



INTERIM GUIDANCE: DETERMINING CEQA SIGNIFICANCE FOR GREENHOUSE GAS EMISSIONS FOR PROJECTS ON THE STATE HIGHWAY SYSTEM

ENVIRONMENTAL MANAGEMENT OFFICE
DIVISION OF ENVIRONMENTAL ANALYSIS

California Department of Transportation

April 2019

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Introduction/Background

The intent of this interim technical guidance is to provide supplemental information to support Caltrans California Environmental Quality Act (CEQA) practitioners in making determinations of CEQA significance for GHG emissions related to a proposed project for which Caltrans is CEQA lead. Caltrans' overall process for CEQA analysis of projects on the State Highway System (SHS) is outlined on the Standard Environmental Reference (SER), with additional information provided in the environmental document Annotated Outlines found on the SER. This is technical guidance only and is not intended to constitute a regulation or be construed as legal advice.

With the passage of Assembly Bill (AB) 32, The Global Warming Solutions Act of 2006, California embarked on a progressive approach to combat the anticipated effects of climate change. Goals for reducing greenhouse gas (GHG) emissions and preparing for the negative impacts of climate change such as extreme weather events, changes in precipitation, and wildfire cycles are at the forefront of many laws, executive orders, and policies across the state.

Caltrans integrates the state's climate goals on GHG reduction and adaptation into departmental decisions and activities. Caltrans promotes and implements measures, practices, and business operations that minimize GHG emissions. These activities include working with our local partners to advocate for efficient land use planning; applying transportation system management (TSM) strategies; implementing operational improvements to increase the efficiency of the transportation system; promoting active transportation; incorporating climate change considerations into the design and maintenance of our facilities; and seeking new opportunities to implement clean-energy alternatives when possible.

In March 2010, in accordance with Senate Bill (SB) 97, the Governor's Office of Planning and Research (OPR) published guidelines requiring analysis of GHG emissions in CEQA documents. Since that time, Caltrans CEQA documents have included project-level analysis of GHG emissions for transportation projects. Pursuant to Section 15064.4(a) of the CEQA Guidelines, Caltrans, as a CEQA lead agency, makes a good faith effort to describe, calculate, and/or estimate the amount of GHG emissions that may result from a proposed project.

The Caltrans Division of Environmental Analysis (DEA) is responsible for ensuring that GHG emissions are considered in all CEQA documents. The analytical approach Caltrans uses for project-level climate change/GHG is located within the CEQA section of the Caltrans environmental document annotated outlines located on the Forms and Templates page of the SER at <http://www.dot.ca.gov/ser/forms.htm>.

The current approach to GHG analysis includes the following components:

- Describe the regulatory setting of state and federal efforts to reduce emissions.
- Provide a quantitative analysis for capacity-increasing or congestion-relief projects, using CT-EMFAC modeling; or a qualitative analysis for non-capacity-increasing projects.
- Analyze (with good faith effort based on available scientific information), describe, and calculate or estimate the amount of GHG emissions resulting from operation of a proposed project.
- Quantify construction emissions.
- Discuss measures that Caltrans is implementing to reduce GHG emissions at a Department level.

- Discuss measures to reduce GHG emissions for the proposed project being analyzed.
- Discuss compliance with Executive Order (EO) S-13-08 regarding adaptation and sea-level rise.

This Interim Guidance establishes the need to make determinations of significance for GHG emissions, and as necessary, identify mitigation measures, as part of the CEQA analysis of projects for which Caltrans is the CEQA lead agency¹. This interim version of the guidance does not update the methodologies currently in place for evaluating projects' effects on GHG emissions. The figure below diagrams the elements of the approach to the analysis and impact determination. The sections following guide you through the current climate change analysis process step-by-step.

On December 28th, 2018, the California Office of Administrative Law completed the rulemaking process and approved amendments and additions to the CEQA Guidelines. These revisions reaffirm the need for CEQA lead agencies to make significance determinations related to greenhouse gas emissions. The revisions to the Guidelines are prospective and new requirements will apply to steps in the CEQA process not yet undertaken by the effective date of the revisions (the 120th day after the effective date of the Guideline amendments, § 15007). CEQA draft documents that are circulated after April 27, 2019 must adhere to this guidance which specifically mandates that Caltrans make CEQA significance determinations for greenhouse gas emissions.

This Interim Guidance addresses the need to make significance determinations for greenhouse gas emissions under CEQA. The traffic analysis that serves as the foundation for a significance determination for a roadway capacity project needs to include an induced travel component, to assess the project's impact on greenhouse gas emissions. Along with other considerations outlined in CEQA guidelines Section 15064.4, determination of whether a project has a significant impact under CEQA will include an analysis of whether the project would be consistent with the state's plans for meeting greenhouse gas emissions reduction targets and stated plan for achieving those emissions reductions (i.e. the California Air Resources Board [CARB] scoping plan). The final version of this document will provide guidance on those additional aspects of the analysis.

This Interim Guidance for Determining CEQA Significance for Greenhouse Gas Emissions is the beginning, not the end, of efforts to implement the CEQA Guidelines completed by OPR on December 28th, 2018. The amended CEQA Guidelines also now include provisions for the implementation of Senate Bill (SB) 743. SB 743 was passed in 2013 and added Section 21099 to the CEQA statute which directed OPR to prepare and adopt new CEQA Guidelines that would establish alternative metrics (in place of level of service [LOS]) to measure transportation impacts. The guidelines state: "(g)enerally, vehicle miles traveled is the most appropriate measure of transportation impacts.". For roadway projects, the CEQA Guidelines provide agencies the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.

Caltrans proposes using VMT as the primary metric for transportation impacts on the SHS and will work with OPR and the CARB to develop draft and final guidance and implement VMT as the metric. Additionally, Caltrans will hold workshops to engage regional and local transportation entities and other parties

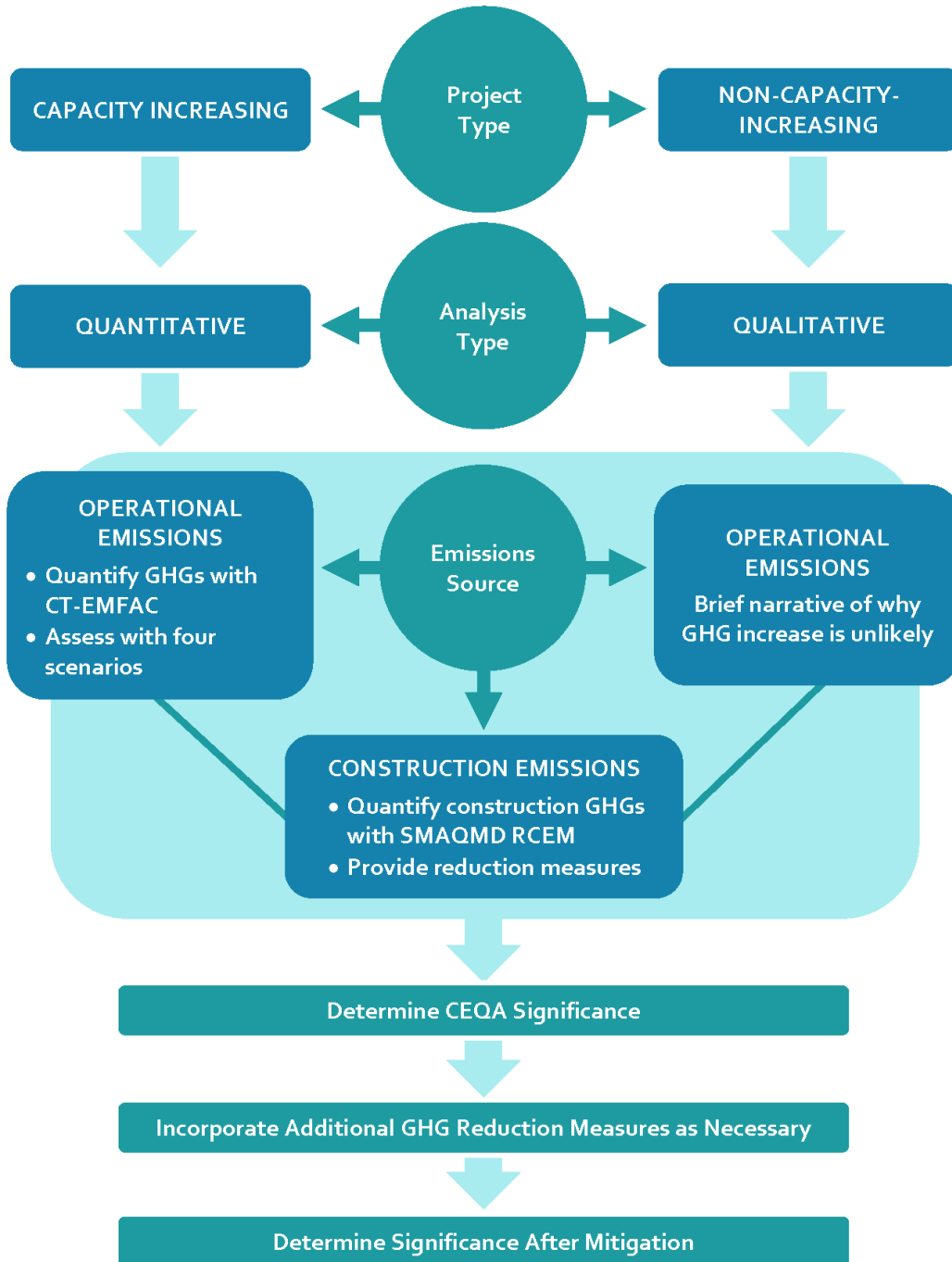
¹ This guidance is intended to address GHG significance determination only and is not intended to reflect broader amendments to the CEQA Guidelines, including but not limited to implementation of the provisions of SB743.

