



These guidelines are nonbinding recommendations, intended to assist lead agencies with navigating the CEQA process. They may be updated as needed in the future, and any updates will likewise be nonbinding and advisory.

## 8 MITIGATING AIR QUALITY AND CLIMATE IMPACTS

### 8.1 INTRODUCTION

This chapter provides recommendations for mitigating air quality and climate impacts from land use development projects. It is essential to incorporate all feasible mitigation measures, and importantly those with the greatest potential to reduce emissions, within the context of the project to reduce significant impacts to less than significant levels. Measures included for the proposed project should be quantified and details surrounding how emissions are expected to decrease should be described by the lead agency.

Standard Conditions of Approval (SCAs) are requirements placed on individual projects by a city prior to approval of a permit to ensure compliance with the City's plans and ordinances. Mitigation measures identified in SCAs must be incorporated as part of a proposed land use development project and must meet all SCA requirements. Additionally, a robust Mitigation Monitoring and Reporting Program (MMRP) should be developed, adopted, and enforced. MMRPs include the monitoring and reporting requirements, in compliance with State CEQA Guidelines Section 15097, that ensure the project and the measures selected mitigate or avoid significant environmental impacts.

### 8.2 MITIGATING PROJECT-LEVEL AIR QUALITY IMPACTS

Operational and construction-related emissions should be mitigated to the greatest extent feasible. If mitigation would not bring a project's impact below the applicable threshold of significance, the project would make a cumulatively considerable contribution to a cumulative impact, which would be significant and unavoidable. Such

a project could be approved only with a statement of overriding considerations demonstrating that all feasible mitigation measures have been implemented (see State CEQA Guidelines Section 15093).

Many air quality–related mitigation measures can also reduce greenhouse gas (GHG) emissions; conversely, many measures that reduce GHG emissions also reduce air quality impacts. To help ensure that the Bay Area meets its fair share of the State’s goal of achieving carbon neutrality by 2045 (Executive Order B-55-18), continues to maintain ambient air quality standards, and addresses local air pollution health risks, lead agencies are encouraged to select mitigation measures that reduce both air pollutants and GHG emissions.

Finally, if emissions cannot be avoided or mitigated on-site to a less-than-significant level, off-site mitigation measures can be a feasible alternative (see State CEQA Guidelines Section 15126.4[c][4]). In implementing off-site mitigation measures, the lead agency must ensure that emission reductions from identified projects are real, permanent, quantifiable, verifiable, enforceable, and additional to any reductions already required or likely to occur for other reasons. In addition, if off-site mitigation measures are used, it is preferable to select measures that benefit the local community, the city, county, or the Bay Area region—in that order.

## CRITERIA POLLUTANTS AND PRECURSORS

For criteria air pollutant impacts, the Air District recommends implementation of all feasible measures to minimize emissions, whether or not operational or construction emissions exceed the applicable thresholds of significance. Example measures to reduce operational emissions include incorporating energy-efficient building design and implementing transportation demand management strategies. For construction-related criteria air pollutants, the Air District recommends implementation all the Air District’s best management practices for fugitive dust (see Chapter 5, Table 5-2) and measures to reduce exhaust emissions including using zero-emission, hybrid, or highest-tier on- and off-road construction equipment; using cleaner fuels and grid power whenever possible; and limiting idling (see Section 6.3 Construction-Related GHG Emissions).

## LOCAL RISKS AND HAZARDS

For local community risks and hazards, the Air District recommends reducing source emissions to the greatest extent feasible, as well as reducing exposure of sensitive receptors to local risks and hazards. Example measures to reduce exposure include locating residential development and sensitive land uses an adequate distance from existing and potential sources of TACs and fine particulate matter (PM<sub>2.5</sub>); locating open spaces, commercial buildings, and parking garages between sensitive land uses and air pollution sources; requiring indoor air quality equipment, such as enhanced air filters, to be installed at schools, residences, and other sensitive land uses; and requiring solid or vegetative barriers to be incorporated into site design between buildings and sources of air pollution. For reducing emissions from stationary sources, please refer to the Air District’s [Permit Handbook](#) and the Air District’s [Best Available Control Technology and Best Available Control Technology for Toxics Workbook](#).

