City of Encinitas CEQA Series

Air Quality and Greenhouse Gas Analyses

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Acknowledgement

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Introductions

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Agenda

1. Air Quality and GHG CEQA 101
2. Modeling Tools
3. Thresholds of Significance
4. City's CAP and Alternate Approaches
5. Relationship Between GHG and VMT

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Air Quality and GHG CEQA 101

Criteria Air Pollutants

Pollutant	Averaging Time	California (CAAQS)	National (NAAQS)	
			Primary	Secondary
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	–	Same as primary standard
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
Nitrogen dioxide (NO_2)	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as primary standard
	1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	—
Respirable particulate matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	—	Same as primary standard
	24-hour	50 µg/m^3	150 µg/m^3	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
	24-hour	—	35 µg/m^3	Same as primary standard

Toxic Air Contaminants

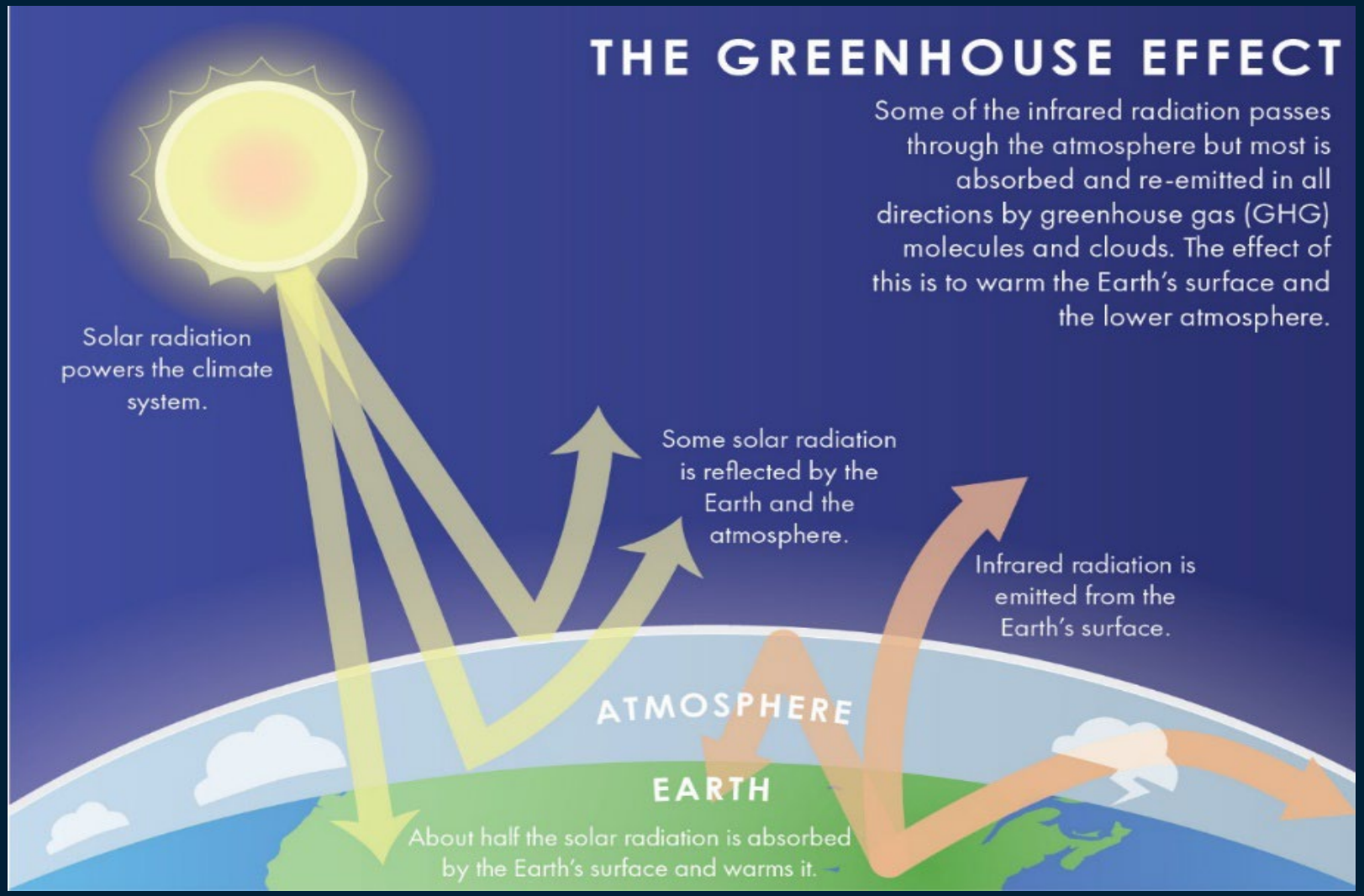
Definition

- “Air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health” (H&SC §39655)
- Common TACs include hexavalent chromium, benzene, and diesel particulate matter (DPM)
- Health impacts of TACs are classified as carcinogenic, acute non-carcinogenic, or chronic non-carcinogenic

Air District Guidance

- Local air districts typically provide guidance for performing health risk assessments (HRAs), including recommended parameters for air dispersion modeling