interested in the upcoming guidance. Caltrans future guidance for the implementation of SB 743 will provide additional quantification tools for VMT and further clarification on the types of on-system projects that will require an induced travel analysis and will provide recommendations on methodologies for calculating induced travel. In the interim, existing methods and tools may be applied². The guidance will provide recommendations for determining the significance of induced travel and increases in VMT under CEQA and will recommend acceptable mitigation for significant effects under CEQA. Additionally, the guidance will include clarification for acceptable mitigation such as VMT banking, regional investment programs, and exchange mechanisms.

Caltrans SB 743 Guidance draft documents are anticipated to be released in fall 2019 and finalized by winter 2020. This Interim Guidance for Determining CEQA Significance for Greenhouse Gas Emissions will be amended concurrently to ensure consistency of VMT assessment with Caltrans SB 743 guidance, state climate goals, and other changes, with input from state and local partners and other interested parties.

² There is an abundance of literature characterizing the magnitude of the induced travel effect in terms of “elasticities”, i.e. the percentage change in total VMT resulting from a given percentage change in lane-miles. In order to rely on a particular study, it is critical to match facility types and lane miles on those particular facilities with those used in the study. The National Center for Sustainable Transportation’s [“Induced Travel Calculator”](#), which is referenced on page 24 of OPR’s “Technical Advisory on Evaluating Transportation Impacts in CEQA”, addresses this concern. As noted by the Technical Advisory, this method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for an entirely new road that establishes new connectivity across a barrier (e.g., a bridge across a river), if that new road would substantially shorten a large share of existing trips. Additionally, the calculator is limited to use for *additions* of general-purpose and high-occupancy-vehicle lanes. It should not be used for additions of toll lanes or high-occupancy-toll (HOT) lanes, nor should it be used for capacity reductions or lane conversions. The calculator uses an elasticity of 1.0 for lane additions to interstate highways, and an elasticity of 0.75 for lane additions to class 2 or 3 facilities. Projects should be evaluated on a case by case basis to determine the most suitable methodology if an induced travel analysis is to be performed.

OVERVIEW
CEQA CONSIDERATION OF GREENHOUSE GAS EMISSIONS FOR PROJECTS
ON THE STATE HIGHWAY SYSTEM



Framing the Analysis: Regulatory Setting

Caltrans analysis of project-level GHG emissions reflects key state legislation, regulations, and policies as outlined below.

CEQA Guidelines

CEQA Guidelines Section 15064.4 states that the determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe and calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

- *Quantify GHG emissions resulting from a project and/or*
- *Rely on a qualitative analysis or performance-based standard.*

In determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes. A lead agency should consider the following factors, among others, when determining the significance of impacts from GHG emissions on the environment:

- *The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;*
- *Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;*
- *The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see, e.g., section 15183.5(b)). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.*
- *A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.*

Key State Laws and Executive Orders

Executive Order (EO) S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill (AB) 32 in 2006 and Senate Bill (SB) 32 in 2016.

Assembly Bill 32, Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that the CARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (California Health and Safety Code Section 38551(b)).

Senate Bill 97, Chapter 185, 2007, Greenhouse Gas Emissions: SB 97 requires OPR to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375, Chapter 728, 2008, Sustainable Communities and Climate Protection Act of 2008: SB 375 supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of sustainable communities. SB 375 requires ARB to set regional emissions reduction targets for passenger vehicle use. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Executive Order B-30-15 (April 2015) establishes a midterm statewide GHG emissions reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMTCO₂e). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32, Chapter 249, 2016: SB 32 codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

Senate Bill 391, Chapter 585, 2009, California Transportation Plan: This bill requires the department to update the California Transportation Plan to address how the state will achieve maximum feasible emissions reductions in order to attain a statewide reduction of greenhouse gas emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050. The bill requires the plan to identify the statewide integrated multimodal transportation system needed to achieve these results.

Senate Bill 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles promote the state's goals of reducing greenhouse gas emissions and traffic related air

pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

Senate Bill 150, Chapter 150 2017, Regional Transportation Plans: This bill requires CARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional greenhouse gas emission reduction targets.

Executive Order B-55-18, (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality, no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

Framing the Analysis: Project Type

The annotated outline provides two approaches to analyzing operational GHG emissions based on the potential of a project to affect change in petroleum consumption **Capacity-increasing projects require a quantitative analysis**, using CT-EMFAC to estimate operational GHG emissions. **Non-capacity-increasing projects use a qualitative analysis** that describes in narrative why an increase in operational emissions is unlikely. Determination of the project type usually occurs early in the project development process and is supported by the purpose and need of the project. Understanding the purpose and scope of the proposed project will assist the practitioner in determining the type and level of analysis to complete. The following tables include example projects for each project type. These are for illustrative purposes and not necessarily a complete list of all projects of each type.

Examples of Capacity-Increasing Projects

New Roadway/Facility	Additional Lanes	Interchange Reconfiguration	Other
Bypass	HOV lane	Ramp widening	Auxiliary lanes more than 1 mile long
New or extended highway	New general purpose or mixed-flow lanes	Increased through lanes on bridges	
New interchange	Managed, express, or toll lanes		

Examples of Non-Capacity Increasing Projects

Safety	Maintenance	Operational Improvements	Other
Install rumble strips	Pavement rehab	Construct turn pockets	Change super-elevation
Curve correction	Slope stabilization	Install vehicle classification System	Excess land disposal
Install guardrail	Replace bridge counterweights	Install loop detectors	Construct noise wall
Install median barrier	Replace bridge joint seals	Install ramp meters	Air space lease
Widen shoulders	Bridge overlay	Install signals	Storm-water improvements and installations
Install lighting	Storm damage repair	Installation of tolling equipment (e.g., electrical boxes, receivers, signal devices, and gantries)	Approve research grants
Install sidewalk	Restore planting and upgrade irrigation	Modify intersection	Relinquishment
Install signs	Replace culvert	On-ramp/off-ramp improvements	Upgrade park and ride
Replace bridge rails	Tie-back slope/soil nails	Install traffic operation system	Upgrade highway rest areas
Install highway planting	Replace bridge in-kind	Install closed circuit television cameras	Install wireless cell towers
Bridge retrofit	Repair sidewalk	Realignments that do not add capacity	Upgrade facilities for ADA compliance
Addition of an auxiliary lane of less than 1 mile in length	Repair signs/lighting	Grade separations	Construct mitigation site/environmental stewardship projects
	Install retaining wall	Install Roundabout	Test drilling and soil sampling
	Maintenance station improvements	Reduction in number of through lanes	Installation, repair or maintenance of Traffic Management System elements, or traffic control devices
	Pavement grinding	Installation or reconfiguration of traffic calming measures	Bike/pedestrian facilities and safety projects
	Culvert clean-out	Addition of traffic wayfinding signage	Encroachment permit applications
	Maintain stormwater facilities		

Framing the Analysis: Emissions Source

GHG emissions from transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and hydrofluorocarbons (HFC). CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Other GHGs including CH₄ and N₂O are also emitted during fuel combustion. HFC emissions from the transportation sector result from the use of mobile air conditioners and refrigerated transport³ rather than fuel combustion.

CO₂ accounts for 95 percent of transportation GHG emissions in the U.S. The largest sources of transportation-related GHG emissions are passenger cars and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the sector. The remainder of GHG emissions comes from other modes of transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants.

Transportation GHG emissions account for 41 percent of total California GHG emissions (2016), 28 percent of total U.S. GHG emissions (2016), and about 14 percent of global GHG emissions (2010).^{4,5} These estimates account only for tailpipe emissions from burning fossil fuels to power vehicles and do not account for GHGs emitted through other transportation lifecycle processes, such as the manufacture of vehicles, the extraction and refinement of fuels, and the construction and maintenance of transportation infrastructure. Including these processes, transportation lifecycle GHGs (including industrial and tailpipe emissions) are estimated to account for more than 50 percent of California's GHG emissions⁶.

