4 OPERATIONAL CRITERIA AIR POLLUTANT AND PRECURSOR EMISSIONS

4.1 INTRODUCTION

Operational emissions typically represent the majority of a project's air quality impacts. After a project is built, operational emissions are anticipated to occur continuously throughout the project's lifetime. Due to their long-term nature, operational emissions would continually contribute to the criteria air pollutant (CAP) emissions inventory for Sacramento County. Operational activities also have the potential to create concentrations of air pollutants that exceed the California and National Ambient Air Quality Standards (AAQS) and/or expose sensitive receptors to substantial pollutant concentrations. Therefore, lead agencies should assess emissions generated by project operation and determine if they could result in a significant impact to air quality. If operational emissions would result in a significant impact, lead agencies should implement all feasible mitigation to reduce the impact.

CAPs and precursors of primary concern from operational activities in California include emissions of reactive organic gases (ROG) and oxides of nitrogen(NO_X), particulate matter with an aerodynamic resistance diameter of 10 microns or less (PM_{10}), and fine particulate matter with an aerodynamic resistance diameter of 2.5 microns or less ($PM_{2.5}$). Carbon monoxide (CO) is also a concern due to the potential for CO hotspots (i.e., exceedance of the CO AAQS) as result of increased traffic congestion. Other pollutants such as sulfur dioxide and lead are of less concern because operational activities are not likely to generate substantial quantities of these CAPs and the Sacramento Valley Air basin has been in attainment for these CAPs for multiple years.

Land use development projects typically include the following sources of operational CAP and precursor emissions:

- Motor vehicle trips generated by the particular land use (i.e., vehicles arriving and leaving the project site), including those by residents, shoppers, workers, and vendors;
- Fuel combustion from landscape maintenance equipment;
- Natural gas combustion emissions used for space and water heating;
- Hearth fuel combustion emissions from residential fireplaces and wood stoves;
- Evaporative emissions of ROG associated with the use of consumer products by inhabitants of residential land uses; and
- Evaporative emissions of ROG from application of architectural coatings as part of building maintenance.

Some projects may also involve the operation of stationary equipment such as backup emergency generators with diesel engines.

Operational greenhouse gas (GHG) emissions are not discussed in this chapter. Please see Chapter 6 Greenhouse Gas Emissions for further guidance regarding operational GHG emissions.

4.2 ANALYSIS EXPECTATIONS

The District recommends that CEQA analyses addressing the potential impacts of operational-related emissions of CAPs and precursors include the following:

- The nature of operational activities including the emission source types and level of activity associated with each;
- The earliest year where operational emissions are anticipated to commence. If a project would be constructed in phases and portions would become operational after each phase, then lead agencies should disclose the timing (i.e., year) of each phase;
- Discussion of whether the project's scope and size qualify it to be analyzed using the District's Operational CAP Screening Levels table, which is discussed in Section 4.3.1, Assessing Mass Emissions;
- If the analysis cannot be completed using the District's Operational CAP Screening Levels, then a quantification of the maximum daily mass emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that would be generated by the project's operational activities (expressed in pounds per day [lb/day]) is recommended. Projects should disclose the input parameters, assumptions, and calculations used to estimate these emission levels. If a project would become operational in phases, lead agencies should quantify the maximum daily operational mass emission levels after construction of each individual phase. (Quantification of mass emission levels of these pollutants is not necessary for projects that can be analyzed using the District's Operational CAP Screening Levels table, as described in Section 4.3.1, Assessing Mass Emission Levels.);
- A discussion of whether the maximum daily operational emissions would exceed the District's mass emission thresholds for precursors, ROG and NO_X;
- A discussion of whether the operational activities associated with the project would generate air pollutant concentrations of CAPs that would exceed or contribute to an exceedance of the applicable AAQS. This should include analysis of whether vehicle trips generated by the project would contribute to existing and cumulative traffic volumes that would result in concentrations of CO that exceed the applicable AAQS.
- A significance determination about the operational CAP emissions, without mitigation; and

- A discussion of feasible mitigation necessary to reduce impacts and whether the mitigation would be sufficient to reduce impacts to a less-than-significant level or if the impact would remain significant and unavoidable.

4.3 METHODOLOGIES

Ground-level ozone is a pollutant of regional concern. Ozone is formed again each day when emissions of ozone precursors, ROG and NO_X, react in the presence of sunlight. Because of the diurnal nature of ozone formation the mass emissions of ozone precursors are analyzed on a daily basis. Thus, the evaluation of a project's daily mass emissions of ROG and NO_X pertains, in part, to the following questions regarding air quality from the Environmental Checklist Form (Appendix G) of the State CEQA Guidelines:

III.a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

III.b. Would the project violate an air quality standard or contribute substantially to an existing or projected air quality violation?

III.c. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

III.d. Expose sensitive receptors to substantial pollutant concentrations?

CO should be evaluated based on the concentrations generated and receptors exposed to those concentrations. Because CO is a pollutant of localized concern and analyzed on a concentration-based level, the evaluation of CO concentrations pertains, in part, to the following questions from the Environmental Checklist Form (Appendix G) of the State CEQA Guidelines:

III.b. Would the project violate an air quality standard or contribute substantially to an existing or projected air quality violation?

III.d. Expose sensitive receptors to substantial pollutant concentrations?

