 - ▲ Has the project received a permit from the local air district?
 - ▲ Does it comply with applicable local air district requirements?
 - ▲ Is the local air district contemplating new regulations that would reduce emissions from the source?
 - ▲ Has a risk assessment been done for the source, and will the source meet air toxics requirements imposed by the local air district?
 - ▲ Is there sufficient new information or public concern to call for a risk assessment or an environmental analysis of the proposed project?
 - ▲ Are there land-used based assessment criteria or performance standards that could be applied to this project in addition to applicable air district requirements?

6. If the proposed project is not regulated by the local air district:
 - ▲ Does the local air district believe that there could be potential air pollution impacts associated with this project category?
 - ▲ Are there secondary emissions impacts that could be associated with the project?
 - ▲ Will the proposed project increase or serve as a magnet for diesel traffic?
 - ▲ If the project is a sensitive receptor, does the local air district believe that the project's proximity to nearby sources could pose potential air pollution impacts to people served by the project?
 - ▲ Is there sufficient new information or public concern to call for a risk assessment or an environmental analysis of the proposed project?
 - ▲ Does the site approval process allow identification and mitigation of potential direct or secondary emissions associated with the potential project?
 - ▲ Are there land-used based assessment criteria or performance standards that could be applied to this project in addition to applicable air district requirements?

7. Does the local air district or land use agency have pertinent information on the source?
 - ▲ Available permit and enforcement data, including for the owner or operator of the proposed source that may have other sources in the State.
 - ▲ The proximity of the proposed project to sensitive receptors.
 - ▲ Potential for the proposed project to expose a receptor to odor or other air pollution nuisances.
 - ▲ Meteorology or the prevailing wind patterns between the proposed project and the nearest receptor, or between the proposed sensitive receptor project and sources that could pose a localized or cumulative air pollution impact.
 - ▲ Number of potentially exposed individuals from the proposed project.

8. Based upon collected data, could the proposed project:
 - ▲ Be a polluting source that is located in proximity, or otherwise upwind, of a residential or sensitive receptor location?
 - ▲ Attract sensitive receptors and be located in proximity to, or otherwise downwind, of a source or multiple sources of pollution, including facilities or transportation-related sources that contribute emissions either directly or indirectly?
 - ▲ Result in health risk to the surrounding community?

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9. If a CEQA categorical exemption is proposed, was the following considered? (see CEQA Guidelines, Section 15300, and Public Resources Code, Section 21084)

- ▲ Is the project site environmentally sensitive as defined by the project's location. (A project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant.)
- ▲ Would the project and successive projects of the same type in the same place result in cumulative impacts?
- ▲ Are there "unusual circumstances" creating the reasonable possibility of significant effects?

PART B-2. QUESTIONS RELATED TO CUMULATIVE IMPACT ASSESSMENT

Land use agencies should consider the questions below to provide the decision-maker with a better understanding of the community and the potential for cumulative air pollution impacts. Answers to these questions will help to determine if proposed new projects or activities warrant a more detailed review. It may also help to see potential environmental concerns from the perspective of the affected community. Additionally, an analysis of the responses will provide local decision-makers with information with which to assess the best policy options for addressing neighborhood-scale air pollution concerns.

These questions can be used to identify whether existing tools and procedures are adequate to address community-specific air pollution issues that can affect or be affected by land use decisions. This process can also be used to pinpoint what land use and air quality characteristics of the community may have the greatest impact on community-level emissions, exposure, and risk. Such elements can include the compliance record of existing sources including those owned or operated by the project proponent, density of sources, proximity to sensitive receptors, transportation circulation in proximity to the proposed project, compatibility with the General Plan and General Plan Elements, etc.

The local air district can provide useful assistance in the collection and evaluation of air quality-related information for some of the questions and should be consulted early in the process.

Technical Questions

1. Is the community home to heavy industrial or numerous light industrial facilities?
2. Do one or more major freeways or high-traffic volume surface streets cut through the community?
3. Are any portions of the community classified for mixed-use zoning?
4. Is there an available list of air pollution sources in the community?
5. Has a walk-through of the community been conducted to corroborate available information on land use activities in the area (e.g., businesses, housing developments, sensitive receptors, etc.)?
6. Has a walk-through of the community been conducted to determine the proximity of existing and anticipated future projects to residential areas or sensitive receptors?

