



# 2019 MUNICIPAL GREENHOUSE GAS INVENTORY REPORT

April 2021



## Introduction

This document presents the City of Culver City's (City's) greenhouse gas (GHG) emissions inventory for municipal operations (referred to as the "municipal GHG inventory" in this report). The purpose of the municipal GHG inventory is to identify source types, distribution, and amount of GHG emissions associated with electricity and natural gas use, transportation, water supply, and wastewater treatment within Culver City (city) resulting from municipal operations. This inventory will help policy makers apply cost-effective GHG reduction strategies in policy areas over which they have considerable influence.

Culver City, covering about five square miles, is in western Los Angeles County and is mostly surrounded by the city of Los Angeles; has an elevation of about 95 feet above sea level; experiences average temperatures that range from a low of 55.2 °F (12.9 °C) to a high of 71.8 °F (22.1 °C); and receives an average of 13.3 inches of rain per year (NOAA, 2004).

## Municipal Operations

The City government serves a community of 38,883 persons (based on 2010 U.S. Census data). A full-time City Manager reports to the City Council and manages the City's day-to-day business. The City employs 708 full-time and 253 part-time workers. Municipal services include community development, community services, police, fire protection, public transportation, street lighting, and traffic signals and other public works. In addition to municipal buildings and facilities, Culver City provides the following facilities for community use: senior center, teen center, several parks, community center, and a sports center with tennis courts and a swimming pool.

Culver City operates and maintains a fleet of vehicles that includes light-, medium-, and heavy-duty trucks; passenger vehicles; police and fire equipment; transit vehicles, including the Culver CityBus fleet; Dial-A-Ride vehicles; refuse collection; sanitary sewer and street sweeping vehicles (indirectly through a contractor); construction equipment; and landscaping equipment. The City fleet includes vehicles that use gasoline, diesel, electricity, and renewable compressed natural gas.

## Methodology and Data Collection

The municipal inventory includes emissions for the calendar year 2019 from electricity, natural gas, vehicle fleet, employee commutes, water supply, and wastewater treatment activities associated with municipal operations. These sources capture energy used by buildings, traffic signals, streetlights, water conveyance (both within the city boundary and upstream of the city). The 2019 municipal GHG inventory is adapted from the 2017 Municipal Energy GHG Inventory Report, which only included emissions from energy use, i.e., electricity and natural gas. In addition to including the full breadth of emissions sectors, the municipal GHG inventory also scaled and updated previously included sectors to match 2019 socioeconomic data provided by Fehr & Peers and municipal growth.

The emission sources and activities included in the municipal energy inventory are based on the Local Government Operations Protocol (LGOP), which was developed by the California Air Resources Board

(CARB), the California Climate Action Registry (CCAR), and Local Governments for Sustainability (ICLEI),<sup>1</sup> in collaboration with The Climate Registry. The LGOP provides a standardized set of guidelines and methods to aid local governments with quantifying and reporting GHG emissions associated with their municipal operations. As such, emissions in the municipal GHG inventory include those that derive from sources under municipal control and from activities by personnel employed by the local government.

This document summarizes the following information for each emissions sector:

- **Data Acquisition and Sources:** Activity data sources used to generate emissions.
- **Emission Calculation Methods:** Methods and models used to calculate emissions.
- **Emissions Summary:** Inventory of GHG emissions by sector.
- **Activity Data and Calculations:** Source activity data and calculations used to develop the inventory (see Error! Reference source not found.).

## Data Acquisition

### On-Road Transportation

The City provided monthly mobile fleet data for vehicles powered by gasoline, diesel, electric, and natural gas. The data includes gallons of gasoline and diesel, kilowatt-hours (kWh) used for electricity, and therms<sup>2</sup> used for natural gas. Additionally, the City provided weekly data on employee commutes by mode of transportation. The data included employee home ZIP codes from which commute distances were derived.

### Electricity

#### Clean Power Alliance (CPA)

CPA is the main electricity provider for Culver City and began its municipal service starting in May 2019. CPA buys clean power and Southern California Edison delivers it to CPA customers and maintains the system infrastructure. The City's municipal facilities all receive CPA's Green Power tier option (100 percent renewable energy). The City provided annual electricity use data for 2019 based on their utility records. Utility records are aggregated by total monthly usage by facility address and rate category.

#### Southern California Edison (SCE)

SCE was the City's main utility provider before CPA's service was phased in starting in mid-2019. The City provided electricity data for 2019 based on their utility records. These data are aggregated by total monthly usage by facility address and rate category.

### Natural Gas

#### Southern California Gas (SoCalGas)

SoCalGas is the sole natural gas provider for building energy in Culver City. The City provided the municipal facilities' natural gas use data in spreadsheets and through the Energy Star Energy Portfolio Manager. If duplicate data was found in both data sources (such as for the same facility), the data source with the larger

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<sup>1</sup> Local Governments for Sustainability (ICLEI) was formerly the International Council for Local Environmental Initiatives.

<sup>2</sup> A unit of heat energy equal to 100,000 British thermal units (Btu).

volume of natural gas was used for the emissions calculations. The 2017 data was scaled according to the City’s employee growth rate between 2017 and 2019 to estimate 2019 natural gas use.

### Clean Energy Fuels (CEF)

In July 2018, Culver City replaced its existing Compressed Natural Gas (CNG) fuel with Renewable Natural Gas (RNG) for its municipal fleet. In 2019, the City’s transit bus fleet was powered entirely by RNG supplied by CEF. CEF produces biomethane, a form of RNG, from renewable sources like digested organic waste and gasified biomass and sells it to the City for use in its municipal fleet. The Transportation Department provided transit bus data including natural gas use for 2019 in therms.

### Water Supply

Golden State Water (GSW) is the sole water provider for City facilities and shares its data with the City. The City provided municipal facilities' water use data from 2017, including monthly use data (in hundred cubic feet) by address. To estimate the City’s total municipal facilities' water use in 2019, the 2017 data was scaled per the City’s employee growth rate between 2017 and 2019.

### Wastewater Treatment

The City provided daily and annual flow rates for the City’s municipal facilities. A process engineer at the Hyperion Wastewater Treatment Plant (WWTP) provided the facility’s daily and annual flow rates, digester gas volumes, and natural gas volumes. Hyperion WWTP treats a sizable portion of Los Angeles County’s wastewater, including wastewater generated by residents and businesses in Culver City. The data received represents annual averages that were applied to both the 2017 and 2019 emissions calculations.

## Emission Calculation Methods

### Growth Factors

To estimate 2019 emissions from natural gas and water use, a growth factor was applied to 2017 emissions. The City provided 2017 and 2019 employment data to calculate an annual growth rate factor for the City’s municipal operations and facilities. **Table 1** summarizes the employment data and calculated growth rate that was applied to the natural gas and water supply sectors. Sectors that were calculated directly for 2019 (i.e., not scaled using growth factors) include on-road transportation, electricity, and wastewater treatment.

**Table 1: Culver City Employee Growth Rate Used for the Natural Gas and Water Supply Sectors**

Year	Employee Type		
	Full Time	Part Time	Full Time Equivalent (FTE)*
2017	705	213	812
2019	708	253	835
<b>2017 – 2019 Growth Rate</b>	-	-	<b>1.028</b>

\* FTE is a measure of comparable workload where full time employees are assumed to have an FTE of 1 and part time are assumed to have an FTE of 0.5.

Year	Employee Type		
	Full Time	Part Time	Full Time Equivalent (FTE)*
Source: City, 2020c			

## On-Road Transportation

Fleet vehicle emissions were calculated for City-owned vehicles. Electric vehicle emissions were estimated by multiplying the annual electric vehicle electricity use by the SCE emission factor shown in **Table 1**. Natural gas vehicle emissions, mainly from the City’s natural gas bus fleet, were calculated by multiplying the total annual therms used for the fleet by the natural gas emission factors shown in **Table 2**. Gasoline and diesel emissions were calculated using standard emission factors shown in **Table 2**.

VMT for employee commutes was calculated using data provided by the City. The data included employee home ZIP codes and mode of transportation per day during an average workweek (Monday through Friday). Distances from home ZIP codes to Culver City City Hall (ZIP code 90232) were calculated and multiplied by the number of weekly trips per ZIP code to estimate total weekly VMT. Weekly VMT was then multiplied by 52 weeks to estimate the total annual VMT generated by City employees. Employees who take public transit, bike, walk, or drive zero emission vehicles were excluded from the VMT estimates. It is assumed that employees who drive to work do so in passenger vehicles, which include the following CARB Emissions Factor (EMFAC) categories, unless otherwise specified:

- **LDA:** passenger cars
- **LDT1:** light-duty trucks (gross vehicle weight rating, GVWR, <6,000 pounds and equivalent test weight, ETW, <= 3,750 pounds)
- **LDT2:** light-duty trucks (GVWR < 6,000 pounds and ETW 3,751 – 5,750 pounds)
- **MDV:** medium-duty trucks (GVWR 6,000 and 8,500 pounds)

CARB’s 2017 Emission Factor model (EMFAC2017) was run in emission rate mode to obtain 2017 run (RUNEX, expressed in grams(g)/mile), idle (IDLEX, expressed in g/minute), and start (STREX, expressed in g/trip) emission factors for all fuel and vehicle types in Los Angeles County. To compare these three processes, IDLEX and STREX emission factors were converted to grams per mile (g/mile) using population, VMT, and trip data from the same EMFAC2017 output. Emission rates for all processes (RUNEX, IDLEX, and STREX) were added for each GHG: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).

Emission factors, weighted by percentage of VMT per fuel type, were calculated for each vehicle type, and derived for each vehicle category based on the percentage of VMT per vehicle type. The derived emission factors were then applied to the VMT by vehicle category to account for total emissions from passenger vehicles.

**Table 2: Fossil Fuel Emission Factors**

Fuel Type	Emission Factor (MTCO <sub>2</sub> e* per gallon)
Gasoline	0.00878
Diesel	0.01021

\*MTCO<sub>2</sub>e stands for Metric tons of CO<sub>2</sub>e

Fuel Type	Emission Factor (MTCO <sub>2</sub> e <sup>*</sup> per gallon)
Source: USEPA, 2014	

## Electricity

Emission factors for CPA and SCE, shown in **Table 3**, were applied to the total kWh consumption values for municipal operations to calculate electricity GHG emissions. CPA has three tiers of emission factors: lean, clean, and green power options. In the case of green power, the emission factor is zero because electricity is sourced from 100 percent renewable (i.e., carbon-free) energy sources. The SCE emission factor is expressed in carbon dioxide equivalents (CO<sub>2</sub>e), an aggregated metric that accounts for the global warming potential (GWP) of all three GHGs.

SCE provides the infrastructure and distribution for its bundled customers (those for whom SCE provides and distributes electricity) and unbundled customers (those for whom SCE distributes electricity, but the customer receives their electricity through the CPA and direct access within the City. Regardless of who supplies the electricity to the customer, SCE tracks the total electricity customers use through their meters. SCE electricity and resultant emissions were calculated for the months that the City’s facilities were not yet enrolled in CPA’s service (January through April 2019).

**Table 3: Electricity Emission Factors Used for the 2019 Inventory**

Utility	Electricity Emission Factors			
	CO <sub>2</sub> e (lbs/MWh)	CO <sub>2</sub> (lbs/MWh)	CH <sub>4</sub> (lbs/GWh)	N <sub>2</sub> O (lbs/GWh)
CPA – Lean Power (36% Renewables)	-	10.59	0.033	0.004
CPA – Clean Power (50% Renewables)	-	9.81	0.033	0.004
CPA – Green Power (100% Renewables)	-	0	0	0
SCE	467.38	-	-	-

Notes: CPA emission factors for CH<sub>4</sub> and N<sub>2</sub>O were unavailable so regional average emission factors from Emissions and Generation Resource Integrated Database (eGRID) for the California region (CAMX) were applied. CPA and SCE emission factors are from 2018, the latest year data was available.

Sources: The Climate Registry, 2018; Edison International, 2018

## Natural Gas

Emissions associated with natural gas use were calculated based on the total therms used by each City facility and the standard emission factors from the United States Environmental Protection Agency (USEPA) for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O expressed in kilograms (kg) per million British thermal units (MMBtu), as shown in **Table 4**.

Table 4: Natural Gas Emission Factors Used for the 2019 Inventory

Fuel Type	Natural Gas Emission Factors		
	CO <sub>2</sub> (kg/MMBtu)	CH <sub>4</sub> (kg/MMBtu)	N <sub>2</sub> O (kg/MMBtu)
Natural Gas	53.02	0.005	0.0001
Source: USEPA, 2014			

## Water Supply

Emissions associated with potable water supply are based on the City’s total water use by municipal facility and land use type (in hundred cubic feet, converted to acre-feet). The acre-feet of water were multiplied by an electricity intensity factor of 1,938 kWh/acre-foot for conveyance, treatment, and distribution (MWDSC, 2015). The resulting electricity use was then multiplied by SCE’s CO<sub>2</sub>e emission factor to calculate the emissions associated with water supply by land use type. GSW purchases electricity from SCE. Therefore, the emissions associated with the treatment, conveyance, and delivery of its water is based on the SCE electricity emission factor.

## Wastewater Treatment

Wastewater treatment emissions were calculated by first estimating the Hyperion WWTP’s total natural gas and digester gas emissions. Methods from the U.S. Community Protocol for WWTP emissions were used to convert total digester gas in cubic feet per day to British thermal units (BTU) per day. The resulting BTUs were then annualized by multiplying by 365 days and converted to CO<sub>2</sub>e using the emission factors from **Table 5**. The amount of natural gas the Hyperion WWTP consumes was also converted to BTUs, annualized, and multiplied by the natural gas emission factors listed in **Table 2**, above.