Therefore, the District recommends that ozone precursor emissions (i.e., ROG and NO_X) be discussed separately from CO in environmental impact analyses. Methodologies for addressing emissions of ozone precursors and CO are discussed separately in greater detail below under Section 4.3.1 and Section 4.3.2, respectively.

4.3.1 Assessing Mass Emissions

Land Use Development Projects

Screening

The District has developed screening levels to help lead agencies analyze operational ROG and NO_X emissions from projects in Sacramento County. The operational screening levels shown in the Operational CAP Screening Levels table represent the size of development by land use type at which the District's operational emissions thresholds of significance for ROG and NO_X would not be exceeded. Therefore, emissions from the operation of projects below the screening levels presented in the table would have a less-than-significant impact on air quality.

Lead agencies are encouraged to use the Operational CAP Screening Levels table; however, the screening levels should not be considered absolute thresholds and shall not be used to evaluate operational emissions from projects that meet one or more of the following conditions:

1. The project would include wood stoves or wood-burning appliances;
2. Project trip generation rate is expected to be greater than the default trip rate in the Urban Land Use Emissions Model (URBEMIS). The default trip rates in URBEMIS, which can be viewed in the Trip Rate data field of the Land Use Module, are based on standard rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual;
3. The vehicle fleet mix for the project is expected to be substantially different from the average vehicle fleet mix in the project area. For example, the fleet mix associated with an industrial land use project would likely consist of a high portion of heavy-duty trucks;
4. The project would include mixed-use development; and
5. The project would include any industrial land use types.

Urban Land Use Emissions Model (URBEMIS)

Emissions associated with the operation of land use development projects should be estimated using the most recent version of URBEMIS, and in accordance with the URBEMIS User's Guide and the program's help menu. The District generally recommends using the default values URBEMIS provides if detailed information about the project's parameters is not known at the time of analysis. Using the default values in the URBEMIS data fields typically results in a more conservative estimate of emissions. Therefore, when possible, users should obtain project-specific information to more accurately estimate operational emissions.

In the opening module of the program (Step 1: Open a New or Existing Project) users should select the "Sacramento County AQMD" geographical area. The

following section provides guidance for the Land Use, Area Source, and Operational modules in URBEMIS that are used to estimate operational emissions. It should be noted that URBEMIS estimates area-source emissions based on the data fields in the Land Use and Area Source Modules and it estimates mobile-source emissions based on the data fields in the Land Use and Operational modules. For the purposes of this guide, "operational emissions" refers to the sum of both area- and mobile-source emissions associated with the operation of a project.

Land Use Module

The Land Use Module (Step 2: Enter Land Use Data) in URBEMIS allows users to enter the size and type of project proposed for development. Users should be aware of the units (e.g., thousand square feet [ksf], acres, students) of the land use types contained in URBEMIS. Some land uses allow users to change the units (e.g., ksf or the number of students can be used for schools); however, other land uses have fixed units. By default, URBEMIS estimates the trip generation rates for each land use type based on equations included in the ITE Trip Generation Manual. The trip rate represents the number of daily trips generated by a particular land use type according to its size. Users can override the trip rate URBEMIS calculates by adjusting the Trip Rate data field if trip rates specific to a project are available in a traffic study prepared for the project.

URBEMIS estimates the Trip Rate differently for residential land use types than for non-residential land use types. For residential land use types, URBEMIS adjusts the default Trip Rate based on residential density (i.e., dwelling units/residential acre). Therefore, overriding the default value for the number of Acres that URBEMIS assumes for a residential land use type would automatically result in a change in the value assumed in the Trip Rate data field. If both the number of Acres and the Trip Rate for a residential development are known, users should enter the Unit Amt first, then adjust the Acres field second, and then adjust the Trip Rate field last.

For nonresidential Land Use Types, URBEMIS uses a default value in the Trip Rate data field that is directly based on the Unit Amt entered in the Land Use Module. URBEMIS also assumes a Floor Area Ratio (FAR) of 0.5 for all nonresidential uses. The FAR is the ratio of the total floor area of a building to the size of the parcel on which it is located. Users should override the value in the Acres data field based on the FAR for the proposed residential land uses. URBEMIS does not adjust the default value for the Trip Rate if users adjust the Acres value for nonresidential Land Use Types.

The Land Use Module includes the Worker Commute Trip % data field for all nonresidential land use types, which corresponds to the Commercial-based Commute Trip Type on the Trip Characteristics category page of the Operational Module. URBEMIS estimates percentages of the other commercial trip types based on the Worker Commute Trip % in the Land Use Module.

The Land Use Module also contains the Trip % Primary, Trip % Diverted, and Trip % Pass-By data fields for all land use types, residential and non-residential. As explained in the URBEMIS User's Guide, primary trips are trips made for the specific purpose of visiting the generator and URBEMIS assumes that primary trips travel a full trip length; pass-by trips are trips made as intermediate stops on the way from an origin to another trip destination; and diverted-linked trips are trips attracted from the traffic volume on roadways in the vicinity of the generator but which require a diversion from that roadway to another roadway to gain access to the site. Pass-by and diverted-linked trips are assigned a shorter trip distance than primary trips. URBEMIS assumes that pass-by trips result in virtually no extra travel, with an assumed trip length of 0.1 miles. Diverted-linked trip lengths are assumed to equal 25% of the primary trip length. URBEMIS allows users to edit these data fields. URBEMIS incorporates the information in these data fields for its estimation of mobile-source emissions only if the check box for the Pass-by Trips category in the Operational Module is checked. When this category is turned off, URBEMIS assumes all trips are primary trips. Changes to these data fields should be based on information provided by a traffic report and/or reasonable assumptions that are disclosed in the CEQA document. Additional discussion about pass-by trips is provided under the Operational Module heading below.

