Appendix A
Glossary

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Adaptation (Climate Change)
Adjusting to a changing environment. Adaptation involves working to reduce or eliminate the impacts of climate change on a community. Adaptation can minimize harm and costs and take advantage of potential opportunities associated with the impacts of climate change. Adaptation includes addressing current and future natural hazards (i.e., wildfire, drought, cyclones, heat waves), as well as gradual changes (i.e., increasing temperatures, sea level rise) that could impact economic sectors, natural resources, and community well-being.

Adaptation Measure
An action that addresses a climate impact. A measure will reduce risk and/or vulnerability for a specific resource, asset, project component, or community.

Adaptive Capacity
A project's existing capacity to cope with the effects of climate change (an element of vulnerability). Adaptive capacity includes the policies, programs, plans, and practices that are already in place or can be easily implemented, which prepare a project, community, and individuals for climate change, and the financial resources to implement such actions.

Additionality
The reduction in emissions by sources or enhancement of removals by sinks that is additional to any that would occur in the absence of the project. The project should not subsidize or take credit for emissions reductions which would have occurred regardless of the project (IPCC 2001).

Albedo
The fraction of solar radiation reflected by a surface or object. Snow-covered surfaces have a high albedo, while vegetation-covered surfaces and oceans have a low albedo. The Earth's albedo varies, because of the dynamic nature of clouds, snow, ice, leaf area, and land cover changes. The normal albedo of snow, for example, is around 1.0, whereas the albedo of vegetation can be as low as 0.1. Human-made surfaces designed to have high albedos (i.e., near 1.0) reflect solar radiation and can help reduce the urban heat island effect. Other human-made surfaces, such as asphalt or conventional shingle roofs, have low albedo and increase the urban heat island effect (IPCC 2001).

Analysis Level for Defaults
Defines the geographic extent of many defaults, including on-road vehicle emission factors, solid waste disposal rates, percent of vehicle travel on unpaved/paved roads, days of landscaping equipment use, and hearth usage. CalEEMod defaults to the "County" analysis level, which provides the most locationally-specific data. Users may override this default and select air basin, air district, or statewide, in which case default inputs would be derived based on aggregated data over the larger geography.

Anthropogenic
Generally, environmental change caused or influenced by humans, either directly or indirectly. In the context of CalEEMod, it is used to describe human-caused GHG emissions.

Below Market Rate Housing
Housing rented at rates lower than the market rate. Below market rate housing is designed to assist lower-income families. When below market rate housing is provided near job centers or transit, it provides lower-income families with a desirable job/housing match or greater opportunities for commuting to work through public transit.

Biochemical Oxygen Demand
Represents the amount of oxygen that would be required to completely consume the organic matter contained in wastewater through aerobic decomposition processes. Under the same conditions, wastewater with higher biochemical oxygen demand (BOD) concentrations will generally yield more methane than wastewater with lower BOD concentrations. BOD_5 is a measure of BOD after five days of decomposition.

Biogenic Emissions
Carbon dioxide (CO_2) emissions that result from materials that are derived from living cells, as opposed to CO_2 emissions derived from fossil fuels, limestone, and other materials that have been transformed by geological processes. Biogenic CO_2 contains carbon that is present in organic materials, including wood, paper, vegetable oils, animal fat, and waste from food, animals, and vegetation (such as yard or forest waste) (CCAR 2009).

Building Climate Zone
Geographic areas of similar climatic characteristics, including temperature, weather, and other factors that affect building energy use. The California Energy Commission identified 16 Building Climate Zones for the Title 24 Standards. Building climate zones are different from Energy Demand Forecast Zones (EDFZs), which were developed by the California Energy Commission and used in the Residential Appliance Saturation Survey (RASS) and the 2018–2030 Uncalibrated Commercial Sector Forecast (Commercial Forecast).

Cal-Adapt®
Cal-Adapt is California's climate risk screening tool used for California's Fourth Climate Change Assessment. As defined by Cal-Adapt's developer, UC Berkeley's Geospatial Innovation Facility (GIF), Cal-Adapt provides "access to the wealth of data and information that has been, and continues to be, produced by State of California's scientific and research community. The data available on this site offer a view of how climate change might affect California at the local level" (CEC 2021).