## LOCAL CARBON MONOXIDE

For local carbon monoxide (CO) impacts, the Air District recommends reducing project-generated traffic volumes and congestion to the greatest extent feasible. Example mitigation measures include trip

reduction programs to reduce vehicle miles traveled (VMT), improving bicycle and pedestrian infrastructure and access; improving public transit service and access; designating truck routes and limiting heavy-duty truck traffic during peak hours, and encouraging the use of cleaner fuel vehicles.

## ODORS

For odors, the Air District considers appropriate land use planning to be the primary method to mitigate impacts. This includes avoiding siting odor sources near sensitive receptors, avoiding siting receptors near odor sources, and providing sufficient buffer zone between sensitive receptors and odor sources. Certain land use types are most likely to result in odor impacts, including wastewater treatment plants; landfill and composting facilities; petroleum refineries; chemical plants; and food services.

Where odor sources and receptors cannot be physically separated, implementing an odor management plan may be an appropriate mitigation measure. Lead agencies should require that odor management plans include:

- ▶ disclosure of equipment or processes that may cause odors;
- ▶ description of proposed odor control equipment and how it will be maintained;
- ▶ requirements for odor control equipment specifications to be included in the construction plan;
- ▶ description of procedures for the facility to monitor, identify, and report odors; and
- ▶ description of the process for the general public to directly report any odors from the project (e.g., website, hotline).

Odor management plans should demonstrate a) how the project will avoid creating odor impacts and b) the corrective actions the project sponsors will take if the project results in odor complaints from the surrounding communities. Odor management plans should be included in mitigation and monitoring plans, and lead agencies are responsible for ensuring that odor management plans are implemented.

In addition to the mitigation measures described above, projects must implement all applicable permit and regulatory requirements including, but not limited to: Portable Equipment Registration Program (PERP) and Air Toxic Control Measure (ATCM) requirements, compliance with Air District Regulation 9, Rule 8 and Regulation 6, Rule 1 for visible emissions from stationary internal combustion engines; and California Air Resources Board's [Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining](#) (CARB 2008) for projects that have the potential to disturb asbestos (from soil or building material).

## ESTIMATING EMISSIONS REDUCTIONS

The Air District recommends lead agencies use the most recent version (2020.4.0) of the California Emissions Estimator Model (CalEEMod) to quantify mitigation measures that reduce air pollution from construction and operational activities. The model, developed by the California Air Pollution Control Officer Association (CAPCOA) quantifies direct and indirect criteria pollutants as well as greenhouse gas emissions (GHG) using default data (e.g., emission factors, trip lengths, meteorology, source inventory) or information specific to the project, to inform land use development project analyses in the Bay Area (See Appendix D, Using CalEEMod for Bay Area Projects).

CalEEMod includes mitigation measures from the CAPCOA Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity: Designed for Local Governments, Communities, and Project Developers (CAPCOA Handbook). The CAPCOA Handbook provides a diverse set of measures that can be used to improve air quality and reduce GHGs. Chapter 3 of the Handbook, “Measures to Reduce GHG Emissions” includes measures by environmental sector: Construction, Energy, Lawn and Landscaping, Natural and Working Lands, Solid Waste, Transportation, Water, Refrigerants, and lists mitigation measures for the various project types along with measures to improve health and equity.

## 8.3 MITIGATING PLAN-LEVEL AIR QUALITY IMPACTS

Plans often have significant and unavoidable adverse air quality impacts related to the San Francisco Bay Area Air Basin’s nonattainment status and the cumulative impacts of growth on air quality. In addition, plans generally have implementation horizons of 20 years or more. For these reasons, it is essential for plans to incorporate all feasible strategies and measures to reduce air quality impacts. Mitigation measures for plans are often broad in scope because of the long timeframe and comprehensive nature of plan policies and programs.

Plans are the appropriate place to establish communitywide air quality policies that reinforce regional air quality plans. Plans present opportunities to establish requirements for new construction, future land uses and redevelopment projects to support continued improvements in local and regional air quality, and avoid inhibiting attainment of state and national air quality standards. Air quality related goals, policies, performance measures, and standards included in the plan will serve to reduce the potential impact of future projects. Therefore, binding, enforceable mitigation measures should be incorporated as policies and implementation programs in the plan to the greatest extent feasible.