Table 5: Digester Gas Emission Factors

Fuel Type	Digester Gas Emission Factors		
	CO <sub>2</sub> (kg/MMBtu)	CH <sub>4</sub> (kg/MMBtu)	N <sub>2</sub> O (kg/MMBtu)
Digester Gas	-	0.0032	0.00063
Source: ICLEI, 2013			

Once emissions associated with Hyperion WWTP energy consumption were calculated, these emissions were apportioned to the City facilities based on the proportion of the City facilities’ annual flow rate compared to Hyperion WWTP’s total annual flow rate. The City’s annual flow is about 0.01 percent of Hyperion’s total annual flow.

# Emissions Inventory

## Summary

The municipal GHG emissions sources include electricity, natural gas, transportation, water supply, and wastewater treatment. **Table 6** presents the total emissions by source in metric tons of CO<sub>2</sub>e. Error! Reference source not found. shows the percent breakdown of the inventory by source.

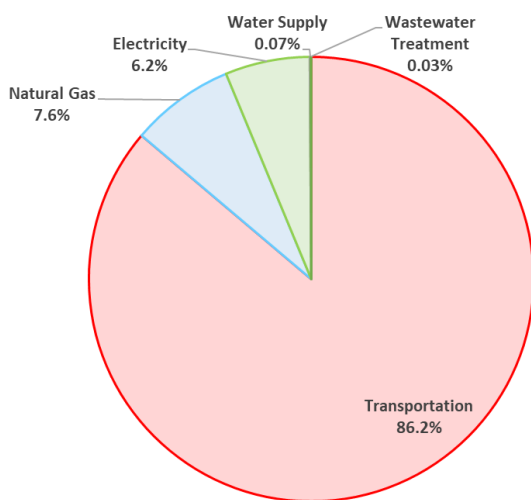
**Table 6: Total Culver City Municipal GHG Emissions by Source in 2019**

Source	Municipal GHG Emissions	
	MTCO <sub>2</sub> e	%
On-Road Transportation	7,290	86.2
Natural Gas	640	7.6
Electricity	521	6.2
Water Supply	6	0.07
Wastewater Treatment	3	0.03
<b>Total</b>	<b>8,459</b>	<b>100.0</b>

Note: Totals may not add up exactly due to rounding in the calculations and significant figures presented in table. Refer to Attachment A, Tables A.1-4 through A.1-8, for detailed calculations.

Sources: CPA, 2019; SCE, 2020; SoCalGas, 2017; GSW, 2017

**Figure 1: Percent of Culver City Municipal Emissions by Source and Energy Type in 2019**



Sources: CPA, 2019; SCE, 2020; SoCalGas, 2017; GSW, 2017



As the results show, the main source of municipal emissions is on-road transportation, representing 86.2 percent of total emissions, followed by natural gas at 7.6 percent and electricity at 6.2 percent. Building energy (electricity and natural gas) makes up a combined 13.8 percent of total emissions. Emissions from electricity are lower than many other local governments because the City primarily uses CPA’s 100 percent renewable, carbon-free electricity.

## On-Road Transportation

As described in the methodology above, on-road transportation emissions were calculated using data on employee commuting and the City’s vehicle fleet that the City provided. On-road transportation is the single largest contributor to emissions in the city, accounting for 86.2 percent of total emissions. **Table 7** shows the emissions breakdown by source and **Figure 2** shows the percent breakdown of emissions by vehicle type.

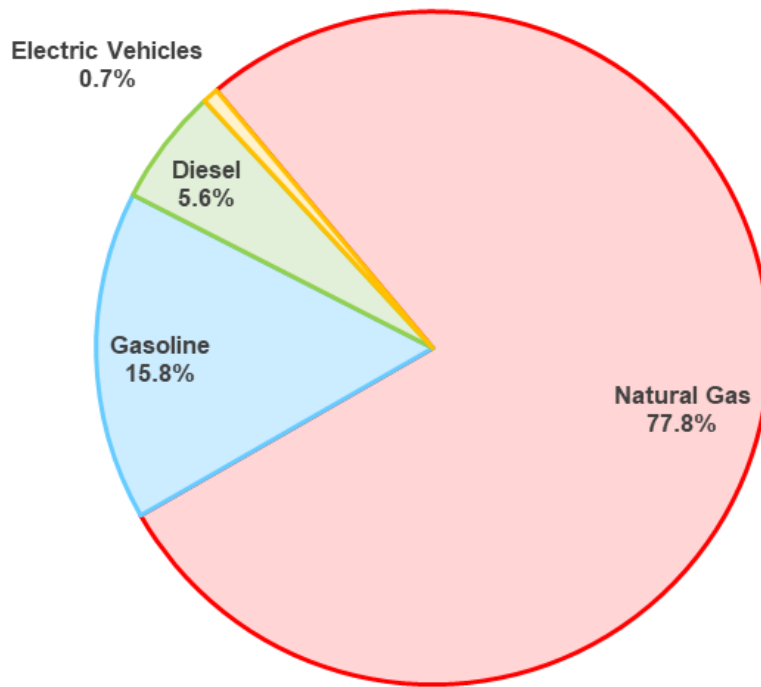
**Table 7: Culver City Municipal On-Road Transportation GHG Emissions by Vehicle Type in 2019**

Vehicle Type	On-Road Transportation Emissions	
	MTCO <sub>2e</sub>	%
RNG	5,162	77.8
Gasoline	1,048	15.8
Diesel	373	5.6
Electric	50	0.7
<b>Total</b>	<b>6,632</b>	<b>100.0</b>

Notes: Gasoline emissions include 658 MTCO<sub>2e</sub> from employee commutes with the remaining emissions from the City-owned vehicle fleet. Totals may not add up exactly due to rounding in the calculations and significant figures presented in table. Refer to Attachment A, Table A.1-6, for detailed calculations.

Source: City, 2020a; City, 2020b

Figure 2: Percent of Culver City Municipal On-Road Transportation GHG Emissions by Vehicle Type in 2019



Source: City, 2020a; City, 2020b

As shown in **Table 7** and **Figure 2**, RNG makes up most of municipal on-road transportation emissions (77.8 percent). RNG is used in all City-owned buses, refuse collection vehicles, and various other light and medium duty trucks. Gasoline consumption is the second largest mobile emission source and includes City-owned vehicles and employee vehicles used for commuting. Diesel fuel makes up 5.6 percent of total emissions and is almost entirely from municipal fleet vehicles, with a negligible amount from employee vehicles. Electric vehicles in the municipal fleet are the smallest emissions source from the on-road transportation sector. Note that electric vehicle emissions assume that SCE supplied the electricity used to charge electric vehicles for the first four months of 2019. After April 2019, CPA took over municipal electricity service and the emissions from electric vehicle use were zero for the remainder of the year.

## Building Energy

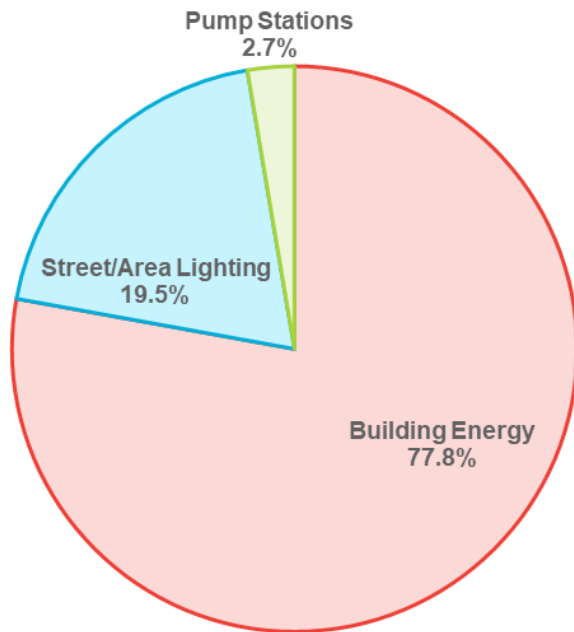
### Electricity

Emissions from building electricity use was calculated for all of Culver City's facilities and makes up 6.2 percent of total emissions. **Table 8** shows the total emissions for each facility. **Figure 3** shows the percentage breakdown by category.

Table 8: Culver City Municipal Electricity GHG Emissions from Building Energy and Operations in 2019

Source	Building Electricity Emissions	
	MTCO <sub>2</sub> e	%
<b>Buildings</b>		
Transportation Facility	90	17.3
City Hall	81	15.6
Veterans Memorial Complex (VMC)	60	11.6
Police Department	52	10.0
Senior Center	18	3.5
Ince Parking Structure	16	3.2
Public Services Building/PW Maintenance Yard	16	3.0
Culver City Park	13	2.4
Fire Station 1	12	2.4
Cardiff Parking Structure	11	2.2
Waseka Parking Structure	9	1.8
Fire Station 3	8	1.6
Transfer Station	6	1.2
Culver West Alexander Park	5	1.0
Fire Station 2	5	0.9
El Marino Park	1	0.2
Fire Department Training Facility	1	0.1
Lindberg Park	0.3	0.1
<b>Building Energy Subtotal</b>	<b>405</b>	<b>77.8</b>
<b>Street/Area Lighting Subtotal</b>	<b>101</b>	<b>19.5</b>
<b>Pump Stations Subtotal</b>	<b>14</b>	<b>2.7</b>
<b>Total</b>	<b>521</b>	<b>100.0</b>
<p>Notes: Emissions from building energy derive from SCE electricity that was used between January and April 2019. After April, the City transitioned to CPA’s green power option which uses 100% clean energy sources. Totals may not add up exactly due to rounding in the calculations and significant figures presented in table. Refer to Attachment A, Table A.1-4, for detailed calculations.</p> <p>Sources: CPA, 2019; SCE, 2019</p>		

Figure 3: Percent Breakdown of Municipal Electricity GHG Emissions by Source in 2019



Sources: CPA, 2019; SCE, 2019

As shown in **Table 8** and **Figure 3**, most electricity-related emissions are associated with building energy, which are responsible for 77.8 percent of total electricity-related emissions of total municipal operations. The greatest single contribution to building energy emissions comes from the Transportation Center, which makes up 17.3 percent of total electricity emissions. As noted in **Table 8**, electricity emissions for municipal operations were all generated between January and April 2019 before the City transitioned to CPA's green power option. No emissions were generated after April 2019 because the green power option uses 100% clean energy.

### Natural Gas

Natural gas is typically used for heating, cooling, and cooking. The City's natural gas emissions make up 7.6 percent of total municipal emissions. The City's emissions from municipal facility natural gas use are presented in

Table 9. Figure 4 shows the percent breakdown of natural gas emissions by municipal facility.

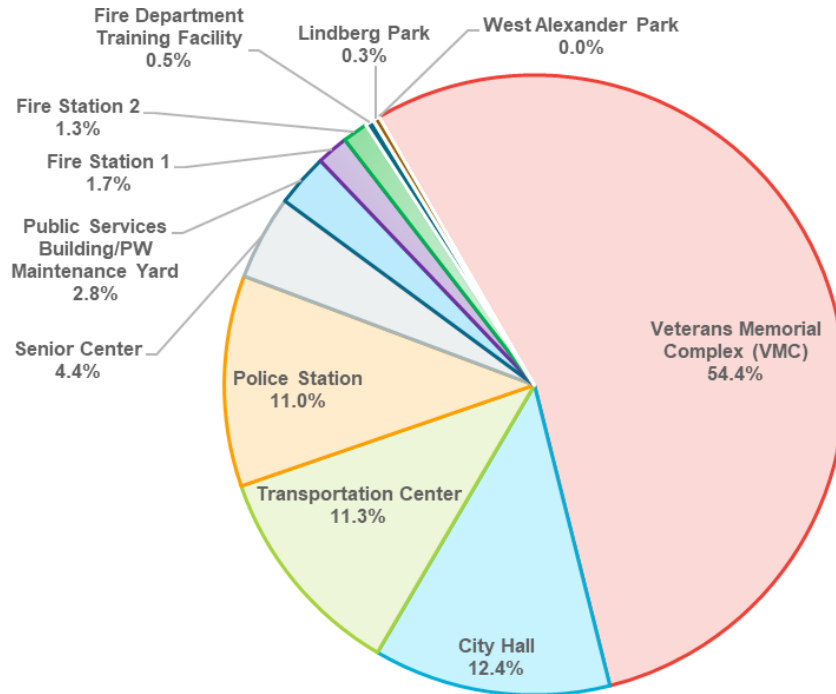
Table 9: Culver City Municipal Natural Gas GHG Emissions from Building Energy in 2019

Land Use	Natural Gas Emissions	
	MTCO <sub>2</sub> e	%
Veterans Memorial Complex (VMC)	348	54.4
City Hall	79	12.4
Transportation Facility	72	11.3
Police Station	70	11.0
Senior Center	28	4.4
Public Services Building/Public Works (PW) Maintenance Yard	18	2.8
Fire Station 1	11	1.7
Fire Station 2	8	1.3
Fire Department Training Facility	3	0.5
Lindberg Park	2	0.3
West Alexander Park	0.1	0.0
<b>Total</b>	<b>640</b>	<b>100.0</b>

Note: Totals may not add up exactly due to rounding in the calculations and significant figures presented in table. Refer to Attachment A, Table A.1-5, for detailed calculations.

Source: SoCalGas, 2017

Figure 4: Percent of Municipal Natural Gas GHG Emissions from Building Energy in 2019



Source: SoCalGas, 2017

VMC uses about 54.4 percent of the City’s total natural gas usage. This is primarily attributable to the heating needs associated with the public swimming pool (Culver City Municipal Plunge) at the VMC. The remaining City facilities have natural gas emissions that are more proportional to their size and land use type. Natural gas used in buildings makes up about 11 percent of total municipal natural gas use. The remaining 89 percent is attributed to the mobile vehicle fleet discussed above.

