

About this Tool

Purpose

This multi-land use screening tool was developed to assist project applicants and planners determine whether a discretionary development project may be below the Bay Area Air Quality Management District's (BAAQMD's) CEQA thresholds for air quality impacts related to construction and operation of the project. This tool does not work for projects which have construction-related activities overlapping with operational activities, and vice versa.

How this Tool was Developed

Each land use type available in the California Emissions Estimator Model (CalEEMod) version 2020.4.0 was modeled using default parameters and inputs for both construction and operation. All wood-burning appliance were removed from the model runs because the installation of wood-burning devices in new development is prohibited per BAAQMD Regulation 6, Rule 3. No mitigation was applied.

Each land use type was run in CalEEMod for 100,000 square feet of the size metric applicable for a construction year of 2020 and an operational year of 2021 to represent the most conservative emissions estimates. In the instance of residential land uses, 100 dwelling units equated to 100,000 square feet except in the cases of mobile home parks and single family residences, in which 83 units and 56 units equaled 100,000 square feet, respectively.

Because CalEEMod version 2020.4.0 uses the California Air Resources Board's EMFAC2017 model, the mobile source emissions factors were replaced with EMFAC2021 results for all model runs conducted. All model runs were conducted for the summer season which generally results in higher emissions and is therefore more conservative. Average daily emissions for each land use were then divided by the building area included in the model run (i.e., 100,000 square feet) to obtain average daily emissions per square foot.

The average daily emissions for each land use type were normalized to the NO_x thresholds (54 lb/day for both construction and operation). Preliminary modeling conducted in CalEEMod confirmed that NO_x is the most restrictive pollutant; therefore, NO_x was used for the purposes of developing the screening tool. Using the normalized average daily emissions, a 100-point system was developed, where 100 points means that the 54 lb/day NO_x limit has been exceeded. Each land use type was given a point value per dominant land use metric (e.g., X points per dwelling unit for residential land uses, X points per 1,000 square feet for nonresidential land uses).

An input table was created that pulls the point values for each land use type. By entering a project's land use types and sizes, users can see if their project would exceed the construction and/or operational NO_x threshold (which is the surrogate for all other criteria air pollutants and precursors). If the project could exceed either the construction or operational threshold, the tool states that BAAQMD's recommendation would be to conduct additional analysis to determine the potential impact of the project with regard to air quality.

Project Example 1

The project applicant is seeking to construct a mixed-use development project with 50 units of high-rise residential, 50,000 square feet of retail space, and 100 parking spaces in a parking lot onsite.

Using the drop-down menus in the screening tool, the project applicant selects these land use types and enters the sizes.

Upon inputting all land use types, the screening tool indicates that neither construction or operational thresholds would be exceeded and no further analysis is recommended by BAAQMD to determine a significance conclusion with regard to air quality.

Project Example 2

The project applicant is seeking to construct a mixed-use development project with 300 hotel rooms, a 25,000 square foot restaurant, and separate enclosed parking garage for 500 vehicles. The project applicant would like to construct the land uses at the same time to expedite the construction schedule.

Using the drop-down menus in the screening tool, the user selects these land use types and enters the sizes. The user also checks the box for each land use type entered that says "Has Overlapping Construction Phases."

Upon inputting all land use types, the screening tool indicates that the construction thresholds would be exceeded and further analysis is recommended by BAAQMD to determine a significance conclusion with regard to air quality. The screening tool also indicates that the operational thresholds would not be exceeded and thus no further analysis would be required for operation-related air quality impacts.

Multi-land Use Screening Tool Overview

This screening tool helps to determine whether the daily construction or operational emissions associated with a proposed land use development project with multiple land use types would exceed BAAQMD's average daily thresholds.

Instructions

Use the drop-down menus to select the land use category and land use type for each type of land use included in the project. Enter the proposed size of each land use based on the default units that are autopopulated in column D.

The tool will estimate whether the project may exceed the construction thresholds, operational thresholds, or both, and whether further analysis is needed before making a significance determination. This tool will not work for projects which have construction-related activities overlapping with operational activities, and vice versa.