Construction GHG emissions mainly result from fuel combustion by construction equipment, which may use diesel fuel as well as gasoline; transport of construction materials and debris; and vehicle trips by construction workers to and from the job site. The use of energy and materials can also contribute to a project's lifecycle GHG emissions.

³ <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

⁴ <https://www.arb.ca.gov/cc/inventory/inventory.htm>

⁵ <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>

⁶ <https://ca50million.ca.gov/transportation/>, CA Greenhouse Gas Inventory 2014 (Data Source: [CARB, California Greenhouse Gas Emission Inventory – 2016 Edition](#), <https://www.arb.ca.gov/cc/inventory/data/data.htm>).

Operational Emissions

The level of analysis necessary for a project should be commensurate with 1) the type of impacts that can be reasonably anticipated from the proposed project and 2) the degree to which the proposed project is expected to contribute to a measurable change in vehicle speed and volume. Projects that change volume and/or speed warrant quantitative analysis due to the link to change in petroleum use.

Operational emissions from Caltrans projects are those emissions that result from vehicle travel on the SHS. CO₂ typically represents the largest contribution to total GHG emissions; the 2016 ARB inventory indicated that CO₂ represented 83 percent of the total statewide inventory. Caltrans uses CT-EMFAC modeling to estimate these emissions for projects.

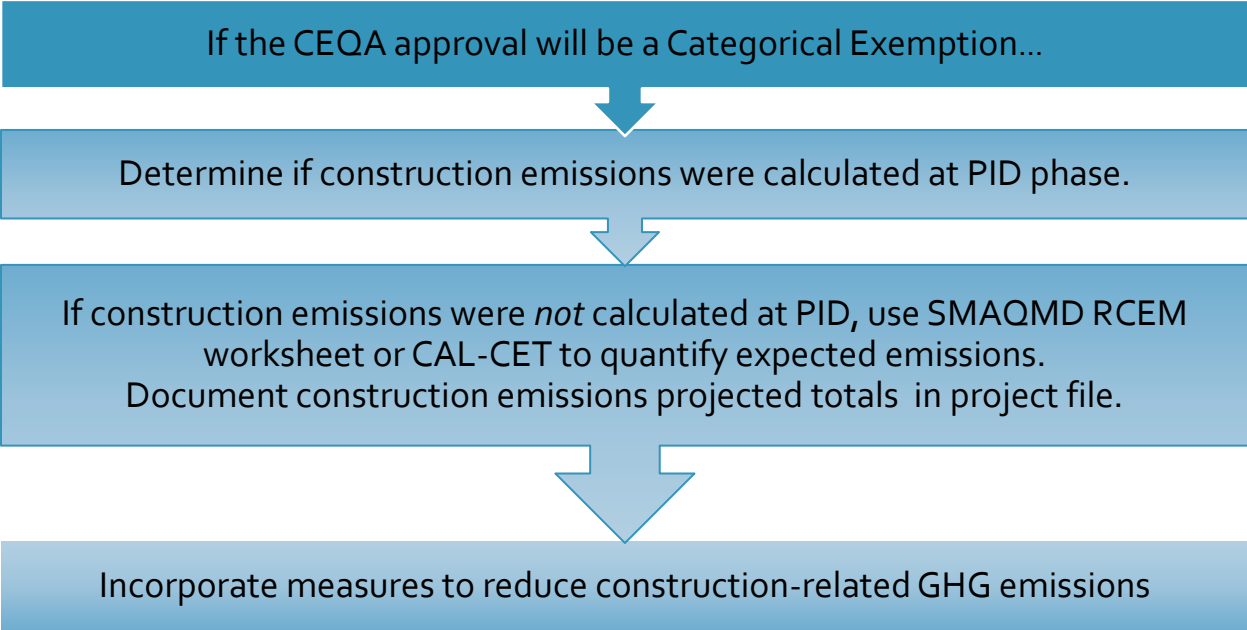
CARB developed the Emission FACTors (EMFAC) model to facilitate preparation of statewide and regional mobile source emissions inventories. The model generates emissions rates that can be multiplied by vehicle activity data from all motor vehicles, from passenger cars to heavy-duty trucks, operating on highways, freeways, and local roads in California. Caltrans' CT-EMFAC model uses data derived from EMFAC to streamline project-level emissions analyses. Caltrans recommends using the CT-EMFAC model to quantify mobile-source emissions from transportation projects on the SHS.⁷

⁷ This guidance does not currently account for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule on transportation emissions, which was proposed in August 2018 but has yet to be adopted. The SAFE rule would amend the existing Corporate Average Fuel Economy (CAFÉ) and GHG emissions standards for passenger cars and light duty trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. If finalized as proposed, the use of EMFAC and CT EMFAC for purposes of GHG emissions analysis will be re-evaluated.

Construction Emissions

Construction emissions are the inevitable result of construction processes such as operation of construction equipment, worker travel, and materials transport and processing. All projects requiring analysis for CEQA involve some level of construction emissions. **Therefore, construction emissions must be quantified, and measures must be incorporated to reduce related emissions.**

Caltrans considers construction emissions at two potential stages in project development, depending upon the type of project. For State Highway Operations and Protection (SHOPP) projects that otherwise qualify for a categorical exemption under CEQA, project-level construction emissions are calculated at the project initiation phase of the project, using the Federal Highway Administration (FHWA) Infrastructure Carbon Estimator (ICE) Tool. This provides a project-level performance measure for programming into the SHOPP program. This process is outlined in Transportation Planning’s guidance *District Guidance for Including GHG Emissions Calculations for 2018 and Future SHOPP Project Initiation Documents*, which provides further information on what projects are appropriate for use of the ICE tool.



For SHOPP projects that do not qualify for a categorical exemption under CEQA, and for all other projects with the potential to generate construction emissions, these calculations shall be completed at the Project Approval and Environmental Document (PA&ED) phase, using the [Sacramento Metropolitan Air Quality Management District’s \(SMAQMD\) Road Construction Emissions Model \(RCEM\)](#), or the [Caltrans Construction Emissions Tool \(CAL-CET\)](#).

Conducting The Analysis

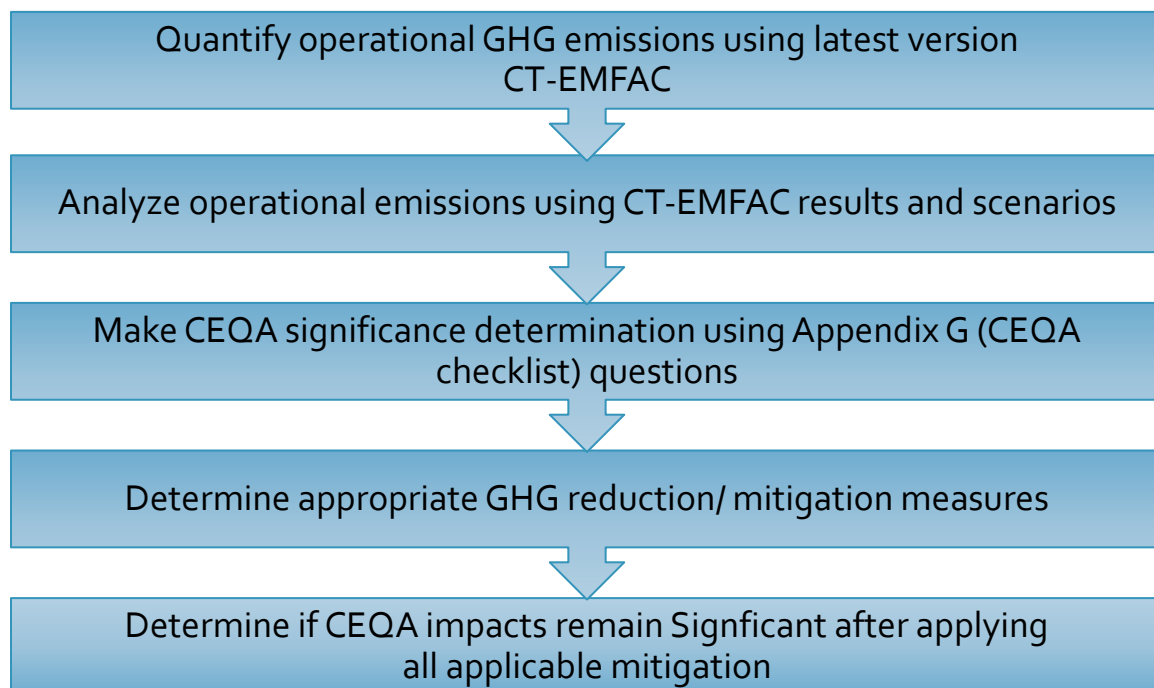
Capacity-Increasing Projects

Projects aimed at increasing vehicle capacity require a **quantitative** emissions analysis using the most current version of CT-EMFAC⁸ to calculate GHG emissions for the existing/ baseline conditions, as well as with and without the proposed project. Reporting quantitative emissions is necessary because these types of projects can both decrease GHG emissions in the near-term (e.g., increased vehicle speed that improves fuel economy) and increase GHG emissions by accommodating additional vehicle volumes and reduced vehicle speeds from increased congestion over the long-term.