When estimating emissions for a type of land use that is not listed in the Land Use Type data field, users should select a similar land use type or add a new land use type on the Blank tab of the Land Use Module. When using a similar nonresidential Land Use Type as a proxy, users should consider the values in the Worker Commute % Trip & Primary, Trip & Diverted, and Trip % Pass-By data fields when making that selection. The name in the Land Use Type data field is unimportant and can be overridden with new text if desired. The District recommends using one of the types of residential land uses listed in the Land Use Type column as a proxy when analyzing any type of unique residential project.

For unique nonresidential types of land used the District recommends either using another nonresidential land use type as a proxy or using a Blank land use type. If a new land use type is analyzed using a row on the Blank tab of the Land Use Module, users would need to enter a trip rate because URBEMIS does not provide default values in the Trip Rate data field on the Blank tab. The District recommends using a trip rate from the ITE Trip Generation Manual, if an appropriate trip rate is provided. If an applicable trip generation rate is not available from the ITE Trip Generation Manual, the lead agency should derive a trip generation rate for the proposed project, based on reasonable assumptions, which could include interviewing operators of similar developments that are already under operation.

Further discussion about modeling project types not listed in URBEMIS is included under the Special Land Use Types heading below.

Operational Module

The Operational Module (Step 5: Enter Operational Data) allows users to estimate vehicle exhaust emissions from vehicle trips generated by a project. The module

consists of seven operational parameter categories including Year & Vehicle Fleet, Trip Characteristics, Temperature Data, Variable Starts, Road Dust, Pass-by Trips, and Double-Counting Correction. The first five operational categories are all needed to calculate motor vehicle exhaust emissions and, therefore, cannot be turned off. Three of the seven operational categories can be turned off: Road Dust, Pass-by Trips, and Double-Counting Correction.

Guidance regarding each of the operational categories is provided below. In general, most of the default values for these seven source categories do not need to be changed, except where otherwise noted herein.

Year & Vehicle Fleet

The Year & Vehicle Fleet category page includes a year data field in the lower right corner. Users should enter into this field the earliest possible year when the project would be operational. Users should be aware that changing the project start year also changes the vehicle fleet mix. The default values in the fleet mix data fields (i.e., Fleet %, Vehicle Type, Non-Catalyst, Catalyst, Diesel) are based on values from EMFAC using the year and the location of the project, Sacramento County, which is specified in Step 1: Open a New or Existing Project). The fleet mix should be modified only if it is known that the fleet mix for a project would be different from the average vehicle fleet mix in the county. In that situation, users should select the check box labeled Keep Current Fleet Mix When Changing Years. Changes to the fleet mix data fields should be based on information provided by a traffic report and/or assumptions that are disclosed in the CEQA document. For instance, the fleet mix of motor vehicle trips generated by a school project would likely consist of a higher percentage of school buses and a lower percentage of motor homes and motor cycles than the county average.

Trip Characteristics

The Trip Characteristics category includes default values for different Trip Types in multiple data fields including Avg Speed, Trip Percentages, Trip Length Urban and Trip Length Rural. Users can modify the Trip Percentages for home-based trips; however, it is not possible to modify the Trip Percentages for commercial-based trips, which URBEMIS calculates using the Worker Commute Trip % entered in the Land Use Module (Step 2: Enter Land Use Data). URBEMIS uses either the trip length values entered into the Trip Length Urban column or the Trip Length Rural column depending on whether the Urban Project or Rural Project radio button is selected on the same screen. The values in the Trip Length field can be changed if supported by information produced in a traffic report and/or reasonable assumptions about the project. For instance, the Trip Length field for a proposed school might be adjusted according to the spatial distribution of the households that would be served by that school, particularly if the majority of the school-generated trips would consist of parents driving their children to the school. When detailed trip length information is not available for a project, the District's general recommendation is to use the Urban Project radio button if the project would be located inside the Urban Policy Area demarcated on the County's Urban Policy Area & Urban Services Boundary map; and to use the Rural Project radio button if a project would be located outside the Urban Policy Area.

Temperature Data
The Temperature Data category contains the Ambient Winter Temperature and Ambient Summer Temperature data fields which are used to estimate winter and summer emissions, respectively. The default temperature values in these data fields are specific to Sacramento County and should only be modified in consultation with the District.

Variable Starts
The Variable Starts parameter category shows the percentage of vehicles in several time classes (minutes since the vehicle engine was turned off) for the six trip types defined in the Trip Characteristics parameter category. This information is derived from the applicable EMFAC file and should only be modified in consultation with the District.

Road Dust
The Road Dust parameter category allows users to specify the distribution of vehicle travel between paved and unpaved roads. This category is used to calculate entrained road dust emissions due to vehicle travel on paved and unpaved surfaces. Users should not turn this category off, and can adjust the Percent on Paved Roads and Percent on Unpaved Roads if detailed project information is known.