Construction and Operation Screening Tool				
Land Use Category	Land Use Type	Unit	Project Land Use Size	Has Overlapping Construction Phases?
Residential	Apartments Mid Rise	DU	40.0	<input type="checkbox"/>
Residential	Condo-Townhouse	DU	16.0	<input type="checkbox"/>
Residential	Single Family Housing	DU	14.0	<input type="checkbox"/>
Commercial	General Office Building	KSF	20.0	<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
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				<input type="checkbox"/>
Exceeds Construction Threshold?			NO	
Exceeds Operational Threshold?			NO	
BAAQMD's Recommendation			Further Analysis Not Required	

	Construction											
	Points per unit	total points	ROG	Nox	Daily (lb/day)		CO	Annual (tpy)				
					PM10	PM2.5		ROG	Nox	PM10	PM2.5	CO
Apartments Mid Rise	0.218119234	8.724769379	4.7	4.7	7.2	4.7	0.1	0.9	0.9	1.3	0.9	0.02
Condo-Townhouse	0.240578704	3.849259259	2.1	2.1	3.2	2.1	0.1	0.4	0.4	0.6	0.4	0.02
Single Family Housing	0.394238981	5.519345728	3.0	3.0	4.5	3.0	0.1	0.6	0.6	0.8	0.6	0.02
General Office Building	0.221120749	4.42241498	2.4	2.4	3.6	2.4	0.1	0.4	0.4	0.7	0.4	0.02
Total	Total points	22.51578935	12.2	12.2	18.5	12.2	0.3	2.3	2.3	3.4	2.3	0.1
Max allowed (BAAQMD)			54.0	54.0	82.0	54.0	1.4	10.0	10.0	15.0	10.0	0.3
Max Allowed (NCUAQMD)			50	50	80		50	40	40	15		100

BAAQMD std	CO calculations	
	lb	1
	ppm	14 from airproducts.com
	ppm	27 from BAAQMD
max (8hr avg)	lb/day	1.928571429
	ppm	20
max (24 hr avg)	lb/day	1.428571429 used this (it's more restrictive)
	lb/yr	521.4285714
	tpy	0.260714286
NCUAQMD std		
	lb/day	50
	lb/yr	200000
	tpy	100

Operations											
Points per total points		Daily (lb/day)					Annual (tpy)				
		ROG	Nox	PM10	PM2.5	CO	ROG	Nox	PM10	PM2.5	CO
0.13226	5.290391	2.9	2.9	4.3	2.9	0.1	0.5	0.5	0.8	0.5	0.01
0.157038	2.512609	1.4	1.4	2.1	1.4	0.0	0.3	0.3	0.4	0.3	0.01
0.237564	3.325897	1.8	1.8	2.7	1.8	0.0	0.3	0.3	0.5	0.3	0.01
0.13077	2.615403	1.4	1.4	2.1	1.4	0.0	0.3	0.3	0.4	0.3	0.01
13.7443		7.4	7.4	11.3	7.4	0.2	1.4	1.4	2.1	1.4	0.1
		54.0	54.0	82.0	54.0	1.4	10.0	10.0	15.0	10.0	0.0
		50	50	80		50	40	40	15		100