Greenhouse Gases



CEQA Guidelines Appendix G – AQ

- Local air districts can set limits on daily mass emissions of criteria pollutants for sources located in their jurisdiction
- Air district daily mass emissions limits are typically used as CEQA significance thresholds
- Ozone is a regional pollutant, so emission limits are specified for its precursors, reactive organic gases (ROG) and oxides of nitrogen (NOx)

III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☐	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☐
d)	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☐

CEQA Guidelines Appendix G – GHGs

Would the project:

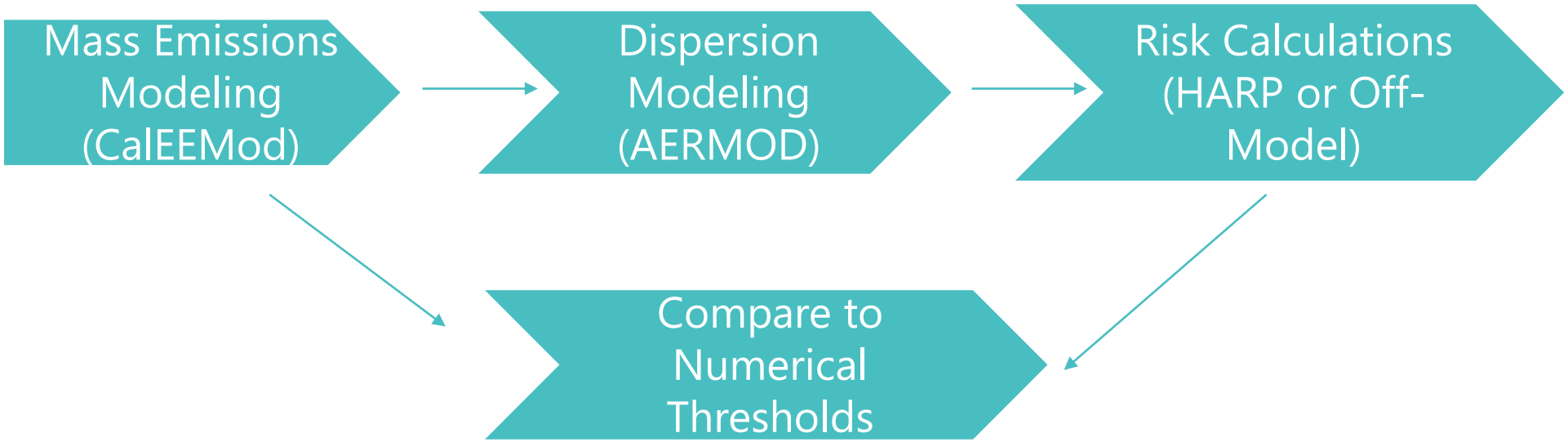
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

2

Emission Quantification Models – Which and When

Air Quality Flow Chart for Quantification



Modeling Choices

Mass Emissions (e.g., lbs per day, metric tons per year)

- Caleemod (v2022 is most recent)
  - Incorporates CARB databases
    - EMFAC
    - Offroad
  - Majority of land use projects
- Off-model -> using similar databases
  - May see for larger projects that do not fit within Caleemod
  - Examples: dam construction, large water infrastructure, giant hotels, Ports, non-infill residential/commercial types
  - Unlikely to see many of these in Encinitas
- Criteria pollutants and GHGs can be modeled in the same run
- Emission outputs are compared to numerical thresholds
- If doing health risk assessment (HRA), emissions from this modeling are used in the HRA (next slides)