Pass-by Trips
The Pass-by Trips parameter category can only be turned on or off. When turned on, this category divides all the project-generated trips into primary, pass-by, and diverted-linked trips (entered as percentages in the Trip % Primary, Trip % Diverted, and Trip % Pass-By data fields of the Land Use Module [Step 2]). When the Pass-by Trips category in the Operational Module is turned off, URBEMIS assumes 100% of the project-generated trips are primary trips. Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. URBEMIS accounts for these trips by setting the trip length to 0.1 miles for each pass-by trip. These trips are most important for retail and commercial land uses, such as gas stations and fast food restaurants. This option is not applicable to all land use types. For example, most of the trips to and from a Warehouse are typically expected to be primary trips and the Pass-by Trips option should not be used. This category check box should not be selected unless the percentage of pass-by trips is supported by a traffic study or a set of reasonable assumptions discussed in the CEQA document. If the Trip Length fields in the Trip Characteristics category or the Trip Rate values in the Land Use Module are overwritten using information provided by a traffic study, users should be aware of whether the traffic data incorporated the occurrence of pass-by trips. If the Pass-By Trips checkbox is selected then the lead agency should discuss its reasoning for assuming that some of the project-generated vehicle trips would be considered pass-by trips.

Double-Counting Correction
The Double-Counting Correction parameter category is designed to account for internal trips between residential and nonresidential land uses. Thus, the Double-

Counting Correction is applicable to mixed-use projects that include both residential and nonresidential land use types in the Land Use Module. For example, a residential trip and a retail trip generated by a mixed-use project may be the same trip. Users have the option of entering the number of internal trips between residential and nonresidential land uses in the Enter the gross internal trip you wish to use data field. The value entered represents the number of internal trips that would not be included in the emissions estimate. This category should not be used unless the traffic study contains data to support the correction factor. In some cases, the traffic study may report project-specific trip generation that is already corrected for internal trips. Users should consult with a traffic engineer to determine the appropriate method to account for internal trips. The Double-Counting Correction checkbox should not be selected if detailed project information is unknown.

Area Source Module

The Area Source Module (Step 4: Enter Area Source Data) allows users to adjust the five area-source emission categories including, natural gas fuel combustion, hearth fuel combustion, landscape fuel combustion, consumer products, and architectural coatings. The natural gas, hearth, and landscape maintenance categories relate to on-site fuel combustion and the consumer products and architectural coatings categories address on-site evaporative emissions.

Guidance regarding each of the area-source categories is provided below. In general, most of the default values for these five source categories do not need to be changed except where otherwise noted in this guide.

Natural Gas Fuel Combustion

Parameters in the Natural Gas Fuel Combustion category are used to estimate the natural gas combustion emissions from space and water heating. On the Natural Gas tab users should not change the default values for the Percent Using Natural Gas for both Residential and NonResidential land use types unless project-specific data is available. Similarly, users should not override the default values in the data fields regarding Natural Gas Usage Rates unless project-specific data is available. On the Emission Factors tab it is not possible to override the default values in the Natural Gas Usage Rates data fields.

Hearth Fuel Combustion

The Hearth Fuel Combustion category consists of separate tabs for Hearth Percentages, Wood Stoves, Wood Fireplaces, Natural Gas Fireplaces, and Natural Gas Emission Factors. Each of the tabs is discussed separately below.

Hearth Percentages

The parameters on the Hearth Percentages tab are applicable only to projects that include residential units. The default percentages should be used for the data fields for Wood Stoves, Natural Gas Fireplaces, and None (% w/o any hearth option) unless project-specific information is available. URBEMIS does not estimate emissions from any hearth types for nonresidential land use types.

Wood Stoves

On the Wood Stoves tab, the default percent values in the right column for the types of wood stoves (i.e., Noncatalytic, Catalytic, Conventional, and Pellet) should not be changed unless project-specific information is available. Similarly, the values for Wood Burned, Wood Stove Usage, and Pounds in a Cord of Wood should not be changed unless project-specific information is available.

Wood Fireplaces

The Wood Fireplaces tab should never be used to calculate hearth emissions for proposed new residential land uses in Sacramento because construction of new wood burning fireplaces is prohibited by District Rule 417. However, this tab may be used when estimating the emissions of existing residential land uses that would be replaced with a new development to calculate the "net change" in land use-related emissions.

Natural Gas Fireplaces

The values in the data fields on the Natural Gas Fireplaces tab should only be modified in the case that project-specific information is available that supports overriding default values.

Natural Gas Emission Factors

The emission factors contained in the Natural Gas Emission Factors tab cannot be modified by users. These values are used to estimate emissions from natural gas combustion in fireplaces/stoves and, according to the URBEMIS User's Guide, are based on U.S. Environmental Protection Agency air pollutant (AP-42) emission factors.

Landscape Fuel Combustion

The Landscape Fuel Combustion source category calculates on-site emissions from landscaping equipment such as lawn mowers, leaf blowers, chain saws, and hedge trimmers that are powered by internal combustion engines. On this tab users should only adjust the Year being Analyzed data field. The year entered into this field should be the earliest year when the project could become fully operational. Landscaping emissions are estimated for the summer period only. URBEMIS uses emission rates from the California Air Resources Board's OFFROAD model to estimate landscape maintenance equipment emissions.

