

## **Appendix C.4**



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### Calculations to Support Additional Emissions Analysis

# Art Center

## Draft EIR

### Appendix C

## Air Quality and Greenhouse Gas Worksheets and Modeling Output Files

- Appendix C.1: Construction Emissions Inventory (Daily Emissions)
  - Construction Assumptions
  - CalEEMod Outputs – Construction
  - Localized Significance Threshold (LST) Calculation Worksheet
  
- Appendix C.2: Operational Emissions Inventory
  - CalEEMod Outputs – Operations (Baseline and Project)
    - Baseline (Existing)
    - Baseline (Buildout Year)
    - Buildout
  
- Appendix C.3: GHG Modeling Parameters and Summary of Emissions
  - GHG Parameters and Summary
  - CalEEMod Outputs
    - Construction Annual
    - Baseline (Existing)
    - Baseline (Buildout Year)
    - Buildout
    -
  
- Appendix C.4: Additional Analysis
  - Shuttle Bus Direct Emissions Inventory
  - Interim Year CalEEMod Outputs
    - Summary of Combined Construction and Operational Emissions for Peak Year
    - ArtsCenter-No Project (2022)
    - Arts Center-Project (2022)

# Arts Center

## Draft EIR

### Appendix C

#### Air Quality and Greenhouse Gas Worksheets and Modeling Output Files

- Appendix C.4: Additional Analysis
  - Shuttle Bus Direct Emissions Inventory
  - Interim Year CalEEMod Outputs
    - Summary of Combined Construction and Operational Emissions for Peak Year
    - ArtsCenter-No Project (2022)
    - Arts Center-Project (2022)

Scenario	Existing - 2016 - 2 Shuttles - Gasoline	Future - 2022 - 6 Shuttles - Gasoline
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**Shuttle Bus Parameters**

Frequency (Minutes per Shuttle)	20	10
Shuttles per Hour	2	6
Hours per Day	16	16
Shuttle Trips per Day	32	96
Trip Length (miles)	12	12
Daily VMT	384	1152
Emissions (lbs/day)		
ROG	0.07	0.08
NOx	0.47	0.58
CO	1.77	1.95
PM10	0.00	0.00
PM2.5	0.00	0.00

**Emission Factors (EMFAC 2014)**

Region	South Coast	South Coast
CalYr	2016	2022
VehClass	OBUS	OBUS
MdYr	Aggregated	Aggregated
Speed	Aggregated	Aggregated
Fuel	GAS	GAS
Population	7264.13	8679.73
VMT	347215.66	386610.99
Trips	145340.61	173663.95
ROG_RUNEX	0.08	0.03
ROG_IDLEX	0.62	0.59
ROG_STREX	0.55	0.37
ROG_HOTSOAK	0.02	0.02
ROG_RUNLOSS	0.23	0.20
ROG_RESTLOSS	0.02	0.02
ROG_DIURN	0.04	0.03
TOG_RUNEX	0.11	0.04
TOG_IDLEX	0.90	0.86
TOG_STREX	0.61	0.40
TOG_HOTSOAK	0.02	0.02
TOG_RUNLOSS	0.23	0.20
TOG_RESTLOSS	0.02	0.02
TOG_DIURN	0.04	0.03
CO_RUNEX	2.10	0.77

CO_IDLEX	5.07	4.90
CO_STREX	8.64	5.91
NOx_RUNEX	0.55	0.23
NOx_IDLEX	0.05	0.05
NOx_STREX	1.39	0.96
CO2_RUNEX	1179.00	1130.76
CO2_IDLEX	374.14	362.90
CO2_STREX	78.02	73.96
PM10_RUNEX	0.00	0.00
PM10_IDLEX	0.00	0.00
PM10_STREX	0.00	0.00
PM10_PMTW	0.01	0.01
PM10_PMBW	0.13	0.13
PM2_5_RUNEX	0.00	0.00
PM2_5_IDLEX	0.00	0.00
PM2_5_STREX	0.00	0.00
PM2_5_PMTW	0.00	0.00
PM2_5_PMBW	0.06	0.06
SOx_RUNEX	0.01	0.01
SOx_IDLEX	0.00	0.00
SOx_STREX	0.00	0.00

Summary of Project Emissions (No Project 2022)						
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Area	11	0	0	0	0	0
Energy	0	4	3	0	0	0
Mobile	7	36	92	0	28	8
Stationary	2	5	4	0	0	0
	20	44	99	0	29	8