CT-EMFAC is an on-road emissions modeling tool used in California for state implementation plan development and transportation conformity analysis. This model quantifies emissions of CO₂, criteria air quality pollutants, and mobile source air toxics. CT-EMFAC combines the emissions factors from ARB's EMFAC with project-specific forecasted transportation activity (fleet mix, speed distribution, and vehicle miles traveled [VMT]).

Use the results of the CT-EMFAC modeling of changes in GHG, refer to the four scenarios presented in the *Considerations for Significance Determinations* section to make an impact determination as discussed under *Answer CEQA Greenhouse Gas Checklist Question #1*.

QUANTITATIVE ANALYSIS FOR OPERATIONAL GHG EMISSIONS



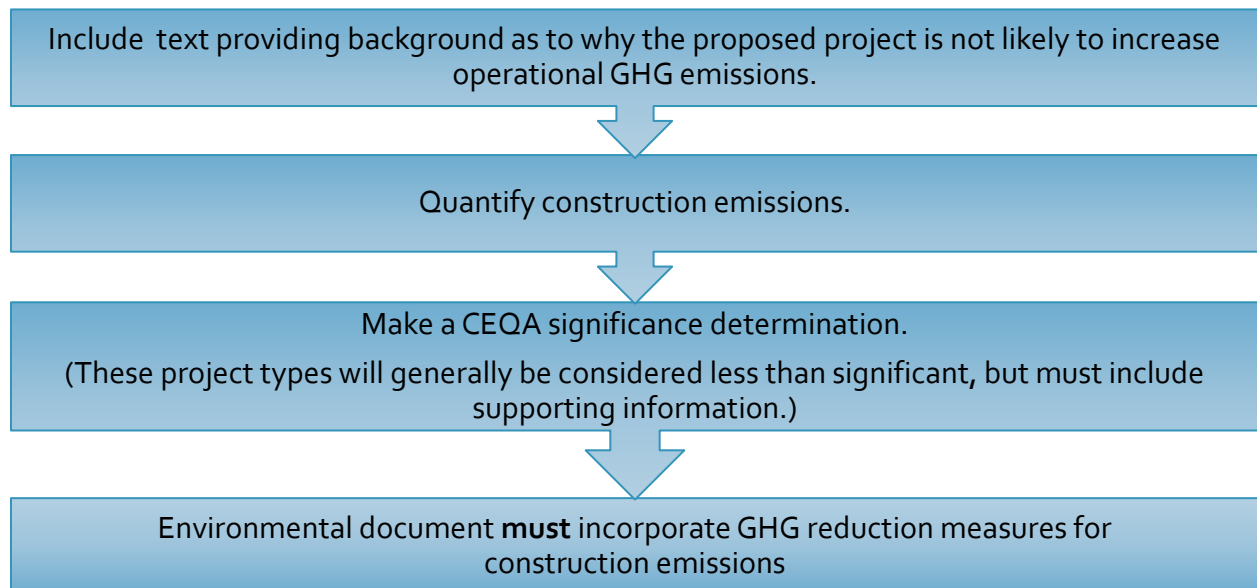
⁸ Consult with Headquarters DEA staff for concurrence if you believe use of previous version of EMFAC is warranted.

Non-Capacity-Increasing projects

Projects that do not add motor vehicle capacity will generally not increase operational GHG emissions. However, these projects will generate construction emissions. While operational emissions for these projects can be described qualitatively in a descriptive paragraph, construction emissions must be **quantified** using the SMAQMD RCEM or CAL-CET, or equivalent.

These project types will generally be considered less than significant under CEQA because there should be no increase in operational emissions. Determination of less-than-significant impact must be supported in the text of the environmental document. Standard conditions or best management practices designed to reduce or eliminate emissions **must** be included as part of the project to further reduce the potential for significant construction emissions.

QUALITATIVE ANALYSIS FOR OPERATIONAL GHG EMISSIONS IN CEQA DOCUMENT



Answer CEQA Checklist Greenhouse Gas Question #1

Would the project: generate greenhouse gas emissions, either directly or INDIRECTLY, that may have a significant impact on the environment?

Science⁹ indicates an aggressive future 2050 target is needed to lessen the potential impacts of global temperature rise. To date, however, there is no general state, federal, or international definition that describes what level of GHG emissions from an individual project would be considered an effect related to a *physical change* as defined by the CEQA Guidelines Section 15358 (b). In other words, analysis of an individual project's emissions will not result in determination of specific changes to wildfire cycles, changes in precipitation, number of extreme heat days, or other climate effects that can be directly attributed to the proposed project. Because CO₂ emissions represent the greatest percentage of GHG emissions, it has been selected as a proxy for potential climate change impacts generally expected to occur. The cumulative impacts from transportation, as described previously, account for more than half of California's GHG emissions.

CEQA Guidelines Section 15064.4 states that when assessing the significance of impacts from GHG emissions on the environment, a lead agency should consider, among other factors, the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting. While comparing future build to future no-build conditions may be useful in determining significance and in establishing the extent of project-level measures to reduce GHG emissions from the project, CEQA and the CEQA Guidelines remain focused on the comparison of future conditions with the project compared to existing conditions.

EO B-30-15 (April 2015) established an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure that California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. As a state agency, Caltrans is subject to this EO and supporting legislation.

Caltrans will use direction outlined in California legislation and EOs to inform its decision making for project-level CEQA significance determinations for projects on the SHS.

⁹ The Intergovernmental Panel on Climate Change (*Climate Change 2014 Synthesis Report Summary for Policymakers*) has identified limiting global warming to 2 degrees Celsius (35.6 degrees Fahrenheit) or less by 2050 as necessary to avoid potentially catastrophic climate change impacts, and remaining below this threshold requires accelerated reductions of GHG emissions.

Considerations for Significance Determinations

Capacity-Increasing Projects

Use CT-EMFAC modeling results and conduct analysis as outlined in example Scenarios 1–4 on the next page to reach a conclusion regarding whether the proposed project is likely to result in **operational** GHG emissions that would be considered significant pursuant to CEQA.

- **Scenario 1: Both future no-build and future build GHG emissions are lower than existing emissions.** In this scenario, because there is a reduction in future emissions compared to existing emissions, there is evidence of substantial progress in reducing emissions and the impact may be considered **less than significant**.
- **Scenario 2: Both future no-build and future build GHG emissions are lower than existing conditions; however, future build emissions are greater than future no-build emissions.** In this scenario, because there is a reduction in future emissions with the project compared to existing emissions, there is still evidence of substantial progress in reducing emissions and the impact may be considered **less than significant**.
- **Scenario 3: Both future no-build and future build GHG emissions are greater than existing conditions; however, future build emissions are lower than future no-build emissions.** In this scenario, despite the decrease in future emissions when comparing future build to future no-build, both are still higher compared to existing emissions. Given the goal to help meet 2030 and 2050 reduction targets and the fact that emissions increase compared to existing conditions, the impact will still generally be considered **significant**.
- **Scenario 4: Both future no-build and future build emissions are greater than existing conditions and future build emissions are greater than future no-build emissions.** In this scenario, because of the increase compared to existing emissions and the lack of progress toward meeting 2030 and 2050 reduction targets, the impact would likely be **significant**.


Standard conditions or best management practices designed to reduce or eliminate construction-related emissions must be included in **all** projects to further reduce the potential for significant construction emissions. If the GHG impact is likely significant, then additional measures, above and beyond the standard conditions or best practices, would be required to avoid or reduce the significant impact associated with operational GHG emissions.


Non-Capacity-Increasing Projects


As discussed earlier in *Framing the Analysis: Analysis Type*, the GHG impacts of non-capacity-increasing projects will generally be considered less than significant under CEQA because there should be no increase in operational emissions. The inclusion of standard conditions or best management practices designed to reduce or eliminate emissions as part of the project is **required** and should eliminate the potential for significant impacts related to construction emissions.


Use the Results from CT-EMFAC Model to Inform Determination

The generalized conclusions for the scenarios below are based on the comparison of existing/baseline conditions to future build conditions, and future build to future no-build conditions. Example results have been provided for illustration.