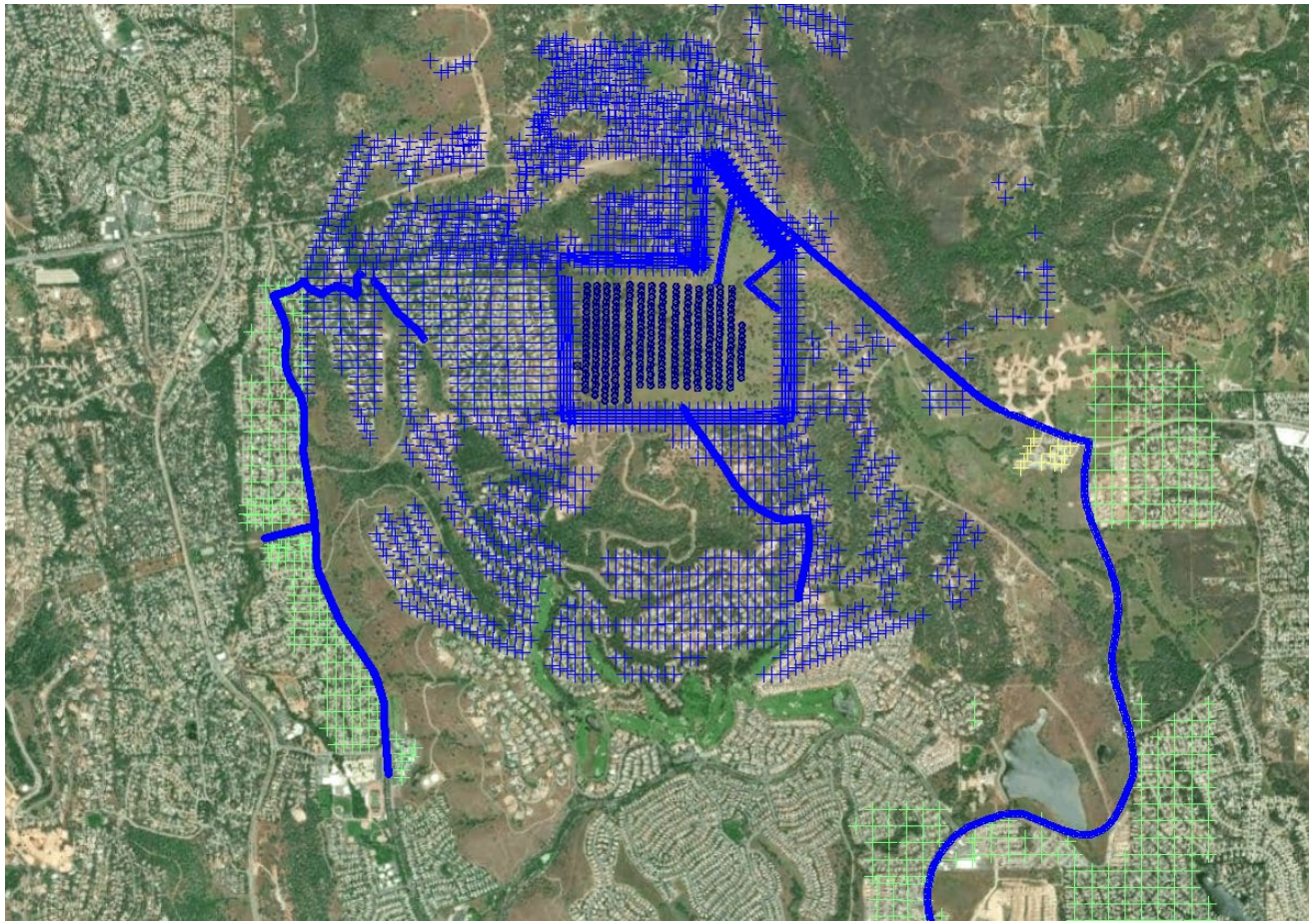
Modeling Choices

- Typical Emission Sources
  - Criteria Air Pollutants
    - Focused on sources with tailpipes/exhaust at or near project site
      - Construction
        - Construction equipment
        - Trucks and worker trips (exhaust and road dust)
        - Dust from soil movement and demolition
        - VOC from painting and asphalt paving
      - Operations
        - Vehicle trips (exhaust and road dust)
        - Boilers/natural gas (space and water heating)
        - Area sources (fireplaces, paints, consumer products, landscaping equipment)
        - Any onsite equipment (like forklifts, generators at warehouses, etc.,)
  - GHGs
    - All those above, plus:
      - Electricity
      - Water
      - Wastewater
      - Solid waste
      - Refrigerants

Modeling Choices

Health Risk Assessment (e.g., cancer risk per million)

- AERMOD is the most widely used model. EPA model, calculates average pollutant concentrations at receptors
- Can be quite resource intensive and costly.
- Of recent City projects, only the *Sanctuary Project* included a quantitative HRA
- Note: AERMOD does not quantify health risk. It only provides pollutant concentrations.
- Health risk is quantified outside of AERMOD -> either in CARB's HARP2 model or in a spreadsheet tool that uses HARP's parameters



More on HRAs

- If there is an HRA, ensure there are modeling outputs for each of these steps.
- If there's an impact and mitigation, modeling needs to show these.
  - Unmitigated caleemod run, and
  - Mitigated caleemod run

  &

  - Unmitigated risk calculation, and
  - Mitigated risk calculation

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Tier 4 Interim	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Electric	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	7.00	84.0	0.37

Table 12. Construction Activity Health Risk Assessment Results Prior to Mitigation

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Offsite				
Cancer Risk	Per Million	33.71	10.0	**Potentially Significant**
HIC	Not Applicable	0.04	1.0	Less than Significant

Source: Appendix B
Notes: CEQA = California Environmental Quality Act; HIC = Chronic Hazard Index.

The results of the HRA demonstrate that the TAC exposure from construction diesel exhaust emissions would result in cancer risk above the 10 in 1 million threshold and Chronic Hazard Index less than 1. Therefore, TAC emissions from construction of the Project would result in a **potentially significant** impact and thus mitigation is required. Mitigation Measure (**MM) AQ-1** would require the use of Tier 4 Interim or Equivalent (e.g. Tier 4 Final) for construction equipment greater than 80 horsepower. Table 13 shows the mitigated HRA results.

Table 13. Construction Activity Health Risk Assessment Results With Mitigation

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Offsite				
Cancer Risk	Per Million	7.78	10.0	Less than Significant
HIC	Not Applicable	<0.01	1.0	Less than Significant

Source: Appendix B
Notes: CEQA = California Environmental Quality Act; HIC = Chronic Hazard Index.