Consumer Products

The Consumer Products source category is only relevant to projects that include residential land use types. The Pounds of ROG (per person) data field should not be adjusted in Consumer Products source category. The Persons per Residential Unit data field should be adjusted based on the estimated number of residents that would be supported by the proposed project, if available. The value should be consistent with the number of residents divided by the number of residential units.

Architectural Coating

Users should not make changes to the data fields in the Architectural Coating source category without consulting the District.

Special Land Use Types

The District recognizes that not all land use types are provided in the Land Use Module of URBEMIS. The District offers ideas about how URBEMIS could be used to analyze some special land use types. These suggestions are intended to share the District's insight and should not be regarded as strict recommendations.

Self-storage facility. The warehouse row in the Land Use Module of URBEMIS may be appropriate to represent this project type. The trip rate may be adjusted based on information provided in the ITE Trip Generation Manual or from empirical data gathered from operators of existing storage centers.

Correctional facility (prison or jail). The mobile-source emission parameters associated with this land use type may be similar to that of a hospital and area-source emissions would likely be similar to that of a multi-family residential land use type.

Sports complex or stadium. Because the vehicle trip characteristics would be event-based, this land use type may be similar to a place of worship. Trip rates could be determined based on the amount of parking provided for the facility, or the amount of seating for the events. However, for outdoor stadiums, there would not be any area-source emissions associated with space heating. Instead, area-source emissions might be similar to those of a restaurant, associated with food vendors.

Parking garage. If a parking garage is proposed to serve a particular land use type, such as downtown office buildings or a shopping mall, then standard trip generation rate for that land use type could be used to estimate mobile-source emissions. While the construction of a parking garage may not necessarily result in new trip generation, the introduction of a parking garage to an area can affect the transportation mode share of the area by creating the capacity for increased automobile trips to the location in place of transit, bicycle, or pedestrian trips. If a parking garage includes ground-floor retail or office uses in the same building, then the appropriate URBEMIS retail or office land use type category should be applied to that component of the project. Overall, the District recommends that the trip rate used to estimate emissions for a parking garage be consistent with the expected turnover rate of the parking spaces.

Police or fire station. Use government office building.

Specific Plans or city zoning changes. If only acreage and zoning information is available, then lead agencies should back-calculate the ksf of areas that would be zoned for nonresidential land uses assuming a FAR of

0.5. A FAR of 0.5 is an internal default assumption within URBEMIS, and cannot be overridden. For example, if 1 acre of commercial land uses were proposed, the user would enter 21.8 ksf of the applicable commercial land use into URBEMIS. This represents 1 acre (43.56 ksf) with an FAR of 0.5. For proposed residentially-zoned areas, the Land Use Type (on the Residential tab of the Land Use Module) that is appropriate for the respective residential density should be used. The URBEMIS User's Guide includes definitions of residential densities that URBEMIS assigns to the various types of residential land uses.

Transportation Infrastructure Projects. These types of projects may include adding lanes to a roadway segment, changes to existing road configuration, a new freeway exit, or a bridge. Lead agencies should discuss the net change in vehicle miles traveled (VMT) associated with implementation of the infrastructure project, which is typically provided by a transportation study. When estimating emissions in URBEMIS, users should use the Blank land use type in the Land Use Module and adjust the Trip Characteristics data fields in the Operational Module to reflect the net regional change in VMT. If the infrastructure project would also affect the speed at which vehicles travel on the roadway segment then the user should execute one URBEMIS run with the existing VMT and existing average travel speed and a second URBEMIS run with the new VMT at the projected travel speed. Users may also use EMFAC to estimate operational emissions for transportation infrastructure projects if a more refined emissions estimate is desired. A more refined estimate could be calculated with EMFAC if detailed information about the change in the fleet mix, change in vehicle speeds, and vehicle starts is known.

Stationary-Source Facilities

A stationary source consists of a single emission source with an identified emission point, such as a stack, at a facility. Facilities can have multiple emission point sources located on-site and sometimes the facility as a whole is referred to as a "stationary source." Stationary sources are typically associated with industrial processes. Examples include boilers, heaters, flares, cement plants, and other types of combustion equipment. The District is responsible for issuing permits to stationary-source facilities to reduce air pollution and to attain (or maintain) the AAQS. Permitted stationary-source facilities are required to implement Best Available Control Technology (BACT), which may include the installation of emissions control equipment or implementation of administrative practices that would result in the lowest achievable emission rate. Stationary-source facilities may also be required to offset their emissions of CAPs in order to be permitted. This may entail shutting down or augmenting another stationary source at the same facility. Facilities also may purchase an emissions reduction credit to offset its emissions.

If a stationary source is subject to stationary permitting requirements (either District-level permitting requirements [District Rule 202] or the federal New

Source Review program) and, in combination with any mobile and area sources associated with the same project, its daily emissions of ROG and NO_X are below the District's CEQA thresholds of significance for operational emissions, it is considered to have a less-than-significant impact with respect to ozone precursors. A stationary source subject to permitting that emits levels of ROG or NO_X that exceed the District's CEQA thresholds of significance for operational emissions, but complies with the District's BACT and emissions offset requirements is also considered to have a less-than-significant impact. Stationary sources with emissions low enough to be exempt from the District's permitting program, including the BACT and offset requirements, would not be considered to have a significant direct air quality impact.