Scenario 1 				
			Example Alternative	CO ₂ e Emissions
Compare	Existing to Build	If the Build is less than Existing	Existing/Baseline Year	500 MT/yr
Compare	No-Build to Build	And the Build is less than No-Build	Design Year No-Build Design Year Build	450 MT/yr 400 MT/yr
Generally Considered Less than Significant				

Scenario 2 				
			Example Alternative	CO ₂ e Emissions
Compare	Existing to Build	If the Build is less than Existing	Existing/Baseline Year	700 MT/yr
Compare	No-Build to Build	And the Build is more than No-Build	Design Year No-Build Design Year Build	500 MT/yr 600 MT/yr
Generally Considered Less than Significant				

Scenario 3 				
			Example Alternative	CO ₂ e Emissions
Compare	Existing to Build	If the Build is more than Existing	Existing/Baseline Year	400 MT/yr
Compare	No-Build to Build	And the Build is less than No-Build	Design Year No-Build Design Year Build	600 MT/yr 500 MT/yr
Generally Considered Significant				

Scenario 4 				
			Example Alternative	CO ₂ e Emissions
Compare	Existing to Build	If the Build is more than Existing	Existing/Baseline Year	500 MT/yr
Compare	No-Build to Build	And the Build is more than No-Build	Design Year No-Build Design Year Build	700 MT/yr 900 MT/yr
Generally Considered Significant				

MT/yr = metric tons per year

Answer CEQA Checklist Greenhouse Gas Question #2

Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gas?

The following presents considerations for analysis and supporting documentation for determining whether the proposed project would conflict with applicable plans, policies, or regulations for the purpose of reducing GHG emissions. Include discussion of the following topics to support CEQA significance determination for GHG emissions.

AB 32/SB 32

AB 32 established a 2020 target of 1990 levels by 2020 (ARB Scoping Plan and 2014 update). SB32 established 2030 target of 40 percent below 1990 levels by 2030 (ARB Scoping Plan 2017 update). Strategies to achieve these statewide targets are outlined in the ARB *Climate Change Scoping Plan*, the State's plan for mitigating the impacts of climate change.

Caltrans generally demonstrates consistency with the Scoping Plan through department-wide policies, strategic management plans, goals, and objectives related to GHG emissions reduction.

- Is the proposed project consistent with department goals and objectives related to GHG reduction?
- Does the project include relevant transportation strategies from the California's 2017 *Climate Change Scoping Plan*?

SB 375

Because the regional MPOs are required to prepare plans to reduce GHG emissions that holistically consider transportation and land use, consistency with the RTP/SCS is desirable and may help impact determinations for projects in which the MPO has adequately addressed GHG reduction in the supporting Environmental Impact Report (EIR). To demonstrate consistency with SB 375, a project must be included in the current version of an RTP/SCS and must identify and implement applicable GHG reduction measures listed in the EIR prepared in support of the current RTP/SCS. Note, inclusion of a project in an RTP/SCS would not by itself be sufficient to ensure a project has a less than significant impact.

For the proposed project, consider:

- Is the proposed project included in an adopted Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) that reflects the most recent GHG reduction targets set by CARB?
- Did the EIR determine impacts to GHG to be less than significant or less than significant with mitigation?
- If the RTP/SCS EIR identified GHG mitigation requirements, will the project incorporate **all** relevant GHG reduction measures identified in the EIR?

EO B-30-15

This EO requires all state agencies to implement measures, pursuant to statutory authority, to achieve 2030 and 2050 GHG emission reduction targets. While no single project is expected to achieve the reduction target alone, the questions below will assist with supporting whether the project will help or hinder substantial progress toward these goals.

- Is the proposed project anticipated to increase operational GHG emissions over the existing/baseline condition?
- Does the proposed project incorporate measures to reduce GHG emissions?

Locally Adopted Climate Action Plans

Many local jurisdictions throughout the state have adopted climate action plans. Consider the proposed project's consistency with these adopted plans.

- Does the City or County in which the proposed project is located have an adopted climate action plan?
- Will the proposed project incorporate relevant measures or policies identified in the adopted climate action plan?

General Plan

Every community in California has an obligation to consider how its general plan update may affect its community-wide GHG emissions and the General Plan Guidelines have been updated to include GHG analysis. Consider the proposed project's consistency with these adopted plans.

- Does the proposed project incorporate specific measures, or features that support goals of, the GHG reduction strategies (if any) outlined in the circulation element or other element of the applicable general plan?

Answer CEQA Checklist Question related to Mandatory Findings of Significance

Does the project have impacts that are individually limited, but cumulatively considerable?

Cumulative impacts refer to whether two or more individual effects, when considered together, are considerable, or compound or increase other environmental effects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of each project when added to other closely related past, present, and reasonably foreseeable probable future projects (CEQA Section 15355).

The California Supreme Court has stated on several occasions:

[B]ecause of the global scale of climate change, any one project's contribution is unlikely to be significant by itself. The challenge for CEQA purposes is to determine whether the impact of the project's emissions of greenhouse gases is *cumulatively* considerable, in the sense that "the incremental effects of [the] individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." "With respect to climate change, an individual project's emissions will most likely not have any appreciable impact on the global problem by themselves, but they will contribute to the significant cumulative impact caused by greenhouse gas emissions from other sources around the globe. The question therefore becomes whether the project's incremental addition of greenhouse gases is 'cumulatively considerable' in light of the global problem, and thus significant." (*Center for Biological Diversity v. California Dept. of Fish and Wildlife* (2015) 62 Cal.4th 204, 219; *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497, 512.)

The analysis of cumulative impact, therefore, is focused on the project's potential to incrementally increase CO₂ emissions. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHGs. In assessing cumulative impacts, it must be determined if a project's incremental effect is cumulatively considerable (CEQA Guidelines Sections 15064(h)(1), 15065(a)(3), and 15130). To make this determination, the incremental impacts of the project must be considered collectively with the effects of past, current, and probable future projects.

While there has been no legislative action to adopt the 2050 GHG reduction target recommended in EOs S-3-05 and B-30-15, or the more aggressive target of carbon neutrality by 2045 laid out in EO-B-55-18, substantial scientific evidence supports consideration of consistency with the state's long-term reduction goals as appropriate for the determination of whether an individual project's emissions would be cumulatively considerable. In addition, a project's contribution may be considered less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure designed to alleviate the cumulative impact (CEQA Guidelines 15130(a)[3]). In this case, Caltrans would need to identify

facts and provide analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

For the purposes of addressing California's climate goals and targets related to GHG emissions, if the proposed project is expected to result in an increase of operational emissions when compared to existing conditions, then it would be considered a cumulatively considerable contribution to global climate change unless substantial evidence is presented that the project will implement or fund its fair share of the GHG cumulative impact.

Identify and Incorporate All Applicable GHG Reduction Measures

Generally, CEQA mitigation policy for Caltrans projects is outlined in the Caltrans' Environmental Management Office Memo *Significance and Mitigation under the California Environmental Quality Act (November 2016)* guidance. Additionally, CEQA Guidelines Section 15126.4(c) has identified specific mitigation related to GHG impacts.

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring and reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effect of greenhouse gas emissions may include, among others:

- (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
- (2) Reduction in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;¹⁰
- (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
- (4) Measures that sequester greenhouse gases;
- (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

Measures identified to reduce GHG emissions must include specific, enforceable actions to reduce project emissions. To the extent feasible and within the parameters of Caltrans' contract authority, each measure should include references or a logical, fact-based explanation as to why a specific measure is expected to achieve the stated reductions. We recognize that information is not readily and consistently available to accurately quantify GHG reductions for all available project-specific measures. In the absence of measurable benefits, explain how the identified measures are proportional to the source and magnitude of the identified GHG emissions related to the proposed project. Due to the nature of GHG emissions, reduction and mitigation measures do not need to be directly linked to the proposed project location and can be successfully implemented off-site if needed. General measures are listed below. See Appendix A for additional GHG reduction resources.

Operational Emissions Reduction Measures

Operational emissions refer to petroleum use by vehicles on the state highway system. Measures to address operational emissions are best considered in the planning or early development of the proposed project. If

¹⁰ CEQA Guidelines Appendix F, *Energy Conservation*

GHG emissions have been determined to have a CEQA significant impact, additional measures shall be incorporated.

- Measures to reduce vehicle miles travelled (VMT).
- Measures listed in the applicable EIR prepared for the RTP/SCS that have been identified to reduce GHG emissions or to reduce VMT.
- Measures to improve energy efficiency.
- Measures to improve water efficiency (including but not limited to landscaping and building operations).
- Incorporation of Complete Streets components.
- Installation of solar to supply power to highway facility components or buildings.
- Installation of zero-emission vehicle (ZEV) infrastructure (e.g., electric vehicle charging stations).
- Incorporation of native plants and vegetation (replacing more vegetation than was removed) to the project design to increase carbon sequestration.
- Installation of urban planting/vegetation to reduce “heat island” effects.
- Inclusion of landscaping components such as mulch and compost application to improve carbon sequestration rates in soils and reduce organic waste.
- Incorporation of green infrastructure (planted areas) instead of gray (concrete) storm water facilities.
- Alternative selection that minimizes disturbance of undeveloped land.
- Design and installation of long-life pavement structures to minimize life-cycle costs. Consider future climate conditions in decisions. (E.g., areas that are expected to experience increased temperatures and extreme heat days may have different pavement needs than areas expecting more frequent freezing temperatures).
- Incorporation of permeable pavements to reduce urban heat islands. The void structure of pervious concrete acts as insulation and prevents the pavement from storing heat that would otherwise raise air temperatures (resulting in a greater use of air conditioning in nearby buildings).