The results of the HRA as shown in Table 13 demonstrate that the TAC exposure from construction diesel exhaust emissions after implementation of mitigation would not result in cancer risk above the 10 in 1 million threshold and Chronic Hazard Index less than 1. Therefore, TAC emissions from construction of the Project would result in a **less than significant impact with mitigation**.

3

Thresholds of Significance

AQ Thresholds

- AQ-2 is quantitative. Typically model (CalEEMod) and compare emissions to County daily (lbs per day) numerical thresholds
  - If you see something else, ask for evidence as to why another threshold is being used

- AQ-3 can be quantitative (if HRA is performed). If so, typical thresholds:
  - Incremental increase of 10 in a million for cancer risk
  - Chronic or acute health hazard index of 1.0 for noncancer effects.

Table 5
Screening-Level Thresholds for Air Quality Impact Analysis

Pollutant	Total Emissions		
	Lbs. Per Hour	Lbs. per Day	Tons per Year
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	55*	10*
Oxides of Nitrogen (NOx)	25	250	40
Oxides of Sulfur (SOx)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOCs)	---	75**	13.7***

* EPA "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards" published September 8, 2005. Also used by the SCAQMD.
** Threshold for VOCs based on the threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley.
*** 13.7 Tons Per Year threshold based on 75 lbs/day multiplied by 365 days/year and divided by 2000 lbs/ton.

In San Diego County, APCD Rule 1210 implements the public notification and risk reduction requirements of State law, and requires facilties with high potential health risk levels to reduce health risks below significant risk levels. In addition, Rule 1200 establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional TACs. Under Rule 1200, permits to operate may not be issued when emissions of TACs result in an incremental cancer risk greater than 1 in 1 million without application of Toxics-BACT (T-BACT), or an incremental cancer risk greater than 10 in 1 million with application of T-BACT, or a health hazard index (chronic and acute) greater than one. The human health risk analysis is based on the time, duration, and exposures expected.

T-BACT will be determined on a case-by-case basis, however examples of T-BACT include diesel particulate filters, catalytic converters and selective catalytic reduction technology.

GHG Thresholds

- Air Districts are often relied upon for air quality and GHG thresholds and approach
- Air District GHG thresholds are typically developed to align with State targets and Scoping Plan
- Evolution of thresholds:
  - 2020-based thresholds: primarily “bright-line” based
  - 2030-based thresholds: primarily efficiency based
  - Carbon neutrality-based thresholds have been based on best management practices, i.e., more qualitative

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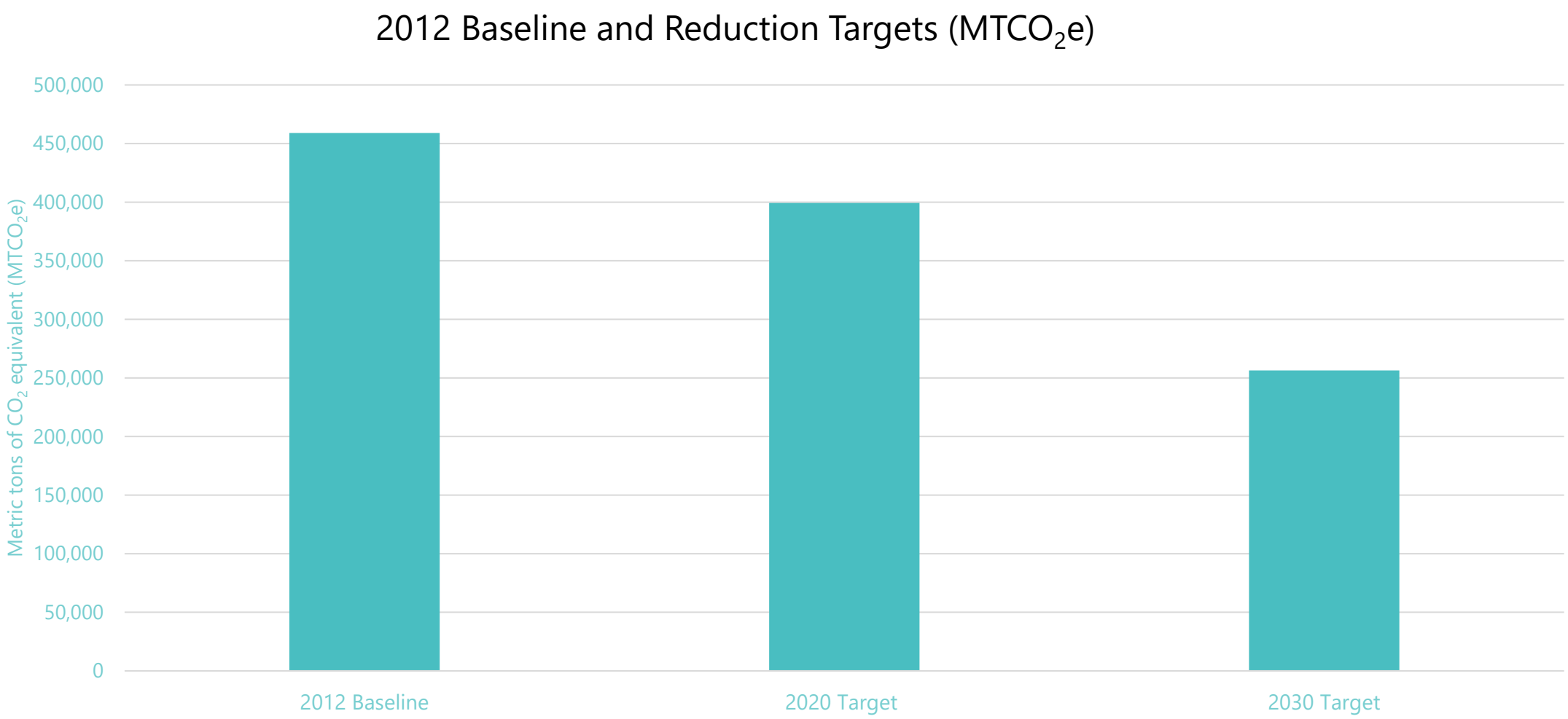
City's CAP and Alternate Approaches