## 8.4 ADDRESSING CLIMATE IMPACTS

### 8.4.1 Land Use Projects and Plans

Unlike the air quality thresholds of significance, the thresholds for climate impacts from GHG emissions are not quantitative, and therefore have no bright line threshold under which there can be an option to mitigate. The climate impact thresholds of significance for land use projects are specific design elements to be included in the project. If these design elements are not included in the project, the project can demonstrate less than significance by being consistent with a locally adopted GHG Reduction Strategy that aligns with State CEQA Guidelines Section 15183.5(b).

For local long-range plans, the climate impact thresholds of significance require the plan to meet the State’s goals of reducing GHG emissions 40 percent below 1990 levels by 2030 and support the State’s goal of carbon neutrality by 2045. If the plan does not include these targets, it can demonstrate less than significance by being consistent with a local GHG reduction strategy that aligns with State CEQA Guidelines Section 15183.5(b).

However, due to the urgency of the climate crisis, and the need to avoid and reduce GHG emissions as quickly as possible, lead agencies are strongly encouraged to maximize GHG reduction as much as possible even if the land use project or plan is found to be less than significant.

## 8.4.2 Stationary Sources

Unlike the thresholds of significance for land use projects and plans, the thresholds for stationary source projects are quantitative (see Chapter 6, Section 6.4). It is therefore appropriate for lead agencies to mitigate GHG emissions from stationary sources. Because stationary sources require an Air District permit to operate, lead agencies should consult with Air District permitting staff on the most feasible approach to mitigating stationary source GHG emissions.

## 8.5 RESOURCES

The California Air Pollution Control Officers Association's *California Emissions Estimator Model* (CalEEMod) and the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (Handbook, CAPCOA 2021) include a robust collection of measures with the potential to reduce criteria air pollutants, toxic air contaminants, and GHG emissions.

CalEEMod Version 2022, which is web-based and available online at <https://www.caleemod.com/>, includes a new, searchable measures tool where users can filter, sort and select both quantifiable and non-quantifiable measures that are included in CalEEMod and/or the Handbook.

In the Handbook, available online at <https://www.caleemod.com/handbook/index.html>, presents measures to reduce emissions organized by economic sector (Chapter 3) as well as measures to advance health and equity (Chapter 5). Below is description of the types of measure included in the Handbook, with a few examples.

**Transportation:** Measures that promote transit and alternative transportation, support use of alternatively fueled vehicles, or encourage land use planning practices that reduce vehicle trips and vehicle miles traveled (VMT). Measures are organized into six subsectors: Land Use, Neighborhood Design, Trip Reduction Programs, Parking Management, Transit, Parking or Road Pricing/Management, and Clean Vehicles and Fuels.

Reducing vehicle-miles travelled and alternative fuel and zero emissions technologies improve air quality. In addition, measures such as a mode shift from single occupancy vehicles to active transportation (walking, bicycling, and ridesharing) offer a broad variety of benefits beyond the potential for emission reductions. For more about transportation measures, see CAPCOA Handbook Measures T-1 through T-30.

- ▶ Example: T-3. Provide Transit-Oriented Development
- ▶ Example: T-6. Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)
- ▶ Example: T-16. Unbundle Residential Parking Costs from Property Cost
- ▶ Example: T-20. Expand Bikeway Network
- ▶ Example: T-25. Extend Transit Network Coverage or Hours
- ▶ Example: T-30. Use Cleaner-Fuel Vehicles

**Energy:** Measures that target energy efficiency improvements/reduced natural gas consumption, renewable energy generation, building electrification, or methane (CH<sub>4</sub>) recovery at landfills and wastewater treatment plants.

Energy efficiency measures such as building electrification and renewable power generation (solar, wind etc.), result in reduced electricity usage and therefore a reduction of criteria pollutants. See measures E-1 through E1-9 of the CAPCOA Handbook for mitigation measures that target direct energy efficiency improvements.