## Water Supply

Supplying water to municipal facilities requires upstream electricity for treatment, conveyance, and delivery. Water supply comprises the smallest share of City emissions, making up 0.06 percent of total emissions. **Table 10** and **Figure 5** show the City’s emissions from water supply and the percent breakdown by facility, respectively.

Table 10: Culver City Municipal Water Supply GHG Emissions by Facility in 2019

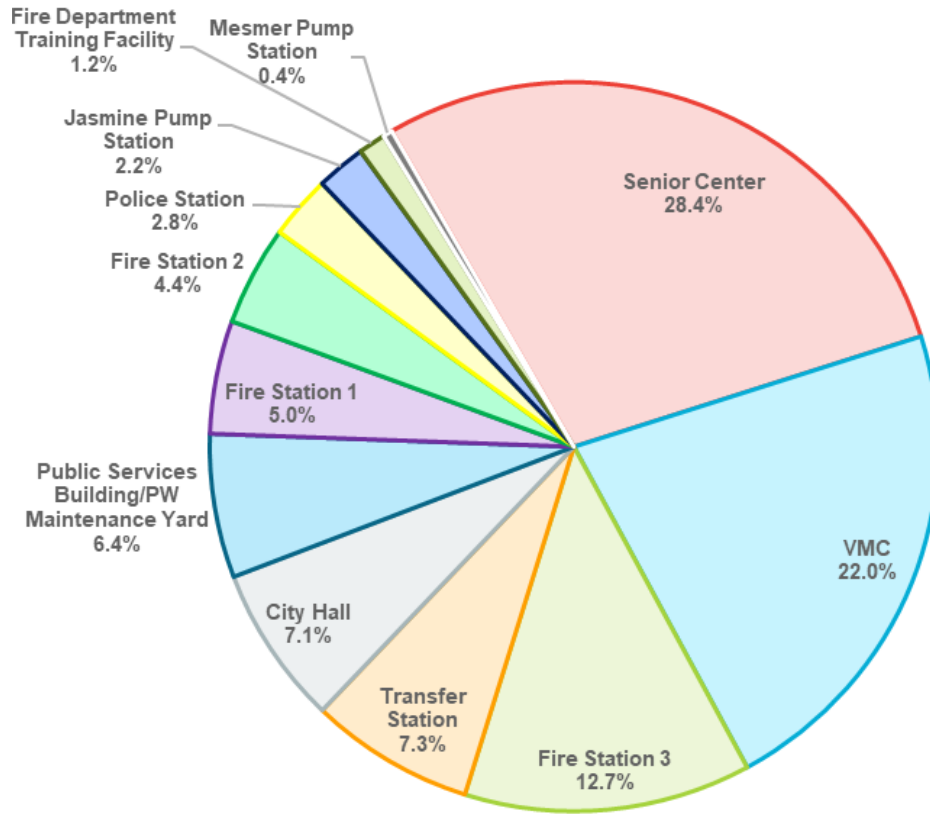
Source	Water GHG Emissions	
	MTCO <sub>2</sub> e	%
Senior Center	1.77	28.4
VMC	1.37	22.0
Fire Station 3	0.79	12.7
Transfer Station	0.45	7.3
City Hall	0.44	7.1
Public Services Building/PW Maintenance Yard	0.40	6.4
Fire Station 1	0.31	5.0
Fire Station 2	0.28	4.4
Police Station	0.18	2.8
Jasmine Pump Station	0.14	2.2
Fire Department Training Facility	0.07	1.2
Mesmer Pump Station	0.03	0.4
<b>Total</b>	<b>6.22</b>	<b>100.0</b>

Note: Totals may not add up exactly due to rounding in the calculations and significant figures presented in table. Refer to Attachment A, Table A.1-7, for detailed calculations.

Source: GSW, 2017



Figure 5 Percent of Water Supply GHG Emissions by Facility in 2019



Source: GSW, 2017

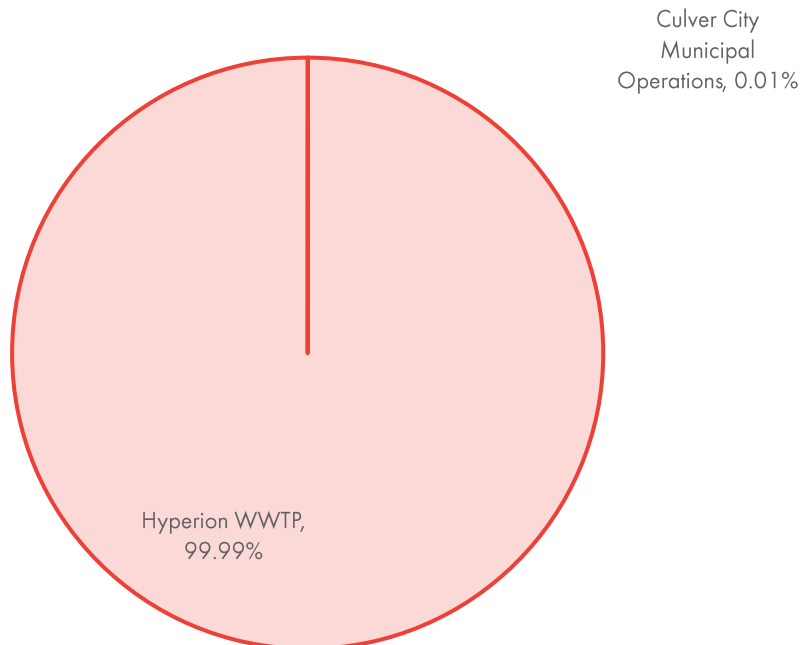
## Wastewater Treatment

Indirect emissions result from the energy used to treat wastewater generated by City operations. This treatment occurs at the regional Hyperion WWTP located in Playa Del Rey (Los Angeles). Energy-related emissions from wastewater treatment include digester gas and natural gas combustion. The Hyperion WWTP is mainly powered by combusting recycled digester gas in the treatment process and supplemented by combusting natural gas. **Table 1** shows the total municipal emissions resulting from the combustion of digester and natural gas at the Hyperion WWTP. Wastewater treatment makes up the smallest source of total energy-related municipal emissions at 0.03 percent of the total. **Figure 6** shows Culver City’s estimated percent share of Hyperion WWTP’s total annual energy-related emissions.

**Table 11: Culver City Municipal GHG Emissions from Wastewater Treatment in 2019**

Source	Emissions (MTCO <sub>2</sub> e)		
	Digester Gas	Natural Gas	Total
Culver City Municipal Wastewater Treatment	0.05	3	3.05
Refer to Attachment A, Tables A.1-8 through A.1-11, for detailed calculations.			
Source: City, 2020d; Hyperion WWTP, 2019			

**Figure 6: Culver City Municipal Operations Share of Hyperion Wastewater Treatment Emissions**



Source: Hyperion WWTP, 2019

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# Attachment A: Activity Data and Calculations

## A-1 Emissions Summaries

# City of Culver City Municipal GHG Inventory - Summary

**Table A.1-1: Total GHG Emissions by Source**

Source	Emissions (MTCO2e)	% of Total
Fleet Vehicles - Natural Gas	373	4.4%
Fleet Vehicles - Gasoline	5,162	61.0%
Employee Personal Vehicles	658	7.8%
Building Natural Gas	640	7.6%
Building Electricity	405	4.8%
Fleet Vehicles - Diesel	1,048	12.4%
Street/Area Lighting	101	1.2%
Fleet Vehicles - Electric	50	0.6%
Pump Stations	14	0.2%
Water Supply	6	0.1%
Wastewater Treatment	3	0.03%
<b>Total</b>	<b>8,459</b>	<b>100.0%</b>

**Table A.1-2: Total GHG Emissions by fuel**

Source	Emissions (MTCO2e)	% of Total
Transportation	7,290	86.2%
Natural Gas	640	7.6%
Electricity	521	6.2%
Water Supply	6	0.07%
Wastewater Treatment	3	0.03%
<b>Total</b>	<b>8,459</b>	<b>100.0%</b>

**Table A.1-3: Total Energy Usage by Source**

Source	Energy Use (MMBtu)
Natural Gas	15,676
Electricity	34,114
<b>Total</b>	<b>49,790</b>

# City of Culver City Municipal GHG Inventory - Electricity

Table A.1-4: Total Municipal Electricity Use and Emissions

Municipal Facilities	CPA	SCE kWh	Total	Total Emissions (MT) CO2e	% of Total
Transportation Center	939,804	424,663	1,364,467	90	17.30%
City Hall	773,424	382,171	1,155,595	81	15.56%
Veterans Memorial Complex (VMC)	618,613	284,632	903,245	60	11.59%
Police Department	538,926	245,347	784,273	52	9.99%
Senior Center	209,154	86,037	295,191	18	3.50%
Ince Parking Structure	167,234	77,384	244,618	16	3.15%
Public Services Building/PW Maintenance Yard	156,416	74,283	230,699	16	3.03%
Culver City Park	139,814	59,908	199,722	13	2.44%
Fire Station 1	120,877	58,556	179,433	12	2.38%
Cardiff Parking Structure	109,122	52,800	161,922	11	2.15%
Watseka Parking Structure	89,329	43,191	132,520	9	1.76%
Fire Station 3	95,934	39,139	135,073	8	1.59%
Transfer Station	69,384	29,172	98,556	6	1.19%
Culver West Alexander Park	37,893	23,605	61,498	5	0.96%
Fire Station 2	56,501	21,453	77,954	5	0.87%
El Marino Park	10,601	4,555	15,156	1	0.19%
Fire Department Training Facility	9,472	2,893	12,365	1	0.12%
Lindberg Park	5,767	1,647	7,414	0	0.07%
<b>Subtotal</b>	<b>4,148,265</b>	<b>1,911,436</b>	<b>6,059,701</b>	<b>405</b>	<b>77.85%</b>
Building Energy	4,148,265	1,911,436	6,059,701	405	77.85%
Street/Area Lighting	5,224,433	478,375	5,702,808	101	19.48%
Pump Stations	114,885	65,575	180,460	14	2.67%
<b>Total</b>	<b>9,487,583</b>	<b>2,455,386</b>	<b>11,942,969</b>	<b>521</b>	<b>100.00%</b>

Sources:

1. CPA, 2020. See Tables A.2-1 through A.2-3
2. SCE, 2019. See Tables A.2-1 through A.2-3

Note: CPA service started in May 2019. Table A.2-1 includes both SCE service (January through April) and CPA service (May through December)

# City of Culver City Municipal GHG Inventory - Natural Gas

Table A.1-5: Total Municipal Natural Gas Use and Emissions

Municipal Facilities	Natural Gas Use (therms)	Emissions (MT)			Total
		CO2	CH4	N2O	CO2e
Veterans Memorial Complex (VMC)	65,449	347	0.03	0.00	348
City Hall	14,865	79	0.01	0.00	79
Transportation Center	13,557	72	0.01	0.00	72
Police Station	13,234	70	0.01	0.00	70
Senior Center	5,293	28	0.00	0.00	28
Public Services Building/PW Maintenance Yard	3,323	18	0.00	0.00	18
Fire Station 1	1,989	11	0.00	0.00	11
Fire Station 2	1,582	8	0.00	0.00	8
Fire Department Training Facility	547	3	0.00	0.00	3
Lindberg Park	421	2	0.00	0.00	2
West Alexander Park	11	0	0.00	0.00	0.06
<b>Total</b>	<b>120,269</b>	<b>638</b>	<b>0.06</b>	<b>0.00</b>	<b>640</b>

Source: Southern California Gas, 2017. See Table A.2-5



# City of Culver City Municipal GHG Inventory - Vehicle Fleet

Table A.1-6: Total Municipal Emissions from Vehicle Fleet

Transportation Fuel Summary			Emissions
Fuel Type	Total Use	Units	CO2e (MT)
Natural Gas	973,940	therm	5,162
Gasoline	119,358	gallons	1,048
Diesel	36,492	gallons	373
Electric Vehicles	715,255	kwh	50
<b>Total</b>	-	-	<b>6,632</b>

Source: City of Culver City, 2020b. See Tables A.2-6 through A.2-8

# City of Culver City Municipal GHG Inventory - Water Supply

Table A.1-7: Total Municipal Electricity and Emissions from Water Supply and Conveyance

Location	Energy from Water Supply	Emissions (MT)
	kWh	CO2e
Senior Center	8,340	1.77
VMC	6,456	1.37
Fire Station 3	3,733	0.79
Transfer Station	2,141	0.45
City Hall	2,068	0.44
Public Services Building/PW Maintenance Yard	1,871	0.40
Fire Station 1	1,473	0.31
Fire Station 2	1,299	0.28
Police Station	828	0.18
Jasmine Pump Station	645	0.14
Fire Department Training Facility	352	0.07
Mesmer Pump Station	124	0.03
<b>Total</b>	<b>29,331</b>	<b>6.22</b>

Source: Golden State Water (GSW), 2017. See Table A.2-4

# City of Culver City Municipal GHG Inventory - Wastewater Treatment

**Table A.1-8: Total Community Electricity and Emissions from Wastewater Treatment**

Culver City - Wastewater Emissions					
Daily Flow (mgal)	Annual Flow (mgal)	% of Hyperion Flow	Emissions (MTCO <sub>2</sub> e)		
			Digester Gas	Natural Gas	Total
0.03	11.5	0.01%	0.05	3	3

Source: City of Culver City (City), 2020d. Wastewater Volumes. Email correspondence with Joe Susca and Mate Gaspar. October 20, 2020.