Summary of Project Emissions (Project 2022) Buildout						
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Area	22	0	32	0	0	0
Energy	1	6	5	0	0	0
Mobile	13	62	157	1	48	13
Stationary	2	5	4	0	0	0
	37	73	197	1	48	14

Net 2022 (Buildout)						
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Area	12	0	32	0	0	0
Energy	0	2	1	0	0	0
Mobile	5	26	65	0	19	5
Stationary	0	0	0	0	0	0
<b>Total</b>	<b>17</b>	<b>29</b>	<b>98</b>	<b>0</b>	<b>20</b>	<b>5</b>
Threshold	55	55	550	150	150	55
Difference	38	26	452	150	130	50
<b>Onsite Total</b>		<b>3</b>	<b>33</b>		<b>0</b>	<b>0</b>
Threshold		97	1921		9	3
Difference		94	1888		9	3

Net 2022 (Phase I Only)						
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Area	7	0	18	0	0	0
Energy	0	1	1	0	0	0
Mobile	3	15	37	0	11	3
Stationary	0	0	0	0	0	0
<b>Total</b>	<b>10</b>	<b>16</b>	<b>55</b>	<b>0</b>	<b>11</b>	<b>3</b>
Threshold	55	55	550	150	150	55
Difference	45	39	495	150	139	52
<b>Onsite Total</b>		<b>1</b>	<b>19</b>		<b>0</b>	<b>0</b>
Threshold		97	1921		9	3
Difference		95	1902		9	3

Phase I Beds:	850
Buildout Beds:	1500
Scalar:	0.6

Combined Construction and Operation (Year 2022)						
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Regional:						
Construction	7	51	66	0	6	3
Operation	10	16	55	0	11	3
<b>Total</b>	<b>17</b>	<b>68</b>	<b>121</b>	<b>0</b>	<b>17</b>	<b>6</b>
Threshold	75	100	550	150	150	55
Impact	No	No	No	No	No	No
Localized:						
Construction	0	46	56	0	3	2
Operation	7	1	19	0	0	0
<b>Total</b>	<b>7</b>	<b>48</b>	<b>75</b>	<b>0</b>	<b>3</b>	<b>2</b>
Threshold	0	97	1921	0	37	9
Impact	No	No	No	No	No	No

ArtsCenter - No Project 2022 - Los Angeles-South Coast County, Winter

**ArtsCenter - No Project 2022**  
**Los Angeles-South Coast County, Winter**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	45.92	1000sqft	1.05	45,923.00	0
University/College (4Yr)	1,893.00	Student	7.99	410,380.00	0
Enclosed Parking with Elevator	355.00	Space	3.19	142,000.00	0
Parking Lot	1,293.00	Space	11.64	517,200.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	33
<b>Climate Zone</b>	11	<b>Operational Year</b>	2022		
<b>Utility Company</b>	Pasadena Water & Power				
<b>CO2 Intensity (lb/MW hr)</b>	865.28	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Carbon Intensity Factor for RPS of 50 Percent (SB 350)

Land Use - Existing

Construction Phase - No construction

Off-road Equipment - No construction

Off-road Equipment -

Vehicle Trips - Traffic Study

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use - Historical

Stationary Sources - Emergency Generators and Fire Pumps - Existing

Stationary Sources - Emergency Generators and Fire Pumps EF -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblEnergyUse	T24E	3.92	0.35
tblLandUse	LandUseSquareFeet	45,920.00	45,923.00
tblLandUse	LandUseSquareFeet	347,928.61	410,380.00
tblProjectCharacteristics	CO2IntensityFactor	1664.14	865.28
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	500.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.50
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	12.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	4.00
tblVehicleTrips	ST_TR	2.46	2.09
tblVehicleTrips	ST_TR	1.30	1.57
tblVehicleTrips	SU_TR	1.05	0.89

tblVehicleTrips	WD_TR	11.03	9.36
tblVehicleTrips	WD_TR	1.71	2.07

## 2.0 Emissions Summary

### 2.2 Overall Operational

#### Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.5115	3.3500e-003	0.3668	3.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003		0.8368
Energy	0.3968	3.6069	3.0298	0.0216		0.2741	0.2741		0.2741	0.2741		4,328.2796	4,328.2796	0.0830	0.0794	4,354.0004
Mobile	7.2106	35.7912	91.6297	0.3294	27.9742	0.2816	28.2558	7.4864	0.2627	7.7491		33,544.3833	33,544.3833	1.7804		33,588.8930
Stationary	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
<b>Total</b>	<b>19.7600</b>	<b>43.9882</b>	<b>99.2107</b>	<b>0.3589</b>	<b>27.9742</b>	<b>0.7985</b>	<b>28.7727</b>	<b>7.4864</b>	<b>0.7796</b>	<b>8.2659</b>		<b>38,712.9621</b>	<b>38,712.9621</b>	<b>1.9831</b>	<b>0.0794</b>	<b>38,786.1868</b>

#### Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	10.5115	3.3500e-003	0.3668	3.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003		0.8368
Energy	0.3968	3.6069	3.0298	0.0216		0.2741	0.2741		0.2741	0.2741		4,328.2796	4,328.2796	0.0830	0.0794	4,354.0004
Mobile	7.2106	35.7912	91.6297	0.3294	27.9742	0.2816	28.2558	7.4864	0.2627	7.7491		33,544.3833	33,544.3833	1.7804		33,588.8930
Stationary	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
<b>Total</b>	<b>19.7600</b>	<b>43.9882</b>	<b>99.2107</b>	<b>0.3589</b>	<b>27.9742</b>	<b>0.7985</b>	<b>28.7727</b>	<b>7.4864</b>	<b>0.7796</b>	<b>8.2659</b>		<b>38,712.9621</b>	<b>38,712.9621</b>	<b>1.9831</b>	<b>0.0794</b>	<b>38,786.1868</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.2106	35.7912	91.6297	0.3294	27.9742	0.2816	28.2558	7.4864	0.2627	7.7491		33,544.3833	33,544.3833	1.7804		33,588.8930
Unmitigated	7.2106	35.7912	91.6297	0.3294	27.9742	0.2816	28.2558	7.4864	0.2627	7.7491		33,544.3833	33,544.3833	1.7804		33,588.8930



### 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated Annual VMT	Mitigated Annual VMT
	Weekday	Saturday	Sunday		
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	429.81	95.97	40.87	1,051,990	1,051,990
Parking Lot	0.00	0.00	0.00		
University/College (4Yr)	3,918.51	2,972.01	0.00	9,683,057	9,683,057
<b>Total</b>	<b>4,348.32</b>	<b>3,067.98</b>	<b>40.87</b>	<b>10,735,047</b>	<b>10,735,047</b>

### 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

### 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
General Office Building	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Parking Lot	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
University/College (4Yr)	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

### 5.0 Energy Detail

Historical Energy Use: Y

### 5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Natural Gas Mitigated	0.3968	3.6069	3.0298	0.0216		0.2741	0.2741		0.2741	0.2741		4,328.2796	4,328.2796	0.0830	0.0794	4,354.0004
Natural Gas Unmitigated	0.3968	3.6069	3.0298	0.0216		0.2741	0.2741		0.2741	0.2741		4,328.2796	4,328.2796	0.0830	0.0794	4,354.0004

### 5.2 Energy by Land Use - Natural Gas

#### Unmitigated

Land Use	Natural Gas Use (kBTU/yr)	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	1565.16	0.0169	0.1535	0.1289	9.2000e-004		0.0117	0.0117		0.0117	0.0117		184.1361	184.1361	3.5300e-003	3.3800e-003	185.2303
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
University/College (4Yr)	35225.2	0.3799	3.4535	2.9009	0.0207		0.2625	0.2625		0.2625	0.2625		4,144.1436	4,144.1436	0.0794	0.0760	4,168.7701

Total		0.3968	3.6069	3.0298	0.0216		0.2741	0.2741		0.2741	0.2741		4,328.2796	4,328.2796	0.0830	0.0794	4,354.0004
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**Mitigated**

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	1.56516	0.0169	0.1535	0.1289	9.2000e-004		0.0117	0.0117		0.0117	0.0117		184.1361	184.1361	3.5300e-003	3.3800e-003	185.2303
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
University/College (4Yr)	35.2252	0.3799	3.4535	2.9009	0.0207		0.2625	0.2625		0.2625	0.2625		4,144.1436	4,144.1436	0.0794	0.0760	4,168.7701
<b>Total</b>		<b>0.3968</b>	<b>3.6069</b>	<b>3.0298</b>	<b>0.0216</b>		<b>0.2741</b>	<b>0.2741</b>		<b>0.2741</b>	<b>0.2741</b>		<b>4,328.2796</b>	<b>4,328.2796</b>	<b>0.0830</b>	<b>0.0794</b>	<b>4,354.0004</b>