The District's permitting requirements are applicable to CAP emissions from stationary sources. It should be noted that other potential air quality impacts of a stationary source would still need to be analyzed (e.g., air toxics, odors). Guidance for analyzing other types of potential impacts of operational emissions to air quality is provided in Chapter 5 (Toxic Air Contaminants), Chapter 7 (Odors), and Chapter 6 (Greenhouse Gas Emissions).

Manual Estimation

URBEMIS is not equipped to estimate emissions generated by stationary sources. Instead CAP emissions from stationary sources should be estimated manually in consultation with the District's Permitting staff. These calculations should be based on EPA AP-42 emission factors for particular industrial processes, manufacturer specifications for specific equipment, throughput data (e.g., fuel consumption, rate of material feed stock input) and other specifications provided by the project engineer. To the extent possible, the District recommends that the methodology used to estimate stationary-source emissions be consistent with calculations that would need to be performed to fulfill requirements of the permitting process, which would typically take place subsequent to CEQA review of the project.

Special Project Types

The District offers ideas about how URBEMIS could be used to analyze some special project types. These suggestions are intended to share the District's insight and should not be regarded as strict recommendations.

> **Landfill.** For example, estimation of the emissions associated with the operation of a landfill can use the EPA AP-42 emission factors for municipal solid waste landfills. The on-road mobile-source emissions associated with vehicle trips to and from a landfill could be estimated using URBEMIS.
>
> **Wastewater treatment facility.** Evaporative emissions associated with wastewater treatment facilities can be estimated using EPA AP-42 emission factors for waste water collection, treatment, and storage and/or the most current version of EPA's WATER model. The on-road mobile-source

emissions associated with vehicle trips to and from a wastewater treatment plant could be estimated using URBEMIS.

DETERMINING LEVEL OF SIGNIFICANCE

Lead agencies should estimate and present a project's operations emissions for both the summer and winter season. Lead agencies should compare the project's maximum daily operational emissions of ozone precursors (i.e., ROG and NO_X) during both seasons to the District's thresholds of significance. If the project's maximum daily emissions of ROG or NO_X during either summer or winter would exceed the District's threshold of significance, then the project would have a significant impact to air quality. By exceeding the District's mass emission thresholds for operational emission of ROG or NO_X, the project would be considered to conflict with or obstruct implementation of the District's air quality planning efforts. Furthermore, the project would result in a cumulatively considerable net increase in precursors of ozone, for which Sacramento County is nonattainment with respect to both the state and national AAQS. For projects that exceed the District's threshold of significance, lead agencies shall implement all feasible mitigation to reduce emissions of the exceeding precursor pollutant.

If a proposed project involves the removal of existing emission sources on the same site as the proposed land use, then the District recommends subtracting the existing emissions levels from the emissions levels estimated for the new proposed land use. This "net" calculation is permissible only if the existing emission sources were operational at the time that the Notice of Preparation (NOP) for the CEQA project was circulated and would continue if the proposed redevelopment project is not approved. This "net calculation" is not permitted for emission sources that ceased to operate (or the land uses were vacated and/or demolished) prior to circulation of the NOP.

EXAMPLE URBEMIS PROJECTS

The District has included Example Operational Analyses to illustrate the use of the Operational CAP Screening Levels table, application of the guidance described above for URBEMIS, and discuss some unique operational scenarios. Lead agencies may refer to these examples for further clarification on how to analyze operational emissions of ROG and NO_X.

4.3.2 ASSESSING LOCAL EMISSION CONCENTRATIONS

Except for CO, land use development projects do not typically have the potential to result in localized concentrations of CAPs that exceed or contribute to an exceedance of the respective AAQS. This is because CAPs are predominantly generated in the form of mobile-source exhaust from vehicle trips associated with the land use development project. These vehicle trips occur throughout a paved network of roads, and, therefore, associated exhaust emissions of CAPs are not generated in a single location where high concentrations could be formed. However, vehicle travel-related emissions of PM_{10} and $PM_{2.5}$ could have the

potential to exceed their respective AAQS if a project would generate a high volume of vehicle trips on unpaved roadways. Otherwise, emissions of PM_{10} and $PM_{2.5}$ are primarily a concern during the construction phase of proposed projects, which is discussed in Chapter 3, Construction-Generated Criteria Air Pollutant and Precursor Emissions.

The primary mobile-source pollutant of localized concern is CO. Local mobile-source CO emissions near roadway intersections are a direct function of traffic volume, speed, and delay. Long-distance transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. Under specific meteorological conditions and traffic conditions, CO concentrations at receptors located near roadway intersections may reach unhealthy levels, when combined with background CO level.

Emissions and ambient concentrations of CO have decreased dramatically in the Sacramento Valley Air Basin with the introduction of the catalytic converter emission control technology for on-road motor vehicles in 1975. No exceedances of the CAAQS or NAAQS for CO have been recorded at a monitoring station in Sacramento County since 1993. Both CARB and EPA have redesignated the Sacramento Valley Air Basin as an attainment area for CO, for the CAAQS in 1997 and the NAAQS on June 1, 1998, respectively. However, elevated localized concentrations of CO still warrant consideration in the environmental review process. Occurrences of localized CO concentrations (i.e., "hotspots") are often associated with heavy traffic congestion, which most frequently occur at signalized intersections of high-volume roadways.