**Table A.1-9: Hyperion Annual Flow and Capacity**

Hyperion WWTP - Total Electricity			
Daily Flow (mgal)	Annual Flow (mgal)	Total Capacity (MW)	Total Operational Hours
260	94,900	20	8,760

Source: Hyperion WWTP, 2019. Email correspondence with Hi Sang Kim, Process Engineer. September 18, 2019.

**Table A.1-10: Hyperion Digester Gas Emissions**

Hyperion WWTP - Digester Gas Emissions					
GHG	ft <sup>3</sup> per day	Btu per ft <sup>3</sup>	kg per MMBTU	Days per year	MTCO <sub>2</sub> e
CH <sub>4</sub>	6,500,000	620	0.0032	365	118
N <sub>2</sub> O	6,500,000	620	0.0006	365	276
<b>Total</b>	-	-	-	-	<b>394</b>

Note: Emissions estimated using information from Hi Sang Kim and methodology from ICLEI's Community Protocol Appendix F WW.1.b and WW.2

**Table A.1-11: Hyperion Natural Gas Emissions**

Hyperion WWTP - Natural Gas Emissions					
Natural Gas Use (therms)	Natural Gas Use (MMBtu)	Emissions from Natural Gas (MT)			
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
4,500,000	450,000	23,859	2.25	0.05	<b>23,929</b>

Source: Hyperion WWTP, 2019. Email correspondence with Hi Sang Kim, Process Engineer. September 18, 2019.

## City of Culver City Municipal GHG Inventory - Commute Emissions

Table A.1-12: Employee Commute Emissions				% Breakdown by Vehicle Type		Emissions (MTCO2e)		
City	Internal-Internal VMT			Internal-Internal VMT		Passenger	Motorcycle	Total
	Passenger	Motorcycle	Total	Passenger	Motorcycle			
Culver City	1,926,350	14,140	1,940,490	99.3%	0.7%	654	4	658

Source: City of Culver City (City), 2020a. Employee Commute Data. Email correspondence with Pam Jackson. May 15, 2020. See Tables A.2-9 through A.2-15

## A-2 Activity Data and Emission Factors

# City of Culver City Municipal GHG Inventory - Electricity Data Summary

Table A.2-1: Electricity Use Summary - Municipal Facilities

Sum of Kwh Usage													
Row Labels	Column Labels												Grand Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Watseka Parking Structure	10,689	11,477	10,680	10,345	11,437	10,820	11,461	10,717	11,043	10,760	12,190	10,901	132,520
Veterans Memorial Complex (VMC)	68,989	78,308	62,677	74,658	66,350	71,011	94,550	87,221	80,810	81,474	70,896	66,301	903,245
Transportation Center	104,435	112,160	103,766	104,302	113,350	109,552	119,039	116,530	124,537	117,038	128,338	111,420	1,364,467
Transfer Station	6,755	7,956	6,612	7,849	8,526	8,193	8,600	9,678	9,584	8,500	8,738	7,565	98,556
Senior Center	19,804	22,393	19,746	24,094	21,599	25,112	29,310	29,518	31,807	27,198	24,152	20,458	295,191
Public Services Building/PW Maintenance Yard	18,079	20,299	18,235	17,670	17,930	17,394	19,547	21,218	23,018	19,952	20,467	16,890	230,699
Police Department	54,916	63,020	58,787	68,624	58,479	60,662	72,811	75,050	75,034	64,482	71,831	60,577	784,273
Lindberg Park	486	457	393	311	395	931	940	839	951	828	489	394	7,414
Ince Parking Structure	18,830	20,611	19,210	18,733	21,234	19,785	20,424	19,665	20,107	20,112	23,433	22,474	244,618
Fire Station 3	9,026	9,154	9,997	10,962	10,624	12,515	12,510	12,596	13,871	11,918	11,124	10,776	135,073
Fire Station 2	4,924	5,270	5,699	5,560	6,052	5,920	7,829	7,937	9,150	7,650	6,433	5,530	77,954
Fire Station 1	14,161	14,405	17,211	12,779	13,642	14,915	16,624	16,674	17,771	14,311	13,250	13,690	179,433
Fire Department Training Facility	474	616	662	1,141	1,140	945	1,306	1,419	1,475	1,154	1,095	938	12,365
El Marino Park	851	1,273	1,469	962	1,679	1,511	851	1,503	1,229	1,179	1,496	1,153	15,156
Culver West Alexander Park	6,740	6,050	6,438	4,377	4,118	4,184	3,631	4,029	3,983	6,016	5,778	6,154	61,498
Culver City Park	13,543	14,170	17,026	15,169	16,931	14,840	14,293	11,934	18,111	20,612	22,531	20,562	199,722
City Hall	96,887	89,750	100,893	94,641	86,137	89,299	94,985	103,061	111,997	99,903	97,562	90,480	1,155,595
Cardiff Parking Structure	13,224	13,890	12,954	12,732	13,919	13,256	14,298	13,254	13,520	13,201	14,774	12,900	161,922
<b>Grand Total</b>	<b>462,813</b>	<b>491,259</b>	<b>472,455</b>	<b>484,909</b>	<b>473,542</b>	<b>480,845</b>	<b>543,009</b>	<b>542,843</b>	<b>567,998</b>	<b>526,288</b>	<b>534,577</b>	<b>479,163</b>	<b>6,059,701</b>

Table A.2-2: Electricity Use Summary - Pump Station

Sum of Kwh Usage													
Row Labels	Column Labels												Grand Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Braddock Pump Station	12,454	13,044	12,113	11,830	13,105	12,261	13,026	12,143	12,078	12,521	13,366	12,986	150,927
Hayden Pump Station	203	172	213	201	186	214	257	195	162	213	264	182	2,462
Jasmine Pump Station 1	1,700	1,689	1,778	1,467	1,496	1,536	1,359	1,291	1,423	1,328	1,432	1,645	18,144
Jasmine Pump Station 2	10	10	10	9	9	10	10	9	10	10	10	11	118
Mesmer Pump Station	5,889	2,783	-	-	-	-	24	30	60	11	2	10	8,809
<b>Grand Total</b>	<b>20,256</b>	<b>17,698</b>	<b>14,114</b>	<b>13,507</b>	<b>14,796</b>	<b>14,021</b>	<b>14,676</b>	<b>13,668</b>	<b>13,733</b>	<b>14,083</b>	<b>15,074</b>	<b>14,834</b>	<b>180,460</b>

Table A.2-3: Electricity Use Summary - Streetlighting

Sum of Kwh Usage													
Row Labels	Column Labels												Grand Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Lighting	127,805	120,984	118,467	111,119	3,133,405	105,624	420,734	98,725	350,709	362,966	374,385	377,885	5,702,808
<b>Grand Total</b>	<b>127,805</b>	<b>120,984</b>	<b>118,467</b>	<b>111,119</b>	<b>3,133,405</b>	<b>105,624</b>	<b>420,734</b>	<b>98,725</b>	<b>350,709</b>	<b>362,966</b>	<b>374,385</b>	<b>377,885</b>	<b>5,702,808</b>

Sources:

- Clean Power Alliance (CPA), 2019. Electricity Use Data
- Southern California Edison (SCE), 2019. Electricity Use Data.

# City of Culver City Municipal GHG Inventory - Water Data Summary

Table A.2-4: Summary of Water Usage and Energy by Facility

Location	Address	Annual Water Use		Energy from Water Supply
		Hundred Cubic Feet (CCF)	Acre-feet	kWh
Fire Station 2	11252 WASHINGTON BLVD	284	0.65	1,263.53
Police Station	4040 DUQUESNE	181	0.42	805.28
Senior Center	4095 OVERLAND	967	2.22	4,302.23
Senior Center	4095 OVERLAND AVE IRR	856	1.97	3,808.38
VMC	4117 OVERLAND	220	0.51	978.79
VMC	4117 POOL OVERLAND	1,191	2.73	5,298.82
Jasmine Pump Station	4494 JASMINE AVE	138	0.32	613.97
Jasmine Pump Station	4494 SEWER JASMINE AVE	3	0.01	13.35
Mesmer Pump Station	5586-SWR PLANT MESMER	27	0.06	120.12
Fire Station 3	6030 BRISTOL PKWY	381	0.87	1,695.09
Fire Station 3	6030 FP BRISTOL PKWY	12	0.03	53.39
Fire Station 3	6030 IRR BRISTOL PKWY	423	0.97	1,881.95
Transfer Station	9255 IRR JEFFERSON	158	0.36	702.95
Transfer Station	9255 JEFFERSON BLVD	310	0.71	1,379.20
Fire Department Training Facility	9275 FP JEFFERSON BLVD (4")	31	0.07	137.92
Fire Department Training Facility	9275 FP JEFFERSON BLVD (6")	36	0.08	160.17
Fire Department Training Facility	9275 JEFFERSON BLVD	10	0.02	44.49
Public Services Building/PW Maintenance Yard	9505 JEFFERSON BLVD	409	0.94	1,819.66
Fire Station 1	9600 CULVER BLVD	311	0.71	1,383.65
Fire Station 1	9600 IRR CULVER BLVD	11	0.03	48.94
City Hall	9770 CULVER BLVD	452	1.04	2,010.97
<b>Grand Total</b>		<b>6,411</b>	<b>14.72</b>	<b>28,522.84</b>

Source: Golden State Water (GSW), 2017. Monthly Water Use Data.

# City of Culver City Municipal GHG Inventory - Natural Gas Data

Table A.2-5: Natural Gas Use by Facility

BA ID	Address	Therms	Gas \$	Tot \$
443034600	Veterans Memorial Complex (VMC)	54657.00	30540.48	34973.03
1410526403	Transportation Center	13183.00	8926.86	10116.56
1179035200	Police Station	12869.00	8766.12	9944.58
317034600	Veterans Memorial Complex (VMC)	8027.00	5475.41	6273.15
1913761216	Senior Center	5147.00	3867.56	4947.08
1850033709	Public Services Building/PW Maintenance Yard	3231.00	2520.37	2962.54
1621040100	Fire Station 1	1934.00	1684.20	2031.34
1587028300	Fire Station 2	1538.00	1354.60	1666.07
359034600	Veterans Memorial Complex (VMC)	961.00	829.02	1099.78
862031800	Lindberg Park	409.00	359.93	588.02
1640033700	Fire Department Training Facility	270.00	236.80	470.10
1661033700	Fire Department Training Facility	262.00	229.06	462.12
431471842	West Alexander Park	11.00	9.75	205.35
	City Hall	14455		
	<b>Total</b>	<b>116,954</b>		

Source: Southern California Gas (SoCalGas), 2017. Natural Gas Usage Data.



# City of Culver City Municipal GHG Inventory - Fleet Data

City of Culver City

Fuel Consumption Information

For the Period January 1, 2019 - December 31, 2019

**Table A.2-6: Monthly Fleet Electricity and Natural Gas Use**

Date	KiloWatt Hours Used	Therms Used
01/01/19 - 01/31/19	59,867	78,836
02/01/19 - 02/28/19	57,427	71,961
03/01/19 - 03/30/19	56,343	78,852
04/01/19 - 04/30/19	60,618	80,198
05/01/19 - 05/31/19	58,510	81,612
06/01/19 - 06/30/19	60,621	78,131
07/01/19 - 07/31/19	60,317	83,188
08/01/19 - 08/30/19	62,803	89,080
09/01/19 - 9/30/19	61,574	83,965
10/01/19 - 10/31/19	58,304	89,670
11/01/19 - 11/30/19	59,672	79,718
12/01/19 - 12/31/19	59,199	78,729
<b>YTD Totals</b>	<b>715,255.00</b>	<b>973,940.00</b>

**Table A.2-7: Annual Fleet Diesel Use**

Facility	Diesel Throughput (Gallons)
Fire Station 1	11,492.30
Fire Station 2	2,425.00
Police Department	-
Transportation Department	21,634.10
Generators	941.00
<b>Total</b>	<b>36,492.40</b>

**Table A.2-8: Annual Fleet Gasoline Use**

Facility	Gasoline Throughput (Gallons)
Fire Station 1	7,158.3
Fire Station 2	-
Police Department	54,695.8
Transportation Department	57,503.8
<b>Total</b>	<b>119,357.9</b>

Source: City of Culver City (City), 2020b, Fleet Vehicle Fuel and Electricity Use. Email correspondence with Allison Cohen. June 10, 2020.