**6.0 Area Detail**

**6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.5115	3.3500e-003	0.3668	3.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003		0.8368
Unmitigated	10.5115	3.3500e-003	0.3668	3.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003		0.8368

**6.2 Area by SubCategory**

**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.2091					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.2683					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0341	3.3500e-003	0.3668	3.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003		0.8368
<b>Total</b>	<b>10.5115</b>	<b>3.3500e-003</b>	<b>0.3668</b>	<b>3.0000e-005</b>		<b>1.3100e-003</b>	<b>1.3100e-003</b>		<b>1.3100e-003</b>	<b>1.3100e-003</b>		<b>0.7850</b>	<b>0.7850</b>	<b>2.0700e-003</b>		<b>0.8368</b>

**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	lb/day								lb/day					
Architectural Coating	1.2091				0.0000	0.0000		0.0000	0.0000			0.0000		0.0000
Consumer Products	9.2683				0.0000	0.0000		0.0000	0.0000			0.0000		0.0000
Landscaping	0.0341	3.3500e-003	0.3668	3.0000e-005	1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003		0.7850	0.7850	2.0700e-003	0.8368
<b>Total</b>	<b>10.5115</b>	<b>3.3500e-003</b>	<b>0.3668</b>	<b>3.0000e-005</b>	<b>1.3100e-003</b>	<b>1.3100e-003</b>		<b>1.3100e-003</b>	<b>1.3100e-003</b>		<b>0.7850</b>	<b>0.7850</b>	<b>2.0700e-003</b>	<b>0.8368</b>

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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## 10.0 Stationary Equipment

### Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	4	0.5	12	500	0.73	Diesel

### Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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### User Defined Equipment

Equipment Type	Number
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## 10.1 Stationary Sources

### Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (200 - 200 HP)	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
<b>Total</b>	<b>1.6411</b>	<b>4.5867</b>	<b>4.1844</b>	<b>7.8900e-003</b>		<b>0.2414</b>	<b>0.2414</b>		<b>0.2414</b>	<b>0.2414</b>		<b>839.5141</b>	<b>839.5141</b>	<b>0.1177</b>		<b>842.4566</b>

## 11.0 Vegetation

ArtsCenter - Project 2022 - Los Angeles-South Coast County, Winter

**ArtsCenter - Project 2022**  
**Los Angeles-South Coast County, Winter**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	45.92	1000sqft	1.05	45,923.00	0
University/College (4Yr)	2,500.00	Student	10.55	536,952.00	0
Enclosed Parking with Elevator	1,171.00	Space	10.54	468,400.00	0
Parking Lot	937.00	Space	8.43	374,800.00	0
High Turnover (Sit Down Restaurant)	11.78	1000sqft	0.27	11,778.00	0
Movie Theater (No Matinee)	300.00	Seat	0.15	6,750.00	0
Apartments Mid Rise	380.00	Dwelling Unit	10.00	345,000.00	1087

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	33
<b>Climate Zone</b>	11			<b>Operational Year</b>	2022
<b>Utility Company</b>	Pasadena Water & Power				
<b>CO2 Intensity (lb/MW hr)</b>	393	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

- Project Characteristics - Carbon Intensity Factor for RPS of 50 Percent (SB 350)
- Land Use - Full buildout
- Construction Phase -
- Off-road Equipment -
- Trips and VMT -
- Architectural Coating -
- Vehicle Trips - Traffic Study
- Woodstoves - No woodstoves and assumed no fireplaces in dorms or out door amenities.
- Area Coating -
- Energy Use - 2016 Title 24
- Water Mitigation - CalGreen
- Waste Mitigation - California Integrated Waste Management Act
- Stationary Sources - Emergency Generators and Fire Pumps - existing
- Stationary Sources - Emergency Generators and Fire Pumps EF -
- Vehicle Emission Factors -
- Vehicle Emission Factors -
- Vehicle Emission Factors -
- Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.77	3.88
tblEnergyUse	LightingElect	7.87	8.13
tblEnergyUse	LightingElect	3.10	3.20