Encinitas Climate Action Plan



Source: City of Encinitas 2022 Climate Action Plan Report

Threshold Examples:
Bay Area Air Quality Management District

Thresholds for Land Use Projects (Must Include A or B)
A. Projects must include, at a minimum, the following project design elements: 1. Buildings a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development). b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines. 2. Transportation a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA: i. Residential projects: 15 percent below the existing VMT per capita ii. Office projects: 15 percent below the existing VMT per employee iii. Retail projects: no net increase in existing VMT b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.
B. Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).

- Provides the rationale for using thresholds to show local jurisdictions are doing their "fair share"
- Developed prior to adoption of AB 1279, but designed to meet the goal of carbon neutrality by 2045
- Applies to land use development projects (residential/office/retail/mixed use)
- Precludes the need to quantitatively evaluate construction emissions; relies on Best Management Practices
- Allows project applicants to avoid estimating emissions, but incorporate:
  - No natural gas
  - Energy efficiency
  - VMT efficiency
  - EV charging

Bay Area Air Quality Management District
A HEALTHY BREATHING ENVIRONMENT FOR EVERY BAY AREA RESIDENT

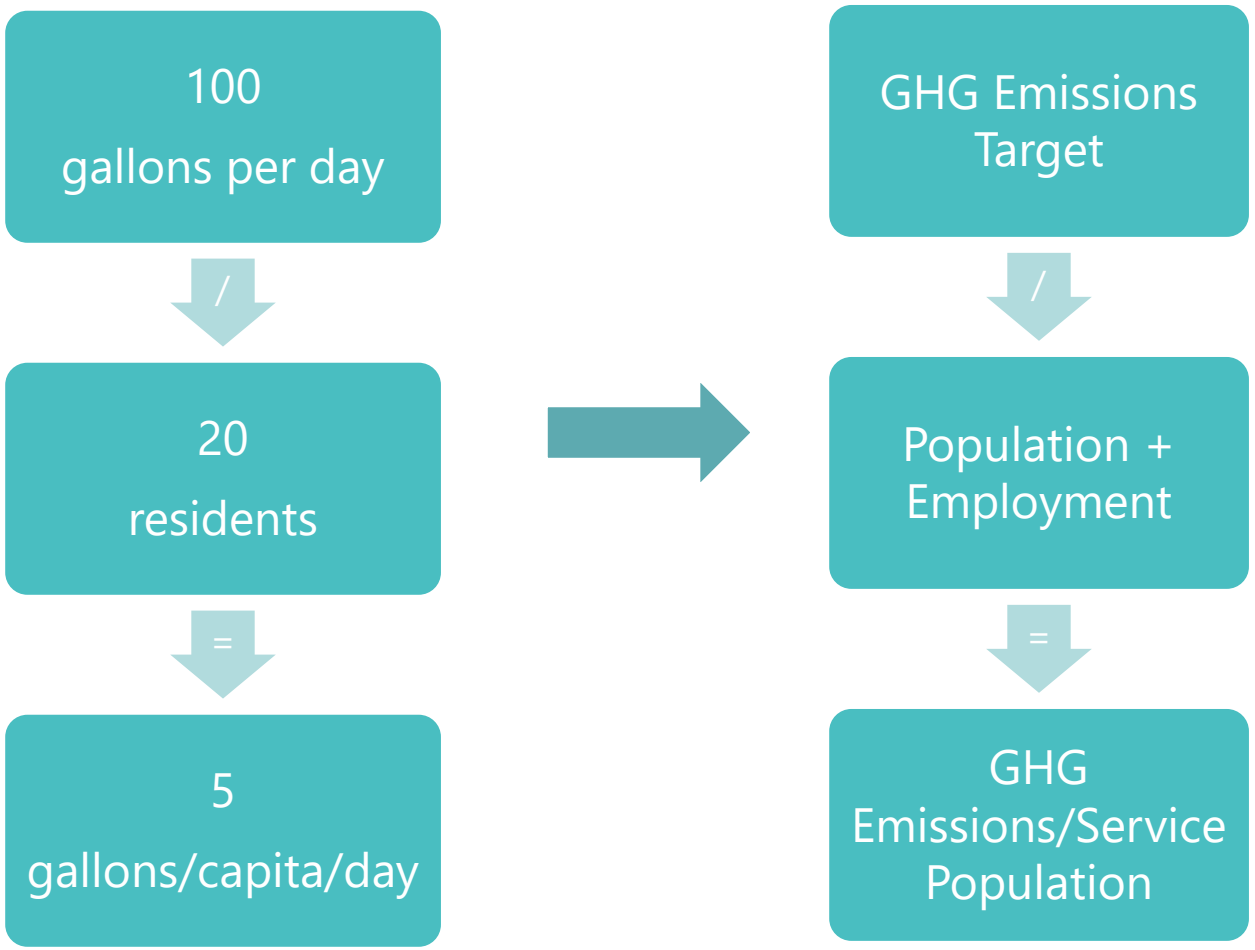
Threshold Examples: Sacramento Metropolitan Air Quality Management District