CalEnviroScreen®
CalEnviroScreen is a mapping tool developed by the State of California to identify communities that are most affected by pollution sources and where people are often especially vulnerable to environmental hazards. CalEnviroScreen calculates an overall score for every census tract in the state using environmental, health, and socioeconomic data from state and federal sources. An area with a higher CalEnviroScreen score experiences higher cumulative impacts from pollution burden and socioeconomic factors than areas with low scores.

California Environmental Quality Act
A statute passed in 1970 that requires state and local agencies to identify the significant environmental impacts of their actions, to avoid or mitigate those impacts, and for projects with significant impacts to consider alternatives. The statute also requires public participation in the review of environmental documents.

Carbon Dioxide Equivalent
A measure for comparing CO_2 with other greenhouse gases (GHG). CO_2e is calculated by multiplying the metric tons of a GHG by its associated global warming potential (GWP).

Carbon Monoxide
Carbon monoxide (CO) is a colorless, odorless, gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. While there are no ecological or environmental effects from CO, human exposure to CO at high concentrations can cause fatigue, headaches, confusion, dizziness, and chest pain.

Carbon Sink
Any process or mechanism that removes carbon dioxide from the atmosphere. A forest is an example of a carbon sink because it sequesters carbon dioxide from the atmosphere.

Co-Benefits
Additional benefits that accompany the emissions reductions associated with GHG reduction measures, such as improvement in air quality, employment, climate resiliency, or community quality of life.

Combined Heat and Power
CHP is the generation of both heat and electricity from the same process, such as combustion of fuel, with the purpose of utilizing or selling both simultaneously. In combined heat and power systems, the thermal energy byproducts of a process are captured and used, whereas, in a separate heat and power system, the byproducts would be wasted. Examples of combined heat and power systems include gas turbines, reciprocating engines, and fuel cells. CHP is also known as *cogeneration*.

Community Air Protection Program Community
Community Air Protection Program communities are defined under Assembly Bill 617 (Garcia, 2017). The program's focus is to reduce exposure in communities throughout California that are most impacted by air pollution.

Compact Infill
Project which is located on an existing site within the central city or inner-ring suburb with high-frequency transit service. Examples may be community redevelopment areas, reusing abandoned sites, intensification of land use at established transit stations, or converting underutilized or older industrial buildings.

Construction Vehicle Mix
The user can select the type of vehicle mix for each of the four construction trip types (e.g., worker). The vehicle class descriptors are as follows.

- "LDA, LDT1, LDT2" = 25/50/25 percent mix of light duty autos, light duty truck class 1, and light duty truck class 2.
- "HHDT, MHDT" = 50/50 percent mix of heavy-heavy duty trucks and medium-heavy duty trucks.
- "HHDT" = 100 percent heavy-heavy duty trucks
- "EMFAC Fleet Mix" = total mix of all vehicles for the analysis level provided by EMFAC2021.

Criteria Pollutant
Criteria pollutants are a group of six common air pollutants for which the federal and state governments have set national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), respectively. The standards are set to protect public health and welfare and the environment. The federal criteria pollutants are ozone (O_3), CO, lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM), which consists of particulates 10 microns in diameter or less (PM10) and 2.5 microns in diameter or less (PM2.5). Definitions of these pollutants are provided in this appendix (see *Carbon Monoxide*, *Lead*, *Nitrogen Dioxide*, *Ozone*, *Particulate Matter*, and *Sulfur Dioxide*). California has set CAAQS for these six pollutants, in addition to standards for visibility reducing particles, hydrogen sulfide, and vinyl chloride.

Dashboard
The CalEEMod dashboard is an interactive and visually engaging tool that allows users to quickly view key emissions, climate, and health and equity results for their project. There are two dashboards for emissions reporting: one for construction results and one for operations results. There is one dashboard for climate risks and one dashboard for health and equity. The dashboards allow users to customize and filter the presentation of results using a combination of tables, graphs, and icons. The user may also view selected measures, as available.

Density
The amount of persons, jobs, or dwellings per unit area. This is an important metric for determining transportation-related parameters.

Destination Accessibility
A measure of the number of jobs or other attractions reachable within a given travel time. Destination accessibility tends to be highest at central locations and lowest at peripheral ones.