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7. Has a walk-through of the affected community been conducted to determine the concentration of emission sources (including anticipated future projects) to residential areas or sensitive receptors?
8. Has the local air district been contacted to obtain information on sources in the community?
9. Do local industries, commercial establishments, or indirect sources such as distribution centers or warehouses, emit air toxics or criteria air pollutants?
10. What air quality monitoring data is available?
11. Have any risk assessments been performed on emission sources in the area?
12. Does the land use agency have the capability of applying a GIS spatial mapping tool that can overlay zoning, sub-development information, and other neighborhood characteristics, with air pollution and transportation data?
13. Based on available information, is it possible to determine if the community or neighborhood experiences elevated health risk due to a concentration of air pollution sources in close proximity? If not, can the necessary information be obtained?

Community-Based Questions

1. Is there a history of chronic complaints about air quality in the community?
2. Is the affected community included in the decision-making process?
3. Have community leaders or citizen groups been contacted about any pre-existing or chronic community air quality concerns?

APPENDIX C

ARB and Local Air District Cumulative Air Pollution Impacts Information and Tools

It is the ARB's policy to support research and data collection activities toward the goal of reducing cumulative air pollution impacts. These efforts include updating and improving the air toxics emissions inventory, performing special air monitoring studies in specific communities, and conducting a more complete assessment of non-cancer health effects associated with air toxics and criteria pollutants.²⁷ This information is important because it helps us better understand links between air pollution and the health of some of our most vulnerable groups -- the young and the elderly.

ARB is working with CAPCOA and OEHHA to improve air pollutant data and evaluation tools to determine when and where cumulative air pollution impacts may be a problem. The following provides additional information on this effort.

How are emissions assessed?

Detailed information about the sources of air pollution in an area is collected and maintained by local air districts and the ARB in what is called an emission inventory. Emission inventories contain information about the nature of the business, the location, type and amount of air pollution emitted, the air pollution-producing processes, the type of air pollution control equipment, operating hours, and seasonal variations in activity. Local districts collect emission inventory data for most stationary source categories.

Local air districts collect air pollution emission information directly from facilities and businesses that are required to obtain an air pollution operating permit. Local air districts use this information to compile an emission inventory for areas within their jurisdiction. The ARB compiles a statewide emission inventory based on the information collected by the ARB and local air districts. Local air districts provide most of the stationary source emission data, and ARB provides mobile source emissions as well as some areawide emission sources such as consumer products and paints. ARB is also developing map-based tools that will display information that will aid local agencies in assessing cumulative emissions, exposure, and health risk.

²⁷ A **criteria pollutant** is any air pollutant for which EPA has established a National Ambient Air Quality Standard or for which California has established a State Ambient Air Quality Standard, including: carbon monoxide, lead, nitrogen oxides, ozone, particulates and sulfur oxides. Criteria pollutants are measured in each of California's air basins to determine whether the area meets or does not meet specific federal or State air quality standards. Air **toxics** or air toxic contaminants are listed pollutants recognized by California or EPA as posing a potential risk to health.

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Criteria pollutant data have been collected since the early 1970's, and toxic pollutant inventories began to be developed in the mid-1980's.

How is the toxic emission inventory developed?

Emissions data for toxic air pollutants is a high priority for communities because of concerns about potential health effects. Most of ARB's air toxics data is collected through the toxic "hotspots" program. Local air districts collect emissions data from industrial and commercial facilities. Facilities that exceed health-based thresholds are required to update their emissions data every four years. Other facilities are required to update their air toxics emissions data if there is an increase that would trigger the reporting threshold of the hotspots program. Air toxics emissions from motor vehicles and consumer products are estimated by the ARB. These estimates are generally regional in nature, reflecting traffic and population.

What additional toxic emissions information is needed?

In order to assess cumulative air pollution impacts, updated information from individual facilities is needed. Even for sources where emissions data are available, additional information such as the location of emissions release points is often needed to better model cumulative impacts. In terms of motor vehicles, emissions data are currently based on traffic models that only contain major roads and freeways. Local traffic data are needed so that traffic emissions can be more accurately assigned to specific streets and roads. Local information is also needed for off-road emission sources, such as ships, trains, and construction equipment. In addition, hourly maximum emissions data are needed for assessing acute air pollution impacts.

What work is underway?

ARB is working with CAPCOA to improve toxic emissions data, developing a community health air pollution information system to improve access to emission information, conducting neighborhood assessment studies to better understand toxic emission sources, and conducting surveys of sources of toxic pollutants.

How is air pollution monitored?

While emissions data identify how much air pollution is going into the air, the State's air quality monitoring network measures air pollutant levels in outdoor air. The statewide air monitoring network is primarily designed to measure regional exposure to air pollutants, and consists of more than 250 air monitoring sites.

The air toxics monitoring network consists of twenty permanent sites. These sites are supplemented by special monitoring studies conducted by ARB and local air districts. These sites measure upwards of sixty toxic air pollutants. Diesel PM,

which is the major driver of urban air toxic risk, is not monitored directly. Ten of the sixty toxic pollutants, not including diesel, account for most of the remaining air pollution cancer risk in California urban areas.