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Land Development and Construction Projects		
Construction Phase		Operational Phase
Greenhouse Gas Emissions (GHG) Thresholds		
GHG as CO2e	1,100 metric tons/year	Demonstrate consistency with the Climate Change Scoping Plan by implementing applicable Best Management Practices (BMP), or equivalent on-site or off-site mitigation.
		All projects must implement tier 1 BMPs (BMP 1 & 2): *BMP 1* - projects shall be designed and constructed without natural gas infrastructure. *BMP 2* - projects shall meet the current CalGreen Tier 2 standards, except all electric vehicle capable spaces shall instead be electric vehicle ready. ***Projects that exceed 1,100 metrict tons/year after implementation of tier 1 BMPs must implement tier 2 BMPs (BMP 3):*** *BMP 3* - residential projects shall achieve a 15% reduction in vehicle miles traveled per resident and office projects shall achieve a 15% reduction in vehicle miles traveled per worker compared to existing average vehicle miles traveled for the county, and retail projects shall achieve a no net increase in total vehicle miles traveled to show consistency with SB 743.

- Similar to BAAQMD with some exceptions
- Includes numerical screening criteria and:
  - No natural gas
  - EV charging
  - VMT efficiency

Quantitative Threshold Option: Per-Capita Concept



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Relationship Between GHG and VMT

GHG and VMT

- Connected in a few ways:
  1. Vehicles a source of emissions – VMT is a data need for estimating emissions.
  2. VMT a metric in CEQA GHG analyses.

     Logic is: VMT efficient = GHG efficient

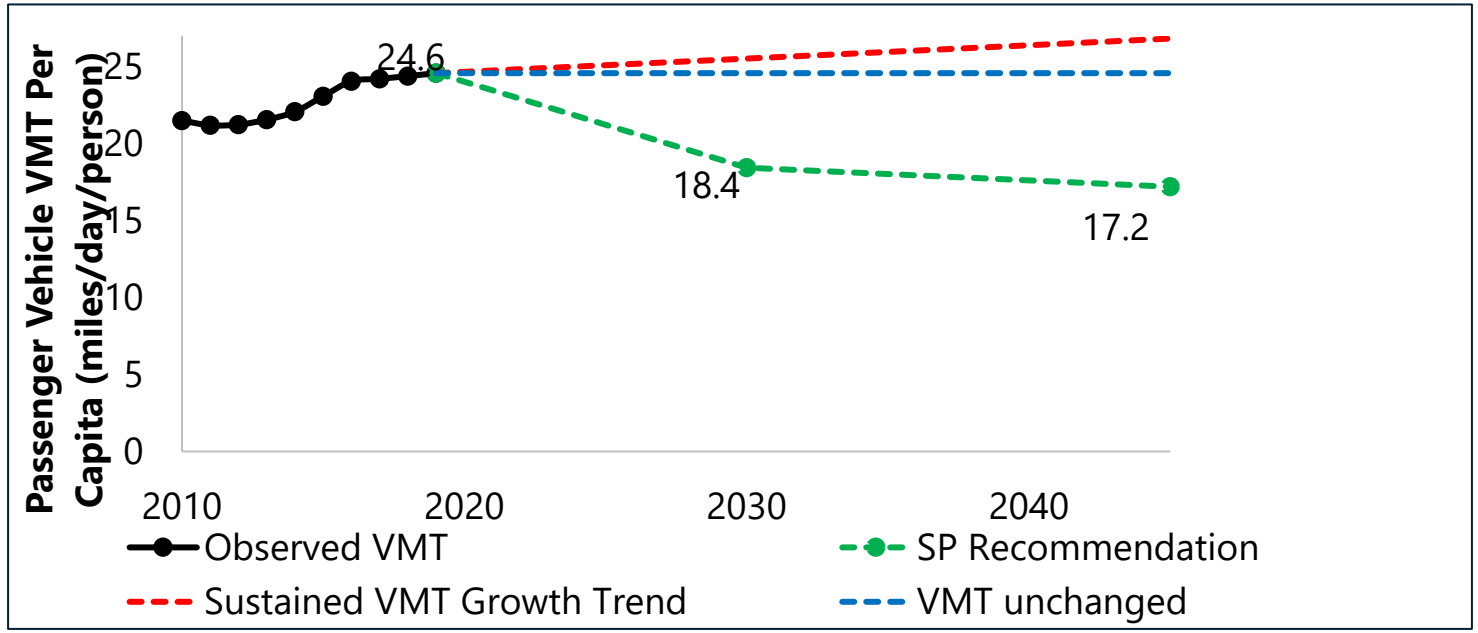
     Per capita traffic vs. mass VMT (needed for emissions)
  3. CARB has shown we need VMT reductions to meet longer term GHG targets