Disadvantaged Community
A disadvantaged community is defined by the State of California as a census tract that is in the top 25 percentile of CalEnviroScreen, an environmental justice screening tool developed by the Office of Environmental Health Hazard Assessment to evaluate communities for their environmental pollution burden as well as vulnerability due to socioeconomic conditions. Disadvantaged community designation is often used by the State of California in funding and other programs (CalEPA 2017).

Efficacy
The capacity to produce a desired effect.

Elasticity
The percentage change of one variable in response to a percentage change in another variable. For example, if the elasticity of vehicle miles traveled (VMT) with respect to density is -0.12, this means a 100 percent increase in density leads to a 12 percent decrease in VMT. Elasticity is represented by the following formula [percent change in variable A] / [percent change in variable B], where the change in B leads to the change in A.

EMFAC
The EMission FACtor model (EMFAC) estimates the official emissions inventories of on-road mobile sources in California. EMFAC is developed and used by CARB to assess emissions from on-road vehicles including cars, trucks, and buses in California, and to support CARB's regulatory and air quality planning efforts to meet the Federal Highway Administration's transportation planning requirements. The U.S. Environmental Protection Agency approves EMFAC for use in State Implementation Plan and transportation conformity analyses.

Emission Factor
A relative value that relates the quantity of a pollutant to an activity associated with the release of that pollutant. Emission factors are typically expressed in terms of pollutant weight divided by an activity rate. For example, metric tons of CO_2 emitted per VMT (annotated as MT CO_2/VMT).

ENERGY STAR
A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy which sets national standards for energy-efficient consumer products. ENERGY STAR-certified products are guaranteed to meet the efficiency standards specified by the program.

Equity
Equity is the "just and fair inclusion into a society in which all can participate, prosper, and reach their full potential" (Policy Link 2021). Equity means creating the conditions, practices and environment that would enable all communities and individuals to lead healthy, thriving lives, recognizing that communities and individuals have historically faced and continue to face today discrimination and oppression because of their race, gender, sexuality, ability, citizenship status, or other characteristics. Thus, distributional equity includes increasing access to power, redistributing and providing additional resources, and eliminating barriers to opportunity.

Evapotranspiration
The loss of water from the soil both by evaporation and by transpiration from plants growing in the soil (USEPA 2010).

Exposure (to climate hazards)
The effects of climate change that a project will face. Exposure includes change in the severity and location of a climate hazard (i.e., flood intensity associated with a flood zone). Projects can be exposed to both primary effects of climate change (i.e., sea level rise, reduced precipitation) and associated secondary effects (i.e., extreme high tides, reduced snowpack).

Exposure (to air pollution)
The effects of air pollution that a project will face. People are exposed to air pollution in multiple ways, including breathing polluted air, eating foods that have accumulated pollutants, drinking contaminated water, ingesting contaminated soils, and touching contaminated surfaces. The primary human health and ecological impacts from exposure to criteria pollutants are defined in this appendix (see *Carbon Monoxide*, *Lead*, *Nitrogen Dioxide*, *Ozone*, *Particulate Matter*, and *Sulfur Dioxide*). Certain reduction measures, such as installation of diesel particulate filters on ventilation systems, may reduce exposure to air pollution.

Fugitive Dust
Dust particles that are introduced [or resuspended] into the air through certain activities such as soil cultivation, or vehicles operating on open fields or dirt roadways.

General Plan
A set of long-term goals and policies that guide local land use decisions. The 2003 *General Plan Guidelines* developed by the California Office of Planning and Research provides advice on how to write a general plan that expresses a community's long-term vision, fulfills statutory requirements, and contributes to creating a great community.

Global Warming Potential
The ratio of radiative forcing that would result from the emission of one unit of a GHG (e.g., methane, nitrous oxide) to that from the emission of one unit of CO_2 over a fixed period (e.g., 20 years, 100 years) (CCAR 2009). For example, methane (CH_4) has a 100-year GWP of 25, which means 1 metric ton of CH_4 has the same global warming impact as 25 metric tons of CO_2 over 100 years. CalEEMod uses GWPs from various publications depending on the pollutant (IPCC 2007, CARB 2020, WMO 2018) .

Graywater
Water from sinks, showers, tubs, and washing machines that has not contacted biological pathogens. It is non-drinkable water that can be collected and reused on site for irrigation, flushing toilets, and other purposes.