Land Use Category	Land Use Subcategory	Land Use Unit	Points per unit - Construction
Commercial	Bank	KSF	0.2
Commercial	General Office Building	KSF	0.2
Commercial	Government (Civic Center)	KSF	0.2
Commercial	Government Office Building	KSF	0.2
Commercial	Hospital	KSF	0.2
Commercial	Medical Office Building	KSF	0.2
Commercial	Office Park	KSF	0.2
Commercial	Pharmacy-Drug Store (no Drive-Thru)	KSF	0.2
Commercial	Pharmacy-Drug Store (w/ Drive-Thru)	KSF	0.2
Commercial	Research & Development	KSF	0.2
Education	Daycare Center	KSF	0.2
Education	School – Elementary	KSF	0.2
Education	School – High School	KSF	0.2
Education	College – Junior (2-year)	KSF	0.2
Education	School – Junior High	KSF	0.2
Education	Library	KSF	0.2
Education	College – University (4-year)	KSF	0.2
Education	Worship Place	KSF	0.2
Industrial	General Heavy Industry	KSF	0.2
Industrial	General Light Industry	KSF	0.3
Industrial	Industrial Park	KSF	0.2
Industrial	Manufacturing	KSF	0.2
Industrial	Refrig Warehouse- No Rail	KSF	0.2
Industrial	Refrig Warehouse- Rail	KSF	0.2
Industrial	Unrefrig Warehouse- No Rail	KSF	0.2
Industrial	Unrefrig Warehouse- Rail	KSF	0.2
Parking	Enclosed Parking Structure	Spaces	0.08856
Parking	Enclosed Parking w/ Elevator	Spaces	0.08856
Parking	Other Asphalt Surfaces	KSF	0.22141
Parking	Other Non-Asphalt Surfaces	KSF	0.22141
Parking	Parking Lot	Spaces	0.08856
Parking	Unenclosed Parking Structure	Spaces	0.08856
Parking	Unenclosed Parking Structure w/ Elevator	Spaces	0.08856
Recreational	Arena	KSF	0.25
Recreational	City Park	Acres	9.64
Recreational	Fast Food Rest No DriveThru	KSF	0.22
Recreational	Fast Food Rest w DriveThru	KSF	0.22
Recreational	Golf Course	Acres	9.64
Recreational	Health Club	KSF	0.22
Recreational	High Turnover (Sit Down Restaurant)	KSF	0.22
Recreational	Hotel	Rooms	0.32
Recreational	Motel	Rooms	0.43
Recreational	Movie Theater (no matinee)	KSF	0.22
Recreational	Quality Restaurant	KSF	0.22
Recreational	Racquet Club	KSF	0.22
Recreational	Recreational Swimming Pool	KSF	0.22
Residential	Apartments High Rise	DU	0.16
Residential	Apartments Low Rise	DU	0.24
Residential	Apartments Mid Rise	DU	0.22
Residential	Condo-Townhouse	DU	0.24
Residential	Condo-Townhouse Hi-Rise	DU	0.18
Residential	Congregate Care (Assisted Living)	DU	0.24
Residential	Mobile Home Park	DU	0.29
Residential	Retirement Community	DU	0.24
Residential	Single Family Housing	DU	0.39
Retail	Auto Care Center	KSF	0.22
Retail	Convenience Market (24-hr)	KSF	0.22
Retail	Convenience Market w/ Gas Pumps	KSF	0.22
Retail	Discount Club	KSF	0.22
Retail	Electronic Superstore	KSF	0.22
Retail	Free-Standing Discount Store	KSF	0.22
Retail	Free-Standing Discount Superstore	KSF	0.22
Retail	Gas-Service Station	Pumps	0.13
Retail	Hardware-Paint Store	KSF	0.22
Retail	Home Improve Superstore	KSF	0.22
Retail	Regional Shopping Center	KSF	0.22
Retail	Strip Mall	KSF	0.22
Retail	Supermarket	KSF	0.22

Points per unit - Operation

1.0
0.1
0.3
0.2
0.2
0.3
0.1
1.0
1.1
0.1
0.4
0.2
0.2
0.2
0.2
0.8
0.1
0.2
0.1
0.1
0.1
0.1
0.1
0.1
0.1
0.1
0.1
3.51E-04
3.51E-04
8.77E-04
8.77E-04
3.51E-04
3.51E-04
3.51E-04
0.2
0.5739
4.7
5.3
0.0
0.4
1.3
0.2
0.1
1.2
1.0
0.2
0.3
0.1
0.2
0.1
0.2
0.1
0.1
0.1
0.1
0.1
0.2
0.3
8.7
6.5
0.5
0.5
0.7
0.6
1.8
0.1
0.5
0.5
0.5
1.4