More detailed guidance for analyzing CO concentrations, using screening criteria or dispersion modeling, are discussed below.

Screening Criteria for Carbon Monoxide Hot Spots

This preliminary screening methodology provides lead agencies with a conservative indication of whether project-generated vehicle trips would result in the generation of CO emissions that contribute to an exceedance of the thresholds of significance. The District's recommended screening criteria are divided into two tiers, as described below. The screening criteria have been developed to help lead agencies analyze potential CO impacts and identify when site-specific CO dispersion modeling is not necessary.

First Tier

The proposed project would result in a less-than-significant impact to air quality for local CO if:

- Traffic generated by the proposed project would not result in deterioration of intersection level of service (LOS) to LOS E or F; or
- The project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

If the first tier of screening criteria is not met then the second tier of screening criteria shall be examined.

Second Tier

If all of the following criteria are met, the proposed project would result in a less-than-significant impact to air quality for local CO.

- The project would not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- The project would not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air would be substantially limited; and
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average (as identified by the EMFAC or URBEMIS models).

Lead agencies shall perform dispersion modeling to estimate CO concentrations at sensitive receptors near congested intersections (LOS E or F) or other locations of traffic congestion that do not meet the above screening criteria. Detailed guidance about how dispersion modeling shall be performed is provided in the District's Carbon Monoxide Dispersion Modeling Guidance. This guidance explains how to estimate the local CO concentrations that would be generated at a congested intersection and how to determine the local background CO concentration.

DETERMINING LEVEL OF SIGNIFICANCE

Following quantification of local CO emissions in accordance with the District's Carbon Monoxide Dispersion Modeling Guidance, the lead agency should compare the total estimated worst-case 1-hour and 8-hour CO concentrations with the applicable threshold of significance. If the modeled 1-hour and 8-hour CO concentrations would not exceed the respective thresholds of significance, the project would have a less-than-significant impact to air quality. If modeled concentrations would exceed any applicable threshold of significance, the proposed project would result in a significant impact, and all feasible mitigation measures would need to be implemented to reduce the high CO concentrations. Potential mitigation measures for reducing CO impacts are discussed in Section 4.4.2, Reducing Carbon Monoxide Concentrations.

4.3.3 CONFORMITY ANALYSES FOR LARGE INFRASTRUCTURE PROJECTS

Pursuant to the Federal Clean Air Act, transportation and non-transportation infrastructure projects in Sacramento County that are supported by federal funding and not subject to special exemptions would be required to comply with District Rule 104, General Conformity. More specifically, as explained on the EPA's

General Conformity web page transportation infrastructure projects (e.g., lane widening, change to existing road configuration, new freeway exit) are subject to EPA's Transportation Conformity Regulations and would require a Transportation Conformity analysis; and non-transportation infrastructure projects are subject to EPA's General Conformity Regulations (e.g., large specific land use development plans, dams and other water infrastructure) would require a General Conformity analysis.

As part of the Transportation Conformity analysis for transportation infrastructure projects in Sacramento County, the California Department of Transportation (Caltrans) determines if an infrastructure project was included in the Regional Transportation Plan (RTP) or Regional Transportation Improvement Plan (RTIP), including the associated plan-level conformity analysis (as explained in Caltrans guidance on conformity analysis and EPA guidance on conformity analysis). Transportation infrastructure projects that have been accounted for in the RTP and/or RTIP that have approved conformity determinations from the U.S. Department of Transportation would meet the Transportation Conformity requirements and would not be considered to conflict with the State Implementation Plan (SIP). Therefore, environmental review of most transportation infrastructure projects is handled by the Transportation Conformity analysis and no further analysis is necessary on a CEQA level. Similarly, non-transportation infrastructure projects are subject to the General Conformity Regulations.

4.4 MITIGATION

State CEQA Guidelines, Section 21002.1(b) requires lead agencies to mitigate or avoid significant environmental impacts associated with discretionary projects whenever it is feasible to do. Environmental documents for projects that have any significant environmental impacts must identify feasible mitigation measures or alternatives to reduce the impacts. If, after the identification of all feasible mitigation measures, a project is still deemed to have significant environmental impacts, the lead agency can approve a project, but must adopt a Statement of Overriding Consideration to explain why further mitigation measures are not feasible, and why approval of a project with significant unavoidable impacts is warranted. This section describes what the Air Districts consider to be feasible mitigation in light of existing regulations and research.

The District recognizes that the final determination of feasibility is made by the lead agency. In addition to CEQA requirements, mitigation of air quality impacts is needed to achieve the AAQS. All incremental emission sources, including those associated with land use development projects must be mitigated to the greatest extent possible in order to achieve and maintain health-based AAQS. Failure to attain commitments of the SIP and AAQS could result in federal sanctions placed on the region such as a loss of federal transportation funds for local roadway projects and implementation of more stringent emission offset requirements on new and modified stationary sources.

Operational emission reduction measures must, by definition, reduce emissions beyond existing regulations. Regulatory programs are in place at the federal, state and District level to reduce air pollutant emissions from nearly all sources; however, they are not always sufficient to eliminate impacts to air quality. For example, ARB's motor vehicle programs have dramatically reduced average tailpipe emissions from the state's vehicle fleet but motor vehicle emissions would continue to be a predominant source of ozone precursor emissions in the Sacramento Valley Air Basin due to growth in the number of vehicles and in vehicle miles traveled.