Construction Emissions

Measures to reduce construction-related GHG emissions **must be included in all projects**. Not all listed measures will be feasible or relevant to every project, but all feasible measures must be included for every project. Examples of general construction emissions reduction measures that can be incorporated are listed below. Some of these measures are best considered early in the project development and should be discussed with the project development team and the design engineer.

- Alternative fuels such as renewable diesel should be used for construction equipment.
- Limit idling to 5 minutes for delivery and dump trucks and other diesel-powered equipment.
- Schedule truck trips outside of peak morning and evening commute hours.
- Reduce construction waste and maximize the use of recycled materials (reduces consumption of raw materials, reduces landfill waste, and encourages cost savings).
- Incorporate measures to reduce consumption of potable water.
- Encourage Improved fuel efficiency from construction equipment (examples provided below):
- Maintain equipment in proper tune and working condition

- Right size equipment for the job
- Use equipment with new technologies
- Construction Environmental Training: Supplement existing training with information regarding methods to reduce GHG emissions related to construction.
- Encourage the use of alternative bridge construction (ABC) (reduce construction windows, use of more precast elements that in turn reduce need for additional falsework, forms, bracing, etc.)
- Maximize use of recycled materials (e.g., tire rubber).
- Salvage large removed trees for lumber or similar on-site beneficial uses other than standard wood-chipping. (E.g., use in roadside landscape projects or green infrastructure components).
- On-site recycling of existing project features is encouraged: (E.g., MBGR, light standards, sub-base granular material, or native material that meets Caltrans specifications for incorporation into new work).
- Lower the rolling resistance of highway surfaces as much as possible while still maintaining design and safety standards.
- Earthwork Balance: Reduce the need for transport of earthen materials by balancing cut and fill quantities.
- Cold in-place recycling: This pavement rehabilitation treatment is used on low traffic-volume, hot mix asphalt (HMA) pavements to extend the pavement service life and to recycle natural resources. The treatment also reduces emissions and energy use associated with processing and hauling these materials. <https://www.dot.ny.gov/programs/climate-change/activities> .
- Reduce need for electric lighting by using ultra-reflective sign materials that are illuminated by headlights.

Appendix A: GHG Reduction Measures References

FHWA Sustainability Website: <https://www.fhwa.dot.gov/environment/sustainability/>

*Environmental Impact Reports for Regional
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Alpine County	<i>Alpine County Draft Initial Study/Environmental Checklist.</i> September 2015. http://www.alpinecountyca.gov/index.aspx?NID=369
Amador County and cities of Jackson, Lone, Sutter Creek, Plymouth, and Amador City	<i>2015 Amador County Regional Transportation Plan Update Final Environmental Impact Report and CEQA Findings.</i> http://actc-amador.org/plans/
Association of Monterey Bay Area Governments (AMBAG) Monterey, San Benito, and Santa Cruz Counties	<i>2040 MTP/SCS and RTPs for Monterey, San Benito, and Santa Cruz Counties Final Environmental Impact Report.</i> Adopted June 2014. (2040 Technical Update to be adopted June 2018). http://www.ambag.org/programs-services/planning/metro-transport-plan/2040-MTP-SCS
Bay Area Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) Counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma	<i>Plan Bay Area 2040.</i> Draft and Final Environmental Impact Reports. http://2040.planbayarea.org/reports
Butte County	Butte County Association of Governments 2016 Regional Transportation Plan and Sustainable Communities Strategy for Butte County. Final Environmental Impact Report. November 2015. http://www.bcag.org/Planning/RTP--SCS/2016-RTPSCS-EIR/index.html
Calaveras County	Calaveras Council of Governments. <i>Initial Study / Mitigated Negative Declaration for the 2017 Calaveras Regional Transportation Plan.</i> August 2017. http://calaverasrtp.com/
Colusa County	<i>2013 Colusa County Regional Transportation Plan.</i> Adopted September 2014. (Chapter 6, Environmental Review, is the Initial Study, certified January 28, 2013) http://www.countyofcolusa.org/index.aspx?NID=150
Del Norte County	Del Norte Local Transportation Commission. <i>2016 Addendum to the Programmatic Environmental Impact Report for the Regional Transportation Plan.</i> November 2016. http://www.dnltc.org/planning-documents-reports/
El Dorado County	El Dorado County Transportation Commission. <i>El Dorado County 2015–2035 Regional Transportation Plan Environmental Impact</i>

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	<i>Report</i>
Fresno County	<p>http://www.edctc.org/3/RTP2015-2035.html</p> <p>Fresno Council of Governments. <i>2014 Regional Transportation Plan and Sustainable Communities Strategy, Draft Program Environmental Impact Report</i> (through 2040)</p> <p>https://www.fresnocog.org/project/regional-transportation-plan-rtp/</p>
Glenn County	<p><i>Glenn County Final Initial Study/Environmental Checklist for the 2015 Regional Transportation Plan</i>. June 2015.</p> <p>https://glenncountyrtp.wordpress.com/documents/</p>
Humboldt County	<p>Humboldt County Association of Governments. <i>Humboldt Regional Transportation Plan 2013/2014 Update Final Environmental Impact Report</i>. July 2014.</p> <p>Humboldt County Association of Governments. <i>VROOM... Variety in Rural Options of Mobility. HCAOG 20-Year Regional Transportation Plan 2017 Update</i>. Adopted December 2017. Appendix B. Addendum to the Final Environmental Impact Report</p> <p>http://hcaog.net/2014-humboldt-county-regional-transportation-plan-o</p>
Imperial County	See Southern California Association of Governments (SCAG)
Inyo County	<p>Inyo County Transportation Commission. <i>Initial Study and Proposed Negative Declaration for the Inyo County 2015 Active Transportation Plan</i>. February 2016.</p> <p><i>Inyo County Regional Transportation Plan 2015 Initial Study/Negative Declaration</i></p> <p>http://www.inyoltc.org/rtp.html</p>
Kern County and cities of Arvin, Bakersfield, California City, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, Wasco	<p>Kern Council of Governments. <i>2014 Regional Transportation Plan for Kern County Final Environmental Impact Report</i>. June 2014.</p> <p>http://www.kerncog.org/category/docs/rtp</p>
Kings County Kings County Association of Governments (Kings County and the cities of Avenal, Corcoran, Hanford, and Lemoore)	<p>Kings County Association of Governments. <i>2014 Regional Transportation Plan and Sustainable Communities Strategy Final Program Environmental Impact Report</i>. July 2014.</p> <p>http://www.kingscog.org/index.asp?SEC=20849C03-018A-4805-BA34-568DAAB5D89C&Type=B_BASIC</p>
Lake County	<p>Lake County/City Area Planning Council. <i>2017 Lake County Regional Transportation Plan</i>. (Appendix D, CEQA Document)</p> <p>https://www.lakeapc.org/library/plans/</p> <p>https://www.lakeapc.org/wp-content/uploads/2018/06/2017-RTP-Final.pdf</p>