What additional monitoring has been done?

Recently, additional monitoring has been done to look at air quality at the community level. ARB's community monitoring was conducted in six communities located throughout the State. Most sites were in low-income, minority communities located near major sources of air pollution, such as refineries or freeways. The monitoring took place for a year or more in each community, and included measurements of both criteria and toxic pollutants.

What is being learned from community monitoring?

In some cases, the ARB or local air districts have performed air quality monitoring or modeling studies covering a particular region of the State. When available, these studies can give information about regional air pollution exposures.

The preliminary results of ARB's community monitoring are providing insights into air pollution at the community level. Urban background levels are a major contributor to the overall risk from air toxics in urban areas, and this urban background tends to mask the differences between communities. When localized elevated air pollutant levels were measured, they were usually associated with local ground-level sources of toxic pollutants. The most common source of this type was busy streets and freeways. The impact these ground-level sources had on local air quality decreased rapidly with distance from the source. Pollutant levels usually returned to urban background levels within a few hundred meters of the source.

These results indicate that tools to assess cumulative impacts must be able to account for both localized, near-source impacts, as well as regional background air pollution. The tools that ARB is developing for this purpose are air quality models.

How can air quality modeling be used?

While air monitoring can directly measure cumulative exposure to air pollution, it is limited because all locations cannot be monitored. To address this, air quality modeling provides the capability to estimate exposure when air monitoring is not feasible. Air quality modeling can be refined to assess local exposure, identify locations of potential hot spots, and identify the relative contribution of emission sources to exposure at specific locations. The ARB has used this type of information to develop regional cumulative risk maps that estimate the cumulative cancer air pollution risk for most of California. While these maps only show one air pollution-related health outcome, it does provide a useful starting point.

What is needed for community modeling?

Air quality models have been developed to assess near-source impacts, but they have very exacting data requirements. These near-source models estimate the impact of local sources, but do not routinely include the contribution from regional air pollution background. To estimate cumulative air pollution exposure at a neighborhood scale, a modeling approach needs to combine features of both micro-scale and regional models.

In addition, improved methods are needed to assess near-source impacts under light and variable wind conditions, when high local concentrations are more likely to occur. A method for modeling long-term exposure to air pollutants near freeways and other high traffic areas is also needed.

What modeling work has ARB developed?

A key component of ARB's Community Health Program is the Neighborhood Assessment Program (NAP). As described later in this section, the NAP studies are being conducted to better understand air quality problems facing low-income, minority communities. Through two such studies conducted in Barrio Logan and Wilmington, ARB is refining community-level modeling methodologies. Regional air toxics toxic modeling is also being performed to better understand regional air pollution background levels.

In a parallel effort, ARB has developed modeling protocols for assessing cumulative impacts. The protocols will cover modeling approaches, procedures for running the models, the development of statewide risk maps, and methods for estimating health risks. The protocols were subject to an extensive peer review process prior to release.

How are air pollution impacts on community health assessed?

On a statewide basis, ARB's toxic air contaminant program identifies and reduces public exposure to air toxics. The focus of the program has been on reducing cancer risk, because monitoring results show urban cancer risk levels are too high. ARB has also looked for potential non-cancer risks based on health reference levels provided by OEHHA. On a regional basis, the pollutants measured in ARB's toxic monitoring network are generally below the OEHHA non-cancer reference exposure levels.

As part of its community health program, the ARB is taking another look to see if there may be localized exposures of concern from the standpoint of non-cancer health effects. This could include chronic or acute health effects. If the assessment work shows elevated exposures on a localized basis, ARB will work with OEHHA to assess the health impacts.

What tools has ARB developed to assess cumulative air pollution impacts?

ARB has developed the following tools and reports to assist land use agencies and local air districts assess and prevent cumulative emissions, exposure, and risk on a neighborhood scale.

Statewide Risk Maps

ARB has produced regional risk maps that show the statewide trends for Southern and Central California in estimated inhalable cancer risk from air toxics between 1990 and 2010.²⁸

ARB also has maps that focus in more detail on smaller areas that fall within the Southern and Central California regions for these same modeled years. The finest visual resolution available in the maps on this web site is 2 kilometers by 2 kilometers. Therefore, individual neighborhoods, or single facilities do not show up on these maps.

Although data are available for regional scale modeling, more care is needed to adapt such tools to a neighborhood scale. Thus far, ARB has conducted neighborhood scale assessments in Wilmington and Barrio Logan. Based on these prototypes, we are collecting data and developing a modeling protocol that can be used to conduct cumulative impact assessments throughout the State. These protocols would provide an approach for modeling established cumulative concentrations of air toxics and therefor exposure. These estimated concentrations could then be used to calculate health risk. When completed, these maps and the user protocols will be published as a separate document.