tblEnergyUse	LightingElect	0.35	0.88
tblEnergyUse	LightingElect	3.39	3.48
tblEnergyUse	NT24E	3,054.10	3,277.06
tblEnergyUse	T24E	164.54	139.71
tblEnergyUse	T24E	3.92	0.36
tblEnergyUse	T24E	4.60	4.58
tblEnergyUse	T24E	8.11	8.08
tblEnergyUse	T24E	2.25	2.24
tblEnergyUse	T24E	3.04	2.07
tblEnergyUse	T24NG	4,385.94	6,328.91
tblEnergyUse	T24NG	10.02	10.07
tblEnergyUse	T24NG	42.98	43.19
tblEnergyUse	T24NG	13.65	13.71
tblEnergyUse	T24NG	26.49	26.63
tblFireplaces	NumberGas	323.00	0.00
tblFireplaces	NumberNoFireplace	38.00	380.00
tblFireplaces	NumberWood	19.00	0.00
tblLandUse	LandUseSquareFeet	45,920.00	45,923.00
tblLandUse	LandUseSquareFeet	459,493.67	536,952.00
tblLandUse	LandUseSquareFeet	11,780.00	11,778.00
tblLandUse	LandUseSquareFeet	380,000.00	345,000.00
tblProjectCharacteristics	CO2IntensityFactor	1664.14	393
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	500.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.50
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	12.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	4.00
tblVehicleTrips	ST_TR	6.39	2.24
tblVehicleTrips	ST_TR	2.46	2.09
tblVehicleTrips	ST_TR	158.37	71.13
tblVehicleTrips	ST_TR	2.24	1.69
tblVehicleTrips	ST_TR	1.30	1.57
tblVehicleTrips	SU_TR	5.86	2.05
tblVehicleTrips	SU_TR	1.05	0.89
tblVehicleTrips	SU_TR	131.84	59.21
tblVehicleTrips	SU_TR	1.85	1.40
tblVehicleTrips	WD_TR	6.65	2.33
tblVehicleTrips	WD_TR	11.03	9.36
tblVehicleTrips	WD_TR	127.15	57.10
tblVehicleTrips	WD_TR	1.76	1.33
tblVehicleTrips	WD_TR	1.71	2.07
tblWoodstoves	NumberCatalytic	19.00	0.00
tblWoodstoves	NumberNoncatalytic	19.00	0.00

## 2.0 Emissions Summary

### 2.2 Overall Operational

#### Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	22.2157	0.3666	31.8920	1.6900e-003		0.1752	0.1752		0.1752	0.1752	0.0000	57.5367	57.5367	0.0573	0.0000	58.9698
Energy	0.6553	5.8892	4.5031	0.0358		0.4528	0.4528		0.4528	0.4528		7,149.0406	7,149.0406	0.1370	0.1311	7,191.5238
Mobile	12.6331	62.0878	156.5157	0.5573	47.1466	0.4778	47.6244	12.6172	0.4457	13.0629		56,759.3384	56,759.3384	3.0375		56,835.2766
Stationary	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
<b>Total</b>	<b>37.1452</b>	<b>72.9303</b>	<b>197.0952</b>	<b>0.6026</b>	<b>47.1466</b>	<b>1.3472</b>	<b>48.4938</b>	<b>12.6172</b>	<b>1.3151</b>	<b>13.9323</b>	<b>0.0000</b>	<b>64,805.4298</b>	<b>64,805.4298</b>	<b>3.3496</b>	<b>0.1311</b>	<b>64,928.2268</b>

**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	22.2157	0.3666	31.8920	1.6900e-003		0.1752	0.1752		0.1752	0.1752	0.0000	57.5367	57.5367	0.0573	0.0000	58.9698
Energy	0.6553	5.8892	4.5031	0.0358		0.4528	0.4528		0.4528	0.4528		7,149.0406	7,149.0406	0.1370	0.1311	7,191.5238
Mobile	12.6331	62.0878	156.5157	0.5573	47.1466	0.4778	47.6244	12.6172	0.4457	13.0629		56,759.3384	56,759.3384	3.0375		56,835.2766
Stationary	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
<b>Total</b>	<b>37.1452</b>	<b>72.9303</b>	<b>197.0952</b>	<b>0.6026</b>	<b>47.1466</b>	<b>1.3472</b>	<b>48.4938</b>	<b>12.6172</b>	<b>1.3151</b>	<b>13.9323</b>	<b>0.0000</b>	<b>64,805.4298</b>	<b>64,805.4298</b>	<b>3.3496</b>	<b>0.1311</b>	<b>64,928.2268</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**4.0 Operational Detail - Mobile**

**4.1 Mitigation Measures Mobile**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.6331	62.0878	156.5157	0.5573	47.1466	0.4778	47.6244	12.6172	0.4457	13.0629		56,759.3384	56,759.3384	3.0375		56,835.2766
Unmitigated	12.6331	62.0878	156.5157	0.5573	47.1466	0.4778	47.6244	12.6172	0.4457	13.0629		56,759.3384	56,759.3384	3.0375		56,835.2766