## City of Culver City Municipal Energy GHG Inventory - Water Data

MONTH	CSA	SYSTEM	PREM_ID	ADDRESS1_UPR	CITY_UPR	POSTAL	REVENUE_CLASS	NAICSCD	CATEGORY	USAGE
JUL-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	212
JUL-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	176
MAY-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	134
DEC-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	123
MAY-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	98
NOV-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	97
OCT-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	91
SEP-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	79
OCT-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	74
AUG-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	72
JUN-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	66
APR-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	64
NOV-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	64
AUG-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	62
FEB-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	62
SEP-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	59
MAR-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	59
JAN-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	57
JUN-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	55
DEC-2017	Culver City	CULVER CI	06419207C	4095 OVERLAND	CULVER CITY	90232	PUBLIC AUTHORITY - METERED	9211	EXECUTIVE, LEGISLATIVE, AND OTHER GENERAL GOVT SUPPORT	54
APR-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	52
MAR-2017	Culver City	CULVER CI	26419207C	4095 OVERLAND AVE IRR	CULVER CITY	90232-3731	IRRIGATION	13	IRRIGATION/LANDSCAPING - PARKS/CITY	13

# Culver City Transportation Emission Factors

EMFAC 2007 Categories	F&P VMT Categories	F&P VMT Categories	EMFAC 2007 Categories
		Passenger Cars	LDA, LDT1, LDT2, MDV, MCY
		Light/Medium/Heavy Trucks	LHDT1, LHDT2, MH, MHDT, HHDT
		Buses	OBUS, SBUS, UBUS
HHDT	Truck		
LDA	Passenger		
LDT1	Passenger		
LDT2	Passenger		
LHDT1	Truck		
LHDT2	Truck		
MCY	Motorcycle		
MDV	Passenger		
MH	Truck		
MHDT	Truck		
OBUS	Bus		
SBUS	Bus		
UBUS	Bus		

EMFAC Category	Vehicle Type
LDA	Light Duty Auto
LDT1	Light Duty Truck 1
LDT2	Light Duty Truck 2
MDV	Medium Duty Vehicle
MCY	Motorcycle
LHDT1	Light Heavy Duty Truck 1
LHDT2	Light Heavy Duty Truck 2
MH	Motorhome
MHDT	Medium Heavy Duty Truck
HHDT	Heavy Heavy Duty Truck
OBUS	Other Bus
SBUS	School Bus
UBUS	Urban Transit Bus

Table A.2-9: EMFAC2017 Emission Factors

Vehicle Category	Fuel	VMT	EMFAC Output (g/mile)			% of VMT by Fuel Type per Vehicle	Fuel-Weighted EFs (g/mile)		
			CO2	CH4	N2O		CO2	CH4	N2O
HHDT	Gasoline	5745.854855	2249.3024	0.161519196	0.181	0.0886%	1.993179361	0.000143127	0.00016068
HHDT	Diesel	6393903.432	1559.87993	0.00866195	0.245	98.6075%	1538.158629	0.008541333	0.24177712
HHDT	Natural Gas	84546.45018	3551.4894	5.76050497	0.724	1.3039%	46.30733457	0.075110355	0.00944005
LDA	Gasoline	151393815.7	298.734357	0.004776325	0.006	98.0572%	292.9305932	0.004683531	0.0060199
LDA	Diesel	1131318.278	232.917574	0.001450306	0.037	0.7328%	1.706705092	1.06271E-05	0.00026827
LDA	Electricity	1868211.138	0	0	0	1.2100%	0	0	0
LDT1	Gasoline	15846032.62	346.181181	0.011932262	0.013	99.6888%	345.1037524	0.011895125	0.0125027
LDT1	Diesel	8765.049263	480.009203	0.01071812	0.075	0.0551%	0.264685168	5.91015E-06	4.1605E-05
LDT1	Electricity	40706.92535	0	0	0	0.2561%	0	0	0
LDT2	Gasoline	50631402.19	383.037005	0.007388051	0.01	99.0117%	379.2513736	0.007315034	0.00981352
LDT2	Diesel	284822.9329	318.695189	0.001212726	0.05	0.5570%	1.77507593	6.75467E-06	0.00027902
LDT2	Electricity	220572.3339	0	0	0	0.4313%	0	0	0
LHDT1	Gasoline	3979863.121	834.567117	0.010871135	0.017	64.4101%	537.5453846	0.007002107	0.01087713
LHDT1	Diesel	2199080.991	485.751961	0.003867899	0.076	35.5899%	172.8787128	0.001376582	0.02717413
LHDT2	Gasoline	621230.0872	957.766235	0.008633069	0.018	42.0802%	403.0302367	0.003632815	0.00770475
LHDT2	Diesel	855069.0774	537.422095	0.003772374	0.084	57.9198%	311.2736403	0.00218495	0.04892788
MCY	Gasoline	1122451.783	223.496484	0.385779257	0.066	100.0000%	223.4964842	0.385779257	0.06564979
MDV	Gasoline	32077377.96	465.398763	0.01085702	0.013	98.0919%	456.518459	0.010649857	0.01245411
MDV	Diesel	582073.9425	413.251798	0.000912888	0.065	1.7800%	7.355753496	1.62491E-05	0.00115622
MDV	Electricity	41902.69663	0	0	0	0.1281%	0	0	0
MH	Gasoline	187915.2952	1738.19488	0.021217234	0.03	78.0705%	1357.016672	0.016564392	0.02306338
MH	Diesel	52784.32924	998.083802	0.003646456	0.157	21.9295%	218.8752232	0.000799651	0.03440414
MHDT	Gasoline	787937.6444	1743.52076	0.023916186	0.036	17.2016%	299.9136372	0.004113969	0.00617074
MHDT	Diesel	3792666.462	1026.84032	0.009081344	0.161	82.7984%	850.2072517	0.007519207	0.13364074
OBUS	Gasoline	177590.6172	1754.23309	0.017901209	0.031	44.9363%	788.2875913	0.008044143	0.01380495
OBUS	Diesel	217614.5591	1256.19789	0.011741817	0.197	55.0637%	691.7089314	0.006465478	0.10872701
SBUS	Gasoline	45425.07347	893.623599	0.014959143	0.027	29.8857%	267.0652827	0.004470638	0.00811024
SBUS	Diesel	106571.1621	1254.73969	0.005913784	0.197	70.1143%	879.7524906	0.00414641	0.13828484
UBUS	Gasoline	32414.88694	2114.03926	0.005952661	0.028	6.9839%	147.6425174	0.000415728	0.00194105
UBUS	Diesel	1580.590656	1665.24424	0.072802876	0.262	0.3405%	5.670890121	0.000247926	0.00089138
UBUS	Electricity	1070.403311	0	0	0	0.2306%	0	0	0
UBUS	Natural Gas	429071.0422	1973.23222	7.216095714	0.402	92.4449%	1824.153097	6.670914453	0.37186554

Source: CARB, EMFAC2017. <https://arb.ca.gov/emfac/emissions-inventory>

**Table A.2-10: EMFAC2017 Aggregated Emission Factors by Vehicle Type and GHG**

Vehicle Category	F&P Category	VMT	Vehicle Category EFs (g/mile)			% VMT by F&P Category	F&P Category EFs (g/mile)		
			CO2	CH4	N2O		CO2	CH4	N2O
LDA	Passenger	154,393,345	294.637298	0.00469416	0.00628817	60.75%	179.005134	0.00285191	0.00382034
LDT1	Passenger	15,895,505	345.368438	0.01190104	0.0125443	6.25%	21.6026064	0.0007444	0.00078464
LDT2	Passenger	51,136,797	381.02645	0.00732179	0.01009254	20.12%	76.6721845	0.00147333	0.00203087
MCY	Motorcycle	1,122,452	223.496484	0.38577926	0.06564979	100.00%	223.496484	0.38577926	0.06564979
MDV	Passenger	32,701,355	463.874213	0.01066611	0.01361033	12.87%	59.6918667	0.00137253	0.00175139
LHDT1	Truck	6,178,944	710.424097	0.00837869	0.03805126	32.59%	231.513652	0.00273045	0.01240018
LHDT2	Truck	1,476,299	714.303877	0.00581777	0.05663263	7.79%	55.6162926	0.00045298	0.00440946
MH	Truck	240,700	1575.8919	0.01736404	0.05746752	1.27%	20.0053654	0.00022043	0.00072953
MHDT	Truck	4,580,604	1150.12089	0.01163318	0.13981148	24.16%	277.850321	0.00281038	0.03377616
HHDT	Truck	6,484,196	1586.45914	0.08379482	0.25137785	34.20%	542.537376	0.02865616	0.08596621
OBUS	Bus	395,205	1479.99652	0.01450962	0.12253196	39.08%	578.344819	0.00566999	0.04788236
SBUS	Bus	151,996	1146.81777	0.00861705	0.14639508	15.03%	172.357735	0.00129507	0.02200204
UBUS	Bus	464,137	1977.4665	6.67157811	0.37469798	45.89%	907.525392	3.06180991	0.17196141

**Table A.2-11: EMFAC2017 Emission Factors by Simplified Vehicle Type**

F&P Category	2019 Emission Factors (g/mile)			
	CO2	CH4	N2O	CO2e
Passenger	336.972	0.006	0.008	339.6322
Motorcycle	223.496	0.386	0.066	252.7046
Bus	1,658.228	3.069	0.242	1807.0174

# City of Culver City Municipal GHG Inventory - Commute VMT

Table A.2-12: Commute Type Legend

Letter	Commute Type
H	Drive Alone
I	Motorcycle
J	2 person in vehicle
K	3 persons in vehicle

Table A.2-13: Commuter VMT by Zip Code and Mode of Travel

Zip Code	Count of Monday Mode	Count of Tuesday Mode	Count of Wednesday Mode	Count of Thursday Mode	Count of Friday Mode	Total One-Way Trip	Total Weekly VMT	Total Annual VMT
<b>H</b>	<b>159</b>	<b>159</b>	<b>159</b>	<b>159</b>	<b>159</b>			
90007	1	1	1	1	1	5	99	5,156
90008	3	3	3	3	3	15	129	6,713
90015	1	1	1	1	1	5	118	6,129
90016	5	5	5	5	5	25	180	9,370
90019	2	2	2	2	2	10	120	6,220
90025	1	1	1	1	1	5	58	2,994
90029	1	1	1	1	1	5	119	6,191
90034	1	1	1	1	1	5	14	748
90035	2	2	2	2	2	10	74	3,839
90043	4	4	4	4	4	20	246	12,815
90044	2	2	2	2	2	10	237	12,299
90045	8	8	8	8	8	40	712	37,041
90046	1	1	1	1	1	5	102	5,310
90047	5	5	5	5	5	25	531	27,591
90056	2	2	2	2	2	10	80	4,165
90061	1	1	1	1	1	5	154	8,000
90063	1	1	1	1	1	5	192	9,982
90066	9	9	9	9	9	45	365	18,986
90220	1	1	1	1	1	5	211	10,979
90222	1	1	1	1	1	5	186	9,679
90230	15	15	15	15	15	75	359	18,654
90232	13	13	13	13	13	65	0.02	1
90245	2	2	2	2	2	10	228	11,876
90247	1	1	1	1	1	5	167	8,688
90249	2	2	2	2	2	10	298	15,473
90250	1	1	1	1	1	5	123	6,400
90260	1	1	1	1	1	5	150	7,802
90262	2	2	2	2	2	10	412	21,423
90266	1	1	1	1	1	5	145	7,543
90277	1	1	1	1	1	5	211	10,949
90278	1	1	1	1	1	5	164	8,511
90293	1	1	1	1	1	5	91	4,756
90301	3	3	3	3	3	15	229	11,896
90302	3	3	3	3	3	15	178	9,274
90304	1	1	1	1	1	5	96	4,973
90305	4	4	4	4	4	20	351	18,270
90404	1	1	1	1	1	5	76	3,940
90405	3	3	3	3	3	15	217	11,281
90501	1	1	1	1	1	5	219	11,362
90503	2	2	2	2	2	10	404	21,013
90504	1	1	1	1	1	5	178	9,268
90505	2	2	2	2	2	10	477	24,813
90605	1	1	1	1	1	5	347	18,068
90660	1	1	1	1	1	5	281	14,607
90706	1	1	1	1	1	5	285	14,796
90712	2	2	2	2	2	10	588	30,592
90713	2	2	2	2	2	10	641	33,327
90717	1	1	1	1	1	5	260	13,524
90723	1	1	1	1	1	5	247	12,854
90745	1	1	1	1	1	5	248	12,916
90806	1	1	1	1	1	5	303	15,780
91016	1	1	1	1	1	5	390	20,271
91030	1	1	1	1	1	5	239	12,405
91307	1	1	1	1	1	5	322	16,762
91311	1	1	1	1	1	5	361	18,793
91351	2	2	2	2	2	10	945	49,128
91354	3	3	3	3	3	15	1,555	80,844
91364	1	1	1	1	1	5	238	12,392
91381	1	1	1	1	1	5	469	24,401
91401	1	1	1	1	1	5	181	9,399
91406	1	1	1	1	1	5	216	11,242
91436	1	1	1	1	1	5	171	8,870
91741	1	1	1	1	1	5	529	27,520
91745	2	2	2	2	2	10	775	40,307
91790	2	2	2	2	2	10	845	43,936
92054	1	1	1	1	1	5	1,327	69,024
92313	1	1	1	1	1	5	994	51,711
92336	1	1	1	1	1	5	866	45,028
92592	1	1	1	1	1	5	1,369	71,210
92832	1	1	1	1	1	5	459	23,850
92833	1	1	1	1	1	5	426	22,163
92845	1	1	1	1	1	5	428	22,238
92886	1	1	1	1	1	5	566	29,431
93010	1	1	1	1	1	5	674	35,055
93063	1	1	1	1	1	5	421	21,901
93225	1	1	1	1	1	5	1,018	52,955
93510	1	1	1	1	1	5	503	26,161
93536	2	2	2	2	2	10	1,620	84,223
93561	1	1	1	1	1	5	1,226	63,757
<b>I</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>			
91306	1	1	1	1	1	5	272	14,140

<b>J</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>				
90016	2	2	2	2	2	10	72	3,748	
90018	3	3	3	3	3	15	209	10,870	
90019	1	1	1	1	1	5	60	3,110	
90043	2	2	2	2	2	10	123	6,407	
90044	1	1	1	1	1	5	118	6,149	
90045	1	1	1	1	1	5	89	4,630	
90046	1	1	1	1	1	5	102	5,310	
90061	1	1	1	1	1	5	154	8,000	
90232	3	3	3	3	3	15	0	0	
90242	1	1	1	1	1	5	256	13,305	
90249	1	1	1	1	1	5	149	7,737	
90262	2	2	2	2	2	10	412	21,423	
90302	2	2	2	2	2	10	119	6,183	
90650	1	1	1	1	1	5	311	16,192	
90712	1	1	1	1	1	5	294	15,296	
91362	2	2	2	2	2	10	876	45,551	
91744	1	1	1	1	1	5	420	21,836	
91791	1	1	1	1	1	5	463	24,065	
92335	1	1	1	1	1	5	858	44,590	
<b>K</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>				
90047	1	1	1	1	1	5	106	5,518	
90062	1	1	1	1	1	5	79	4,085	
90064	1	1	1	1	1	5	35	1,838	
90220	1	1	1	1	1	5	211	10,979	
90503	1	1	1	1	1	5	202	10,507	
90807	1	1	1	1	1	5	292	15,205	
<b>Grand Total</b>	<b>194</b>	<b>194</b>	<b>194</b>	<b>194</b>	<b>194</b>	<b>970</b>	<b>37,317</b>	<b>1,940,490</b>	

Source: City of Culver City (City), 2020a. Employee Commute Data. Email correspondence with Pam Jackson. May 15, 2020.