Community Health Air Pollution Information System (CHAPIS)

CHAPIS is an interactive, internet-based procedure for identifying and evaluating cumulative emissions in geographic areas defined by the user of the program. CHAPIS uses Geographical Information System (GIS) software to deliver “live” maps over the Internet.

Through CHAPIS, land use planners and air district staff can quickly and easily identify pollutant sources and emissions within a specified area. Emissions sources and quantities that CHAPIS can identify include major point (or industrial) sources, and smaller sources, such as gas stations, dry cleaners, distribution centers and the like that can be located with emissions estimated from local air district records. These data can then be submitted electronically by user request to the ARB’s Hot Spots Analysis and Reporting Program (HARP) that will process

²⁸ARB maintains State trends and local cancer risk maps that show statewide trends in estimated inhalable cancer risk from air toxics between 1990 and 2010. This information can be viewed at ARB’s web site at <http://www.arb.ca.gov/toxics/cti/hlthrisk/hlthrisk.htm>

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toxic emissions, and provide a map of cumulative air pollution impacts in the community to the requesting user.

CHAPIS is being developed in stages to assure data quality. The initial release of CHAPIS is due out in 2004 and will include facilities emitting 10 or more tons per year of nitrogen oxides, sulfur dioxide, carbon monoxide, PM10, or reactive organic gases; air toxics from refineries and power plants of 50 megawatts or more; and facilities that conducted health risk assessments under the California “Hot Spots” program²⁹ for specific source categories.

CHAPIS can be used by land use agencies and community groups to educate the public about community level impacts of air pollution by showing the contribution from mobile, area, and point sources on the air quality of that community.

“Hot Spots” Analysis and Reporting Program (HARP)

HARP³⁰ is a free software package that evaluates emissions to determine a neighborhood’s potential health risk based on the latest risk assessment guidelines published by Cal/EPA’s Office of Environmental Health Hazard Assessment (OEHHA).

With HARP, a user can perform the following tasks:

- Create and manage facility databases;
- Perform air dispersion modeling;
- Conduct health risk analyses;
- Output data reports; and
- Output results to GIS mapping software.

HARP can model downwind concentrations of air toxics based on the calculated emissions dispersion at a single facility. HARP also has the capability of assessing the risk from multiple facilities, and for multiple receptors near those facilities. HARP can also evaluate multi-pathway, non-inhalation health risk resulting from air pollution exposure, including skin and soil exposure, and ingestion of meat and vegetables contaminated with air toxics, and other toxics that have accumulated in a mother’s breast milk.

²⁹ “Hot Spots” program will be defined in the glossary.

³⁰ More detailed information can be found on ARB’s website at:
<http://www.arb.ca.gov/toxics/harp/harp.htm>

Neighborhood Assessment Program (NAP)

The NAP is a key component of ARB's Community Health Program. It includes the development of tools that can be used to perform assessments of cumulative air pollution impacts on a neighborhood scale. The NAP studies are being conducted to better understand air quality problems facing low-income, minority communities. In these studies ARB will be looking at emissions, exposure, and health risk. As they become available, the ARB, local air districts, environmental groups, community activists, affected industries and others will be able to use the tools to support consistent, uniform, and science-based evaluations of neighborhood air pollution impacts and reduction strategies. This was the case in Barrio Logan and Wilmington where ARB is conducting comprehensive neighborhood assessments to evaluate the potential air pollution impacts from the proximity of high-risk facilities within the community to schools and other sensitive receptor locations.

Urban Emissions Model (URBEMIS) is a computer program that can be used to estimate emissions associated with land development projects in California such as residential neighborhoods, shopping centers, office buildings, and construction projects. URBEMIS uses emission factors available from the ARB to estimate vehicle emissions associated with new land uses. URBEMIS 2001 estimates sulfur dioxide emissions from motor vehicles in addition to reactive organic gases, nitrogen oxides, carbon monoxide, and PM10.

Land-Use Air Quality Linkage Report³¹

This report summarizes data currently available on the relationships between land use, transportation and air quality. It also highlights strategies that can help to reduce the use of the private automobile. It also briefly summarizes two ARB-funded research projects. The first project analyzes the travel patterns of residents living in 5 higher density, mixed use neighborhoods in California, and compares them to travel in more auto-oriented areas. The second study correlates the relationship between travel behavior and community characteristics, such as density, mixed land uses, transit service, and accessibility for pedestrians.

³¹To access this report, please refer to ARB's website or click on:
<http://www.arb.ca.gov/ch/programs/link97.pdf>