If a project's long-term emissions would remain above the applicable threshold of significance after implementation of all feasible on-site mitigation measures, the lead agency can implement a District-approved off-site mitigation strategy to further reduce long-term air quality impacts below the applicable threshold of significance. Each off-site mitigation strategy should be developed in consultation with, and approved by, the District. An off-site mitigation strategy may only be implemented after all other feasible operational emission reduction measures have been implemented.

For every operational emission reduction measure included in a CEQA document the District recommends that the text be as detailed as possible and clearly identify who is responsible for implementation, funding, enforcement, and any required maintenance activities. The lead agency should also explain why the measure would be effective in reducing emissions and why each measure is considered to be feasible. In the case that operational emission reduction measures relate directly or indirectly to policies in the local jurisdiction's General Plan, the District encourages the explanation of these relationships also be included.

Detailed guidance about reducing mass emissions of CAP and precursors from land use development projects, CO concentrations, and CAP and precursors from stationary-source emissions is provided below.

4.4.1 Reducing Mass Emissions from Land Use Development Projects

For land use development projects that would exceed the District's operational emissions thresholds of significance for ROG and NO_X, the District recommends the project proponent develop an Air Quality Mitigation Plan (AQMP) describing how the project would reduce operational emissions.

The District's Guidance for Land Use Emission Reductions (District Guidance) provides a description of the most current feasible mitigation measures to reduce area- and mobile-source emissions. All of the measures in the District Guidance include detailed information about the percent reduction achieved by each measure from the affected source type. These percent reductions have been identified and substantiated through a comprehensive literature review. The District Guidance provides a variety of reduction measures for residential, commercial, and mixed-use projects. Lead agencies and project proponents can

also research and develop additional measures, in consultation with the District, which have reductions that are both quantifiable and substantiated.

The District has determined that a minimum 15% reduction in emissions can be achieved by a land use development project in a manner that is both administratively and economically feasible.

In order to satisfy Section 21002.1(b) of the State CEQA Guidelines, however, which requires lead agencies to mitigate or avoid significant environmental impacts associated with discretionary projects whenever it is feasible to do, the AQMP developed for a land use development project would be required to reduce operational emissions by more than 15% if implementation of additional feasible mitigation is possible.

To assist in documenting, quantifying, and monitoring the mitigation measures selected by the project proponent, the District has prescribed that the selected operational mitigation measures be explained in the context of an AQMP. The AQMP is a standalone document separate from any other documents or plans required by CEQA or other laws, ordinances, or regulations. During the environmental review process, and before certification of the CEQA environmental document by the lead agency, the District independently endorses the AQMP with a letter. The endorsed AQMP should then be referenced in the CEQA document as an air quality mitigation measure, appended to the document, and referenced as a condition of approval by the lead agency.

Recognizing that direct and indirect emissions from land use development projects can significantly impact the region's air quality, the County of Sacramento and other incorporated cities in the county have adopted land use review requirements in their respective General Plans. These land use review policies require that projects with significant operational air quality impacts reduce direct and indirect emissions by a minimum of 15% by selecting and implementing mitigation measures.

4.4.2 Reducing Carbon Monoxide Concentrations

The following section describes District-recommended mitigation measures for reducing local CO impacts to air quality. Lead agencies shall consider implementation of the following measures, as feasible, for reducing project-generated hourly traffic volumes (and associated CO emissions) at affected intersections. The emission reductions achieved by implementation of these measures shall be supported by project-specific transportation modeling.

- Synchronize traffic signals to improve traffic flow and minimize traffic congestion,
- Install additional traffic signals (such as light metering) to relocate congested traffic farther away from receptors,

- Improve public transit service (e, g, , increase transit headway frequency) to reduce vehicle traffic and increase public transit mode share during peak traffic congestion periods,
- Improve bicycle and pedestrian infrastructure (e, g, , install class I or II bike lanes, install or widen sidewalks, implement traffic calming features around pedestrian crosswalks) to reduce vehicle traffic and increase bicycle and pedestrian mode share during peak traffic congestion periods,
- Adjust pedestrian crosswalk signal timing to minimize waiting time for vehicles turning right (or otherwise sharing green time with pedestrians) by giving pedestrians a head start (pedestrian signal changes to green before traffic signal),
- Where pedestrian traffic is high, implement pedestrian crosswalks with multi-directional crossings (where vehicle signals are red in all directions simultaneously) allowing pedestrians to cross intersections diagonally,
- Limit heavy-duty truck traffic during peak hours and designate truck routes that divert truck traffic away from congested intersections,
- Prohibit left turns, U-turns, or other maneuvers during peak hours that add to congestion,
- Limit on-street parking during peak hours, to allow for added vehicle capacity, and/or
- Implement traffic congestion-alleviating mitigation measures as identified by a traffic engineer.

4.4.3 Reducing Emissions from Stationary Sources

Mitigations measures developed for reducing CAP and precursor emissions from stationary-source facilities should be developed on a case-by-case basis. Area- and mobile-source emissions could be mitigated in the same ways as land use development projects, as discussed in Section 4.4.1. Additional offsets could be implemented, including but not limited to the purchase of emission reduction credits to ensure that a facility's CAP emissions are reduced to a less-than-significant level.