# Culver City Employee Commuter Log

Table A.2-13: Employee Commute Log

City	State	Home Zip	Department Name	StartTime	Time of Day	Monday Mode	Tuesday Mode	Wednesday Mode	Thursday Mode	Friday Mode
Los Angeles	CA	90008	PRCS	900	A	CC	CC	CC	CC	CC
Los Angeles	CA	90007	PRCS	200	P	H	H	H	H	H
Los Angeles	CA	90007	Transportation	730	A	C	C	H	C	Z
los angeles	CA	90008	Public Works	700	A	H	H	H	H	H
Los Angeles	CA	90008	PRCS	200	P	H	H	H	H	H
LOS ANGELES	CA	90008	FINANCE/CITY HALL	730	A	H	H	H	H	H
los angeles	CA	90011	public works	700	A	C	C	C	C	C
Los Angeles	CA	90015	Finance	730	A	H	H	J	H	Z
Los Angeles	CA	90016	Parks & Rec	200	P	H	H	H	H	H
Los Angeles	CA	90016	Public Works	730	A	H	B	B	H	Z
Los Angeles	CA	90016	Administration	730	A	D	E	C	C	Z
LOS ANGELES	CA	90016	Animal Services	900	A	H	H	H	H	Y
los angeles	ca	90016	Transportation	600	A	H	H	H	H	H
Los Angeles	CA	90016	PRCS	900	A	H	H	H	H	H
Los Angeles	CA	90016	prcs	600	A	J	J	J	J	J
Los Angeles	CA	90016	PRCS	600	A	J	J	J	J	Z
LOS ANGELES	CA	90018	PD	700	P	CC	CC	CC	H	H
Los Angeles	CA	90018	Administrative Services	725	A	J	H	J	J	Z
Los Angeles	CA	90018	Prcs	300	P	CC	H	H	CC	CC
Los Angeles	CA	90018	Information Technology	730	A	J	H	H	H	Z
Los Angeles	CA	90018	PRCS	730	A	J	J	BB	J	J
Los Angeles	CA	90018	Finance	730	A	B	B	B	B	Z
LOS ANGELES	CA	90019	CCPD	500	A	J	J	J	J	J
Los Angeles	CA	90019	Community Development	730	A	H	H	H	H	Z
Los Angeles	CA	90019	Public Works - EPO	700	A	H	H	H	H	Z
Los Angeles	CA	90019	PRCS	200	P	B	B	B	B	B
Los Angeles	CA	90019	IT	730	A	E	E	E	E	Y
Los Angeles	CA	90020	Community Development	730	A	B	B	B	B	Z
Los Angeles	CA	90025	Finance	730	A	H	H	H	H	Z
Los Angeles	CA	90029	Finance	730	A	H	H	H	H	H
Los Angeles	CA	90034	PRCS	830	A	AA	AA	AA	H	H
Los Angeles	CA	90034	Public works	700	A	Z	E	E	E	E
Los Angeles	CA	90034	PRCS	845	A	Z	H	D	H	H
Los Angeles	CA	90034	Police Department	600	A	H	H	H	X	X
Los Angeles	CA	90034	PRCS	900	A	Z	H	H	H	H
Los Angeles	CA	90035	Community Development	1130	A	H	H	H	X	X
Los Angeles	CA	90035	Transportation	730	A	B	B	B	B	B
Los Angeles	CA	90035	City Manager's Office	830	A	H	H	H	H	H
Los Angeles	CA	90036	Community Development	730	A	BB	H	H	H	Z
Los Angeles	CA	90038	PRCS	100	P	CC	CC	CC	CC	H
Los Angeles	CA	90043		600	A	J	J	J	J	J
LOS ANGELES	CA	90043	POLICE	600	A	H	H	H	H	Y
Los Angeles	CA	90043	Street Dept.	500	A	AA	H	H	H	H
Los Angeles	CA	90043	EPO Division	800	A	J	J	J	J	J
Los Angeles	CA	90043	Engineering	900	A	H	H	H	H	H
Los Angeles	CA	90043	Public Works	700	A	H	H	H	H	Z
Los Angeles	CA	90043	Information Technology	730	A	H	H	AA	AA	Z
Los Angeles	CA	90044	PRCS	200	P	H	H	H	H	H
Los Angeles	CA	90044	PD	530	A	J	J	J	J	Y
Los Angeles	CA	90044	PRCS	730	A	H	H	H	H	Z
Los Angeles	CA	90045	Culver City Police Dept	700	A	H	H	H	H	H
Los Angeles	CA	90045	Transportation	730	A	H	H	H	H	H
Los Angeles	CA	90045	Fire	630	A	E	E	E	E	Z

Key

Letter	Commute Type
A	Zero Emission Vehicle
B	Bus
C	Rail/Plane
D	Walk
E	Bicycle
F	Telecommute
G	Noncommuting
H	Drive Alone
I	Motorcycle
J	2 persons in vehicle
K	3 persons in vehicle
L	4 persons in vehicle
M	5 persons in vehicle
N	6 persons in vehicle
O	7 persons in vehicle
P	8 persons in vehicle
Q	9 persons in vehicle
R	10 persons in vehicle
S	11 persons in vehicle
T	12 persons in vehicle
U	13 persons in vehicle
V	14 persons in vehicle
W	15 persons in vehicle
X	3/36 work week
Y	4/40 work week
Z	9/80 work week
AA	Vacation
BB	Sick
CC	Regular Day Off
DD	NSR
OO	Off-Peak Trips

Los Angeles	CA	90045	Police	700	A	X	X	H	E	E
Los Angeles	CA	90045	Public Works	700	A	H	BB	BB	H	Z
Los Angeles	CA	90045	City Attorney	800	A	H	J	J	J	Z
Los Angeles	CA	90045	Administration	830	A	H	H	H	H	Z
Los Angeles	CA	90045	Community Development	730	A	H	H	H	H	Z
Los Angeles	CA	90045	FIRE	700	A	X	X	CC	CC	H
los angeles	CA	90045	Finance/Payroll	730	A	H	H	H	H	Z
Los Angeles	CA	90045	Transportation	730	A	H	BB	BB	BB	Z
los angeles	CA	90045	police	700	A	X	H	H	H	X
WESTCHESTER	CA	90045	Comm Dev	730	A	J	J	J	J	J
West Hollywood	CA	90046	Administration	800	A	H	H	H	H	Z
los angeles	CA	90046	Fire	700	A	X	X	H	G	G
Los Angeles	CA	90046	Transportation	730	A	J	J	J	J	Z
Los Angeles	CA	90047	Transportation	600	A	H	H	H	H	CC
Los Angeles	CA	90047	Public Works	730	A	H	H	H	H	H
LOS ANGELES	CA	90047	Comm Dev	730	A	K	K	K	K	Z
LOS ANGELES	CA	90047	TRANSPORTATION	730	A	B	BB	B	B	Z
Los Angeles	CA	90047	Streets	700	A	H	H	H	H	CC
Los Angeles	CA	90047	Community Development	730	A	H	H	H	H	H
Los Angeles	CA	90047	Public Works	730	A	H	H	H	H	H
Los Angeles	CA	90056	IT	730	A	H	H	H	H	Z
Los Angeles	Ca	90056	Public Works	800	A	H	H	H	H	Z
Los Angeles	CA	90056	Public works	700	A	AA	H	H	H	Z
Los Angeles	CA	90061	Public Works	700	A	J	J	J	J	Z
Los Angeles	CA	90061	PRCS	200	P	H	H	H	H	H
Los Angeles	CA	90062	Finance	730	A	K	K	K	K	Z
Los Angeles	CA	90063	PRCS	829	A	H	J	H	J	H
Los Angeles	CA	90064	Community Development	730	A	K	K	K	K	Z
Los Angeles	CA	90066	PRCS	330	P	D	D	D	D	D
Los Angeles	CA	90066	Comm Dev	730	A	H	H	H	H	H
Los Angeles	CA	90066	Public works	700	A	H	H	H	H	H
los Angeles	CA	90066	Parks	600	A	E	E	E	E	E
Los Angeles	CA	90066	PD	730	A	H	H	H	H	Z
Los Angeles	CA	90066	PRCS	200	P	B	B	B	B	B
Los Angeles	CA	90066	PRCS	245	P	H	H	H	H	H
Los Angeles	CA	90066	Transportation	430	P	H	H	H	H	H
Los Angeles	CA	90066	PRCS	830	A	H	H	H	H	H
Los Angeles	CA	90066	Public Works	730	A	H	H	H	E	Z
Los Angeles	CA	90066	Comm Dev	730	A	H	E	E	H	Z
Los Angeles	CA	90066	City Manager's Office	730	A	H	H	H	H	Z
W. Hollywood	CA	90069	POLICE`	730	A	CC	CC	H	H	H
Compton	CA	90220	Streets	700	A	K	K	K	K	K
Compton	CA	90220	Transportation	730	A	H	H	H	H	Z
Compton	CA	90220	PRCS	600	A	A	A	A	A	A
compton	CA	90222	Public Works	700	A	H	H	H	H	H
Culver City	CA	90230	Information Technology	730	A	H	H	H	H	H
Culver City	CA	90230	Transit garage	400	P	H	H	H	H	Z
Culver City	CA	90230	Police	530	A	H	H	H	H	Y
culver city	CA	90230	transportation	130	P	H	H	H	H	Z
Culver City	CA	90230	PRCS	200	P	H	H	H	H	H
Culver City	CA	90230	Finance	730	A	BB	H	H	H	Z
CULVER CITY	CA	90230	ELECTRICAL	700	A	D	D	D	D	D
Culver City	CA	90230	Police	700	A	H	H	H	H	H
Culver City	CA	90230	Community Development	730	A	H	H	H	H	Z
CULVER CITY	CA	90230	FINANCE	730	A	B	B	B	B	Z
Culver City	CA	90230	PRCS	200	P	E	E	E	E	E
culver city	CA	90230	finance	830	A	H	H	H	H	H
los angeles	CA	90230	public works	700	A	H	H	H	H	Z
Culver City	CA	90230	Public Works	700	A	H	H	H	H	Z
Culver City	CA	90230	PRCS	1000	A	H	H	H	H	Z



Culver City	CA	90230	Police / Forensics	530	A	Y	H	H	H	H
Culver City	CA	90230	Finance	730	A	H	H	H	H	Z
CULVER CITY	CA	90230	FINANCE	900	A	H	H	H	H	Z
Culver City	CA	90230	Public Works	700	A	H	H	H	H	H
Culver City	CA	90230	POLICE	700	A	H	H	H	H	Y
Culver City	CA	90230	PRCS	600	A	E	E	E	E	E
Culver City	CA	90230	Parks	600	A	BB	BB	BB	BB	E
Culver City	CA	90230	Public Works	600	A	E	E	E	E	E
Culver City	CA	90232	PRCS	200	P	H	H	J	H	H
Culver City	CA	90232	Fleet Services	830	A	J	J	J	J	L
Culver City	CA	90232	PRCS	845	A	H	H	H	H	H
culver city	CA	90232	police	600	A	H	H	H	E	Y
Culver City	CA	90232	Administrative Services	830	A	J	J	J	J	Z
Culver City	CA	90232	Aquatics	500	A	E	D	E	D	CC
Culver City	CA	90232	Public Works	700	A	D	D	D	D	Z
Culver City	CA	90232	Administration	730	A	H	H	H	H	H
Culver	CA	90232	PRCS	330	P	G	G	G	G	G
Culver City	CA	90232	PRCS	730	A	H	H	H	H	BB
Culver City	CA	90232	Finance	730	A	H	H	H	H	H
Culver City	CA	90232	Transportation	800	A	H	H	H	J	D
Culver City	CA	90232	Public works Dept	700	A	D	D	D	D	Z
Culver City	CA	90232	Community Development	730	A	H	D	H	D	Z
Culver City	CA	90232	Building Safety	730	A	J	J	J	J	Z
Culver City	CA	90232	PRCS	900	A	H	H	H	H	Z
Culver City	CA	90232	Police	700	A	H	H	D	D	Y
Culver City	CA	90232	Police department	700	P	X	H	H	H	X
Culver City	CA	90232	PRCS	730	A	H	H	H	H	Z
Culver City	CA	90232	PRCS	330	P	D	D	D	D	D
Culver City	CA	90232	Public Works	730	A	E	H	E	E	Z
CULVER CITY	CA	90232	PURCHSING	530	A	H	H	H	H	H
Culver City	CA	90232	Police	730	A	H	J	J	J	Y
culver city	CA	90232	PRSC	845	A	D	D	D	D	D
Culver City	CA	90232	Administration	730	A	D	H	H	D	Z
Downey	CA	90241	Police	600	A	CC	H	H	H	H
Downey	CA	90242	Building Maintenance	700	A	J	J	J	J	Z
El Segundo	CA	90245	PD	530	A	H	H	H	H	Y
EL SEGUNDO	CA	90245	POLICE DEPARTMENT	700	P	X	X	H	H	H
El Segundo	CA	90245	PD	600	A	X	X	H	H	H
El Segundo	CA	90245	Community Development	930	A	H	H	H	H	Z
Gardena	CA	90247	Fire	730	A	H	H	H	H	Z
Gardena	CA	90249	Equipment Maintenance	600	A	H	H	H	H	H
Gardena	CA	90249	Transportation	500	A	J	H	J	H	J
gardena	CA	90249	POLICE	800	A	H	H	H	H	Y
hawthorne	CA	90250	public works	730	A	H	H	H	H	Z
Hawthorne	CA	90250	Police Records	600	P	X	X	H	H	H
Hawthorne	CA	90250	Community Development	730	A	B	B	B	B	Z
Hawthorne	CA	90250	Fire	700	A	X	X	CC	CC	H
hermosa beach	CA	90254	Fire	700	A	X	X	CC	H	G
Lawndale	CA	90260	Police	600	A	H	H	H	H	A
Lynwood	CA	90262	CCPD	330	A	H	H	H	H	CC
Lynwood	CA	90262	Fleet Maintenance	600	A	J	J	J	J	J
Lynwood	CA	90262	Public Works	700	A	J	J	J	J	CC
Lynwood	CA	90262	PRCS	600	A	H	H	H	H	Z
Malibu	CA	90265	Police Department	700	P	CC	CC	X	X	H
Manhattan Bch	CA	90266	Community Development	730	A	H	H	H	H	Z
Redondo Beach	CA	90277	IT	730	A	A	A	A	A	Z
Redondo Beach	CA	90277	Fire Department	700	A	H	G	G	X	X
Redondo Beach	CA	90278	Public Works	100	P	H	H	H	H	Z
Marina Del Rey	CA	90292	Fire	545	A	CC	X	X	H	G
Marina del Rey	CA	90292	City Attorney	730	A	BB	BB	BB	BB	Z