     Is a CARB Priority Area

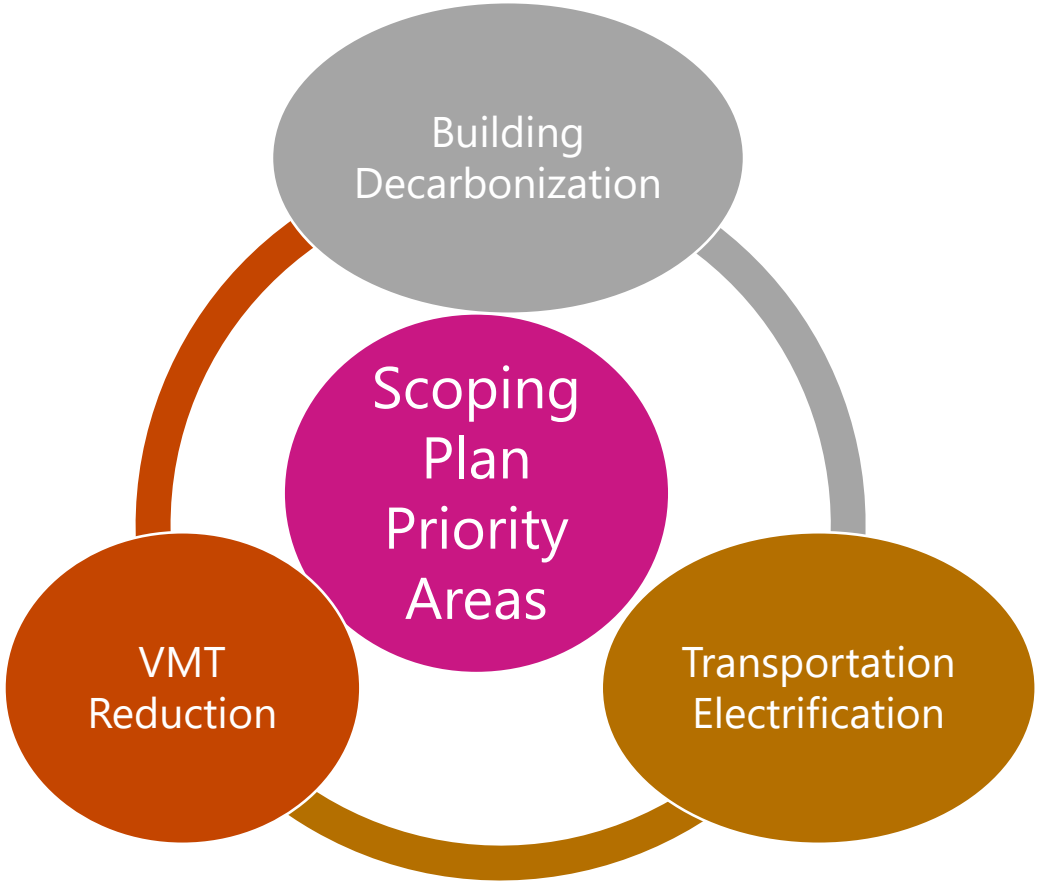
Thresholds for Land Use Projects (Must Include A or B)

A. Projects must include, at a minimum, the following project design elements:
   1. Buildings
      a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
      b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.
   2. Transportation
      a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA:
         i. Residential projects: 15 percent below the existing VMT per capita
         ii. Office projects: 15 percent below the existing VMT per employee
         iii. Retail projects: no net increase in existing VMT
      b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

B. Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).



VMT and GHG:
2022 Scoping Plan Local Actions



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Class 32 and Infill Exemptions

Class 32 Exemptions: Approach

- The point of this exception is to streamline infill development for projects that are consistent with planning documents (GP, Zoning) and that will not require any mitigation.
- Infill projects tend to be more efficient and reduce VMT (walkable).
- Sometimes you can model, but you don’t need to.
- Traffic analyses not typically required. Screened out.
- Can typically do the same for AQ and GHG.