**4.2 Trip Summary Information**

Land Use	Average Daily Trip Rate			Unmitigated Annual VMT	Mitigated Annual VMT
	Weekday	Saturday	Sunday		
Apartments Mid Rise	885.40	851.20	779.00	2,956,910	2,956,910
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	429.81	95.97	40.87	1,051,990	1,051,990
High Turnover (Sit Down Restaurant)	672.64	837.91	697.49	953,708	953,708
Movie Theater (No Matinee)	399.00	507.00	420.00	884,538	884,538
Parking Lot	0.00	0.00	0.00		
University/College (4Yr)	5,175.00	3,925.00	0.00	12,787,979	12,787,979
<b>Total</b>	<b>7,561.85</b>	<b>6,217.08</b>	<b>1,937.36</b>	<b>18,635,125</b>	<b>18,635,125</b>

### 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down Restaurant)	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Movie Theater (No Matinee)	16.60	8.40	6.90	1.80	79.20	19.00	66	17	17
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

### 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Enclosed Parking with Elevator	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
General Office Building	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
High Turnover (Sit Down Restaurant)	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Movie Theater (No Matinee)	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Parking Lot	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
University/College (4Yr)	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

### 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.6553	5.8892	4.5031	0.0358		0.4528	0.4528		0.4528	0.4528		7,149.0406	7,149.0406	0.1370	0.1311	7,191.5238
NaturalGas Unmitigated	0.6553	5.8892	4.5031	0.0358		0.4528	0.4528		0.4528	0.4528		7,149.0406	7,149.0406	0.1370	0.1311	7,191.5238

### 5.2 Energy by Land Use - NaturalGas

#### Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	11618.5	0.1253	1.0707	0.4556	6.8300e-003		0.0866	0.0866		0.0866	0.0866		1,366.8866	1,366.8866	0.0262	0.0251	1,375.0094
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	1316.04	0.0142	0.1290	0.1084	7.7000e-004		9.8100e-003	9.8100e-003		9.8100e-003	9.8100e-003		154.8282	154.8282	2.9700e-003	2.8400e-003	155.7483
High Turnover (Sit Down Restaurant)	7453.05	0.0804	0.7307	0.6138	4.3800e-003		0.0555	0.0555		0.0555	0.0555		876.8299	876.8299	0.0168	0.0161	882.0404
Movie Theater (No Matinee)	335.836	3.6200e-003	0.0329	0.0277	2.0000e-004		2.5000e-003	2.5000e-003		2.5000e-003	2.5000e-003		39.5101	39.5101	7.6000e-004	7.2000e-004	39.7449





Landscaping	0.9952	0.3666	31.8920	1.6900e-003		0.1752	0.1752		0.1752	0.1752		57.5367	57.5367	0.0573		58.9698
<b>Total</b>	<b>22.2157</b>	<b>0.3666</b>	<b>31.8920</b>	<b>1.6900e-003</b>		<b>0.1752</b>	<b>0.1752</b>		<b>0.1752</b>	<b>0.1752</b>	<b>0.0000</b>	<b>57.5367</b>	<b>57.5367</b>	<b>0.0573</b>	<b>0.0000</b>	<b>58.9698</b>

**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.1831					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	19.0374					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.9952	0.3666	31.8920	1.6900e-003		0.1752	0.1752		0.1752	0.1752		57.5367	57.5367	0.0573		58.9698
<b>Total</b>	<b>22.2157</b>	<b>0.3666</b>	<b>31.8920</b>	<b>1.6900e-003</b>		<b>0.1752</b>	<b>0.1752</b>		<b>0.1752</b>	<b>0.1752</b>	<b>0.0000</b>	<b>57.5367</b>	<b>57.5367</b>	<b>0.0573</b>	<b>0.0000</b>	<b>58.9698</b>

**7.0 Water Detail**

**7.1 Mitigation Measures Water**

Apply Water Conservation Strategy

**8.0 Waste Detail**

**8.1 Mitigation Measures Waste**

Institute Recycling and Composting Services

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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**10.0 Stationary Equipment**

**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	4	0.5	12	500	0.73	Diesel

**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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**10.1 Stationary Sources**

**Unmitigated/Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (200 - 500 HP)	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566

Total	1.6411	4.5867	4.1844	7.8900e-003		0.2414	0.2414		0.2414	0.2414		839.5141	839.5141	0.1177		842.4566
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## 11.0 Vegetation

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