Playa del Rey	CA	90293	Fire	630	A	H	H	H	H	Z
inglewood	CA	90301	public works	700	A	H	H	H	H	Z
INGLEWOOD	CA	90301	STREET DEPT.	700	A	H	H	H	H	H
inglewood	CA	90301	public works	700	A	H	I	I	I	I
inglewood	CA	90302	prcs	800	A	B	J	B	C	J
Inglewood	CA	90302	PRCS	600	A	J	BB	J	J	H
inglewood	CA	90302	sewers	700	A	J	H	J	J	CC
Inglewood	CA	90302	Public works Dept	500	A	H	H	H	AA	Z
Inglewood	CA	90302	Housing	730	A	H	H	H	H	Z
Inglewood	CA	90302	Transpertation	600	P	H	H	H	H	H
Inglewood	CA	90304	Police	530	A	H	H	H	H	Y
Inglewood	CA	90305	PRCS	845	A	H	H	H	H	H
inglewood	CA	90305	prcs	700	A	H	H	H	H	H
Inglewood	CA	90305	Fire	730	A	H	H	H	H	Z
INGLEWOOD	CA	90305	FINANCE	730	A	H	H	H	H	Z
Santa Monica	CA	90404	Police	530	A	H	H	H	H	Y
Santa Monica	CA	90404	Comm Dev	730	A	C	BB	BB	C	Z
Santa Monica	CA	90404	PRCS	1000	A	CC	CC	H	H	H
Santa Monica	CA	90405	Community Development	700	A	H	H	H	C	Z
Santa Monica	Ca	90405	Public Works	730	A	H	H	H	H	Z
Santa Monica	CA	90405	Police	700	P	H	H	H	X	X
Torrance	CA	90501	Police	700	P	H	CC	CC	CC	CC
Torrance	CA	90503	City Attorney	830	A	H	H	H	H	Z
torrance	CA	90503	maintenance garage	500	P	H	H	H	CC	CC
TORRANCE	CA	90503	POLICE DEPARTMENT	600	A	Y	H	H	H	H
Torrance	CA	90503	Fire	700	A	CC	X	X	H	G
torrance	CA	90503	Fire	700	A	E	G	G	X	X
Torrance	CA	90503	Finance	700	A	K	K	K	K	Z
Torrance	CA	90504	Culver City Department	330	A	CC	H	H	H	H
TORRANCE	CA	90504	PUBLIC WORKS	730	A	H	H	H	H	H
torrance	CA	90505	police department	800	A	H	H	H	H	Y
Torrance	CA	90505	Records	600	A	H	H	CC	CC	CC
Whittier	CA	90605	Police	400	P	H	H	H	H	Y
La Palma	CA	90623	Fire	700	A	X	X	CC	CC	H
LA MIRADA	CA	90638	FINANCE	530	A	BB	BB	H	H	H
NorWalk	CA	90650	Parks & PlayGrounds	1145	A	C	C	C	C	C
Norwalk	CA	90650	Transportation	1130	A	J	J	J	J	J
PICO RIVERA	CA	90660	POLICE	600	A	Y	H	H	H	H
Pico Rivera	CA	90660	public works	500	A	H	H	H	H	H
Bellflower	CA	90706	Administration	730	A	H	H	H	H	Z
Lakewood	CA	90712	PD	700	P	H	CC	CC	CC	H
Lakewood	CA	90712	PRCS	730	A	H	H	H	H	Z
LAKEWOOD	CA	90712	POLICE	600	P	J	J	X	X	CC
Lakewood	CA	90712	Police Department	630	A	Y	L	L	L	L
Lakewood	CA	90712	Police	600	A	Y	L	L	L	L
Lakewood	CA	90713	Transportation	500	A	H	H	H	AA	AA
lakewood	CA	90713	police	700	A	X	X	H	H	H
Lakewood	CA	90713	POLICE	700	P	H	H	X	X	CC
Lomita	CA	90717	Community Development	730	A	H	H	H	H	H
Los Alamitos	CA	90720	Fire Department	700	A	G	G	H	X	X
Paramount	CA	90723	Publicworks	700	A	H	H	H	H	H
San Pedro	CA	90731	Transportation	600	A	Z	J	J	H	H
carson	CA	90745	Transportation	500	P	H	H	H	H	H
Carson	CA	90745	Police	400	P	CC	CC	CC	H	H
Long Beach	CA	90806	Police	1100	A	H	H	H	AA	Y
Long Beach	CA	90807	Public Works Steets	700	A	K	K	K	K	J
Long Beach	CA	90807	Community Development	730	A	A	A	A	A	Z
Long Beach	CA	90815	Transportation	730	A	A	A	A	A	A
Long Beach	CA	90815	Fire	700	A	X	H	G	G	X
Long Beach	CA	90815	Fire department	700	A	AA	AA	X	X	CC

La Canada	CA	91011	Finance	730	A	B	B	B	B	Z
Monrovia	CA	91016	Fire	700	A	H	H	H	H	Z
South Pasadena	CA	91030	Administration	730	A	H	H	H	H	Z
Winnetka	CA	91306	Public Works	700	A	I	I	BB	I	Z
West Hills	CA	91307	Park and Recreation	630	A	H	H	H	H	H
Chatsworth	CA	91311	PRCS	430	A	H	H	H	H	H
Newbury Park	CA	91320	Fire Supression	700	A	CC	X	X	H	H
Newbury Park	CA	91320	Fire Department	700	A	Z	H	J	J	J
Newbury Park	CA	91320	Fire	700	A	X	X	H	G	G
Northridge	CA	91324	Fire	700	A	X	X	H	G	G
Lake View Terr	CA	91342	Finance	730	A	Z	H	H	H	H
Sylmar	CA	91342	Police Department	700	P	CC	H	H	H	CC
North Hills	CA	91343	PRCS	830	A	B	B	B	B	B
Santa Clarita	CA	91350	Transportation	200	P	CC	H	H	H	H
Santa Clarita	CA	91350	Police	600	A	Y	H	H	H	H
Canyon Country	CA	91351	Finance Department	730	A	A	A	A	A	Z
Santa Claria	CA	91351	Public Works	600	A	H	H	H	H	Z
Canyon Country	CA	91351	Police Department	600	A	H	H	H	H	Y
Valencia	CA	91354	Fire	700	A	X	X	H	G	G
Valencia	CA	91354	Fire	700	A	H	H	CC	CC	X
valencia	CA	91354	POLICE	700	P	H	H	H	H	H
Valencia	CA	91354	Police	600	A	H	H	H	H	Y
Valencia	CA	91355	Police	700	A	Y	H	H	H	H
Tarzana	CA	91356	Community Development	700	A	BB	A	A	A	Z
Westlake Village	CA	91362	Police	700	A	J	J	J	J	Y
Westlake Village	CA	91362	Administration	700	A	J	J	J	J	Z
Woodland Hills	CA	91364	EPO	630	A	H	H	H	H	CC
Steveson Ranch	CA	91381	Police Department	600	A	H	H	H	H	Y
Castaic	CA	91384	Police	700	A	X	X	H	H	H
Castaic	CA	91384	Police	700	P	CC	CC	H	H	H
Valley Glen	CA	91401	Public Works	730	A	H	H	AA	AA	Z
van nuys	CA	91406	streets	700	A	H	H	H	H	H
Van Nuys	CA	91406	Police Department	600	A	Y	H	H	H	H
ENCINO	CA	91436	POLICE	400	A	H	H	H	X	X
Burbank	CA	91504	Fire	700	A	X	X	G	G	H
Rancho Cucamonga	CA	91730	Police department	400	P	CC	CC	H	H	H
El Monte	CA	91731	Transportation	730	A	C	C	C	C	C
Alta Loma	CA	91737	Police	700	A	X	X	H	H	H
Glendora	CA	91741	Transportation	300	P	H	H	H	H	CC
W. Covina	CA	91744	PRCS	600	A	J	J	J	J	Z
hacienda heights	CA	91745	Police	700	A	H	H	I	CC	CC
hacienda heights	CA	91745	Accounting	730	A	H	H	H	H	H
rowland heights	CA	91748	information department	830	A	A	A	A	A	A
la verne	CA	91750	police	630	A	Y	H	H	H	H
POMONA	CA	91766	Fire	700	A	CC	CC	X	X	H
West Covina	CA	91790	Police Department	600	A	H	BB	J	J	Y
West Covina	CA	91790	Police Department	600	A	Y	J	J	J	H
West Covina	CA	91790	Police	400	P	H	H	H	H	H
west.covina	CA	91791	Parks	600	A	J	J	J	J	J
West Covina	CA	91791	Police Department	700	P	X	H	H	H	X
Alhambra	CA	91803	Information Technology	600	A	A	A	A	A	Y
Oceanside	CA	92054	Fire	700	A	H	H	X	X	CC
Grand Terrace	CA	92313	Transportation	400	A	H	H	H	H	Z
Los Angeles	CA	92335	Information Technology	800	A	J	J	J	J	Z
fontana	CA	92336	public works	500	A	H	H	H	H	Z
Temecula	CA	92592	Fire	700	A	H	H	H	H	Y
Irvine	CA	92620	Fire	700	A	X	X	G	G	H
Huntington Bch	CA	92646	POLICE	530	A	Y	H	H	H	H
Huntington Bch	CA	92646	Fire	700	A	X	X	H	G	G

Brea	CA	92821	FIRE	700	A	X	X	H	H	H
Brea	CA	92821	FIRE	700	A	CC	X	X	H	G
Fullerton	CA	92832	Fire Department	700	A	H	H	X	X	CC
Fullerton	CA	92833	community development	730	A	H	J	J	BB	Z
garden grove	CA	92845	fire	700	A	H	H	X	X	CC
Orange	CA	92869	Fire	700	A	X	X	H	G	G
Yorba Linda	CA	92886	Transportation	1030	A	H	H	H	H	Z
yorba linda	CA	92887	fire	600	A	X	H	G	G	X
Ventura	CA	93001	Fire	700	A	CC	CC	H	H	CC
Camarillo	CA	93010	Fire Sta. 1	700	A	H	H	X	X	CC
Camarillo	CA	93012	Fire	700	A	X	X	H	G	G
Simi Valley	CA	93063	Fire	700	A	X	X	H	G	G
Simi Valley	CA	93063	Fire	700	A	H	G	G	X	X
Frazier Park	CA	93225	Fire	700	A	H	G	G	X	X
Acton	CA	93510	Fire	700	A	H	H	H	X	X
Lancaster	CA	93535	Streets Dept.	700	A	B	B	B	B	CC
Lancaster	CA	93536	Public Works	730	A	H	H	H	H	Z
Lancaster	CA	93536	Police	400	A	H	H	H	Y	H
Tehachapi	CA	93561	Police Department	700	A	H	G	G	H	Y
Auburn	CA	95603	Fire	700	A	X	X	CC	CC	C

Source: City of Culver City (City), 2020a. Employee Commute Data. Email correspondence with Pam Jackson. May 15, 2020.