- ▶ Example: E-1. Buildings Exceed 2019 Title 24 Building Envelope Energy Efficiency Standards
- ▶ Example: E-10-B. Establish Onsite Renewable Energy Systems - Solar Power
- ▶ Example: E-15. Require All-Electric Development

**Lawn and Landscaping:** Measures that promote zero-emission landscaping equipment over conventional fossil fuel-powered counterparts.

- ▶ Example: LL-1. Replace Gas-Powered Landscape Equipment with Zero-Emission Landscape Equipment

**Solid Waste:** Measures that require alternative waste management pathways, such as recycling and composting, to increase landfill waste diversion.

Solid waste emissions include indirect emissions from recycling, composting and landfill materials, that generate an increase in GHGs. The CAPCOA Handbook solid waste measures S-1 through S-5 discusses organic waste diversion measures and alternative recycling techniques to reduce landfill emissions.

- ▶ Example: S-2. Implement Organics Diversion Program

**Natural and Working Lands:** Measures that enhance the sequestration capacity of natural lands or reduce the intensity of emissions from working lands.

- ▶ Example: N-2. Expand Urban Tree Planting

**Construction and Construction Equity:** Measures that promote efficient construction management practices or alternatively fueled construction equipment, and measures focused on reducing the air quality, traffic, noise, and other impacts of construction for the surrounding community.

Construction-related emissions can be reduced by using vehicles and equipment with cleaner engines, including using zero-emission, hybrid, or highest-tier on- and off-road construction equipment; the use of cleaner fuels and grid power whenever possible; limiting idling; and best management practices to reduce construction related dust. For construction-related fugitive dust, the Air District recommends implementation of the best management practices in Chapter 5, Table 5-2 as well as the additional measures provided in Chapter 5. For more on construction mitigation measures, see the CAPCOA Handbook measures C-1 through C-3 and CE-1 through CE-6.

- ▶ Example: C-1-A. Use Electric or Hybrid Powered Equipment
- ▶ Example: C-1-B. Use Cleaner-Fuel Equipment
- ▶ Example: C-2. Limit Heavy-Duty Diesel Vehicle Idling
- ▶ Example: CE-1. Create a Construction Plan with Community Input
- ▶ Example: CE-3. Post a Clear, Visible Enforcement and Complaint Sign
- ▶ Example: CE-4. Portable Indoor Air Filtration for Nearby Residents During Construction

- ▶ Example: CE-5. Air Quality Monitoring and Response Plan

**Public Health and Air Quality:** measures to improve the health outcomes of project residents as well as nearby neighborhoods.

- ▶ Example: PH-1. Establish Vegetative Barriers to Reduce Pollution Exposure
- ▶ Example: PH-2. Increase Urban Tree Canopy and Green Spaces
- ▶ Example: PH-3. Highly Rated Air Filtration

Lead agencies can also consult the following additional resources, among many others, to investigate further feasible measures to reduce air quality and climate impacts:

- ▶ Bay Area Air Quality Management District's [\*Final 2017 Clean Air Plan\*](#)
- ▶ Bay Area Air Quality Management District's [\*Local Climate Action Plan \(LCAP\) Reduction Measures database\*](#) a searchable database of the emission reduction measures contained in Bay Area climate action plans adopted as of June 2019
- ▶ Bay Area Air Quality Management District's [\*Planning Healthy Places\*](#)
- ▶ California Air Resources Board's [\*Air Quality and Land Use Handbook: A Community Health Perspective\*](#)
- ▶ California Air Resources Board's [\*Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways\*](#)

## 8.6 REFERENCES

California Air Pollution Control Officers Association. 2021 (December). *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*. Available: [https://www.airquality.org/ClimateChange/Documents/Final%20Handbook\\_AB434.pdf](https://www.airquality.org/ClimateChange/Documents/Final%20Handbook_AB434.pdf). Accessed March 1, 2022.

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California Air Resources Board. 2008 (April 22). Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining. Available: <https://www.arb.ca.gov/regact/asbesto2/asbesto2.htm>. Accessed March 1, 2022.

CAPCOA. See California Air Pollution Control Officers Association.

CARB. See California Air Resources Board.

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