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Lassen County	Lassen County Transportation Commission. <i>Lassen County 2012 Regional Transportation Plan</i> . http://www.lassentransportation.com/resources/transportation-planning-documents/2012-regional-transportation-plan
Los Angeles County	See Southern California Association of Governments (SCAG)
Madera County	Madera County Transportation Commission. <i>Draft Program Environmental Impact Report for the 2014 Regional Transportation Plan & Sustainable Communities Strategy</i> . May 2014. http://www.maderactc.org/rtpscs/
Mariposa County	Mariposa County Local Transportation Commission. <i>2012 Regional Transportation Plan</i> . March 2013. http://www.mariposacounty.org/index.aspx?nid=1478
Mendocino County and cities of Ukiah, Fort Bragg, Willits, and Point Arena	Mendocino Council of Governments. <i>2017 Mendocino County Regional Transportation Plan. Final</i> . Adopted February 5, 2018. <i>Final Draft Negative Declaration</i> . December 19, 2017. https://www.mendocinocog.org/mendocino-county-regional-plans
Merced County and cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced	Merced County Association of Governments. <i>Final Program Environmental Impact Report for the Merced County 2018 Regional Transportation Plan/Sustainable Communities Strategy</i> . Adopted August 6, 2018. http://www.mcagov.org/307/2018-RTP <i>2018 Regional Transportation Plan Sustainable Communities Strategy for Merced County</i> . Adopted August 6, 2018. http://www.mcagov.org/307/2018-RTP
Modoc County	Modoc County Transportation Commission. <i>2014 Modoc Regional Transportation Plan and Negative Declaration</i> http://modoctransportation.com/plans-reports/
Mono County	<i>County of Mono Regional Transportation Plan & General Plan Update Draft EIR</i> http://monocounty.ca.gov/planning/page/general-plan
Monterey County	See Association of Monterey Bay Area Governments (AMBAG)
Nevada County	Nevada County Transportation Commission. <i>Nevada County Regional Transportation Plan 2015–2035</i> . Adopted January 2018. <i>Final Supplemental Environmental Impact Report for the 2016 Nevada County Regional Transportation Plan</i> . October 2017. http://www.nctc.ca.gov/Reports/Regional-Transportation-Plan/index.html
Orange County	See Southern California Association of Governments (SCAG)
Placer County	Placer County Transportation Planning Agency. <i>Final Placer County 2036 Regional Transportation Plan</i> . February 2016. <i>Final Environmental Impact Report for the 2036 Placer County Regional Transportation Plan Update</i> . February 2016. http://pctpa.net/regional-planning/

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	<p>Also see <i>Sacramento Area Council of Governments Metropolitan Transportation Plan/Sustainable Communities Strategy</i>. Adopted February 2016. https://www.sacog.org/metropolitan-transportation-plansustainable-communities-strategy</p> <p><i>Final 2016 MTP/SCS Environmental Impact Report</i>. Certified February 18, 2016. https://www.sacog.org/general-information/final-2016-mtpscs-environmental-impact-report</p>
Plumas County	<p><i>Final Environmental Impact Report for the Plumas County Regional Transportation Plan – 2010</i>. January 2011. The 2010 RTP for Plumas County was adopted November 21, 2011. Administrative Modification, Draft v1.1 June 20, 2018. http://www.plumascounty.us/index.aspx?nid=1900</p>
Riverside County	See Southern California Association of Governments (SCAG)
Sacramento Area Council of Governments (SACOG) Sacramento, Yolo, Yuba, Sutter, El Dorado and Placer counties and the 22 cities within those counties, excluding the Tahoe Basin	<p><i>Sacramento Area Council of Governments Metropolitan Transportation Plan/Sustainable Communities Strategy</i>. Adopted February 2016. https://www.sacog.org/metropolitan-transportation-plansustainable-communities-strategy</p> <p><i>Final 2016 MTP/SCS Environmental Impact Report</i>. Certified February 18, 2016. https://www.sacog.org/general-information/final-2016-mtpscs-environmental-impact-report</p>
San Benito County	See Association of Monterey Bay Area Governments (AMBAG)
San Bernardino County	See Southern California Association of Governments (SCAG)
San Diego County	<p>San Diego Association of Governments. <i>Final Environmental Impact Report. San Diego Forward: The Regional Plan</i>. Adopted October 9, 2015. http://www.sdfoward.com/envimpactreport</p>
San Joaquin County and cities of Ripon, Escalon, Lathrop, Lodi, Manteca, Tracy, and Stockton	<p>San Joaquin Council of Governments. <i>2018 Regional Transportation Plan/Sustainable Communities Strategy</i> (Adopted June 28, 2018) and <i>Final Programmatic Environmental Impact Report</i>. http://www.sjcog.org/275/RTP-Sustainable-Communities-Strategy</p>
San Luis Obispo County and cities of Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach and San Luis Obispo	<p>San Luis Obispo Council of Governments. <i>2019 Regional Transportation Plan: Moving Forward, Connecting Communities</i>. Public Review Draft. February 2019. <i>2019 RTP Connecting Communities Draft Environmental Impact Report</i>. March 5, 2019. https://www.slocog.org/2019RTP</p>
Santa Barbara County and cities of Buellton,	Santa Barbara County Association of Governments. <i>Fast Forward 2040: SBCAG Regional Transportation Plan and Sustainable</i>

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Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria, and Solvang	<p><i>Communities Strategy Final Supplemental Environmental Impact Report.</i> August 2017. http://www.sbcag.org/uploads/2/4/5/4/24540302/ff2040_seir.pdf</p> <p><i>Fast Forward 2040: SBCAG Regional Transportation Plan and Sustainable Communities Strategy.</i> Adopted August 17, 2017. http://www.sbcag.org/rtp.html</p>
Santa Cruz County	<p>See Association of Monterey Bay Area Governments (AMBAG).</p> <p>Santa Cruz County Regional Transportation Commission. <i>2040 Santa Cruz County Regional Transportation Plan.</i> Final. June 2018. https://sccrtc.org/funding-planning/long-range-plans/2040-rtp/2040-plan/</p>
Shasta County and cities of Redding, Anderson, and Shasta Lake	<p>Shasta Regional Transportation Agency. <i>2018 Regional Transportation Plan and Sustainable Communities Strategy for the Shasta Region.</i> Adopted October 9, 2018.</p> <p><i>Final Supplemental Environmental Impact Report.</i> Certified October 9, 2018. https://www.srta.ca.gov/300/2018-RTP</p> <p><i>Final 2015 Regional Transportation Plan (RTP), including Sustainable Communities Strategy (SCS) and Final Environmental Impact Report (EIR).</i> Certified June 2016. http://www.srta.ca.gov/142/Regional-Transportation-Plan</p>
Sierra County	<p>Sierra County Transportation Commission. <i>Sierra County 2015 Regional Transportation Plan Initial Study and Negative Declaration.</i> Adopted June 2015. http://www.sierracounty.ca.gov/480/Regional-Transportation-Plan</p>
Siskiyou County	<p><i>2016 Regional Transportation Plan for Siskiyou County.</i> Adopted May 2016. https://www.co.siskiyou.ca.us/content/local-transportation-commission</p> <p>The CEQA Initial Study Checklist is included at the end of the RTP.</p>
Southern California Association of Governments (SCAG) Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura	<p>Southern California Association of Governments. <i>Final Program Environmental Impact Report for the 2016–2040 Regional Transportation Plan/sustainable Communities Strategy.</i> Certified April 2016. http://scagrtpscs.net/Pages/FINAL2016PEIR.aspx</p> <p>Final 2016 RTP/SCS. Adopted April 2016. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx</p>
Stanislaus County and cities of Ceres, Hughson, Modesto, Newman, Oakdale, Riverbank, Turlock, and Waterford	<p>Stanislaus Council of Governments. <i>2018 Regional Transportation Plan/Sustainable Communities Strategy.</i> Adopted August 2018.</p>

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	<p>2018 Regional Transportation Plan Sustainable Communities Strategy Programmatic Environmental Impact Report. Adopted August 2018. http://www.stancog.org/rtp.shtm</p>
Tahoe Metropolitan Planning Organization	<p><i>Linking Tahoe: Regional Transportation Plan and Sustainable Communities Strategy Initial Study / Mitigated Negative Declaration / Initial Environmental Checklist / Finding of No Significant Effect.</i> February 2017. http://www.trpa.org/regionaltransportationplan/</p>
Tehama County	<p><i>Tehama County 2015 Regional Transportation Plan – Negative Declaration.</i> June 2016. <i>2019 Tehama County Regional Transportation Plan. Draft.</i> January. <i>Initial Study/Environmental Checklist. 2019 Tehama County Regional Transportation Plan.</i> January. http://www.tehamacountypublicworks.ca.gov/transportation/rtp.html</p>
Trinity County	<p>Trinity County Transportation Commission. <i>Final 2016 Regional Transportation Plan. Trinity County, California.</i> <i>Appendix 5. Initial Study. Trinity County Transportation Commission 2016 Regional Transportation Plan.</i> August 2017. RTP and IS adopted October 2017. https://www.trinitycounty.org/Transportation-Commission</p>
Tulare County and cities of Dinuba, Exeter, Farmersville, Lindsay, Porterville, Tulare, Woodlake, and Visalia	<p>Tulare County Association of Governments. 2018. <i>2018 Regional Transportation Plan/Sustainable Communities Strategy Final Program Environmental Impact Report.</i> August 2018. http://www.tularecog.org/rtp2018/</p>
Tuolumne County	<p><i>Tuolumne County Transportation Council 2016 Regional Transportation Plan Final Environmental Impact Report.</i> January 2017. https://www.tuolumnecountytransportationcouncil.org/single-post/2016/07/13/2016-Regional-Transportation-Plan-Update</p>
Ventura County	<p>See Southern California Association of Governments (SCAG)</p>

Miscellaneous Other GHG Reduction Resources

California Air Pollution Control Officers Association (CAPCOA). 2010. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures.* August. Quantification methods for GHG mitigation measures.