Greenhouse Gas
The principle anthropogenic GHGs contributing to global warming are CO_2, CH_4, nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). The most common GHGs emitted by land use developments and linear construction projects, which are quantified by CalEEMod, are CO_2, CH_4, N_2O, and HFCs (including refrigerants).

Hazard (Climate Hazard)
A danger to a project or a community caused or exacerbated by climate change, including extreme weather events or gradual changes in climate (i.e., flooding, wildfires, drought, increasing temperatures, reduced snowpack).

Headway
The amount of time, typically measured in minutes, that elapses between two public transit vehicles servicing a given route. Headway for buses and rail are generally shorter during peak periods and longer during off-peak periods. Headway is the inverse of frequency (i.e., headway = 1/frequency), where frequency is the number of arrivals over a given time, such as the number of buses per hour).

Health Equity
Health equity is achieved when all people have full and equal access to opportunities that enable them to lead healthy, thriving lives (California Health and Safety Code Section 131019.5).

Healthy Places Index®
Developed by the Public Health Alliance of Southern California, the HPI evaluates the socioeconomic and community conditions that shape health outcomes at the neighborhood level. The HPI score is calculated from eight weighted Policy Action Areas: Economic, Education, Transportation, Social, Neighborhood, Housing, Clean Environment, and Healthcare Access. The final HPI scores are then ranked as percentiles, with higher percentiles (closer to 100) indicating healthier community conditions, and lower (closer to 0) indicating less healthy conditions.

Impact (of climate change)
The way a project experiences an effect of climate change. A climate hazard's impact is determined by the project's vulnerability to a hazard and its adaptive capacity. Impacts can be direct (sea level rise, changes in precipitation) or secondary, meaning they are related to a specific sector (i.e., public health, water management, natural resources).

Infill Development
A project that is located within or contiguous to the central city. Examples of infill projects are construction on redevelopment areas, abandoned sites, or underutilized older buildings/sites.

Job Center
An area with a high degree and density of employment.

Kilowatt Hour (kWh)
The kWh is a measure of electrical energy that is equal to 3,600 kilojoules. It is commonly used by utilities to measure and bill consumers for their electricity use. The kWh is the basis for most energy-related GHG emissions calculations. Alternatively, megawatt hours (MWh) are also used. There are 1,000 kWh hours in 1 MWh.

Land Use Scale
The land use scale defines the geographic extent of the project and influences the applicability of various measures. CalEEMod includes two land use scales: Project/Site and Plan/Community.

Land Use Scale (Program/Community)
One of two land use scales. Projects that occur at the scale of a neighborhood (e.g., specific plan, general plan, climate action plan), corridor, or entire municipality (e.g., city- or county-level).

Land Use Scale (Project/Site)
One of two land use scales. Projects that occur at the scale of a parcel, business, or individual development smaller than a neighborhood.

Land Use Type
Land use types are broad categories of land uses with similar operating characteristics. Each of these land use types includes several more detailed land use subtypes. CalEEMod has eight land use types: Commercial, Educational, Industrial, Parking, Recreational, Residential, Retail, and Linear. The user-selected land use type is a foundational input to construction and operations modules because it determines many default parameters.

Land Use Subtype
Land use subtypes are distinct land use developments or facility types. CalEEMod has 79 different land use subtypes. These land use subtypes were chosen for inclusion in CalEEMod because each has an established trip rate, which is critical for mobile source calculations. The four land use subtypes for linear land use types were directly incorporated in CalEEMod from the RCEM. The user selected land use subtype is a foundational input to construction and operations modules because it determines many default parameters.

Landscape Area
Water features and all planting and turf areas in a landscape design plan, including any special landscape areas. The landscape area should not include building footprint, sidewalks, driveways, parking lots, decks, patios, or other hardscapes and non-irrigated areas designed for non-development.

Lead (Pb)
Pb is a soft metal that was previously added to gasoline, which, when combusted, generated small Pb particles that could be inhaled and deposited in environment (soil and water). Once absorbed into the body, Pb accumulates in bones and adversely affects multiple organ systems. Children are particularly at risk of lead poisoning. The primary health impacts of Pb exposure are anemia, behavioral disorders, low IQ, reading and learning disabilities, and nerve damage. Ecological effects of Pb include losses in biodiversity, changes in community composition, and decreased growth and reproductive rates in plants and animals. Leaded fuel in the U.S. was banned in all on-road vehicles in 1996. The primary sources of Pb emissions today are metal refineries, smelters, battery manufacturers, iron and steel producers, and racing and aircraft industries.