Class 32 Exemptions: Possible Screening

- Some jurisdictions have developed screening criteria:
  - Projects that meet this criteria would not have a significant effect on the environment.
  - City of LA: if project is: <80 units or >75,000 ft2 non-res (retail/commercial) & <20,000 cubic yards of export, no assessment required. Qualitatively dismiss, say below screening criteria, LTS.
  - Bay Area AQMD: separate construction and operations.
    - Apts = <416 units = screened out

Land Use Category	Land Use Subcategory	Land Use Unit	Screening Level	
			Construction	Operation
Education	Worship Place	KSF	452	642
Industrial	General Heavy Industry	KSF	452	1,009
Industrial	General Light Industry	KSF	452	998
Industrial	Industrial Park	KSF	452	1,247
Industrial	Manufacturing	KSF	452	1,009
Industrial	Warehouse[1]	KSF	452	1,423
Recreational	Arena	KSF	732	600
Recreational	City Park	Acres	10	175
Recreational	Fast Food Restaurant	KSF	452	21
Recreational	Health Club	KSF	452	261
Recreational	Hotel	Rooms	312	633
Recreational	Motel	Rooms	230	767
Recreational	Movie Theater	KSF	458	80
Recreational	Restaurant – High Turnover (Sit-Down)	KSF	452	75
Recreational	Restaurant – Quality (Fine Dining)	KSF	452	105
Recreational	Racquet Club	KSF	452	457
Recreational	Recreational Swimming Pool	KSF	452	376
Residential	Apartments	DU	416	638
Residential	Condo-Townhouse	DU	416	637
Residential	Mobile Home Park	DU	377	721
Residential	Congregate Care/Retirement Community	DU	416	1,008
Residential	Single Family Housing	DU	254	421
Retail	Auto Care Center	KSF	452	336
Retail	Convenience Market	KSF	452	11
Retail	Discount Store	KSF	452	150
Retail	Home Improvement Superstore/Hardware-Paint Store	KSF	452	221
Retail	Regional Shopping Center	KSF	452	221
Retail	Strip Mall	KSF	452	204
Retail	Supermarket	KSF	452	72

Notes: DU = dwelling unit; KSF = thousand square feet.

[1] The use of the warehouse land use is not appropriate for a logistics or distribution center. These types of projects should use project-specific traffic data or a more land use-specific trip generation rate.

Source: Modeling conducted by Ascent Environmental in 2021 using CalEEMod version 2020.4.0 and EMFAC2021 version 1.0.0.

Class 32 Exemptions: Possible Screening

- Not often used, but County of SD has some screening tables in its *AQ Report Format and Content Requirements* guide
- Old (2007), dated modeling, only accounts for operations, but is another data point that could be used.
  - 300 single family units
  - 370 – 420 apartments
- https://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/AQ-Report-Format.pdf

TABLE 5
Operational Phase Air Quality Study Trigger Criteria

Land Use	Unit of Measure	Assumed SANDAG Trip Generation Rate	Project Size that Would be Anticipated to Generate Air Emissions Greater than the Threshold Limit	Equivalent SF unit
Single Family Residential*	Dwelling Unit	10	300	**1**
Apartments – 6-20 DU/acre*	Dwelling Unit	8	370	**0.811**
Apartments – > 20 DU/acre*	Dwelling Unit	6	420	**0.714**
Condominiums*	Dwelling Unit	8	370	**0.811**
Mobile Home Park*	Dwelling Unit	5	400	**0.750**
Supermarket**	1,000 sq. ft.	150	25	**12.0**
Restaurant, Fast Food w/drive through**	1,000 sq. ft.	650	6.5	**46.2**
Restaurant, Quality Sit Down**	1,000 sq. ft.	100	43	**6.98**
Motel**	# of rooms	9	480	**0.625**
Neighborhood/County Park (undeveloped)**	Acre	5	880	**0.341**
Standard Commercial Office (<100,000 sq ft per office site)**	1,000 sq. ft.	20	190	**1.58**
Neighborhood shopping center**	1,000 sq. ft	120	35	**8.57**

* Limited by VOC emissions; for these residential units it is assumed that 5% of the units have active fireplaces burning 0.25 cord of wood over a period of 82 days and 10% of the units have active natural gas fireplaces that are used for 3 hours per day over a period of 90 days (note: hours per day and days per year are the URBEMIS defaults).

** Limited by CO emissions

Pointers for Technical Study Reviews

- Look for nexus between ambient air quality standards, public health, and thresholds of significance
- Review modeling assumptions – these should be well documented, not hidden in a technical appendix
  - Construction duration, phases, soil cut and fill, truck trips
  - Trip generation, trip distance, assumptions about fireplaces
  - If model defaults are updated, ask the question why
- Ensure health risk section is comprehensive
  - Project-generated truck trips
  - Stationary sources such as emergency generators
  - Proximity to sources of TACs where project may exacerbate impacts
- GHG section should tell the story of chosen threshold and why it is appropriate for project

THANK YOU!

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Q&A

Relevant Links

- SDAPCD CEQA Page: https://www.sdapcd.org/content/sdapcd/planning/ceqa.html#v1-0ce9206d80-item-4a148f3197
- CARB CEQA Page: https://ww2.arb.ca.gov/our-work/programs/resource-center/strategy-development/ceqa-resources (reviewing comment letters from expert agencies is a good training tool)
- CalEEMod: https://caleemod.com/
- BAAQMD Guidelines: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines
- BAAQMD CalEEMod guide: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-d-using-caleemod-for-bay-area-projects_finaljm-pdf.pdf?rev=1f23858aba7a43fcac5418c6455a51c8&sc_lang=en
- BAAQMD Screening tables: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-4-screening_final-pdf.pdf?rev=ac551d35a52d479dad475e7d4c57afa6&sc_lang=en