# EMFAC Outputs and Mobile Source Emission Factors

Source: EMFAC2017 (v1.0.3) Emission Rates

Region Type: Sub-Area

Region: Los Angeles (SC)

Calendar Year: 2019

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

**Table A.2-14: EMFAC2017 Outputs**

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	VMT	Trips	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
Los Angeles (SC)	2019	HHDT	Aggregate	Aggregate	Gasoline	5745.854855	1403.313786	2249.302399	0	55.39814718	0.161519196	0	0.000206911	0.181327091	0	0.027968806
Los Angeles (SC)	2019	HHDT	Aggregate	Aggregate	Diesel	6393903.432	526213.356	1559.879928	11004.21288	0	0.00866195	0.218345273	0	0.245191402	1.729709021	0
Los Angeles (SC)	2019	HHDT	Aggregate	Aggregate	Natural Gas	84546.45018	8105.327856	3551.489397	4291.994446	0	5.76050497	1.373193566	0	0.723994347	0.874951145	0
Los Angeles (SC)	2019	LDA	Aggregate	Aggregate	Gasoline	151393815.7	18027338.26	298.7343569	0	59.21908046	0.004776325	0	0.065040293	0.006139167	0	0.028677838
Los Angeles (SC)	2019	LDA	Aggregate	Aggregate	Diesel	1131318.278	131436.7404	232.9175736	0	0	0.001450306	0	0	0.036611399	0	0
Los Angeles (SC)	2019	LDA	Aggregate	Aggregate	Electricity	1868211.138	242582.0984	0	0	0	0	0	0	0	0	0
Los Angeles (SC)	2019	LDT1	Aggregate	Aggregate	Gasoline	15846032.62	1897905.486	346.1811807	0	69.14885612	0.011932262	0	0.09469186	0.012541729	0	0.032796473
Los Angeles (SC)	2019	LDT1	Aggregate	Aggregate	Diesel	8765.049263	1239.756272	480.0092028	0	0	0.01071812	0	0	0.075450762	0	0
Los Angeles (SC)	2019	LDT1	Aggregate	Aggregate	Electricity	40706.92535	5745.878809	0	0	0	0	0	0	0	0	0
Los Angeles (SC)	2019	LDT2	Aggregate	Aggregate	Gasoline	50631402.19	6073756.947	383.0370054	0	77.23683502	0.007388051	0	0.08656076	0.009911478	0	0.038669607
Los Angeles (SC)	2019	LDT2	Aggregate	Aggregate	Diesel	284822.9329	30920.53937	318.6951885	0	0	0.001212726	0	0	0.050094446	0	0
Los Angeles (SC)	2019	LDT2	Aggregate	Aggregate	Electricity	220572.3339	32115.47304	0	0	0	0	0	0	0	0	0
Los Angeles (SC)	2019	LHDT1	Aggregate	Aggregate	Gasoline	3979863.121	1588663.959	834.5671165	123.1855284	19.48944937	0.010871135	0.129221376	0.029813592	0.01688731	0.003274727	0.043951752
Los Angeles (SC)	2019	LHDT1	Aggregate	Aggregate	Diesel	2199080.991	625132.3159	485.7519615	136.0090051	0	0.003867899	0.005098128	0	0.076353444	0.021378722	0
Los Angeles (SC)	2019	LHDT2	Aggregate	Aggregate	Gasoline	621230.0872	257862.6118	957.766235	142.2918058	22.04460563	0.008633069	0.129591953	0.030001698	0.018309663	0.003191827	0.04345315
Los Angeles (SC)	2019	LHDT2	Aggregate	Aggregate	Diesel	855069.0774	252008.2701	537.4220952	217.9515598	0	0.003772374	0.005098128	0	0.084475269	0.03425895	0
Los Angeles (SC)	2019	MCY	Aggregate	Aggregate	Gasoline	1122451.783	310141.3425	223.4964842	0	60.7603992	0.385779257	0	0.238710976	0.065649792	0	0.015024969
Los Angeles (SC)	2019	MDV	Aggregate	Aggregate	Gasoline	32077377.96	4105187.128	465.3987626	0	94.4560424	0.01085702	0	0.107320091	0.01269637	0	0.04237565
Los Angeles (SC)	2019	MDV	Aggregate	Aggregate	Diesel	582073.9425	68145.51042	413.2517983	0	0	0.000912888	0	0	0.064957428	0	0
Los Angeles (SC)	2019	MDV	Aggregate	Aggregate	Electricity	41902.69663	6070.767129	0	0	0	0	0	0	0	0	0
Los Angeles (SC)	2019	MH	Aggregate	Aggregate	Gasoline	187915.2952	1887.502947	1738.194876	0	27.22602746	0.021217234	0	0.034586239	0.029541751	0	0.032867431
Los Angeles (SC)	2019	MH	Aggregate	Aggregate	Diesel	52784.32924	494.0886279	998.0838023	0	0	0.003646456	0	0	0.156884875	0	0
Los Angeles (SC)	2019	MHDT	Aggregate	Aggregate	Gasoline	787937.6444	287302.7844	1743.520757	558.0844527	41.42434282	0.023916186	0.253111268	0.045212378	0.035873016	0.006992611	0.028638547
Los Angeles (SC)	2019	MHDT	Aggregate	Aggregate	Diesel	3792666.462	603492.1459	1026.840316	891.1422906	0	0.009081344	0.007036009	0	0.161404998	0.140075158	0
Los Angeles (SC)	2019	OBUS	Aggregate	Aggregate	Gasoline	177590.6172	80418.14652	1754.233086	386.3037845	27.61013917	0.017901209	0.194736118	0.032782807	0.030721152	0.005301177	0.02536242
Los Angeles (SC)	2019	OBUS	Aggregate	Aggregate	Diesel	217614.5591	28954.25874	1256.197891	3130.153758	0	0.011741817	0.076911638	0	0.197456815	0.492016581	0
Los Angeles (SC)	2019	SBUS	Aggregate	Aggregate	Gasoline	45425.07347	4300.885628	893.6235985	2658.526613	49.14905686	0.014959143	2.401988052	0.05839889	0.027137581	0.084898965	0.053532509
Los Angeles (SC)	2019	SBUS	Aggregate	Aggregate	Diesel	106571.1621	38732.79918	1254.739689	3666.68021	0	0.005913784	0.014958972	0	0.197227606	0.576351067	0
Los Angeles (SC)	2019	UBUS	Aggregate	Aggregate	Gasoline	32414.88694	1792.642509	2114.039264	0	90.01609632	0.005952661	0	0.123071301	0.027793249	0	0.076068054
Los Angeles (SC)	2019	UBUS	Aggregate	Aggregate	Diesel	1580.590656	56.7776	1665.244244	0	0	0.072802876	0	0	0.261753205	0	0
Los Angeles (SC)	2019	UBUS	Aggregate	Aggregate	Electricity	1070.403311	48	0	0	0	0	0	0	0	0	0
Los Angeles (SC)	2019	UBUS	Aggregate	Aggregate	Natural Gas	429071.0422	16211.93478	1973.232221	0	0	7.216095714	0	0	0.402256297	0	0

Source: CARB, EMFAC2017. <https://arb.ca.gov/emfac/emissions-inventory>

Table A.2-15: EMFAC2017 Outputs Converted to Common Units

Vehicle Category	Fuel	Concatenate	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
HHDT	Gasoline	HHDTGasoline	2249.302399	0	13.52992472	0	5.0534E-05	0.181327091	0	0.006830839
HHDT	Diesel	HHDTDiesel	1559.879928	92.06400994	0	0.001826731	0	0.245191402	0.01447118	0
HHDT	Natural Gas	HHDTNatural Gas	3551.489397	105.504201	0	0.03375533	0	0.723994347	0.021507722	0
LDA	Gasoline	LDAGasoline	298.7343569	0	7.051558811	0	0.007744724	0.006139167	0	0.003414836
LDA	Diesel	LDA Diesel	232.9175736	0	0	0	0	0.036611399	0	0
LDA	Electricity	LDAElectricity	0	0	0	0	0	0	0	0
LDT1	Gasoline	LDT1Gasoline	346.1811807	0	8.282072655	0	0.0113414	0.012541729	0	0.003928088
LDT1	Diesel	LDT1Diesel	480.0092028	0	0	0	0	0.075450762	0	0
LDT1	Electricity	LDT1Electricity	0	0	0	0	0	0	0	0
LDT2	Gasoline	LDT2Gasoline	383.0370054	0	9.265351994	0	0.010383853	0.009911478	0	0.004638817
LDT2	Diesel	LDT2Diesel	318.6951885	0	0	0	0	0.050094446	0	0
LDT2	Electricity	LDT2Electricity	0	0	0	0	0	0	0	0
LHDT1	Gasoline	LHDT1Gasoline	834.5671165	3.300507784	7.779711223	0.003462226	0.011900856	0.01688731	8.77397E-05	0.017544464
LHDT1	Diesel	LHDT1Diesel	485.7519615	3.073697896	0	0.000115214	0	0.076353444	0.000483143	0
LHDT2	Gasoline	LHDT2Gasoline	957.766235	3.964358766	9.150361036	0.003610531	0.012453222	0.018309663	8.89268E-05	0.018036703
LHDT2	Diesel	LHDT2Diesel	537.4220952	5.106653186	0	0.00011945	0	0.084475269	0.000802695	0
MCY	Gasoline	MCYGasoline	223.4964842	0	16.78852674	0	0.065957526	0.065649792	0	0.004151505
MDV	Gasoline	MDVGasoline	465.3987626	0	12.08826139	0	0.013734572	0.01269637	0	0.005423136
MDV	Diesel	MDVDiesel	413.2517983	0	0	0	0	0.064957428	0	0
MDV	Electricity	MDVElectricity	0	0	0	0	0	0	0	0
MH	Gasoline	MHGasoline	1738.194876	0	0.27347006	0	0.000347399	0.029541751	0	0.000330135
MH	Diesel	MHDiesel	998.0838023	0	0	0	0	0.156884875	0	0
MHDT	Gasoline	MHDTGasoline	1743.520757	10.17054511	15.10440467	0.004612706	0.016485622	0.035873016	0.000127434	0.010442367
MHDT	Diesel	MHDTDiesel	1026.840316	14.50328134	0	0.000114511	0	0.161404998	0.002279714	0
OBUS	Gasoline	OBUSGasoline	1754.233086	8.742976817	12.50266626	0.004407343	0.014844999	0.030721152	0.000119978	0.011484834
OBUS	Diesel	OBUSDiesel	1256.197891	42.32980694	0	0.001040094	0	0.197456815	0.006653656	0
SBUS	Gasoline	SBUSGasoline	893.6235985	62.9279054	4.653475628	0.056855582	0.005529258	0.027137581	0.002009577	0.005068505
SBUS	Diesel	SBUSDiesel	1254.739689	115.4812899	0	0.00047113	0	0.197227606	0.018152051	0
UBUS	Gasoline	UBUSGasoline	2114.039264	0	4.978165773	0	0.00680622	0.027793249	0	0.004206796
UBUS	Diesel	UBUSDiesel	1665.244244	0	0	0	0	0.261753205	0	0
UBUS	Electricity	UBUSElectricity	0	0	0	0	0	0	0	0
UBUS	Natural Gas	UBUSNatural Gas	1973.232221	0	0	0	0	0.402256297	0	0

Conversion to Common Units (g/mile)

EMFAC Category	Emission Type
RUNEX	Running Exhaust
IDLEX	Idling Exhaust
STREX	Start-up Exhaust

EMFAC Category	Vehicle Type
LDA	Light Duty Auto
LDT1	Light Duty Truck 1
LDT2	Light Duty Truck 2
MDV	Medium Duty Vehicle
MCY	Motorcycle
LHDT1	Light Heavy Duty Truck 1
LHDT2	Light Heavy Duty Truck 2
MH	Motorhome
MHDT	Medium Heavy Duty Truck
HHDT	Heavy Heavy Duty Truck
OBUS	Other Bus
SBUS	School Bus
UBUS	Urban Transit Bus

# City of Culver City Municipal GHG Inventory - Constants / Factors

Table A.2-16: Electricity Emission Factors by Utility

Utility	2019		
	Emission Factors (lbs/MWh)		
	CO2	CH4	N2O
CPA - Green	0	0	0
SCE <sup>1</sup>	467.38	0.000	0.00000

1. Edison International, 2018. ESG/Sustainability Template - Section 2: Quantitative Information. <https://www.edison.com/content/dam/eix/documents/sustainability/eix-esg-pilot-quantitative-section-sce.pdf> This emission factor is a CO2e rate

Table A.2-17: GHG Global Warming Potentials

GHG	GWP <sup>1</sup>
CO2	1
CH4	25
N2O	298

1. IPCC AR4, 2007. <https://www.ipcc.ch/reports/>

Table A.2-18: Natural Gas GHG Emission Factors

GHG	Natural Gas EF (kg/MMbtu) <sup>1</sup>
CO2	53.02
CH4	0.005
N2O	0.0001

1. USEPA, 2014. Emission Factors for Greenhouse Gas Inventories. [https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

Table A.2-19: Water Supply, Gasoline, and Diesel Emission Factors

Water Supply Electricity Intensity Factor (kWh/acre-foot) <sup>1</sup>	Gasoline Emission Factor (MTCO2e per gallon) <sup>2</sup>	Diesel Emission Factor (MTCO2e per gallon) <sup>2</sup>
1,938	0.00878	0.01021

1. Metropolitan Water District of Southern California, 2015. Urban Water Management Plan. [http://www.mwdh2o.com/PDF\\_About\\_Your\\_Water/2.4.2\\_Regional\\_Urban\\_Water\\_Management\\_Plan.pdf](http://www.mwdh2o.com/PDF_About_Your_Water/2.4.2_Regional_Urban_Water_Management_Plan.pdf)

2. USEPA, 2014. Emission Factors for Greenhouse Gas Inventories. [https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

Table A.2-20: Natural Gas Emission Factor and Fuel Conversions

Natural Gas Emission Factor (MTCO2e per GGE) <sup>1</sup>	BTU per Gallon of Gasoline <sup>1</sup>	BTUs per Therm
0.00530	125,000	99,976

1. USEPA, 2014. Emission Factors for Greenhouse Gas Inventories. [https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

Table A.2-21: General Conversions

Conversions			
1	lb	2205	MT
1	kWh	0.001	MWh
1	therm	0.1	MMbtu
1	kg	0.001	MT
100	cubic feet	0.002	acre-feet

Table A.2-22: Culver City Employment

Culver City Employment		
Employee Type	2017	2019
Full Time	705	708
Part Time	213	253
<b>FTE</b>	<b>811.5</b>	<b>834.5</b>
<b>Growth Rate</b>	<b>-</b>	<b>1.028</b>

Source:

City of Culver City (City), 2020c. Part- and Full-time Employment 2017-2019. Email correspondence with Joe Susca. June 3, 2020.