Lifecycle Emissions
Emissions that are produced from the energy and resources used throughout the lifecycle of a product or material. Lifecycle emissions include the extraction of raw resources, physical distribution, use of the product or material, and disposal at the end of a product's life.

Locational Context
Used to identify emission reduction measures within the transportation sector that are appropriate in certain types of neighborhoods differentiated by transportation characteristics and level of development (e.g., urban, rural, suburban). See *Suburban*, *Urban*, and *Rural*.

Low-Income Community
Low-income communities are census tracts with median household incomes at or below 80 percent of the statewide median income or at or below the state income limit threshold. Assembly Bill 1550 (Gomez, 2016) requires at least 10 percent of the state's cap-and-trade funds go to projects benefiting low-income households or communities.

Lumen
A unit measure of the brilliance of a source of visible light, or the power of light perceived by the human eye. The more lumens, the brighter the light. For example, a 100-watt incandescent bulb produces about 1,600 lumens. A 40-watt energy savings bulb produces about 450 lumens.

Master Planned Community
Large communities developed specifically incorporating housing, office parks, recreational area, and commercial centers within the community. Master planned communities tend to encompass a large land area with the intent of being self-sustaining. Many master planned communities may have lakes, golf courses, and large parks.

Mixed Use
A development project that incorporates more than one type of land use. For example, a mixed-use development may be a building with ground-floor retail and housing on the floors above. A larger mixed-use development may incorporate a variety of land uses within a short proximity of each other. This may include integrating office space, shopping, parks, schools, and residential development. Given the close proximities, mixed-use developments can encourage walking and other non-auto modes of transport from residential to office/commercial/institutional locations (and vice versa).

Nitrogen Dioxide (NO_2)
NO_2 can be directly emitted from combustion sources, such as boilers, gas turbines, and mobile and stationary engines. NO_2 is also naturally formed through photochemical reactions among nitric oxide (NO) and other air pollutants. Human exposure to NO_2 at high concentrations can aggravate lung and heart problems, intensify responses to allergens in asthmatics, decrease lung-function in children, and potentially lead to premature death. NO_2 is a precursor to O_3 formation and acid rain and can contribute to global warming and reduce water quality. High ambient NO_2 concentrations over prolonged periods may also injure crops.

Ordinance
A local law usually found in municipal code. Examples of ordinances include those related to noise control, snow removal, pet restrictions, and zoning.

Outcome Measures
Health and equity measures that focus on enhancing the project features and operational practices that advance equity-supportive outcomes.

Ozone (O_3)
Ground-level O_3, or smog, is not directly emitted into the atmosphere. Rather, it is naturally formed through photochemical reactions between volatile organic compounds (VOC) and nitrogen oxides (NO_X) (both by-products of combustion). Concentrations of ground-level O_3 are typically greatest on sunny days in urban environments, but because O_3 can be transported long distances in the air, rural communities also experience O_3 pollution. Exposure to ground-level O_3 at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggravate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Within the environment, ground-level

O_3 can cause crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death.

Particulate Matter
PM pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. NAAQS and CAAQS have been set for two sizes of PM—PM10 (10 microns in diameter or less) and PM2.5 (2.5 microns in diameter or less). PM10 typically deposits on the surfaces of the larger airways of the upper region of the lung and can induce tissue damage and lung inflammation and is linked with asthma and chronic obstructive pulmonary disease. PM2.5 travels into and deposits on the surface of the deeper parts of the lung and can induce tissue damage and lung inflammation and is also linked with hospitalizations from heart and lung causes. Depending on its composition, PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain.

Photovoltaic
A system that converts sunlight directly into electricity using cells made of silicon or other conductive materials. When sunlight hits the cells, a chemical reaction occurs, resulting in the generation of electricity (USEPA 2010). There are often many PV cells in a single solar panel.

Process Measures
Health and equity measures that focus on facilitating greater community participation and decision-making in the process of land use planning.