California Attorney General's Office. 2010. *Addressing Climate Change at the Project Level.* (Rev. 01/06/2010). Table of very basic on- and off-site mitigation measures.
http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf

Federal Highway Administration (FHWA). 2012. *Reference Sourcebook for Reducing Greenhouse Gas Emissions from Transportation Sources*.

https://www.fhwa.dot.gov/environment/climate_change/mitigation/publications/reference_sourcebook/referencesourcebook.pdf. One section reviews Transportation System Management Strategies including

several project-level practices: signal optimization, ramp metering, roundabouts, resurfacing roads, and alternative construction materials.

National Cooperative Highway Research Program (NCHRP). 2012. *Synthesis of State DOT and MPO Planning and Analysis Strategies to Reduce Greenhouse Gas Emissions*. NCHRP 08-36, Task 107.

[http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36\(107\)_FR.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36(107)_FR.pdf)

NCHRP. 2010. *Greenhouse Gas Mitigation Measures for Transportation Construction, Maintenance, and Operations Activities*. NCHRP25-25(58). Identifies emissions-reducing practices related to electricity use, on-road and off-road vehicles and equipment, materials, and traffic management. Appendices provide emissions comparisons for each category. [http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25\(58\)_FR.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25(58)_FR.pdf)

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2016. *Guidance for Construction GHG Emissions Reductions*. Chapter 6 Appendix. May. List of emission-reducing construction BMPs.

<http://www.airquality.org/LandUseTransportation/Documents/Ch6ConstructionMitMeasuresFINAL5-2016.pdf>

SMAQMD. 2017. *Basic Construction Emissions Control Practices (Best Management Practices)*. May.

<http://www.airquality.org/LandUseTransportation/Documents/Ch3BasicEmissionControlPracticesBMPS%20FINAL5-2017.pdf>

SMAQMD. 2017. *Mitigation*. Links to various mitigation resources.

<http://www.airquality.org/Residents/CEQA-Land-Use-Planning/Mitigation>

Appendix B: Executive Order B-30-15

4-29-2015

EXECUTIVE ORDER B-30-15

WHEREAS climate change poses an ever-growing threat to the well-being, public health, natural resources, economy, and the environment of California, including loss of snowpack, drought, sea level rise, more frequent and intense wildfires, heat waves, more severe smog, and harm to natural and working lands, and these effects are already being felt in the state; and

WHEREAS the Intergovernmental Panel on Climate Change concluded in its Fifth Assessment Report, issued in 2014, that "warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia" and that "continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems;" and

WHEREAS projections of climate change show that, even under the best-case scenario for global emission reductions, additional climate change impacts are inevitable, and these impacts pose tremendous risks to the state's people, agriculture, economy, infrastructure and the environment; and

WHEREAS climate change will disproportionately affect the state's most vulnerable citizens; and

WHEREAS building on decades of successful actions to reduce pollution and increase energy efficiency the California Global Warming Solutions Act of 2006 placed California at the forefront of global and national efforts to reduce the threat of climate change; and

WHEREAS the Intergovernmental Panel on Climate Change has identified limiting global warming to 2 degrees Celsius or less by 2050 as necessary to avoid potentially catastrophic climate change impacts, and remaining below this threshold requires accelerated reductions of greenhouse gas emissions; and

WHEREAS California has established greenhouse gas emission reduction targets to reduce greenhouse gas emissions to 1990 levels by 2020 and further reduce such emissions to 80 percent below 1990 levels by 2050; and

WHEREAS setting an interim target of emission reductions for 2030 is necessary to guide regulatory policy and investments in California in the midterm, and put California on the most cost-effective path for long term emission reductions; and

WHEREAS all agencies with jurisdiction over sources of greenhouse gas emissions will need to continue to develop and implement emissions reduction programs to reach the state's 2050 target and attain a level of emissions necessary to avoid dangerous climate change; and

WHEREAS taking climate change into account in planning and decision making will help the state make

more informed decisions and avoid high costs in the future.

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, in particular Government Code sections 8567 and 8571 of the California Government Code, do hereby issue this Executive Order, effective immediately

IT IS HEREBY ORDERED THAT:

1. A new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 is established in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050.
2. All state agencies with jurisdiction over sources of greenhouse gas emissions shall implement measures, pursuant to statutory authority, to achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.
3. The California Air Resources Board shall update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.
4. The California Natural Resources Agency shall update every three years the state's climate adaptation strategy, *Safeguarding California*, and ensure that its provisions are fully implemented. The *Safeguarding California* plan will:
 - Identify vulnerabilities to climate change by sector and regions, including, at a minimum, the following sectors: water, energy, transportation, public health, agriculture, emergency services, forestry, biodiversity and habitat, and ocean and coastal resources;
 - Outline primary risks to residents, property, communities and natural systems from these vulnerabilities, and identify priority actions needed to reduce these risks; and
 - Identify a lead agency or group of agencies to lead adaptation efforts in each sector.
5. Each sector lead will be responsible to:
 - Prepare an implementation plan by September 2015 to outline the actions that will be taken as identified in *Safeguarding California*, and
 - Report back to the California Natural Resources Agency by June 2016 on actions taken.
6. State agencies shall take climate change into account in their planning and investment decisions and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives.
7. State agencies' planning and investment shall be guided by the following principles
 - Priority should be given to actions that both build climate preparedness and reduce greenhouse gas emissions;
 - Where possible, flexible and adaptive approaches should be taken to prepare for uncertain climate impacts;
 - Actions should protect the state's most vulnerable populations; and
 - Natural infrastructure solutions should be prioritized.
8. The state's Five-Year Infrastructure Plan will take current and future climate change impacts into account in all infrastructure projects
9. The Governor's Office of Planning and Research will establish a technical, advisory group to help state agencies incorporate climate change impacts into planning and investment decisions.

10. The state will continue its rigorous climate change research program focused on understanding the impacts of climate change and how best to prepare and adapt to such impacts.

This Executive Order is not intended to create, and does not, create any rights or benefits, whether substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

Appendix C: CEQA Guidelines Appendix F, Energy Conservation

APPENDIX F: ENERGY CONSERVATION

I. Introduction

The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

- (1) decreasing overall per capita energy consumption,
- (2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and
- (3) increasing reliance on renewable energy sources.

In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy (see Public Resources Code section 21100(b)(3)). Energy conservation implies that a project's cost effectiveness be reviewed not only in dollars, but also in terms of energy requirements. For many projects, cost effectiveness may be determined more by energy efficiency than by initial dollar costs. A lead agency may consider the extent to which an energy source serving the project has already undergone environmental review that adequately analyzed and mitigated the effects of energy production.

II. EIR Contents

Potentially significant energy implications of a project shall be considered in an EIR to the extent relevant and applicable to the project. The following list of energy impact possibilities and potential conservation measures is designed to assist in the preparation of an EIR. In many instances specific items may not apply or additional items may be needed. Where items listed below are applicable or relevant to the project, they should be considered in the EIR.

- A. Project Description may include the following items:
 1. Energy consuming equipment and processes which will be used during construction, operation and/or removal of the project. If appropriate, this discussion should consider the energy intensiveness of materials and equipment required for the project.
 2. Total energy requirements of the project by fuel type and end use.
 3. Energy conservation equipment and design features.
 4. Identification of energy supplies that would serve the project.
 5. Total estimated daily vehicle trips to be generated by the project and the additional energy consumed per trip by mode.
- B. Environmental Setting may include existing energy supplies and energy use patterns in the region and locality.
- C. Environmental Impacts may include:
 1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
 2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
 3. The effects of the project on peak and base period demands for electricity and other forms of energy.
 4. The degree to which the project complies with existing energy standards.
 5. The effects of the project on energy resources.

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

D. Mitigation Measures may include:

1. Potential measures to reduce wasteful, inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal. The discussion should explain why certain measures were incorporated in the project and why other measures were dismissed.
2. The potential of siting, orientation, and design to minimize energy consumption, including transportation energy, increase water conservation and reduce solid waste.
3. The potential for reducing peak energy demand.
4. Alternate fuels (particularly renewable ones) or energy systems.
5. Energy conservation which could result from recycling efforts.

E. Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy.

F. Unavoidable Adverse Effects may include wasteful, inefficient and unnecessary consumption of energy during the project construction, operation, maintenance and/or removal that cannot be feasibly mitigated.

G. Irreversible Commitment of Resources may include a discussion of how the project preempts future energy development or future energy conservation.

H. Short-Term Gains versus Long-Term Impacts can be compared by calculating the project's energy costs over the project's lifetime.

- I. Growth Inducing Effects may include the estimated energy consumption of growth induced by the project.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21000-21176. Public Resources Code.

Revised 2009

appendix D: standard ghg reduction measures

Place holder for measures currently in development