Recycled Water
Non-drinkable water that can be reused for irrigation, flushing toilets, and other purposes. It has been processed through a wastewater treatment plant, unlike greywater, and typically needs to be redistributed from the treatment plant to the site where it will be used.

Renewable Energy
Energy sources that are, within a short time frame relative to the Earth's natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon-neutral technologies such as biomass (IPCC 2001).

Resilience (to climate change)
The ability of an individual, project, community, or natural system to prepare, cope, and recover from disruptions, shocks, and stresses caused by climate impacts.

Ride Sharing
A form of carpooling or vanpooling where multiple people travel in the same vehicle instead of separately driving in individual vehicles. Ridesharing can be casual and formed independently or as part of an employer program.

Rural
An area characterized by little development. Compared to urban and suburban areas, rural areas have a lower density of residences, higher numbers of single-family residences, and higher numbers of vehicle-dependent land use patterns.

Sensitivity (to climate change)
The project's susceptibility to the effects of climate change. The degree to which different components of a project will be exposed to climate change and their capabilities hindered. Points of sensitivity include the project's functions, structures, and individuals who interact with the project. Sensitivity is an element of *Vulnerability*.

Separate Heat and Power
A typical system for acquiring heat and, separately, acquiring power. Thermal energy and electricity are generated and used separately. For example, heat is generated from a boiler while electricity is acquired from the local utility. Separate heat and power systems can be replaced by more efficient combined heat and power systems.

Sequestration
The process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through afforestation, reforestation, and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases or from processing fossil fuels to produce hydrogen- and carbon dioxide-rich fractions and long-term storage in underground depleted oil and gas reservoirs, coal seams, and saline aquifers (IPCC 2001).

Special Landscape Area
The portion of landscape area dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play, such as parks, sports fields, golf courses, and other areas where turf provides a playing surface.

Suburban
An area characterized by dispersed, low-density, single-use, automobile-dependent land use patterns, usually outside of the central city.

Sulfur Dioxide (SO_2)
SO_2 is generated by burning fossil fuels, industrial processes, and natural sources, such as volcanoes. Exposure to SO_2 at certain concentrations can increase incidence of pulmonary symptoms and disease, decrease pulmonary function, and lead to increased risk of mortality, especially among the elderly and people with cardiovascular disease or chronic lung disease. SO_2 deposition in the environment contributes to soil and surface water acidification and acid rain.

Title 24
Title 24, Part 6 regulates building energy efficiency standards in California. Regulated energy uses include space heating and cooling, ventilation, domestic hot water heating, and some hard-wired lighting. Title 24 determines compliance by comparing the modeled energy use of a "proposed home" to that of a minimally Title 24 compliant "standard home" of equal dimensions. Title 24 focuses on building energy efficiency per square foot; it places no limits upon the size of the house, or the actual energy used per dwelling unit. The current Title 24 standards were published in 2019.

Transit-Oriented Development
Transit-oriented development (TOD) refers to projects built in compact, walkable areas that have easy access to public transit, ideally in a location with a mix of uses, including housing, retail offices, and community facilities. TODs are generally described as places within a 10-minute walk (0.5 mile) of a high-frequency rail transit station (either rail or bus with headways of less than 15 minutes).

Transit Ridership
The number of passengers who ride in a public transportation system, such as buses and subways.

Transportation Demand Management
A transportation strategy designed to increase the transportation system efficiency and reduce demand on the system. Common transportation-demand management (TDM) strategies include discouraging single-occupancy vehicle travel; encouraging more efficient travel patterns and alternative modes of transportation (e.g., walking, bicycling, public transit, and ridesharing); and shifting travel patterns from peak to off-peak hours and to closer destinations.

Tree and Grid Network
Describes the layout of streets within and surrounding a project. Streets that are characterized as a tree network actually look like a tree and its branches. Streets are not laid out in any uniform pattern, intersection density is low, and the streets are less connected. In a grid network, streets are laid out in a perpendicular and parallel grid pattern. Streets tend to intersect more frequently, intersection density is higher, and the streets are more connected.

Trip Purpose
CalEEMod divides total residential trips across the following three trip purpose types.

- "Home-Work (H-W)" = represents trips traveling in either direction between home and work locations.
- "Home-Shop (H-S)" = represents trips traveling in either direction between home and shopping destinations (generally retail).
- "Home-Other (H-O)" = represents trips traveling in either direction between home and all other locations that are not work or shopping destinations (e.g., school, park, gym).

CalEEMod divides total non-residential trips across the following three trip purpose types.

- "Home-Work (H-W)" = represents trips traveling in either direction between home and work locations.
- "Work-Other (W-O)" = represents trips made by an employee traveling in either direction between a work location and all other locations that are not home.
- "Other-Other (O-O)" = represents trips made by a person traveling in either direction between land uses that do not involve home or work locations.

Under-Served (or Under-Represented), Under-Resourced, and/or Marginalized Communities
Communities that have been historically neglected by governments at all levels, whether because of policy (e.g., redlining), systemic racism, or a combination of factors. These communities are likely to not only experience greater levels of day-to-day pollution burdens, but also have greater vulnerability to climate disasters, economic disruptions, and other challenges. In addition, community members have often been excluded from decision-making and lack the resources and capacity to participate meaningfully in land use planning and other civic and political processes.

Urban
An area located within the central city with higher density land uses than in the suburbs. Often characterized by multi-family housing, tall office buildings, and dense retail.

Urban Heat Island Effect
A term used to describe when a developed area is warmer than the surrounding rural areas, caused by urban land surfaces that retain heat (e.g., concrete, asphalt, metal, and other materials found in buildings and pavements). These urban surfaces can be darker than natural vegetation found in more rural areas. Darker surfaces absorb more sunlight that lighter surfaces, resulting in more heat (see *Albedo*). Urban environments also tend to have fewer plants and trees compared to rural locations. Plants and trees release water vapor to the air

through transpiration, cooling the ambient temperature. Urban tree planting and measures requiring lighting building surfaces can help reduce the urban heat island effect.

Vehicle Miles Traveled
The number of miles driven by vehicles, an important traffic parameter, and the basis for most traffic-related emissions calculations.

Vehicle Occupancy
The number of persons in a vehicle during a trip, including the driver and passengers.

Vulnerable Population (to climate change)
A group of individuals or a community that faces greater risks and has higher sensitivity to the impacts of climate change. Additionally, these groups may have a lower ability and/or fewer or insufficient resources to manage or recover from climate impacts. Populations may be vulnerable because of their physical environment, socioeconomic demographics, political status, or other drivers. Example factors that can contribute to a population's vulnerable status include race, class, sexual orientation, sexual identification, and income-status.

Vulnerability (to climate change)
The extent to which a project is susceptible to climate change. Vulnerability is the combination of a project's sensitivity, exposure, and adaptive capacity to climate hazards. Vulnerability includes susceptibility to direct climate impacts as well as secondary climate impacts. Vulnerability encompasses not only physical threats to a project's structure or facilities, but also impacts on a project's functions, operations, and users.

References

California Air Resources Board (CARB). 2020. *Refrigerant Management Program: Service Technicians & Contractors*. Available: https://ww2.arb.ca.gov/our-work/programs/refrigerant-management-program/rmp-servicetechnicians-contractors. Accessed: January 2021.

California Climate Action Registry (CCAR). 2009. *General Reporting Protocol, Version 3.1.* Available: https://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf.

California Energy Commission (CEC). 2021. *About Cal-Adapt*. Available: https://cal-adapt.org/about/. Accessed: November 2021.

California Environmental Protection Agency (CalEPA). 2017. *Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (De Leon)*. Available: https://calepa.ca.gov/wp-content/uploads/sites/6/2017/04/SB-535-Designation-Final.pdf. Accessed: May 2021.

Intergovernmental Panel on Climate Change (IPCC). 2001. *Third Assessment Report: Climate Change 2001 (TAR). Annex B: Glossary of Terms.* Available: http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: *The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp. Available: https://www.ipcc.ch/report/ar4/wg1/. Accessed: January 2021.

Policy Link. 2021. *Mission Statement*. Available: https://www.policylink.org/about-us/mission-statement. Accessed: May 2021.

U.S. Environmental Protection Agency (USEPA). 2010. *Greenlining EPA Glossary.* Available: https://www.epa.gov/oaintrnt/glossary.htm.

World Meteorological Organization (WMO). 2018. *Scientific Assessment of Ozone Depletion: 2018, Global Ozone Research and Monitoring Project—Report No. 58*. 5886 pp., Geneva, Switzerland.